

Chapter One

Introduction

1.1. Background to the Study

Language is a dynamic tool of communication that evolves continuously due to social, geographical, and individual factors. In multilingual societies like Nigeria, the English language functions as the lingua franca, bridging ethnic and linguistic diversity. However, as English is learned as a second language (L2), especially in academic settings, its pronunciation and phonological patterns often vary across different socio-cultural and regional backgrounds^{1,2}. This variation is more evident in the accentual features of speakers, influenced by factors such as ethnicity, first language (L1) interference, education, exposure, and socio-economic status.

Accentual variation, in one hand, refers to the differences in stress patterns, intonation, and rhythm used by speakers in pronouncing words and phrases. On the other hand, it refers to all phonological differences in the spoken language of two individuals. These variations may be due to the speakers' efforts to approximate native speaker models or entrenched L1 phonological systems³. In Nigerian English, the accent has been widely studied and categorized into various forms, such as the Popular Nigerian English (PNE), the Educated Nigerian English (ENE), and the Acrolectal Nigerian English (ANE), with each showing distinctive phonological characteristics^{5,6}. These forms are often shaped by the speaker's level of education, ethnic affiliation or social identity.

University students in Nigeria present a fertile ground for studying socio-phonological phenomena, as they are often drawn from diverse ethnic and linguistic backgrounds. While much research has been conducted on the phonological features of Nigerian English, particularly in arts and humanities faculties, there has been relatively less attention paid to students from science-based disciplines. Yet, these students also interact extensively in English in both academic and non-academic contexts, and their phonological patterns may differ due to factors such as less phonological awareness training and a greater focus on scientific terminologies rather than language accuracy⁷.

The University of Ibadan, being Nigeria's premier university, attracts students from all regions of the country, making it a microcosm of the nation's linguistic diversity. The Faculty of Science, in particular, accommodates students with varying language proficiencies and cultural orientations. This diversity often manifests in their spoken English, where accentual differences may reveal deeper socio-linguistic patterns. A socio-phonological study of this group is therefore crucial for understanding how social variables such as ethnicity, gender, age, and region influence accentual features among young Nigerian English speakers.

Recent studies have highlighted the need to investigate accentual variation not just as a phonetic phenomenon, but as a marker of social identity and group affiliation^{8,9}. In Nigerian academic institutions, accent often becomes a symbol of prestige or marginalization, with students sometimes modifying their speech to align with perceived educated norms or peer expectations. This suggests that accent is not merely a linguistic construct but a social asset that reflects one's educational background, aspirations, and social belonging¹⁰.

Variability is a defining characteristic of human speech. No two voices are identical, and no two utterances are the same. However, speech variability is not entirely random or chaotic; it arises from specific sources and can form rule-governed patterns. Language is a dynamic tool of communication that evolves continuously due to social, geographical, and individual factors. In multilingual societies like Nigeria, the English language functions as the lingua franca, bridging ethnic and linguistic diversity. However, as English is learned as a second language (L2), especially in academic settings, its pronunciation and phonological patterns often vary across different socio-cultural and regional backgrounds^{11,12}. This variation is more evident in the accentual features of speakers, influenced by factors such as ethnicity, first language (L1) interference, education, exposure, and socio-economic status.

This study, therefore, aims to explore the accentual variations among students of the Faculty of Science, University of Ibadan, through a socio-phonological lens. It seeks to identify the phonological features of their speech, examine the social factors influencing these variations, and contribute to the growing scholarship on Nigerian English phonology, particularly in underrepresented academic domains.

1.2. Statement of the Problem

Nigeria's multilingual landscape, with over 500 languages and distinct phonological systems among its major ethnic groups (Hausa, Igbo, and Yoruba), fosters significant accentual variation in English pronunciation. These ethnically attributed patterns are well-documented, yet the modern reality of unified living suggests that the causes of accent variation are becoming more complex. Beyond ethnicity, a confluence of socio-phonological factors, including social background, educational disparities, and mother-tongue interference, shapes

these accents, leading to features like consonant substitution and vowel shifts that deviate from standard models and can impede clear communication.

This problem is particularly acute in university settings, which bring together students from diverse linguistic backgrounds. The University of Ibadan, as a microcosm of the nation, naturally hosts a wide variety of phonological expressions. However, a significant gap exists in understanding how these accentual patterns evolve and interact when students from different ethnic and social groups are closely knit in an academic environment over an extended period. There is a paucity of research investigating whether prolonged contact leads to the levelling of ethnic features or if other social factors, such as gender, become more pronounced determinants of accent within this educated demographic.

This study is therefore justified in its aim to critically analyse these socio-phonological variations among students in the Faculty of Science at the University of Ibadan. By focusing on this young, educated cohort, the research will move beyond merely cataloguing ethnic differences to explore the dynamic interplay of gender, ethnicity, and language background in shaping accent. The findings will enrich our understanding of language use in multilingual contexts and provide valuable insights for developing targeted pedagogical strategies to address pronunciation challenges, thereby enhancing English language proficiency and fostering more effective communication.

1.3. Aim and Objectives of the Study

The primary aim of this study is to carry out a social-phonological analysis of accentual variations among the students of the Faculty of Science at the University of Ibadan. The specific objectives shall be to:

1. identify common phonological elements that varied in the speeches of respondents;
2. examine the social factors (e.g. gender, age, ethnicity, language background) that influence accentual variation among respondents;
3. assess the level at which the variations lead to identity construction; and
4. discuss the patterns of accentual variation among respondents from different socioeconomic backgrounds.

1.4. Research Questions

1. What are common phonological elements that varied in the speeches of students of the respondents?
2. What are the social factors (e.g. gender, age, ethnicity, language background) influencing accentual variation among respondents?
3. How do accentual variation lead to identity marker?
4. What are the patterns of accentual variation among respondents from different socioeconomic background?

1.5 Scope of the Study

This study is focused on investigating socio-phonological analysis of accentual variation among the Students of Faculty of Science, University of Ibadan. The geographical scope of this research is limited to the University of Ibadan, Ibadan.

1.6 Significance of the Study

This study will be significant for university students as it seeks to enhance their understanding of how socio-phonological factors, such as accent and intonation, influence communication in academic settings. Many Nigerian students face challenges in English pronunciation and intonation due to the linguistic diversity present in their native languages. By identifying and addressing these challenges, the study aims to improve students' English language proficiency, thereby boosting their academic performance, interpersonal communication, and employability prospects in both local and international contexts. Lecturers stand to benefit from this study as it will provide insights into the phonological variations among their students and how these affect classroom dynamics and learning outcomes. Understanding these accentual differences can help lecturers develop more effective pedagogical approaches tailored to the linguistic needs of their students.

This will promote clearer communication in lectures, reduce misunderstandings, and enable a more inclusive teaching environment that accommodates the diverse linguistic backgrounds of students.

For parents, this research underscores the value of being aware of the socio-linguistic challenges children may face with English pronunciation. A supportive home environment can play a significant role in complementing formal education. Parents can foster language

development by encouraging activities such as reading aloud, engaging in conversations, and providing access to diverse English media like audiobooks and educational programs. This proactive involvement can build a child's confidence and competence in English, a key asset for their academic progress and future professional opportunities.

Furthermore, the findings of this study provide actionable insights for school administrators and educators. It highlights the need to move beyond a one-size-fits-all approach to language teaching. Schools can better support students by implementing targeted interventions, such as specialized pronunciation workshops, language labs, and teacher training focused on the specific phonological challenges identified. By investing in these resources and creating a more inclusive learning environment that acknowledges linguistic diversity, schools can significantly enhance the effectiveness of English language instruction and equip all students for success

For school administrators, this research provides a clear roadmap for enhancing language support services. By pinpointing specific socio-phonological challenges, schools can move beyond generic instruction to implement targeted interventions. Establishing well-equipped language labs, introducing practical phonetics training, and offering communicative workshops can empower students to navigate different speaking contexts effectively. Such initiatives strike a crucial balance: they celebrate Nigeria's rich linguistic diversity while simultaneously equipping students with the standardized communication skills vital for academic excellence and professional advancement.

On a broader scale, the study offers a vital evidence base for national policy reform. The government can leverage these findings to craft forward-thinking language policies that

genuinely reflect Nigeria's multilingual reality. This includes initiating curriculum reforms that integrate sociolinguistic awareness into English pedagogy at all levels and developing specialized teacher training programs. By equipping educators with the skills to understand and address accentual variation, policymakers can drive a significant improvement in educational quality and ensure equitable learning outcomes for students from every linguistic background.

1.7 Operational Definition of Terms

Socio-phonology: This is the study of how social factors, such as ethnicity, age, gender, and education, influence the phonological features of a language, leading to variations in pronunciation, stress, and intonation among speakers.

Ethnicity: This is a social identity based on shared cultural traits, ancestry, language, and historical or geographic origins.

Social Identities and Interactions: It entails factors like ethnicity, gender, age, and socioeconomic status, which significantly influence how a student speaks.

Accentual Variation: This refers to the differences in pronunciation, stress patterns, and intonation that occur within a language due to factors such as regional influences, social background, linguistic diversity, and educational exposure.

Vowel Substitutions: This is a systematic change in the pronunciation of vowel sounds within a language over time, often affecting their quality, position, or length in the phonetic space. These shifts will be analysed in this context with the focus on the influence of social, geographical, and linguistic factors that serve as key focus in the study of accentual variations.

Consonant Substitutions: Consonant substitutions are often a key feature that differentiates dialects and accents. For example, the substitution of /θ/ with /f/ (as in "think" pronounced as "fink") is a well-known characteristic of some British English accents. Your definition of terms are not in order.

