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Analysis of Hausa Plosive Sounds Pronounced in Disyllabic Hausa Words by Igbo and Yorùbá Speakers

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Abstract

The phonetic challenges faced by second language learners in acquiring the phonetic features of a new language have implications for language teaching and learning in general. This paper examines the phonetic characteristics of plosive sounds in Hausa, specifically how they are pronounced in disyllabic Hausa words by Igbo and Yorùbá speakers learning Hausa as an additional language other than their mother tongue. Using a mixed mode (quantitative and qualitative approaches), ten (10) participants (5 from each group) who were 18 years and above (males and females), and willing to participate voluntarily in the study, were selected based on a random sampling technique. Extracted wordlist from Bargery's (1934) English Hausa Dictionary and a structured questionnaire were used as research instruments. The data were analysed using supra-segmental phonology and explained within the framework of Flege and Bohn's (2020) 'Revised Speech Learning Model'. The results show that even though some of the participants could accurately produce some Hausa plosives, yet, issues related to substitution of sounds, aspiration distinction, and phonetic transfer were identified. Both Igbo and Yorùbá speakers' learners of Hausa have specific difficulties in their pronunciations, especially due to cross-linguistic influences impacting their pronunciations. Thus, the paper also reveals the importance of cultural and linguistic backgrounds in the production of speech sounds, as well as the significance of the study in general.

Keywords: Bilabial, plosive, phonetic, production, learning

Introduction

The United Nations Educational, Scientific, and Cultural Organization (UNESCO) (2001), recognises the value of language and considers it an integral part of our lives. Udoh (2003) says that several people, particularly linguists and other researchers who appreciate the importance of language, have often decried the lack of a useful and

persistent language survey for Nigerian languages. Pronunciation of Hausa plosives by Igbo and Yorùbá speakers learning Hausa as a second language can vary based on their familiarity with the target language and their native language phonology. Individual differences and accents also play an important role in the pronunciation of Hausa plosive sounds by Igbo and Yorùbá speakers, learners of Hausa. While some Igbo and Yorùbá speakers may find it a bit challenging when producing the Hausa plosive sounds, the native Hausa speakers produce Hausa sounds accurately with minimal effort due to their familiarity with such sounds in their mother tongue. In Igbo and Yorùbá, for instance, plosive sounds are not distinguished based on voicing, unlike the way it is in Hausa (Amfani et al., 2011; Udoh, 2004; Opoola, 2002). This and many more reasons may result in confusion and mispronunciation of words in the affected language.

The intersection of language acquisition and phonetics presents a fascinating area of study, particularly in the context of second language learning. This focus is on the specific challenges faced by Igbo and Yorùbá speakers learning Hausa as a second language, especially in pronouncing disyllabic Hausa words. The difficulties encountered in pronouncing certain Hausa plosives, primarily due to differences in articulation and voicing, affect not only the communication of Hausa learners but also their socio-cultural and socio-economic activities (Crozier & Blench, 1992). While Hausa is an Afro-Asiatic language, Igbo and Yorùbá originate from the Benue-Congo language phylum. Nigerian languages have been categorised into two groups: 'major' and 'minor', with Hausa, Igbo, and Yorùbá classified as major languages, while the 'minor' group includes Nupe, Gwari, Ijaw, Efik, Tiv, Jukun, Ikale, Fulfulde, Ogoni, and others. Hausa is primarily spoken in northern Nigeria, whereas Igbo and Yorùbá are spoken in the southwest and southeast of Nigeria, respectively (NPE, 2004; Grimes, 2000).

Understanding the phonetic distinctions for learning Hausa as a second language is essential and beneficial for learners, as the different sound systems of the Igbo and Yorùbá languages affect how learners perceive and produce Hausa plosives (Sani, 2005). While the intuitive Hausa speaker pronounces Hausa sounds with minimal effort, some Igbo and Yorùbá speakers find it challenging to produce the Hausa plosive sounds, particularly when pronouncing disyllabic Hausa words. The description of consonant sounds in languages, especially the plosive sounds, is based on three parameters: place of articulation, manner of articulation, and the state of the glottis (Muhammad, 2021; Shuaibu, 2018; Osisanwo, 2009; Fatusin, 2007).

The place of articulation refers to the speech apparatus used for sound production. In Hausa for instance, the production of /b/ and /m/, which are all bilabial sounds involve

the upper and lower lips coming together, even though /b/ is a plosive sound while /m/ is a nasal sound based on their manners of articulations. The manner of articulation concerns the nature of the air obstruction. While certain sounds require a complete closure of the air passage, some sounds have their air passage slightly obstructed. The degree or level of obstruction or constriction of the air is what is referred to as the ‘manner of articulation’ (Opoola, 2002). The state of the glottis relates to how the human glottis is positioned, especially when consonant sounds are produced. It reveals what occurs to the glottis and the vocal cords during sound production. Speech sounds can either be voiced or voiceless, depending on the states of the glottis at the time they are produced (Osisanwo, 2009; Fatusin, 2007).

The present study is a data driven research aimed at investigating the Hausa plosive sounds produced by Igbo and Yorùbá native speakers when learning Hausa as a second language with the view to addressing the pronunciation challenges faced by the learners, in line with the postulation of Flege and Bohn’s (2020) ‘Revised Speech Learning Model’. The significance of this study lies not only in enhancing language proficiency for speakers of these ethnic backgrounds but also in contributing to the broader field of applied linguistics. By exploring the phonological transfer that occurs when native speakers of Igbo and Yorùbá attempt to master the Hausa plosive sounds, especially in pronunciation, this study illuminates the complexities of language learning and the implications for teaching methodologies in multilingual contexts.



Figure 1. Flege and Bohn’s (2020) ‘Revised Speech Learning Model’ (SLM-r)

Literature Review

Language acquisition in multilingual settings, especially in West Africa, has garnered a lot of scholarly interest, particularly when it comes to phonological transfer and learning a second language (L2). Hausa, a West Chadic language widely spoken in Nigeria and Niger, serves as a crucial lingua franca, enabling communication between different ethnic groups, facilitating trade, and supporting Islamic education (Muhammad, 2021). While Igbo and Yorùbá, both are part of the Benue-Congo language family, boast of millions of native speakers (Yusuf, 2007), the socio-political and economic importance of Hausa language makes it essential for the speakers of

other ethnic groups such as Igbo and Yorùbá to learn it (Hausa) as either a second or additional language. However, this linguistic interaction often faces hurdles due to phonetic and phonological mismatches. One significant challenge is Hausa's intricate set of plosive consonants, which includes /b/, /d/, /t/, /g/, /k/, /kw/, /gw/, /ky/, and /gy/ which some of them are peculiar only to Hausa. These sounds are quite different from the phonemic inventories found in Igbo and Yorùbá (Keshavarz & Khamis, 2017; Sani, 1989). The plosives in Hausa have various places of articulation and voicing characteristics that do not easily align with the phonological systems of the learners' first languages. Moreover, Hausa language do not have the /p/, /v/, and /x/ sounds, using /f/ instead of /p/, /b/ instead of /v/, and /s/ instead of /x/ in similar situations—this peculiarities add another layers of complexity for the speakers of languages where sound such as /p/ is a phonemic sound.

The journey of acquiring a second or additional language is influenced by the idea of phonological transfer, where learners apply the phonological rules and speaking habits from their first language to the new language. This phenomenon is highlighted in research on Yorùbá-English bilinguals. Fajobi and Akande (2018) found that Yorùbá speakers show different pronunciations of English inter-dental fricatives depending on factors like gender, education, and the position of the word. Similarly, Princewill (2000) pointed out that the differences in phonotactic rules between English and Yorùbá lead to articulation difficulties and lower intelligibility among Yorùbá-English bilinguals. Uba's (2020) research further explores these dynamics, shedding light on the complexities of language acquisition in this context. For Igbo and Yorùbá speakers learning Hausa language, these challenges are not merely theoretical. Learners often resort to vowel epenthesis, consonant substitution, and devoicing when attempting to articulate unfamiliar Hausa plosives (Opoola, 2002; Sani, 2005). Hausa's adherence to CV, CVV, and CVC syllable structures contrasts with the more complex syllabification patterns in Igbo and Yorùbá, compounding articulatory difficulty. Even though Fajobi and Akande (2018) discussed issues related to Yorùbá speakers, especially the English inter-dental fricatives, the research did not focus on Hausa plosives, leaving such gap unattended to. This is similar to the studies by Princewill (2000), as well as Uba (2020) who researched English-Yorùbá and Igbo-Yorùbá focussing on phonotactic rules between English and Yorùbá, vowel epenthesis, consonant substitution, including devoicing respectively, the two studies failed to address the challenges on Hausa plosives pronounced by the Igbo-Yorùbá speakers, hence, the need to bridge the gap in this present study.

Even though Igbo and Yorùbá languages are from the Benue-Congo language Phylum with million speakers across the globe (Yusuf, 2007), Hausa, a Chadic language predominantly spoken in Nigeria and Niger, serves as a vital linguistic bridge in West

Africa, facilitating communication among diverse ethnic groups. As one of the largest languages on the continent, Hausa is not only a primary means of daily interaction for millions but also a key conduit for trade, culture, and Islamic education. Its significance extends beyond mere communication; Hausa plays a crucial role in media and politics, influencing socio-economic dynamics in the region (Muhammad, 2021). The language's phonetic inventory, particularly its distinct plosive sounds, poses unique challenges for learners, especially for speakers of adjacent languages like Igbo and Yorùbá. Meanwhile, the importance of native language interference, and understanding the phonetic differences affect language acquisition by other ethnic groups such as Igbo and Yorùbá speakers, especially in the area of pronunciation (Keshavarz & Khamis, 2017; Sani, 1989).

Fajobi and Akande (2018) investigated the pronunciation patterns of English inter-dental fricatives by some Yorùbá speakers of English at Obafemi Awolowo University (OAU), Ile-Ife to find out the extent to which gender, the level of education, and the position in words of the inter-dental fricatives could affect the realisations of the fricatives, otherwise known as (th) and (dh) variables, using thirty-three (20 males & 13 females) Yorùbá participants, with different educational backgrounds. The study revealed that the (dh) variable was significantly affected by gender, while the (th) variable was not. It was also demonstrated that while the (th) was significantly affected by the level of education of the participants, the (dh) variable had no statistical significant relationship with the speakers' level of education. Lastly, the findings indicated that the position of a word (whether initial, medial, or final) of each variable affects the realizations of the two variables significantly.