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Endnotes

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Chapter Two

Review of Related Literature

2.0. Introduction

This chapter explores the literature on socio-phonological accent variations among students in the Faculty of Science, University of Ibadan, Nigeria, through a theoretical, conceptual, and empirical analysis. It conceptualises core factors influencing these variations, such as dialect and local phonological elements, in a multilingual and multicultural setting. The chapter also highlights gaps in existing literature and discusses how this study addresses those gaps to understand accent variation in English better as a second language.

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2.1 Conceptual Review

2.1.1 Prosody

Prosody, also known as prosodic or suprasegmental phonology, is concerned with the way connected speech sounds. In linguistics, prosody refers to the rhythm, stress, and intonation of speech. It includes elements like pitch, stress, intonation, rhythm patterns, loudness, pauses and duration that contribute to the overall musicality and expressive quality of spoken language. Together, these elements of prosody help to convey meaning, emotion, and nuance

in spoken language. They can also influence how we interpret what is being said, adding layers of meaning beyond just the words themselves.

The word 'prosody' comes from ancient Greek, where it was used for a "song sung with instrumental music". In later times the word was used for the "science of versification" and the "laws of meter", governing the modulation of the human voice in reading poetry aloud. In modern phonetics, the word 'prosody' and its adjectival form 'prosodic' are most often used to refer to those properties of speech that cannot be derived from the segmental sequence of phonemes underlying human utterances. Without any hesitation we may justify prosody as "the grammar of verse". It is the study of the rhythm, stress, and intonation. Prosody has two branches- Orthoepy (dealing with the quantity and accent of syllables, emphasis, pauses and tones). Versification (dealing with the laws of meter). Prosody, therefore, is concerned with the external framework of verse not with its internal thoughts.

Prosody is the combination of voice's pitch, duration and energy variation during speech. It provides an additional sense to the words, which is extraordinarily important in natural speech. For example, interrogative and declarative sentences have very different prosody (especially intonation). Besides, the prosody of a sentence is one of the factors that make a speaker seem happy, sad, angry or frightened. We can even decide from prosody if the speaker is an energetic person or, on the contrary, a lazy one. Singing, intonation and timing evolution characterize melody. But prosody is not only important in natural speech but also in synthetic speech. Prosody is crucial in order to achieve an acceptable naturalness¹.

In a study on analysis of speech emotions using dynamics of prosodic parameters a novel approach to speech emotion recognition using prosodic parameters is proposed. The study's rigorous methodology and high accuracy in emotion recognition are significant strengths.

However, the limited dataset and lack of contextual factors like language and cultural background are weaknesses. Additionally, the proposed approach may require specialized equipment and expertise, limiting its applicability².

The study titled “Face masks influence emotion judgments of facial expressions: a drift-diffusion model” explores how face masks impact emotion judgments. The study’s novel research question, rigorous methodology, and important implications are notable strengths. However, the limited generalizability and small sample size are weaknesses. Moreover, the study could have considered contextual factors like cultural background and personal experiences³.

In the study of prosodic aspects of speech, it is usual to distinguish between auditory measures (subjective impressions produced in the mind of the listener) and objective measures (physical properties of the sound wave and physiological characteristics of articulation that may be measured objectively). Auditory (subjective) and objective (acoustic and articulatory) measures of prosody do not correspond in a linear way. Most studies of prosody have been based on auditory analysis using auditory scales⁴.

Auditorily, the major prosodic variables are:

- pitch of the voice (varying between low and high)
- length of sounds (varying between short and long)
- loudness or prominence (varying between soft and loud)
- voice quality (quality of sound)

Acoustically, these prosodic variables correspond closely to:

- fundamental frequency (measured in hertz, or cycles per second)
- duration (measured in time units such as milliseconds or seconds)
- intensity, or sound pressure level (measured in decibels)
- spectral characteristics (distribution of energy at different parts of the audible frequency range)⁴.

2.1.1.1 Prosodic Features

Prosodic features refer to the various elements of prosody in linguistics, which include pitch, fundamental frequency, vowel lengthening, voice quality, prominence, tone unit, stress, intonation, rhythm, loudness, and pauses. These features collectively contribute to the melody and rhythm of spoken language, helping to convey meaning, emotion, and emphasis.

Here's a breakdown of each prosodic feature:

2.1.1.2 Pitch

Pitch, as a basic property of sounds and an important suprasegmental feature of speech, exerts its effect on many linguistic aspects at different levels.

In some cases, pitch could convey the lexical meanings of a language. Pitch, for another thing, is related to the frequency of sounds. As it refers to the degree of highness or lowness of a tone and “an indication of pitch enters into the lexical realization of at least some morphemes” in tonal languages, it could reflect correlation with the meaning contrasts⁵.

Pitch is the relative highness or lowness of a tone as perceived by the ear. It depends on the number of vibrations per second produced by vocal cords. It is also the main acoustic correlate of tone and intonation⁵.

Pitch has long been a central focus of many trans voice studies. Yet, even in early research, the primacy of pitch has been questioned. It is noted that pitch increase alone is insufficient to eliminate a persistently male voice quality in trans women. Similar conclusion was reached in an experiment evaluating the pitch, intonation, and vowel formants of 15 trans women. Their results showed that speakers perceived as female had a significantly higher mean and maximum SFF than speakers perceived as male. However, in this study, Pitch is one of the most salient prosodic features targeted in voice feminization surgery (VFS). However, women generally produce higher vocal pitch than men but this is subject to cultural norms. Trans women assigned male at birth often have lower average pitch compared to cisgender women, which can contribute to gender misidentification and dysphoria. VFS typically involves altering the vocal cords to raise the fundamental frequency of the voice, achieving a more feminine pitch range⁶.

In addition to average pitch, pitch variability is also important for conveying femininity in speech. Cisgender women tend to exhibit greater pitch variability compared to cisgender men, resulting in a more melodious and expressive vocal quality. VFS aims to increase pitch variability in trans women's speech by potentially affecting the vocal fold mucosa (the tissue covering the vocal cords) and their overall tension. This can allow for greater modulation and expressiveness⁷.

Pitch curve refers to the visual representation of changes in pitch over time, as seen in a spectrogram. It shows how the pitch of a speech signal varies, which is crucial for understanding intonation patterns, stress, and prosody in spoken language. Essentially, it captures the rising and falling patterns of pitch in speech, aiding in the analysis of tone and emphasis in linguistic study. In a spectrogram, time is represented on the horizontal axis, and

frequency (pitch) is represented on the vertical axis, with intensity shown by color or grayscale shading. A pitch curve on a spectrogram displays the contour of pitch changes over time, showing where the speaker's voice rises or falls in pitch during speech. This information is crucial for understanding aspects of spoken language such as emphasis, emotional expression, and grammatical structure, especially in tonal languages where pitch can convey lexical or grammatical meaning⁵.

2.1.1.3 Fundamental Frequency

The fundamental frequency refers to the lowest frequency of a periodic waveform, like a sound wave produced by the vibration of the vocal cords during speech. It determines the perceived pitch of a sound. When we speak, our vocal cords vibrate, producing sound waves. These sound waves travel through the air as vibrations. Frequency refers to how often a wave repeats itself in a given time period. In the case of sound waves, it determines the pitch we perceive. Higher frequency sounds are perceived as higher pitch, while lower frequency sounds are perceived as lower pitch. In essence, the fundamental frequency is the lowest frequency of a complex sound wave. In speech, it's primarily determined by the rate of vibration of the vocal cords. So, if your vocal cords vibrate at 100 Hz, the fundamental frequency of the sound produced will be 100 Hz⁸.

The number of 'cycles' in the waveform (the number of complete repetitions in the period waveform) reflects the number of times the vocal folds have opened within the time frame displayed. This is known as the fundamental frequency (f_0), which is measured in Hertz (Hz). A frequency of 200Hz means that there are 200 hundred complete cycles per second within the waveform, so 200 times the vocal folds have opened. In reality, most speech sound waves have a rather complex pattern, and are known as complex waves. These are

made up of two or more simple sine waves, and the fundamental frequency can also be calculated on complex waveforms by counting the number of cycles per second on a waveform⁷.

2.1.1.4 Amplitude / Loudness

In prosody, amplitude refers to the intensity or loudness of speech sounds. It's a measure of the strength or magnitude of the acoustic signal produced by the speaker. Amplitude variations in speech can convey aspects such as stress and emphasis. Amplitude, in the context of sound and speech analysis, refers to the magnitude or strength of a waveform. It measures the maximum displacement of particles in a medium (such as air for sound waves) from their rest position as a sound wave passes through. In simpler terms, it represents the "height" of the wave, indicating how loud or intense a sound is. In a spectrogram, amplitude is typically represented by the brightness or darkness of the spectrogram's shading or color, with higher amplitude sounds appearing darker and lower amplitude sounds appearing lighter⁹.

The frequency (pitch) and amplitude ('loudness' or intensity) of a sound can be analysed on a waveform. Frequency can be calculated through the number of cycles on a periodic waveform with a repeating pattern. The higher the number of cycles per second, the higher the frequency and perceived pitch. Frequency is usually expressed in Hertz (Hz). Analysing the amplitude of a waveform tells us how intense or 'loud' a sound is, and how much the air particles deviate. It is conventionally expressed in decibels (dB). The x-axis on a waveform corresponds to the time frame in which the sound was produced (usually in seconds or milliseconds), and the y-axis represents the amplitude⁸.

Another way to analyse a sound acoustically is through looking at a spectrogram. They provide much more complex information than what we can see on a waveform. Similarly, to waveforms, time is displayed on the x-axis, but the y-axis measures the frequency of the sound. Amplitude is represented by the darkness in the acoustic energy. The louder the sound, the darker it appears on a spectrogram and is therefore more intense. Spectrograms allow us to see the high frequency energy that comes with aperiodic sounds⁸.

The amplitude determines the volume of a sound. The amplitude of a sound affects the way the loudness or volume of a sound is perceived. A sound with a taller amplitude is perceived as a louder sound. Sound waves with a higher amplitude require more energy to create. The 3 main properties of sound waves are amplitude, wavelength, and frequency. The amplitude, wavelength, and frequency of a sound wave determine how the sound is perceived and are affected by the amount of energy used to create the sound. The amplitude, or height of the sound wave determines its loudness. The wavelength is the distance between two waves and affects the wave's frequency. Frequency determines the pitch of the sound. A higher frequency means a higher pitched sound¹⁰.

2.1.1.5 Prominence

We say that a linguistic entity is prosodically prominent when it stands out from its environment by virtue of its prosodic characteristics. That is, we define prominence as a property of a linguistic entity relative to an entity or a set of entities in its environment. Although the definition is cast in relative terms, it includes monosyllabic utterances, because they stand out from silence. In the acoustic domain, the primary prosodic properties bringing about these relative differences are amplitude, duration and 'F0' (we use F0 as a shorthand form for the inverse of the quasi-periodicity of the speech signal). The corresponding

perceptual properties are loudness, duration or length, and pitch. Also, particular aspects of timbre come into play, such as those relating to vowel reduction, spectral slope or tilt, etc., and properties relating to voice quality, e.g. creak¹¹.

Prominence in prosody refers to how certain elements of speech are made to stand out to the listener. This is achieved through variations in pitch, where the fundamental frequency changes to make a syllable or word more noticeable. Loudness also plays a role, as increasing the intensity of a sound can draw attention to it¹¹.

Additionally, the duration of sounds is a factor, with longer syllables or words often perceived as more prominent. Changes in the quality of the voice, such as shifts in timbre, can further enhance prominence. These prosodic features are essential for effective communication, as they help convey meaning, organize speech, and emphasise important information. In English, for instance, stressed syllables and emphasised words naturally carry prominence, helping to highlight new or significant content within a sentence.

2.1.1.6 Voice Quality

Voice quality serves as a primary means by which speakers project their physical, psychological, and social characteristics to the world. Although voice is central to a range of human activities, it has proven difficult to provide a single, useful, all-purpose definition of voice, and several senses of the term are in common use. Voice can be defined narrowly as sound produced by vibration of the vocal folds, or broadly as essentially synonymous with speech. Details of phonation and articulation, pitch and amplitude variations, and temporal patterning all contribute to how a speaker sounds, and broad definitions of voice reflect this fact. Which stage in the voice production process receives definitional focus depends on the

interest of the practitioner, experimenter, or listener. The overall quality of a sound is formally defined as that attribute of auditory sensation in terms of which a listener can judge that two sounds similarly presented and having the same loudness and pitch are dissimilar. By this definition, quality is multidimensional, making it difficult to operationalize the concept. Quality is also by definition a perceptual response in the particular task of determining that two sounds are dissimilar, and it is unclear how this definition might generalize to other common, seemingly-related tasks like evaluating a single stimulus¹².

Voice quality has been defined variously in the literature ranging from states or postures of the glottis and vocal tract in general most broadly, to a narrower definition which refers to characteristics of vocal fold vibration during voiced phonation. Linguists have traditionally broken the *voicing* continuum into five basic categories based on roles they play in a language's phonology: (spread) voiceless, breathy, modal, creaky, (constricted) voiceless¹³. Of these, the three central states, breathy, modal, creaky, are relevant to voice quality as discussed in this work. Voice qualities can be modeled as an interaction between sub glottal pressure, degree of vocal fold approximation (*aperture*), longitudinal tension of the vocal folds (*stiffness*), and medial compression of the vocal folds (*thickness*). Breathy voicing is achieved with high glottal aperture, low stiffness, and low thickness, resulting in noise, low pitch, and increased spectral tilt. Creaky voicing has differing realizations depending on its linguistic role, *prototypical creaky voice* has low aperture, low stiffness, and high thickness, resulting in irregular and lower pitch, and decreased spectral tilt¹³.

Voice quality refers simply to the sound quality of a person's voice. Each person has a unique voice quality but characteristics common with other voices. Often, laryngeal pathology and neurological disorders lead to physical changes in the voice production system that influence

voice quality. Voice quality is that component of speech which gives the primary distinction to a given speaker's voice when pitch and loudness are excluded. It involves both phonatory and resonatory characteristics. Some of the descriptions of voice quality are harshness, breathiness and nasality¹⁴.

Voice quality can refer to any of the suprasegmental properties of speech that result from how your vocal apparatus is configured. Example: nasality. Usually, though, we use “voice quality” to refer specifically to the properties of speech affected by stuff inside your larynx. To produce speech, we move air through our vocal apparatus.

2.1.2 Accentual Variation

Accent, within the broader context of accentual variation, typically denotes the manner in which pronunciation differs among speakers, especially in the realization of stress and intonation patterns¹⁵. Accentual features are prosodic and suprasegmental, affecting rhythm, pitch, and syllable stress more than individual sounds¹⁶. Accentual variation is thus the observable diversity in these prosodic elements across different language users.

From sociolinguistic perspective, accent is a social marker that reflects a speaker's geographical background, ethnicity, social class, and even gender. Accent becomes a means of identity performance and social alignment. Accent is believed to transcend simply a matter of sound; it encodes complex social meanings and indexes social identities and group affiliations¹⁷. Accent can be the basis for accentism or accent-based discrimination, as certain accents are valorized (e.g., "Received Pronunciation") while others are stigmatized (e.g., working-class or foreign accents). Accent-based prejudice is among the most persistent and socially acceptable forms of linguistic discrimination today¹⁸.

From the technological/AI perspective, especially in voice recognition, AI, and speech synthesis, accent presents technical challenges due to system biases toward dominant or “standard” accents. Systems often fail to recognise or process non-standard or global accents accurately. “Speech technologies disproportionately favor standard accents, reinforcing biases and limiting accessibility for global users¹⁹. Efforts are underway to make AI systems accent-inclusive, promoting fairness in automated voice recognition and transcription.

From a phonetic point of view, an accent refers to the distinctive way in which a language is pronounced, particularly focusing on segmental (individual sounds) and suprasegmental features (intonation, rhythm, and stress). “Accent is the phonetic realization of speech sounds and prosodic features that make one speaker’s pronunciation distinct from another’s²⁰. In this view, all speakers have an accent, whether or not it is labeled as “foreign” or “standard.” Even within native varieties of a language, such as American or British English, regional and personal accent differences abound.

Recent scholars highlight that accentual variation is dynamic, context-dependent, and often intersects with issues of identity and linguistic discrimination²¹. In educational and professional domains, accentual variation may contribute to perceived intelligibility, comprehensibility, and speaker credibility²².

Accentual variation refers to the differences in pronunciation, stress patterns, and intonation among speakers of the same language or dialect. It is a critical area in phonetics, sociolinguistics, and applied linguistics, particularly in multilingual societies, second language acquisition, and global English studies. The variation in accent can be influenced

by geographical, social, ethnic, and educational factors, reflecting deeper patterns of identity and language change.

Accentual variation “includes the variation in pitch, loudness, and duration that shapes the perceived rhythm and melody of speech²³. Scholars emphasise that accentual variation is “not merely a phonetic curiosity but a central factor in listener judgments about intelligibility, credibility, and even character²⁴.

Accentual variation refers to the differences in stress patterns, intonation, and pronunciation features (such as rhythm and pitch) among speakers of the same language. It is a suprasegmental phenomenon, meaning it operates above the level of individual sounds (phonemes), affecting syllables, words, and phrases.

In practical terms, accentual variation explains why English sounds different when spoken by individuals from different regions, social classes, or linguistic backgrounds, even if they use the same vocabulary and grammar. Accentual variation is explained as part of the broader sociolinguistic phenomenon of language variation, shaped by both linguistic environments and social identities²⁵. Accentual variation reflects how speakers of different backgrounds manage prosodic features to align with local, regional, or global speech norms.

2.1.2.1 Factors Influencing Accentual Variation

a. Geographical Location

Geography remains a dominant factor in shaping accentual patterns. Regional dialects, such as Southern British English and Northern American English, display distinct accentual

features²⁶ In countries like Nigeria and India, regional accents of English reflect substratum influences from local languages^{27,28}.

b. Social and Educational Background

Accent often acts as a social marker. Speakers from higher socio-economic classes or formal educational backgrounds may acquire what is considered a “prestige” accent²⁹. Conversely, local accents may be stigmatized despite their linguistic legitimacy.

c. Language Contact and Bilingualism

In multilingual settings, such as South Africa or Malaysia, accentual variation is shaped by the phonological systems of indigenous languages that influence the stress and intonation of English³⁰.

d. Age and Gender

Studies also reveal that younger speakers tend to adopt new accentual patterns faster, often aligning with urban speech styles³¹. Gender-based variation shows complex trends, with women often leading in innovative accentual changes³².

2.1.3 Socio-phonology

Sociolinguistics is the study of the relationship between language and society. It examines how social factors such as class, gender, age, ethnicity, and context influence the way language is used, and how language, in turn, reflects and helps construct social identities and structures. According to Scholars have described Sociolinguistics is concerned with the

relationship between language and the context in which it is used³³. This means that sociolinguists explore not only linguistic forms but also the social meanings attached to them, and how language use varies across different social settings.

Another scholar succinctly defines sociolinguistics as the study of language in relation to society³⁴ and note that it encompasses both variation in language and the societal factors that influence that variation. This includes regional dialects, sociolects, language attitudes, code-switching, multilingualism, and language policy.