The exploration of Hausa plosive sounds reveals distinct phonetic characteristics that present challenges for Igbo and Yorùbá speakers, learners of Hausa. Hausa, as a West Chadic language has up to 9 (nine) plosive consonants sounds, such as: /b/ - voiced, bilabial; /t/ - voiceless, alveolar; /d/ - voiced, alveolar; /k/ - voiceless, velar; /g/ - voiced, velar; /kw/ - voiceless, labial-velar; /gw/ - voiced, labial-velar; /ky/ - voiceless, palato-velar; and /gy/ - voiced, palato-velar with each exhibiting unique articulatory features that could be problematic for learners whose native languages operate on different phonological principles. While Hausa adheres strictly to simpler syllable structures such as CV, CVV, and CVC, Igbo and Yorùbá may accommodate complex onsets and syllable formations, leading to potential deviations in pronunciation. Such adaptations may involve vowel epenthesis or consonant substitutions, resulting in phonetic outcomes that diverge from the standard Hausa articulatory system. Moreover, the influence of regional accents, as highlighted in accent classification studies, underscores the varying proficiency in recognising and producing these plosive sounds, which further complicates the learning process for these bilingual speakers. Note.

Hausa does not have a /p/ consonant. Instead, it is /f/, which is regarded as the voiceless, bilabial, and fricative sound that is used in most cases, except that such a sound appears in the name of a person or town.

Msuya (2020), who researched the phonological errors associated with the segmental level involving selected consonant sounds which are produced by Kimakunduchi speaking English as a Foreign Language (EFL) learners in Zanzibar. The study sought to provide evidence of cross-linguistic influence involving phonological transfer on the segmental level, employing stratified and random sampling techniques. Three secondary schools located in Makunduchi district in Unguja Island -Makunduchi, Kusini, and Kizimkazi were used as study locations. Data was collected through an oral interview and observation, and subjected to both qualitative and quantitative approaches, guided by Selinker's (1992) Transfer Theory. The findings revealed that, to a large extent, native Kimakunduchi speakers of EFL tended to transfer the sounds existing in their L1, or even in Kiswahili, into English. Such a transfer was due to the nonexistence of the particular sound in the students' native language, as well as the discrepancy between spelling and pronunciation in the English language. The study concludes that vowel articulation is more difficult compared to consonants due to their absence in the first language (L1). Even though Msuya's (2020) study focus on errors on consonant sounds at the segmental level produced by Kimakunduchi speaking English as a Foreign Language (EFL) learners in Zanzibar, it falls short of analysis of Hausa plosive sounds pronounced by Igbo and Yorùbá speakers, learners of Hausa.

Uba (2020) researched the phonological patterning of words between Ogidi dialect and standard Igbo using the Comparative Method as the theoretical framework, and the descriptive approach for data analysis. According to the research, many varieties of the Igbo language differ in sounds and sound patterning. This phonological patterning sometimes involves the alternation of the standard Igbo /s/, /r/ and /w/ with /ts/, /l/, and /b/ respectively in the Ogidi variant. The study discovered that the standard Igbo /s/ is not found in Ogidi-Igbo dialect, and instead, the dialect of Ogidi-Igbo substitutes such sound with /ts/, which is the closest match phoneme for /s/ in Ogidi. For /r/ and /l/ phonemes, they are observed to be in free variation in most words, though with few exceptions in words like *órìà* 'sickness', *ríó* 'beg'/'plea', and *ùríóm* 'assign made by hand in rejection of 'evil'. In addition, the substitution of standard Igbo /w/ with /b/ in the Ogidi-Igbo occurs most times, but not entirely in words containing the inceptive extensional suffix -we/-wa 'start/begin to'.

In a study conducted by Princewill (2000), the vowels and consonants are inherent features of phonetics and phonology in every language, as phonotactic constraints differ from language to language, and phonological disorder ensues when the constraints are

breached by either transfer, substitution, insertion, or deletion. The study explains why many L2 learners struggle with the articulation of target language sounds, which often influences syllabification and intelligibility. The study aims to determine whether the dissimilarities in the phonotactic constraints of the syllable structures of English and Yorùbá languages induce pronunciation deficiency in English for Yorùbá-English speakers. As guided by the Natural Phonology Theory of David Stampe, with 100 students of Lagos State Polytechnic (National Diploma) as participants, using a thirty-word list that is monosyllabic, disyllabic, and multisyllabic, the study reveals that Yorùbá speakers of English have myriad phonological challenges as a result of the divergent Yorùbá and English phonotactic constraints.