Sociolinguistics operates on both micro and macro levels; the microsociolinguistics looks at language use in specific social interactions (e.g., how gender affects conversational style), while macrosociolinguistics deals with broader societal issues such as language change, language death, and official language policies. It covers key areas such as Language Variation and Change, Language and Identity, Language Attitudes, Dialectology, Multilingualism and Code-Switching and Language and Power.

Phonology, on the other hand, is the branch of linguistics that studies the systematic organization of sounds in languages. It focuses on the abstract, cognitive aspects of sounds, how they function and interact in a given language, rather than how they are physically produced (which is the concern of phonetics). "Phonology is the study of the sound system of a particular language and the abstract rules that govern how sounds function and pattern together³⁵. This involves understanding how sounds are organized in the mind and how they are used to convey meaning. Phonology is defined as the systematic study of the sound patterns of human language³⁶.

It entails the arrangement of sounds of a particular language based on rules and constraints. Phonology seeks to identify which sound differences are meaningful within a language (called phonemes) and how these sounds are combined, altered, or omitted in different contexts. While phonetics deals with the physical properties of speech sounds (such as articulation and acoustics), phonology is more concerned with phonemes (the smallest units of sound that can change meaning), allophones (variants of phonemes that do not change meaning), phonological rules (the patterns and constraints governing how sounds interact) and syllable structure and prosody, including stress, intonation, and rhythm.

Sociophonology is a subfield of linguistics that lies at the intersection of phonology and sociolinguistics. It investigates how social factors influence the phonological patterns and sound systems of language, and how phonological variation reflects and constructs social identities, group affiliations, and cultural norms. Whereas traditional phonology is concerned with the abstract, mental representation of sounds and the rules governing their organization, sociophonology incorporates the influence of social variables, such as region, class, gender, age, ethnicity, and style, on the use and perception of phonological forms.

Sociophonology is a dynamic interdisciplinary field that brings together the theoretical and methodological frameworks of sociolinguistics and phonology. At its core, sociophonology investigates how social variables, such as class, gender, ethnicity, age, and region, affect phonological behavior, and conversely, how phonological variation contributes to the construction and maintenance of social meaning and identity. Traditional phonology focuses on the abstract, rule-governed structure of sound systems within a language. It investigates the mental representations of phonemes, syllable structure, phonotactic constraints, and

prosodic features. Sociolinguistics, by contrast, emphasises the role of society in shaping language use and variation. Sociophonology, therefore, represents a convergence of these perspectives, aiming to understand how socially conditioned phonological patterns emerge, evolve, and function in natural language use^{37,38}.

Sociolinguistics foundational work has demonstrated that phonological variables, such as the post-vocalic /r/ in New York City English, are not merely random or free variants but are structured by social hierarchies and communicative goals. His quantitative methodology laid the groundwork for sociophonological analysis by showing that phonological variation correlates with social stratification, linguistic style, and contextual shifts³⁹.

In modern sociophonology, variation is not seen as deviation from an idealised norm but as a central feature of phonological competence. Scholars outline three waves of sociolinguistic research that have influenced sociophonology: the first wave focused on correlating linguistic variables with broad social categories; the second wave investigated local social meanings in community-based studies; and the third wave emphasises the role of phonological variation in the active construction of social identity⁴⁰.

Recent work has expanded the field further, incorporating computational methods and acoustic analysis to investigate large-scale variation across dialects and speaker communities⁴¹. These developments have enabled researchers to track subtle, socially meaningful variation that would be imperceptible using traditional auditory techniques. Another dynamic aspect of sociophonology is its attention to perception as well as production. Research emphasises how listeners interpret phonological variation to make

inferences about a speaker's social background, aligning perception studies with broader questions of social cognition and linguistic ideology⁴².

Moreover, sociophonological research is increasingly intersectional, examining how multiple social identities interact to influence phonological practices. For instance, explores how gender and sexuality intersect to shape speech styles in ways that go beyond single-category explanations. This approach reflects a growing understanding that phonological variation cannot be fully explained without considering the complex, layered nature of social identity⁴³.

In multilingual and postcolonial contexts, sociophonology also plays a critical role in analyzing the effects of language contact, creolisation, and language shift on sound systems. In African and Asian linguistic contexts, phonological variation often reflects historical, political, and cultural influences⁴⁴. Sociophonology is not merely a blend of phonology and sociolinguistics, but a dynamic, evolving field that challenges static views of language structure by emphasising variation, social meaning, and speaker agency. It bridges the gap between abstract phonological theory and real-world language use, offering a richer, socially informed understanding of how human speech operates.

Accentual variations refer to differences in pronunciation that mark one speaker or group of speakers apart from another. These variations are often phonological in nature, affecting how sounds are produced, perceived, and patterned in spoken language. The analysis of accentual variation within sociophonology focuses on how these differences correlate with social, regional, and contextual factors. In sociophonological research, the analysis of accentual variation involves a detailed examination of both segmental and suprasegmental phonological features. These features not only reflect linguistic background and regional

origin but also serve as important markers of social identity, group affiliation, and communicative intent. Understanding these features provides insights into how language operates as both a cognitive system and a social tool.

2.1.4 Accentual Variation in Nigerian English

Accentual variation in Nigerian English (NE) is a widely researched area within sociophonology, especially given Nigeria's rich linguistic diversity and the influence of indigenous languages on English spoken across the country. NE is recognised as a pluricentric variety, characterized by systematic phonological differences across regions that reflect ethnic, social, and educational backgrounds^{45,46,47}.

2.1.4.1 Studies on Phonological Variation across Nigerian Regions

Several recent studies have documented regional phonological variations within Nigerian English, highlighting the ways in which accentual features are shaped by local linguistic ecologies:

A comprehensive descriptions of segmental and suprasegmental variations, including vowel shifts, consonant substitutions, and stress patterns have been provided. His work emphasises how phonological processes such as vowel centralization and cluster simplification vary across Nigerian regions, especially between the South-West (Yoruba-dominant) and South-East (Igbo-dominant) zones⁴⁸.

Acoustic and perceptual analyses have been conducted showing that Yoruba-influenced Nigerian English tends to exhibit a syllable-timed rhythm and monophthongisation of

diphthongs, while Igbo-influenced speech shows different intonational patterns and consonantal variations. His research also highlights the impact of educational background on the degree of accentual variation.

Investigation have been carried out on the phonological variation in Nigerian university students and finds evidence of “accent leveling” among younger speakers, especially in formal settings, suggesting a gradual shift towards a more standardised Nigerian English accent influenced by mass media and educational policies⁵⁰.

Acoustic phonetic methods have been used to analyze vowel formants among Nigerian English speakers from different regions, revealing statistically significant differences in vowel space usage that correlate with speakers’ ethnolinguistic backgrounds⁵¹.

2.1.5 Influence of Mother Tongue Interference

Mother tongue interference is a critical factor influencing accentual variation in Nigerian English. The transfer of phonological features from indigenous languages to English manifests in segmental and suprasegmental domains:

Research demonstrates that tonal languages like Yoruba and Igbo influence the pitch and intonation patterns in Nigerian English, leading to tonal interference that shapes perceived accent differences. For example, Yoruba speakers tend to apply tonal contours to English phrases, affecting the prosody and rhythm of their English speech⁵².

Consonantal substitutions have been documented stemming from native phonemic inventories, such as replacing dental fricatives /θ, ð/ with stops /t, d/, a feature common

across many Nigerian English accents due to the absence of these fricatives in indigenous languages⁵³. Morphophonological influences from mother tongues on Nigerian English vowel harmony and syllable structure, showing how speakers' native phonotactic constraints shape their English accentual patterns have also been explored⁵⁴.

2.1.6 Nigerian English as a Pluricentric Variety

The concept of Nigerian English as a pluricentric variety has gained strong empirical support from recent sociophonological studies:

Scholars have argued that Nigerian English should not be treated as a monolithic variety but rather as a constellation of accents and phonological norms that vary regionally, socially, and contextually. This pluricentric view is supported by systematic studies that reveal distinct regional phonological norms that coexist within the national English^{55,56}.

Studies provide phonetic evidence for pluricentricity by showing measurable differences in vowel quality and stress patterns across Nigerian regions, indicating that these varieties fulfill unique communicative and identity functions⁵⁷. Another study highlights how globalization and education interact with indigenous language contact to produce hybridized Nigerian English accents, with speakers code-switching and style-shifting between local and pan-Nigerian English norms⁵⁸.

The pluricentric nature of Nigerian English also manifests in sociophonological attitudes, as reported, where speakers evaluate regional accents differently based on social prestige, ethnicity, and urban versus rural origin⁵⁹.

Recent empirical studies have substantially enriched our understanding of accentual variation in Nigerian English by highlighting: Pronounced regional phonological differences shaped by indigenous language influence and sociocultural factors; the pervasive role of mother tongue interference in shaping segmental and suprasegmental phonological features; the recognition of Nigerian English as a pluricentric variety with multiple coexisting accents, each linked to identity and social context. These findings underscore the importance of sociophonological analysis in understanding language variation and change within Nigeria's multilingual landscape.

2.1.7 Language Use and Speech Patterns among University Students

Recent studies have explored how university students negotiate their linguistic identities through phonological variation in academic settings. For instance, studies examined speech patterns among University of Ibadan students, finding that students often adopt a hybridised form of English that blends standard Nigerian English with regional phonological features. This code-mixing allows them to navigate between informal peer group norms and formal academic expectations⁶⁰.

Similarly, a sociophonetic analysis of speech in lecture halls and student interactions, revealing a tendency towards “academic style-shifting,” where students modulate stress patterns, intonation, and vowel pronunciation depending on the interlocutor's perceived authority or social distance⁶¹.