A study on inter-dental consonant sound errors made by first-semester students of English education at Sanata Dharma University by Arsanto, Prawinanto, and Bram (2019) investigated factors influencing students' pronunciation, as many non-native English speakers have difficulty pronouncing certain words that contain the phonemes not used in their native languages. Focusing on English inter-dental consonants [θ] and [ð], which are not available in the Indonesian language sound system produced by students of English education, a qualitative approach was used interviews as a method for collecting primary data. With twenty participants from the English Language Education Study Program (ELESP) of Sanata Dharma University, Yogyakarta, Indonesia, being interviewed on the pronunciation of the two inter-dental consonant sounds, the findings indicated that the mother tongue, age, and teacher instruction on target language exposures affected the ELESP students' (mis)pronunciation. While the work of Arsanto, Prawinanto, and Bram (2019) was on factors influencing students' pronunciation at Sanata Dharma University with focus on inter-dental consonant sound errors made by first-semester students of English education, the present study is on the pronunciation of Hausa plosives by Igbo and Yorùbá speakers, using a different methodology, theory and analysis.

In a related development, Renaldi, Stefani, and Gulö (2016) researched phonological difficulties faced by students in learning English. In collecting the data needed for the study, the researchers surveyed talks, speeches, and presentations made by the students. At the end of the study, the results showed that most of the phonological problems found were related to consonant sounds such as voiced dental fricative, voiceless dental fricative, voiceless post-alveolar fricative, and voiced alveolar approximant sounds. Meanwhile, Hamad's (2023) pronunciation error analyses in university students' oral assignments using fifty oral assignments of second-year college students in phonology class in College of Education at Salahaddin University between 2021-2022 academic year indicated that the pronunciation errors so far identified were primarily due to the influence of students' mother tongue, deep-rooted learning from their primary and

elementary stages of education, as well as inaccurate pronunciation models. The study conducted by Al-Mafalees (2020) on pronunciation problems faced by Yemeni EFL learners at secondary schools when pronouncing English consonants discussed the English consonant clusters system. Using a questionnaire and a recording test as research instruments, 100 students (50 boys and 50 girls) were randomly chosen from the same schools as participants. The results revealed that the participants had difficulty pronouncing certain English consonant sounds. The results also showed that the participants unintentionally insert a vowel sound in English syllables to break up consonant clusters. The studies by Renaldi, Stefani, and Gulö (2016) who researched phonological difficulties faced by students in learning English, and Hamad's (2023) pronunciation error analyses, yet, Hausa plosive sounds pronounced by Igbo and Yorùbá speakers when learning Hausa as either a second or additional language were not discussed in their works, hence, the need to conduct the present study to fill the existing gap both in the area of methods and theory.

Mathew (1997), in a Master's Degree thesis on consonantal phoneme pronunciation errors in the English of EFL learners from three different first language groups in the province of Aceh, northern Sumatra, Indonesia, using a qualitative approach, described the errors found in each first language group. The data was collected from the participants in the language laboratory using an aural discrimination test, a word repetition test, and a reading passage test, including an interviews with eight participants (aged between 19 and 25) from each of the three first language groups, which were recorded on audio cassettes before the analysis. The findings indicate errors are largely limited to final stops and sibilants, and initial as well as final affricates and inter-dentals. The error data did not completely accord with previous findings. A transfer viewpoint explains why these particular sounds were found difficult for these three first language groups. Patterns in the error data showed that stops were mostly devoiced or ellipsed, and both of these processes are developmental. The affricates and inter-dentals were frequently generalized to a stop or sibilant found in the first language. Overgeneralization of these articulatory difficult sounds was found to be a common developmental process. Both transfer and developmental factors and their interaction appear to be at work in inter-language and explain much of the error data, though other factors such as hypercorrection and spelling interference were also seen to play a role in the study.

Based on the work of Sakul (2013), teaching English as a Foreign Language (EFL) contributes significantly to how well students communicate orally, since it supports both communicative skills and the skills needed for reading and writing, both of which are essential to students' progress in school. The research looked at the mispronunciation of words by 34 EFL Freshmen FKIP students from Klabat University,

while they were studying the Basic Listening and Speaking Subject. Particularly, the purpose of the study was to identify both voiced and voiceless consonants that are spoken incorrectly. A descriptive-quantitative tool was used to analyze the compiled data. The findings from the testing of 397 English words in the students' textbook, including the words displayed, were paired with their minimal pairs. The results demonstrated that students were able to pronounce the voiceless /p/, /k/ and /s/ sounds properly, but needed to work on the remaining five: /t/, /θ/, /ʃ/, /tʃ/ and /f/ as well as the six voiced consonant sounds: /b/, /d/, /g/, /v/, /ð/, /z/, /ʒ/ and /dʒ/. Some students were also observed to have challenges pronouncing certain words correctly, particularly when the consonants were in word-initial, medial, or final position.

Hausa, as a prominent member of the Chadic group of the Afro-Asiatic language family, is characterized by a diverse array of plosive sounds, notably the voiceless and voiced stops. These plosive sounds manifest distinct phonetic features, including the place of articulation, voicing, and aspiration. For instance, the voiceless stops /b/, /d/, /t/, /g/, /k/, /kw/, /gw/, /ky/, and /gy/ are produced with either a complete obstruction of airflow followed by a burst or narrowing of the air passage, resulting in a strong aspirated quality, particularly in the initial positions (Keshavarz & Khamis, 2017). Conversely, the voiced stops (/b/, /d/, /g/, /gw/, and /gy/) are articulated with a vibration of the vocal cords, contributing to their sonority. When learning Hausa as a second language, speakers of Igbo and Yorùbá tend to encounter challenges in accurately producing these plosives due to negative transfer from their native phonetic systems, which can lead to mispronunciations that affect intelligibility (Sani, 2005; Opoola, 2002). It becomes evident that the acquisition of Hausa plosive sounds by Igbo and Yorùbá speakers is mediated by several interrelated factors: phonemic inventory mismatches, phonotactic constraints, sociolinguistic variables (e.g., gender and education), and the pedagogical environment. Table 1 below illustrates the plosive sounds of Hausa, Igbo, and Yorùbá languages (voiced and voiceless):