2.1.7.1 Social Stratification and Phonological Variation in Educational Institutions

Phonological variation in universities often reflects underlying social stratifications. Scholars

demonstrated that students from higher socioeconomic backgrounds tend to adopt phonological variants closer to the prestige forms of Nigerian English, while those from rural or less affluent backgrounds retain stronger regional accent features⁶². Their findings align with Labovian variationist theories, indicating that educational contexts reproduce broader social hierarchies through language use.

2.1.8 Accent and Social Variables

2.1.8.1 Role of Social Class, Gender, Ethnicity, and Peer Groups in Accentual Variation

A growing body of research highlights the complex interplay between social variables and accentual variation: It was found that upper-middle-class students at Nigerian universities exhibited less marked regional phonological features, aligning their accents with perceived prestige norms, while working-class students showed greater retention of local phonological traits⁶³. Further, studies have revealed that female students are more likely than males to employ phonological variants associated with standard or “educated” speech, a pattern explained by gendered expectations around language and social mobility⁶⁴. Moreover, research documents reveals how ethnic identity strongly conditions accentual variation, with Yoruba, Igbo, and Hausa students exhibiting distinct phonological patterns influenced by their first languages, which they maintain or modify depending on social context⁶⁵.

Also, a study investigated peer influence and found that students’ accentual styles shift within peer networks to enhance solidarity or signal differentiation, often through subtle changes in intonation and vowel quality⁶⁶. Style-shifting and accommodation have been extensively studied as dynamic linguistic strategies among Nigerian youths. Scholars have demonstrated that university students accommodate their speech both towards and away from

“standard” Nigerian English accents based on interlocutor status, setting, and communicative goals. This aligns with Communication Accommodation Theory and illustrates the performative nature of accent in social interactions⁶⁸.

2.1.9.1 Studies on Yoruba English Phonological Feature

Yoruba English, a key variety within Southwestern Nigeria, exhibits distinctive phonological traits. Recent acoustic analyses confirm common features such as monophthongisation of diphthongs, syllable-timed rhythm, and the substitution of dental fricatives with stops (e.g., /θ/ → /t/)⁶⁹. Their research also highlights intonational patterns influenced by the tonal nature of Yoruba, leading to pitch variations atypical in other English varieties.

Additionally, vowel quality shifts in Ibadan speakers, noting a tendency to centralise high vowels and reduce vowel length contrasts compared to other Nigerian English varieties⁷⁰.

2.1.9.2 Accentual Variations and Identity

Accentual variation, the differences in pronunciation patterns within a language, is a powerful linguistic marker closely linked to social identity. It encompasses variations in vowel and consonant sounds, intonation, stress, and rhythm, which often index a speaker's regional, ethnic, social, or cultural background. Researchers have long recognised that accents are more than mere speech patterns; they serve as symbolic resources through which individuals negotiate, construct, and perform their identities^{72,73}.

2.1.9.3 Accent as a Marker of Social and Regional Identity

One of the foundational ideas in sociolinguistics is that accentual variation encodes information about a speaker's geographical origin. Classic studies work on New York City English demonstrated how accents vary by neighborhood and social class, embedding local identities in speech. In multilingual and multicultural societies, accents often signal ethnic or cultural identity⁷⁴. For example, in Nigeria, variations in English accents frequently reflect underlying indigenous language influences and ethnic affiliations^{75,76}. Speakers use accentual features to assert their ethnic identities or to align themselves with broader national or cosmopolitan identities⁷⁷.

2.1.9.4 Accentual Variation and Social Identity

Beyond static identity markers, accentual variation is dynamic and strategic. Speakers often adjust their accent to manage social interactions and project desired identities. This process, known as style-shifting or speech accommodation, allows individuals to align with or distance themselves from social groups⁷⁸.

For youths, especially, accent is a crucial identity resource. Studies have shown that young people frequently use accent shifts to index group membership, social aspirations, or resistance. For instance, it was observed how adolescents in England manipulate accent features to negotiate local versus global identities⁷⁹. Similarly, in Nigerian university contexts, students alternate between localized English accents and more standardized forms to navigate academic and peer environments⁸⁰.

2.1.9.5 Accent, Identity, and Power Relations

Accentual variation is also deeply implicated in social power dynamics. Accents associated with prestige and socio-economic power often become targets for emulation, while stigmatized accents may trigger discrimination or social marginalization⁸¹. Research highlights how speakers of non-standard accents negotiate identity and social acceptance within such power hierarchies.

In Nigeria, the tension between local accents and the “standard” Nigerian English accent reflects wider issues of social mobility and linguistic capital⁸². Speakers may consciously modify their accents to gain social prestige or access educational and professional opportunities, illustrating the social significance of accent as an identity resource⁸³.

2.10 The Role of Accent in Multilingual and Multicultural Contexts

In multilingual settings, accents not only mark ethnic identity but also signify language contact and hybrid identities. Sociophonological studies reveal that accentual features often carry traces of indigenous phonologies, creating distinct varieties of English that reflect complex identity negotiations⁸⁵.

For example, in Southwestern Nigeria, Yoruba-influenced English accents exhibit distinctive phonological traits, which speakers use to assert ethnic pride or solidarity⁸⁶. At the same time, many speakers navigate between multiple accentual repertoires to perform situational identities, oscillating between local, national, and global selves⁸⁷.

2.1.11 Sociophonetics and Identity Construction

Recent research has incorporated acoustic phonetic methods to examine how subtle phonetic variations contribute to identity construction. Sociophonetic studies emphasise how pitch, vowel quality, and prosodic features are harnessed as social semiotic tools^{87,88}.

For instance, studies have explored how Latina youth in California use prosodic features to index ethnic identities and group membership⁸⁹. Similarly, acoustic studies in Nigerian English show how vowel formant frequencies and intonation patterns vary systematically with social variables, reinforcing accent as a dynamic identity marker⁹⁰.

The literature on accentual variation and identity highlights the multifaceted role of accent as both a reflection and a construction of social identities. Accents encode regional, ethnic, social, and cultural affiliations, while also serving as strategic resources in identity performance and negotiation. In multilingual societies like Nigeria, accentual variation reveals the complex interplay between indigenous linguistic influences and global English norms, positioning accent as a central site of identity work and social meaning.

2.1.11.1 Patterns of Accentual Variation among Nigerian Speakers of English across Ethnic Poles

Nigeria is a linguistically diverse country with over 500 indigenous languages and major ethnic groups such as the Yoruba, Hausa, and Igbo, among others. This rich ethnic diversity significantly influences how English, the official language, is spoken, giving rise to distinct accentual variations across ethnic poles. These variations are phonologically marked and socially meaningful, reflecting the interplay between indigenous phonologies and English^{91,92}.

2.1.11.2 Ethnic Influence on Accentual Features

Accentual variation among Nigerian English speakers often mirrors the phonological characteristics of their mother tongues, a phenomenon widely known as mother tongue interference or language transfer. The distinct phonetic and phonological systems of ethnic languages imprint features on English pronunciation, resulting in ethnically recognisable accents.

Yoruba is a tonal language with a relatively simple syllable structure and vowel harmony. These features affect the English accent of Yoruba speakers. For instance, Yoruba English speakers tend to exhibit monotonic intonation patterns, reflecting the tonal nature of Yoruba, and may reduce consonant clusters to fit Yoruba phonotactics. Vowel substitution is also common, with English vowels approximated to the closest Yoruba vowel, resulting in distinct vowel qualities⁹³.

Igbo, another tonal language with complex vowel and consonant systems, influences English accent in different ways. Igbo speakers often produce rhythmic stress patterns that differ from Standard British or American English, sometimes creating syllable-timed rhythm rather than stress-timed rhythm typical of English. The substitution of English dental fricatives /θ/ and /ð/ with alveolar stops /t/ and /d/ is also a salient feature among Igbo English speakers.

Hausa is a Chadic language with distinct phonological features such as implosive consonants and tonal distinctions. Hausa English speakers typically influence English pronunciation through replacement of certain consonants, such as pronouncing /v/ as /b/ and /z/ as /s/, reflecting phonemes absent in Hausa⁹⁴. Intonation and stress patterns also tend to be simplified in line with Hausa prosodic features.

2.1.11.3 Accentual Variation as an Ethnic Identity Marker

Accentual variation serves as a strong marker of ethnic identity in Nigeria. Speakers consciously or unconsciously maintain phonological features that signal their ethnic affiliations, which may function as a source of pride or social solidarity⁹⁵. For instance, Yoruba English accents are often instantly recognisable and evoke cultural identity and group belonging.

However, ethnic accents can also become stigmatized in certain social contexts, especially in formal or educational settings where a more “neutral” Nigerian English or “standard” English accent is preferred. This creates social pressures for code-switching or accent modification among educated Nigerians, especially urban youths⁹⁶.

2.1.11.4 Regional and Urban-Rural Accentual Differences

Apart from ethnic influences, accentual variation also reflects regional and urban-rural divides within ethnic groups. Urban centers such as Lagos and Ibadan often exhibit more linguistic hybridity due to interaction between ethnic groups and exposure to Standard Nigerian English or even international English varieties⁹⁷. Rural speakers may retain stronger ethnic accent features due to less exposure to diverse linguistic influences.

Accentual variation across Nigerian ethnic poles is characteristic of distinct phonological patterns shaped by indigenous language phonologies (tonality, vowel systems, and consonant substitutions). The use of accent as a symbol of ethnic identity and cultural affiliation. Variation is influenced by social context, education, and urbanisation, leading to accent modification or code-switching. The presence of a pluricentric Nigerian English, where

multiple regional and ethnic accents coexist and interact. This rich tapestry of accentual variation underscores the complexity of English pronunciation in Nigeria and highlights how language serves as a site for ethnic identity expression and social negotiation.

2.1.12 Gender Phonology

Gender phonology refers to the study of how language and speech patterns are influenced by gender, including how individuals perceive and produce speech sounds, intonation patterns, and other linguistic features about gender identity. It explores how language and speech are used to express and construct gender identities, as well as how gender norms and stereotypes may influence language use⁹⁸.

In the context of gendered speech, prosodic features are particularly significant as they contribute to the perception of gender identity. Feminine prosody is characterized by higher fundamental frequency (pitch), greater pitch variability, smoother intonation contours, and more rhythmic speech patterns compared to masculine prosody. Prosodic features are integral to the perception of femininity in speech and are often targeted in voice feminization interventions to help trans women achieve a more feminine vocal presentation.

A study provides a comprehensive introduction to prosody, covering its definition, key concepts, and relationship with phonology and phonetics. The chapter's clear and concise explanation of prosody and its components is a strength⁹⁹. However, the limited depth in some areas and few examples and illustrations are weaknesses.

Lastly, Zuzana Pospěchová's "Gendering Prosody in Communication" explored how prosody is used to construct and negotiate gender in communication. The article's interdisciplinary

approach, nuanced analysis, and empirical grounding are strengths. However, the limited generalizability and technical terms may be unfamiliar to non-experts.

Differences in pitch and voice quality between male and female speakers, and these differences may be perceived and interpreted in social contexts¹⁰⁰.

Pitch refers to the perceived frequency of a sound, and it plays a crucial role in distinguishing male and female voices. Typically, males have lower-pitched voices due to the length and thickness of their vocal folds, which are influenced by hormonal factors such as testosterone during puberty. In contrast, females tend to have higher-pitched voices due to shorter and thinner vocal folds. Females typically have wider pitch ranges and greater pitch variability compared to males. This means that females can produce a broader spectrum of pitches and modulate their pitch more freely, allowing for more expressive and melodic speech patterns. Male voices often resonate in the chest cavity, creating a deeper and fuller tone.

This resonance is due to the larger size of the male larynx and vocal tract. Female voices, on the other hand, resonate more in the head, resulting in a lighter and brighter quality. Females tend to articulate more clearly and have slightly faster speech rates compared to males. This may be influenced by anatomical differences in the vocal tract and cultural norms surrounding speech. Female intonation patterns often exhibit more variation and melodic contour compared to male patterns. Females may use rising intonation at the end of sentences to indicate questions or uncertainty, while males may use falling intonation for declarative statements.

Language use encompasses vocabulary choice, syntax, and conversational styles, which can vary between genders and cultures. Females may use more expressive language, politeness markers, and supportive speech, whereas males may use more assertive and direct language.

These differences can reflect societal norms and expectations surrounding gender roles and communication styles. While biological sex influences certain aspects of speech and voice production, it's essential to recognise that gender identity and expression play significant roles as well. Transgender individuals may experience dysphoria related to their voice and seek voice modification techniques to align their voice with their gender identity. This process can involve adjusting pitch, resonance, and other speech characteristics to achieve a voice that feels authentic and affirming⁹⁸.

Overall, gender phonology provides insights into the complex relationship between language, speech, and gender, highlighting how language use reflects and constructs gender identities and how gender norms influence linguistic practices. Taken together, this research suggests that a female voice is likely to have a higher fundamental frequency, higher vowel formant frequencies, more varied intonation with more upward inflections, and a greater degree of breathiness than a male voice. These norms inform the expectations a listener has about which characteristics a voice coming from a female body will have. These expectations, in turn, impact a listener's perception of the speaker's gender⁹⁹.

Gender identity refers to a person's internal sense of their own gender, which can be male, female, both, neither, or any other identity beyond the traditional binary categories. Transgender individuals may feel that the gender assigned to them at birth doesn't accurately represent who they are, leading them to explore and express their gender in ways that feel authentic to them²³.

2.2 Review of Empirical Studies

Previous studies have noted significant differences between the intonation patterns of Standard English and native English varieties, yet there is limited research on L2 learners'

interpretation and production of accentual intonation tunes. To address this gap, a study was conducted involving 50 final-year Nigerian university students majoring in English. Each participant was asked to read aloud and interpret ten English sentences, with their responses recorded and analysed. The results showed that while respondents demonstrated a certain level of competence in interpreting accentual tunes, their application at the production level was considerably lacking. Specifically, out of 500 expected instances, appropriate intonation occurred only 134 times, while inappropriate use was observed 366 times.

This indicates that although learners could somewhat understand accentual patterns, they struggled to consistently reproduce them in spoken English. Gender analysis revealed no significant differences in performance between male and female participants, with both genders exhibiting similar levels of competence and inaccuracy in accentual tunes. Additionally, the study highlighted that out of 500 instances in interpreting intonational meaning, respondents misinterpreted 140 sentences, underscoring the challenge of not only producing but also accurately interpreting intonation in English as an L2. The study suggests that to enhance intonation proficiency, L2 learners, particularly in Nigerian educational settings, should have increased exposure to digitised materials and resources that are culturally neutral, allowing for greater focus on standard intonation patterns. Such resources, available across educational institutions, could improve learners' production and interpretation of English prosody, fostering better L2 proficiency¹⁰².

In the recent study which explored students' perceptions of English accent varieties within two Bachelor of Arts programmes, English and English Teaching, at a higher education institution in Costa Rica. The investigation of accent diversity in language education is particularly relevant, given that English is spoken in numerous dialects and accents

worldwide. The study employed a quantitative approach, utilizing a 16-point survey that was distributed to 77 participants enrolled in the BA programs.

The survey assessed students' views on the importance of recognising and imitating various English accents. The results indicated a strong preference among students for the inclusion of multiple English accents in their curriculum. A significant 93.5% of participants recognised the importance of being able to recognise and understand different English accents. 76.6% of respondents regarded the ability to imitate various English accents as an important skill. Also, the overwhelming majority of students considered the incorporation of diverse English accents essential for their major, advocating for curricular revisions to include these accents. These findings suggest a clear demand for a more inclusive approach to English language education that acknowledges the global nature of the language. Students' desire to engage with both native and non-native English accents reflects a growing awareness of the importance of accent diversity in fostering effective communication skills.

Another study investigated the effects of accentual variations in English on the academic performance of students in Nigerian universities, focusing on three-hundred level students of Electrical-Electronic Engineering at the Nigerian-Turkish Nile University in Abuja. Data collected revealed that both lecturers and students exhibit diverse English accents, leading to insufficient attunement and mutual understanding. As a result, students often misinterpreted their lecturers, which negatively impacted their ability to respond correctly to questions, thereby affecting their academic performance. Utilising the sociolinguistic research methods the study found that the Nigerian accent is the most comprehensible among students, while other accents, such as Indian, Turkish, and American, contribute little to effective

communication. This highlights the need for educators to be mindful of accentual diversity to enhance learning outcomes in diverse linguistic environments¹⁰³.

In a study that investigated the attitudes of postgraduate biology students from three top-ranked Russian universities toward the foreign accents of non-native English-speaking lecturers. Using a questionnaire, fifty participants provided insights into how lecturers' accents impact their concentration and comprehension of lecture material. Through quantitative analysis, the study found that Russian students generally exhibit a tolerant attitude towards foreign accents in English-medium instruction, indicating their adaptability and openness to understanding non-standard English. These findings emphasises Russian students' readiness to engage with the diverse English accents common within the global academic community in natural sciences.

Relatedly a study explored the role of English as a lingua franca in Sweden and its impact on language education within the context of the European Union (EU), where effective communication in English is highly prized. Swedish language curricula have increasingly emphasised communicative competence over acquiring an "inner-circle" or native English accent, reflecting a broader trend across Europe. However, this shift raises questions about how forgoing native-like pronunciation influences students' communicative confidence and proficiency. The study employed a descriptive, empirical approach with a quantitative analysis of data collected from a web-based survey completed by 80 upper-secondary students enrolled in English 6, a required course for academic progression. The findings revealed that students view native-like accents as somewhat overemphasised in English learning, prioritising effective communication over accent precision. Many respondents indicated that as long as their message is understood, their pronunciation is of secondary

concern. This suggests that the Swedish approach to English education, which values communicative clarity over accent perfection, aligns well with student perspectives, promoting confidence in language use without the pressure of achieving a native-like accent¹⁰³.

Another study examined the role of English-medium instruction (EMI) in fostering internationalisation, cosmopolitanism, and global citizenship in higher education. As universities increasingly adopt EMI, lecturers' non-native English accents can sometimes create comprehension challenges for students, potentially impacting their perception of teaching quality. Additionally, students' motivation, whether instrumental, aimed at achieving practical goals, or integrative, fostering a connection to the language community, may significantly influence their attitudes towards diverse English accents. However, few studies have explored the impact of students' cosmopolitan orientations and motivation on their reception of different accents in EMI contexts. Conducted at a Dutch university of applied sciences, this quantitative study surveyed 1,225 students, examining their attitudes toward both Dutch-English and standard English accents within EMI. The results revealed that while students generally favoured standard English accents, those with higher cosmopolitan orientations were more accepting of Dutch-English accents. This suggests that students' openness to diverse accents may be influenced by their global outlook. The study recommends further research using longitudinal and mixed-method designs to deepen understanding of the role of motivation and cosmopolitanism in shaping students' attitudes over time. Insights from these studies could support higher education institutions in refining EMI policies to enhance inclusivity and enrich learning experiences¹⁰⁴.

A related study addresses the increasing trend of brain drain in Bangladesh, focusing on the factors motivating students to pursue higher education abroad rather than locally. Using a sample of 200 students (100 male and 100 female), the study examined four key dimensions influencing this choice. Through ANOVA testing, the study established the reliability of these variables, and the results showed a strong positive relationship between them, with an R-value of 82.2%. Findings identified cultural acceptance, cost, and campus facilities as the most significant factors driving students' preference for foreign education, highlighting areas where local institutions might need to improve to retain talented students¹⁰⁵.