Table 1: Plosive Consonants' Chart

Language	Bilabial		Alveolar		Velar		Palato-velar	Labial-velar	
Hausa	-	b	t	d	k	g	kygy	kw	gw
Igbo	p	b	t	d	k	g	- -	kw	gw
Yorùbá	p	b	t	d	k	gb	- -	-	-

Even though Hausa has almost all the plosive sounds as contained in the above Table 1, except /p/, unlike in Igbo and Yorùbá, which do not have /ky/ and /gy/ in addition to the

Yorùbá /gb/ sound. Such dissimilarities are capable of causing pronunciation challenges, especially to second-language learners.

Methodology

To investigate the phonetic characteristics of Hausa plosive sounds pronounced in disyllabic Hausa words by Igbo and Yorùbá speakers, the present study employed a case study design to address certain phenomena associated with learning an additional language, using a mixed-mode (quantitative & qualitative) approach. David and Ronald (2009); Yang(2013); Yin(2014); Creswell (2014) opine that a case study is the proper design for a researcher to examine a “case” associated with individual or group of individuals’ behaviour, organisation, including schools’ performance.

Since a universal rule concerning the number of samples to use in case study research design could not be established (Sharp et al, 2012), in the present study, only ten (10) participants were randomly selected as a sample size drawn from the population of Igbo and Yorùbá speakers in Ondo, even though the findings will not be generalized. Using 10 samples in the present study is in line with Krejcie and Morgan’ (1970) Determining sample size from a given population. Making such a selection was to ensure that the data was fairly represented. The ten (10) participants(5 from each group) who were 18 years and above (males and females), and willing to participate voluntarily in the present study, were the only ones chosen based on random sampling because even though many of the Igbo and Yorùbá speakers were interested in participating in the research, they don’t have time due to their businesses. Incidentally, while 4 out of the 5 Igbo participants aged between 19 to 40 years were indigenes of Imo State, the remaining 1 was from Anambra State; all in the south-east Nigeria. However, they were born and brought-up in Ondo town, Ondo State, Nigeria. In a related development, the Yorùbá participants between the ages of 20 to 45 years old, all hailed from Ondo town in Ondo State, Nigeria. Holton and Bennett (1997) opine that the acceptable sample size for quantitative and qualitative research is 10 to 15, especially when trying to make inferences about larger groups that could cost much in terms of spending.

Even though the two groups (Igbo & Yorùbá) have all been residing and conducting their businesses in Sabo-Ondo (the concentrated area of Hausa people in Ondo town) for a very long time, Igbo and Yorùbá speakers were learning Hausa in a non-formal setting. Recruiting only Igbo and Yorùbá speakers as participants in the study was to ensure that the data used were authentic. This also enabled the researcher to measure the level of passion, perception, and understanding of the Hausa language, taking into account the long-time relationship that has existed between Hausa, Igbo, and Yorùbá ethnic groups in Nigeria.

An extracted wordlist from Bargery's (1934) English Hausa Dictionary and a structured questionnaire were used as research instruments. The Hausa plosives: /b/ - voiced, bilabial; /t/ - voiceless, alveolar; /d/ - voiced, alveolar; /k/ - voiceless, velar; /g/ - voiced, velar; /kw/ - voiceless, labial-velar; /gw/ - voiced, labial-velar; /ky/ - voiceless, palato-velar; and /gy/ - voiced, palato-velar with each exhibiting unique articulatory features as contained in the prepared disyllabic wordlist (with CV structure) were read aloud by each of the ten (10) participants while, the researcher personally audio-recorded the tasks using the Sony IC (ICD-SX2000) recorder with 192 KHz to determine the level of accuracy or error associated with the pronunciation. Using such a wordlist from the standard Dictionary was to ensure the source and the originality of the data used in the study. The data collected from the participants was subjected to transcription and thematic analysis. SPSS version 23 statistical tool was used to run the frequency test, and the transcribed data was explained according to the patterns of errors observed in the study.

Data Analysis, Results, and Discussion

In this section, a mixed-mode approach was used to analyse the data, and explanations were provided regarding the challenges or difficulties encountered by the participants in the present research based on the speakers of Igbo and Yorùbá languages. Meanwhile, the frequency column reveals the percentages of errors committed by the participants, and the discussion begins with the challenges faced by Igbo speakers, and later, an explanation concerning the Yorùbá challenges follows.