Furthermore, a study developed a framework for the automatic analysis and recognition of accentual patterns by identifying acoustic cues that indicate syllable prominence and distinguishing pitch accent types at a surface-phonological level. Through acoustic analysis, the study created a compact representation composed of 13 unique acoustic features that capture distinctions between perceptually different utterances without redundancy. This feature set offers a robust model for examining accentual patterns at the acoustic-phonetic level, ensuring that each feature is both essential and independent, thus optimising the framework's analytical precision. In a subsequent phase, the study trained statistical models to automatically identify accentual patterns in speech. This process involved detecting syllabic prominence and assigning specific pitch accent types to these prominent syllables, effectively categorizing accentual variations within the speech samples. The models achieved an accuracy rate exceeding 80% on average, even with minimal acoustic feature vectors, indicating high efficacy and the potential for streamlined, efficient accent analysis applications. This framework opens avenues for future advancements in automated speech

recognition and linguistic analysis by providing a refined method for decoding accentual nuances in spoken language¹⁰⁶.

Also, a study examined the effects of targeted phonological and phonetic interventions on improving English pronunciation and oral reading proficiency among teacher trainees in Bengaluru. Employing a single-group pretest-posttest design, 32 participants underwent a 20-hour intervention programme that included phonology and phonetics modules designed by the researcher. The segmental approach in the modules emphasised pronunciation techniques, and participants recorded their progress using Audacity after each session. Expert validation ensured accurate scoring of intelligible words, and an oscillographic analysis tracked pronunciation improvements. Findings indicated significant differences between pre-and post-intervention scores, as shown by the Wilcoxon signed-rank test results, with a p-value less than 0.05 for all measures, affirming the intervention's effectiveness in enhancing pronunciation and oral reading skills among teacher trainees. The study stressed the necessity of incorporating phonology and phonetics within English language teaching (ELT) curricula for teacher trainees, particularly for those teaching English as a foreign language (EFL). It recognises that effective training in pronunciation can enable teachers to guide students toward more intelligible pronunciation. By demonstrating the impact of structured, technology-integrated phonetic training, the study advocates for English teacher education programs to incorporate similar interventions, suggesting that proficiency in pronunciation can be greatly enhanced through dedicated phonological and phonetic instruction. The findings present a strong case for B.Ed. programmes to prioritise phonetics and phonology in training future educators¹⁰⁷.

This study investigates how gender stereotypes influence observers' perceptions of conversational behavior, using a matched-guise technique to manipulate voice quality in recorded conversations. The same conversation was presented with one version of "Speaker A" sounding male and the other female, and respondents' perceptions of conversational traits such as floor apportionment, interruptions, and signaling interest were assessed. Findings showed that respondents perceived the male guise as more dominant in conversation, attributing more floor time and interruptions to it, while the female guise was perceived as signaling interest more often. These perceptions aligned with respondents' explicit stereotypes, viewing interruptions and conversational dominance as male traits and signaling interest as a female characteristic. The study underscores that gender-based preconceptions can significantly distort perceptions of identical conversational behaviour, highlighting the role of stereotypes in influencing assessments of communication style¹⁰⁸.

A study explored the phonological characteristics of Nigerian English, focusing on how sociolinguistic factors like age, gender, occupation, education, exposure, and motivation influence these features. Drawing on a synthesis of Labov's and Preston's sociolinguistic frameworks, it examined how these variables shape the phonological patterns among educated Nigerian English speakers. The study collected data from over a hundred Nigerian English speakers whose recordings were phonemically transcribed using A.C. Gimson's model and analysed acoustically with Praat software¹⁰⁹.

Key findings indicated that adult Nigerian speakers approximate Standard British English pronunciation more closely than younger speakers. Additionally, vowel lengthening tendencies were observed, influenced by the vocalic systems in Hausa, Yoruba, and Igbo languages, while some female speakers tended to devoice voiced consonants. Overall, the

study concludes that sociolinguistic factors comprehensively account for the distinct phonological features found in Nigerian English¹⁰⁹.

The present study investigates the concept of willingness to communicate (WTC) in a second language (L2), specifically among 811 Chinese college students learning English as a foreign language. Utilizing confirmatory factor analysis and structural equation modeling, the researchers tested a hypothesized model that integrates class social climate, language mindset, academic emotions (including enjoyment, pride, anxiety, and boredom), and L2 WTC both in and out of the classroom¹¹⁰.

The findings revealed that class social climate significantly affects L2 WTC in class, with this relationship fully mediated by the four academic emotions. Interestingly, while enjoyment, pride, and boredom mediate the effects of language mindset on L2 WTC in class, pride was found to have a negative association with WTC, whereas boredom showed a positive correlation. Additionally, the study highlighted that L2 WTC within the classroom and a favourable language mindset directly influenced WTC outside of class, emphasising the multifaceted nature of factors that contribute to students' willingness to communicate in a second language¹¹⁰.

While some believe that an individual's speech can indicate their place of origin, this assumption has been challenged due to concerns regarding the accuracy of such analyses. A study explored the reliability of language analysis in determining speakers' origins, particularly in the context of asylum processes in developed nations. The research consists of two phases: firstly, it provides a detailed segmental description of four Nigerian English accents, Hausa, Igbo, Kanuri, and Yoruba, and secondly, it evaluates the effectiveness of different methods in classifying these accents¹¹¹.

Data was gathered from a corpus of 60 speakers, with each accent represented by 15 respondents, and included an accent classification task involving 118 participants from diverse backgrounds. The results indicated that while all four methods showed potential for accent recognition, native speakers performed significantly better than non-native linguists or automated systems. Notably, UK-based phoneticians and the automatic accent recognition system, Y-ACCDIST, excelled in identifying Yoruba-English speakers, suggesting that familiar stereotypes associated with particular accents can enhance the accuracy of identification¹¹¹.

The findings magnify the importance of considering the qualifications and backgrounds of those conducting language analysis. It recognises that native speakers are more adept at identifying accents within their linguistic community, suggesting a potential bias in favour of the supervised native speaker approach over expert linguist-only approaches. This research contributes to the ongoing debate surrounding the reliability of language analysis, advocating for a more nuanced understanding of how speaker stereotypes can influence the accuracy of accent classification. Consequently, it highlights the need for further empirical investigation into the methodologies employed in language analysis to improve the accuracy of determining speakers' origins, particularly in sensitive contexts like asylum-seeking¹¹¹.

Sociolinguistic studies have extensively documented variation in native English speakers' pronunciation patterns, particularly concerning shibboleths such as h-deletion and h-insertion. However, there remains a notable gap in research focusing on postcolonial, non-native varieties of English, particularly Nigerian English. A study was conducted to address this oversight by investigating the sociolinguistic constraints affecting h-deletion and h-insertion in three major Nigerian English varieties: Hausa, Yoruba, and Igbo Englishes. By employing

a multidisciplinary approach, the research explored the social and extralinguistic factors influencing these phonological features, highlighting how they enregister as distinctive identity markers within the Nigerian context¹¹².

Utilising the International Corpus of English – Nigeria (ICE-NG), the study revealed significant differences in the frequency of h-deletion and h-insertion among the ethnic groups, with Yoruba speakers exhibiting a higher incidence of these phenomena than their Hausa and Igbo counterparts. The findings suggest that sociolinguistic variables such as ethnicity, word type, gender, and syllable count significantly influence the observed variation, while extralinguistic factors also play a crucial role in the enregisterment of the ‘h-factor’ as a marker of Yoruba identity¹¹².

This research challenges traditional assumptions that apply uniform constraints across all English varieties, demonstrating that sociolinguistic and World Englishes frameworks can be effectively integrated to enhance understanding of phonological variation in postcolonial contexts. Accordingly the Dynamic Model of Postcolonial Englishes suggested that Nigerian English is positioned between the nativisation and endonormative phases, indicating an evolving linguistic identity among educated speakers. The study posits that the pronounced use of h-deletion and h-insertion by Yoruba speakers serves not only as a linguistic feature but also as a reflection of broader sociocultural dynamics, suggesting that there is yet to be a universally accepted pan-ethnic variety among educated Nigerian English speakers¹¹².

This study investigates the variable use of r-liaison and boundary consonant deletion processes among young Nigerian speakers of English to validate the hypothesis that continuous speech processes (CSPs) can exhibit social differentiation within a speech community. A sample of 180 educated Nigerian English speakers, stratified by gender and

social class, participated by voicing 19 utterances and a short passage into digital recording devices, alongside completing a structured questionnaire¹¹³.

The analysis focused on identifying and statistically examining all instances of r-liaison and consonant deletion occurring at word and morpheme boundaries, utilising Analysis of Variance (ANOVA) for data evaluation. Results indicated that the primary speech variation existed between male and female speakers regarding boundary consonant deletion ($F(1, 176) = 6.24, p = .013$), while the overall findings did not provide strong evidence of variability in speech patterns among young Nigerian English speakers concerning r-liaison and boundary consonant deletion processes¹¹³.

A recent study investigated the phonological intelligibility of Nigerian speakers of English, specifically focusing on how vowel quality in their speech impacts understanding by listeners from different linguistic backgrounds. A total of 100 evaluators, comprising international listeners who are non-Nigerian speakers, transcribed six speech samples taken from audio podcasts featuring Nigerian speakers delivering speeches. The transcription process aimed to assess intelligibility at the pronunciation level, particularly concerning segmental features. The findings revealed that deviations in vowel realisations, particularly those distinct from the central vowels [ʌ], [ɜ:], and [ə], resulted in intelligibility challenges for international listeners, indicating that certain phonological characteristics of Nigerian English can hinder effective communication across different contexts¹¹⁴.