Even though plosive sounds such as /kw/ and /gw/ exist in both Hausa and Igbo, the challenges that Igbo speakers encounter in accurately pronouncing some Hausa plosives primarily stem from the phonological differences between the two languages. Plosive sounds such as /ky/ and /gy/ do not have direct counterparts in the Igbo phonetic system, where certain sounds undergo different articulatory processes. This discrepancy often leads to interference, making it difficult for Igbo speakers to produce these sounds adequately and accurately when learning Hausa as a second language. As noted, when learning a second language, the phonological system of the learner's first language influences the pronunciation of the target language (Yang, 2013). Moreover, the tonal nature of Igbo complicates the production of Hausa's consonant sounds, such as the plosives, as nuances in pitch can alter meaning. Consequently, this interplay of linguistic influences significantly impacts the effectiveness of communication for Igbo learners of Hausa, necessitating targeted phonetic training. As learning additional languages involves pronunciation, Arsanto, Prawinanto, and Bram (2019) add that all aspects of pronunciation are connected to the learners' native language, consisting of sounds, stress, and intonation, and sometimes, these factors are applied by learners while learning a foreign language.

Table 2: Challenges faced by Igbo speakers in pronouncing Hausa plosives

Challenge	Description	Sound	Frequency	Hausa Pronunciation	Igbo Pronunciation	Gloss
Substitution of sounds	Igbo speakers often substitute Hausa plosive sounds with similar phonemes from their native language.	/ky/	75%	/kyàutá:/	/cauta/	To give out something
		/gy/	58%	/gyá:rá:/	/jara/	To repair something
Vowel length variation	Igbo speakers struggle with varying vowel lengths that affect the articulation of Hausa plosives.	/e:/	60%	/gé:zá:/	/geza/	Combretum micranthum
Aspiration distinction	Difficulty in distinguishing between aspirated and unaspirated plosives in Hausa due to differences in Igbo phonetics.	/t/	70%	/thúdù/	/tu:du/	Hill
		/k/	46%	/khú:rá:/	/kra/	Hyena
Phonetic transfer	Error arising from the transfer of Igbo phonetic rules, which can lead to mispronunciation of Hausa sounds.	/'y/	65%	Glottalic consonants	No Glottalic consonant	-
		Tone System: H-L-F Tone	67%	-	H-L-Down stepped Tone	-

The phonetic influence of Igbo language on the production of Hausa plosive sounds is particularly noteworthy among speakers learning Hausa as a second language. The Igbo language features a distinct set of phonetic characteristics, including its tonal nature and

the presence of both voiced and voiceless plosives, which can lead to interference in the articulation of Hausa sounds. For instance, Igbo speakers may struggle with the Hausa voiceless plosives (/t/, and /k/) due to the differing articulatory contexts in their native language. This is evident in a tendency to replace standard Hausa sounds with those that mirror Igbo phonetics, creating variations that deviate from the accepted Hausa pronunciation. Usually, when sounds occur in close contact, either at word boundary in connected speech, or at syllable juncture within lexical items, a new sound segment, which may be an amalgam of the sounds in contact, emerges, following an affinity of such sounds (Josiah & Soneye, 2011; Dinneen, 1966).

Moreover, as Igbo and Hausa share some phonological qualities, the resulting transfer can both aid and hinder the acquisition process for learners (Muhammad, 2021). Such nuances highlight the complex interplay between language phonetics and learning outcomes in multilingual contexts. The pronunciation challenges encountered by Yorùbá speakers when learning Hausa, particularly regarding the plosive sounds, underscore the complexities of language transfer and phonological interference. Yorùbá phonetics includes a different set of sounds, which complicates the accurate articulation of Hausa plosive sounds such as /ky/, /gy/, /kw/, and /gw/ as they appear in some Hausa words. This discrepancy often leads to significant mispronunciations due to the absence of certain phonemes in the Yorùbá sound inventory, predominantly affecting word-initial positions. As scholars note, the process of learning a second language involves not only the acquisition of new phonological rules but also the ability to suppress or modify the phonological rules of the native language, highlighting the intrinsic difficulties faced by Yorùbá learners of Hausa. Consequently, these phonetic barriers not only hinder effective communication but also inhibit the overall fluency and comprehension of the language, making it imperative to address these phonological challenges through targeted linguistic training.

The studies reviewed converge on a central theme: first language (L1) phonological structures significantly influence the acquisition and articulation of second language (L2) speech sounds. This phonological transfer manifests in various ways, including sound substitution, segmental mispronunciations, and articulatory simplifications, all of which are well-accounted for within the framework of the Revised Speech Learning Model (SLM-r) proposed by Flege and Bohn (2020). According to SLM-r, L2 sound learning is contingent upon the learner's ability to perceive L2 phonetic elements as either similar to or distinct from existing L1 categories. Where similarity is high, learners are likely to 'equivalence-classify' the L2 sound into an existing L1 category, thereby impeding the formation of a new phonetic category. Conversely, if the L2 sound is perceived as sufficiently distinct, new categories can emerge, promoting more native-like pronunciation (Flege & Bohn, 2020).

Table 3: Challenges faced by Yorùbá speakers in pronouncing Hausa plosives

Challenge	Description	Sound	Frequency	Hausa Pronunciation	Yorùbá Pronunciation	Gloss
Difficulty in differentiating voiceless and voiced plosives	Many Yorùbá speakers struggle to distinguish between voiced sounds like /b/ and voiceless sounds like /p/, even though the /p/ sound does not exist in Hausa.	/k/	65%	/kádà:/	/kǎdà:/	Crocodile
		/g/	54%	/gádà:/	/gǎdà:/	Bridge
Influence of native language tone	The tonal nature of Yorùbá can affect the pitch and pronunciation of plosives in Hausa, leading to misunderstandings.	L-H-R	-	-	-	-
Articulation challenges	Some Yorùbá speakers find it difficult to articulate certain Hausa plosives due to differences in articulatory settings.	/q/	50%	/táushè:/	/tóshè/	To squeeze something down
Transfer errors from Yorùbá phonetics	Phonetic transfer from Yorùbá can lead to incorrect pronunciations of Hausa plosives.	/g/	60%	/gárwà:/	/garuwa/	Can
Limited exposure to Hausa sounds	Many Yorùbá speakers have limited exposure to authentic Hausa sounds, impacting their ability to learn proper pronunciation.	/gy/	55%	/gyàdǎ:/	/jada/	Groudnut
		/gw/	62%	/gwáuró:/	/gooro/	Bachelor

This theoretical perspective is exemplified in the current study's investigation into the influence of Yorùbá phonetics on Hausa plosive articulation. The difficulty Yorùbá speakers face in producing Hausa clusters such as /ky/, /gy/, /kw/, and /gw/ underscores the absence of analogous plosive distinctions in Yorùbá. As these sounds are either

non-existent or differently realized in the Yorùbá phonological system, learners often default to the closest available L1 articulatory equivalents, demonstrating SLM-r's concept of category assimilation due to perceived phonetic similarity (Muhammad, 2021). This phenomenon is not unique to the Yorùbá-Hausa linguistic interface. In a study of Igbo-English bilinguals, Princewill (2022) documented systematic substitution of the trill /r/ with the lateral /l/, which is indicative of L1 transfer due to the absence or underutilization of the /r/ sound in certain Igbo dialects. The instinctive reliance on L1 articulatory patterns, even in a second language context, affirms SLM-r's proposition that L1 phonological categories exert persistent influence, especially when learners fail to discern critical acoustic differences.

Similarly, Usman (2022) highlighted Hausa-English bilinguals' substitution of English /p/ with /ɸ/ and /θ/ with /t/, /d/, or /s/, reflecting phonological processes such as spirantisation, stopping, and affrication. These substitutions are consistent with SLM-r, which suggests that when L2 sounds do not exist in L1 and are perceived as acoustically similar to L1 categories, learners are more likely to adapt the L2 sounds using familiar articulatory strategies. Further triangulating these findings, Komariah (2019) investigated the pronunciation difficulties faced by Banjar-speaking learners of English, revealing widespread mispronunciation of English consonants and vowels due to the absence of those segments in the Banjar phonemic inventory. The inability to produce sounds like /θ/, /ʃ/, and /ʒ/ accurately correlates with SLM-r's assertion that new category formation is obstructed by strong L1 influence when L2 sounds are not perceived as categorically distinct.

Fajri and Asyik (2022) contributed further evidence through their analysis of voiceless plosive production errors in Acehnese learners of English. The errors observed, such as misclassification of aspirated and unaspirated stops, point to a lack of phonetic category distinction, as predicted by SLM-r, especially when aspiration is not a phonemic feature in the learners' L1. Finally, the study by Arafik, Yusra, and Saputra (2019) on local language speakers in West Nusa Tenggara provided compelling insight into how segmental phonological problems, such as the mis-articulation of /f/, /v/, /t/, and /d/, are deeply rooted in the learners' L1 phonological framework. These learners, similar to the others reviewed, defaulted to articulations aligned with their L1, an act that the SLM-r would interpret as evidence of failed phonetic category differentiation due to perceived similarity. Across all the studies reviewed, a consistent pattern emerges: the learners' perception of L2 sounds through the lens of their L1 phonology frequently leads to pronunciation errors rooted in equivalence classification and the failure to establish new phonetic categories. Flege and Bohn's (2020) Revised Speech Learning Model provides a comprehensive explanatory framework for these phenomena, emphasizing the role of perceived phonetic distance in determining whether L2 learners will form new phonetic

categories or assimilate L2 sounds into existing L1 structures. As such, the model not only accounts for the nature and persistence of L1 interference but also suggests pedagogical strategies emphasizing perceptual training and contrastive analysis to promote the formation of new phonetic categories and improve L2 pronunciation accuracy.

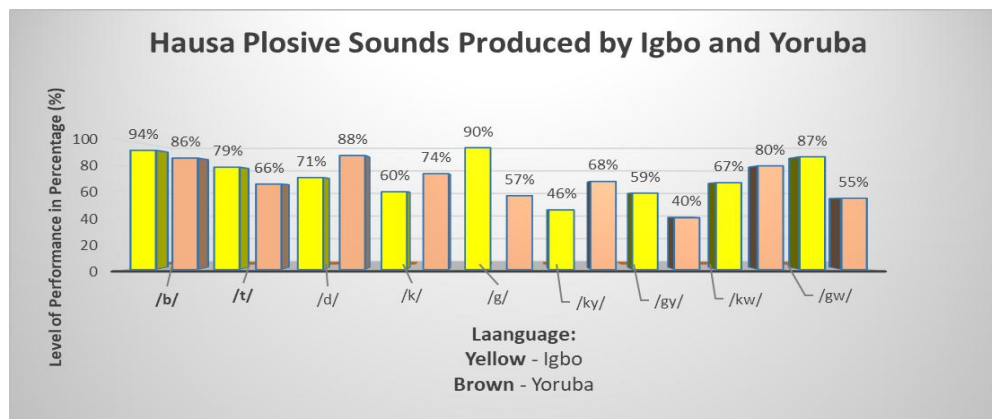


Figure 2. Level of frequency of Hausa plosive sounds pronounced by Igbo and Yorùbá

The chart in Figure 2 above illustrates the performance levels associated with various Hausa plosive sounds when pronounced by Igbo and Yorùbá speakers, learners of Hausa. Each sound's corresponding difficulty level is represented in the above bar chart, enabling a comparative analysis of the challenges faced by the learners.

Summary of major findings and implications for language learning and teaching

The findings from the present study reveal significant phonetic challenges faced by Igbo and Yorùbá speakers in producing Hausa plosive sounds, particularly in terms of articulation and voicing. Specifically, Igbo speakers exhibited difficulty in distinguishing between voiced and voiceless plosives, while Yorùbá speakers showed inconsistent articulation patterns that stem from their native phonetic inventories. These challenges elucidate the necessity for tailored pedagogical strategies in language teaching that account for specific phonological backgrounds.

With these, instructors can enhance learners' proficiency by integrating focused phonetic training sessions that emphasize correct articulatory practices, thereby facilitating better pronunciation and comprehension in Hausa. Additionally, incorporating auditory discrimination exercises could help learners develop a more understanding of Hausa plosives, fostering greater confidence in their speaking abilities. Lastly, these findings underscore the importance of adapting language

instruction to the diverse needs of learners, promoting a more effective and inclusive approach to second language acquisition or learning additional languages.

Conclusion

In conclusion, the investigation of Hausa plosive sounds as pronounced by Igbo and Yorùbá speakers learning Hausa as a second language highlights significant insights into the intricacies of phonetic transfer and the impact of native language influence. The findings suggest that both groups exhibit distinct pronunciation patterns that underscore the concept of negative transfer, demonstrating how native phonetic traits shape the articulation of Hausa sounds. As noted in previous studies, speakers from diverse linguistic backgrounds encounter unique challenges when acquiring new phonemes, a phenomenon that reinforces the necessity for tailored pedagogical approaches in language instruction. Furthermore, this research contributes to the broader understanding of language phonetics and phonology, revealing that regional linguistic features can intensely affect second language acquisition in a multicultural environment such as Nigeria. Ultimately, these insights not only enhance linguistic scholarship but also inform educational strategies that cater to the phonological needs of Hausa learners.

Recommendations

This study recommends that learners should be actively engaged with native Hausa speakers both in formal and non-formal settings and use audio and or video resources to improve their pronunciation tasks. It will be helpful to have a native speaker or language instructor always to provide feedback and guidance to the learners for them to master the pronunciation of their target language. With constant and regular practice, Igbo and Yorùbá speakers can improve their pronunciation and effectively learn Hausa language for the socio-cultural, socio-political, and socio-economic activities, especially where the Hausa language is widely spoken.

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Appendix

Stimuli

Vowel	Bilabial	Alveolar		Velar		Palato-velar		Labial-velar	
	b	t	d	k	g	ky	gy	kw	gw
a	/bàrà:/	/táà:/	/dàrà:/	/káà:/	/gàà:/	/kyàà:/	/gyàà:/	/kwàà:/	/gwàà:/
a:	/bà:bà:/	/tá:bà:/	/dà:bà:/	/ká:sà:/	/gà:tà:/	-	/gyà:rà:/	/kwà:kwà:/	/gwà:mà:/
e	-	-	-	-	-	-	-	-	-
e:	/bé:nà:/	/té:là:/	/Dè:lu/	/ké:rè:/	/gé:zà:/	-	-	-	-
i	/bíkà:/	/tìshì:/	/díri:/	/kífè:/	/gínì:/	-	-	-	-
i:	/bí:tà:/	/tí:tì:/	/dí:bì:/	/kí:fì:/	/gí:fi:/	-	/gyí:fi:/	/kwí:fi:/	/gwí:wà:/
o	/Bóbí/	/tòfí:/	/dójè:/	/kòkè:/	/gògè:/	-	-	-	-
o:	/bò:là:/	/tò:shì:/	/dò:kà:/	/kò:fì:/	/Gò:zà:/	-	-	-	-
u	/búgà:/	/túmù:/	/dúhù:/	/Kútà/	/gúzà:/	-	-	-	-
u:	/bú:sà:/	/tú:tà:/	/dú:ri:/	/kú:rà:/	/gú:gà:/	-	-	-	-
ai	/bâibâi/	/tâiki/	/dâidâi/	/kâicò:/	/gâiyà:/	-	-	-	/gwâibà:/
au	/bâushê:/	/tâushê:/	/Dâudâ/	/kâucè:/	/gâutâ:/	/kyâutâ:/	/gyâurò:/	/kwâurè:/	/gwâurò:/