Phonological classifications of Nigerian English have garnered significant interest among linguists due to the distinct sociolinguistic influences that shape its features. In a study that analysed both the segmental and supra-segmental characteristics of Nigerian English as articulated by speakers from Nigeria's three major indigenous languages: Hausa, Igbo, and

Yoruba. Employing a purposive sampling technique, the research interviewed educated individuals across various educational backgrounds, including school certificate holders, OND/NCE holders, HND/first-degree holders, and postgraduate degree holders. The findings reveal that segmental phonological attributes vary significantly based on regional backgrounds. For instance, Hausa speakers demonstrated superior proficiency in syllabic consonants, notably in pronouncing "Beetle" as /bi/, outperforming their counterparts from the other ethnic groups in this regard¹¹⁵.

On the supra-segmental level, the study observed that Nigerian English speakers achieved only 30% accuracy in intonation patterns, while their stress patterns and articulation of phonological processes yielded no correct responses, indicating a lack of division of tone groups into feet in the analysed data. Despite the ongoing exploration of Nigerian English's phonological, sociolinguistic, and grammatical dimensions by linguistic scholars, the inherent variations within Nigerian English persist. This variation stresses the complexity and dynamic nature of Nigerian English, which continues to fuel research interests aimed at establishing a standardised form of Nigerian English. Such investigations highlight the necessity of recognising the multifaceted influences on language use and the quest for a cohesive linguistic identity among diverse speakers in Nigeria¹¹⁵.

The study of dialect perception, particularly in the context of Language Analysis in the Asylum Procedure (LAAP), remains underexplored, with limited experimental research conducted thus far. A work attempts to establish a theoretical framework of native speaker competence in dialect perception, drawing on concepts from sociocultural evolution, variationist sociolinguistics, social psychology, and antireductionist philosophy. An experimental study was conducted with 197 native English speakers, including both

Yorkshire natives and participants from outside the region, some of whom had educational backgrounds in linguistics. Participants listened to ten brief voice samples, four from Yorkshire speakers and six from non-Yorkshire speakers within the broader linguistic northern England, and were asked to identify whether the samples featured a Yorkshire accent¹¹⁶.

The results indicate that the strongest predictor of accurate identification of Yorkshire speakers is being born and raised in Yorkshire, reinforcing the idea that local experience significantly shapes dialect perception. Although the study found a statistically significant correlation between linguistic education and accuracy, it suggested that this effect may stem from sample imbalances rather than direct influences of education on perceptual abilities. These findings align with the proposed theory that dialect perception is more influenced by innate social faculties rather than linguistic training. The implications for LAAP highlight the need to consider the characteristics of speaker-listeners engaged in linguistic analysis, as the local knowledge of dialect features can play a crucial role in the accuracy and reliability of assessments made during asylum procedures¹¹⁶.

Lending credence to the factors associated with accentual variation among university students, a study investigated the pronunciation challenges among undergraduate students of Adekunle Ajasin University, Akungba-Akoko, Ondo State, Nigeria. The research employed a descriptive survey design, with a sample of 100 respondents from five departments, selected through simple random sampling. A structured, self-constructed questionnaire was used for data collection, and the data were analysed using frequency counts and percentages. The findings revealed that the influence of the mother tongue plays a significant but negative role in the phonological acquisition of second language learners. Additionally, language contact,

particularly with pidgin and Creole, contributes to incorrect English pronunciation among undergraduates. The study recommends detailed teaching of English sounds, intonation, and stress patterns to alleviate pronunciation issues. It suggests that phonetics and phonology should be thoroughly taught, and relevant textbooks should be provided and used by educators and students alike¹¹⁸.

Acquiring accurate pronunciation in a second language (L2) is a complex but crucial element in developing communicative competence, as it directly impacts a learner's ability to be understood and to engage in effective communication. Research highlights that pronunciation acquisition is influenced by two main types of factors: inner factors (such as age, brain plasticity, aptitude, learner goals, and individual learning types) and outer factors (including L1 interference, motivation, teaching methodologies, teacher expertise, classroom environment, and institutional support). Younger learners typically experience greater neural flexibility, facilitating more native-like pronunciation, while learner motivation and explicit pronunciation goals further impact success. Studies show that learners who actively prioritise pronunciation achieve higher levels of phonetic accuracy, stressing the role of targeted learning strategies.

External factors such as L1 interference and classroom environment play an equally critical role. L1 interference often causes learners to carry phonetic patterns from their native language into English, which can lead to persistent pronunciation difficulties. Moreover, motivation and teaching methodologies greatly impact pronunciation development; highly motivated learners often invest more effort, and approaches like communicative language teaching (CLT) and task-based learning (TBL) have been shown to improve fluency and accuracy. Empirical evidence suggests that pronunciation instruction benefits from

interactive tasks and the inclusion of phonetic tools, which help learners understand English sound patterns. These findings emphasise the importance of informed and adaptive teaching practices, providing valuable insights for educators to support L2 learners in achieving effective communicative competence in English¹¹⁹.

2.3. Consonant Variations

2.3.1 Consonant substitution

Consonant substitution in Nigerian English refers to the replacement of English consonant sounds with alternatives more familiar to Nigerian speakers based on the phonological systems of their first languages (L1s). These substitutions are consistent and predictable, often resulting in ethnically influenced accents across Nigeria's linguistic landscape^{120,121}.

These are common substitution patterns:

/θ/ and /ð/ → /t/ and /d/

The voiceless and voiced dental fricatives /θ/ (as in think) and /ð/ (as in this) are absent in most Nigerian languages. Consequently, they are regularly substituted:

/θ/ → /t/: think → [tɪŋk]

/ð/ → /d/: this → [dis]

This substitution is widespread across all ethnic groups¹²². /v/ → /b/ or /f/ -In some varieties, especially among Hausa and Igbo speakers, the voiced labiodental fricative /v/ may be substituted with /b/ or /f/: very → [beri] or [feri]. This occurs due to the limited presence or absence of /v/ in certain Nigerian languages¹²³ - /z/ → /s/. Voiced fricatives like /z/ are often devoiced to /s/, particularly among Yoruba and Igbo speakers: zoo → [su]

This reflects the influence of L1 phonology which often lacks voiced fricatives¹²⁴.

/ʃ/ → /s/ and /tʃ/ → /tʃ/ The palato-alveolar fricative /ʃ/ (as in shoe) may be replaced with /s/, and /tʃ/ (as in church) may be softened to /tʃ/: shoe → [su], church → [tʃʌ]

These patterns are found among speakers whose languages have limited or different affricate/fricative inventories¹²⁵.

Examples of cluster reduction are:

Consonant clusters (e.g., /st/, /sp/, /bl/) are often simplified:

school → [skul] or [sukul]

play → [pule]

This simplification arises due to the syllable structures of Nigerian languages, which typically disallow complex onsets or codas¹²⁶.

Examples of insertion of epenthetic vowels are:

Vowels are often inserted to break up clusters or final consonants:

text → [tekisi]

stop → [sitɒp]

This pattern is common among Yoruba and Igbo speakers and reflects syllable structure constraints in L1.

Ethnic Influences

Yoruba speakers often exhibit substitution of voiced fricatives and insert epenthetic vowels to maintain an open syllable structure.

Igbo speakers tend to devoice final obstruents and simplify clusters.

Hausa speakers show substitutions such as /v/ → /b/, influenced by the Hausa phoneme inventory.

Consonant substitution in Nigerian English results from the phonological interference of indigenous Nigerian languages, which differ significantly from English in terms of consonantal structure and inventory. While these substitutions can diverge from native English norms, they are part of the natural evolution of Nigerian English and contribute to its distinctive identity as a nativised variety of English.

2.3.2 Devoicing

Devoicing is a phonological process in which voiced consonants (e.g., /b/, /d/, /g/, /z/, /v/) are produced without vocal cord vibration, resulting in their transformation into voiceless counterparts (e.g., /p/, /t/, /k/, /s/, /f/). In Nigerian English, devoicing is a common feature, shaped by the phonemic constraints of indigenous Nigerian languages, many of which have a limited number of voiced obstruents or do not contrast voiced and voiceless consonants at all^{127,128}.

Voiced consonants at the end of words are often devoiced. For example:

bag /bæg/ → [bæk]

love /lʌv/ → [lɒf]

bed /bɛd/ → [bɛt]

This is particularly frequent among Igbo and Yoruba speakers, whose native languages typically avoid voiced obstruents in final position.

Devoicing of fricatives is represented by voiced fricatives such as /z/, /v/, and /ʒ/ are frequently replaced with their voiceless counterparts:

zoo /zu:/ → [su:]

very /'veri/ → [feri]

measure /'meʒə/ → [meʃə]

This occurs due to the absence or rare usage of voiced fricatives in most Nigerian languages

Characterised by intervocalic devoicing. Some voiced consonants between vowels are devoiced as below:

baby /'beɪbi/ → [beɪpɪ]

Though less frequent, this pattern occurs in rapid or casual speech and may reflect L1 prosodic influence Voicing Neutralisation

In many cases, the voicing contrast is simply neutralised, making words like bat and bad sound alike, e.g., both → [bat]. This often results in loss of minimal pair distinctions, especially in the absence of contextual support.

Igbo speakers are especially prone to devoicing of final consonants and voicing neutralisation due to the absence of word-final obstruents in Igbo phonology. Yoruba speakers also display devoicing, though less markedly. Yoruba allows some final nasals and approximants but avoids obstruents, leading to final devoicing¹²⁹. Hausa speakers tend to retain voiced stops more consistently but often devoice fricatives like /v/ and /z/, influenced by Hausa's consonant inventory.

Devoicing in Nigerian English often leads to accentual variation and may cause intelligibility issues in international communication. However, within the Nigerian context, these patterns are widely understood and contribute to the emergent phonological norms of Nigerian English as a nativised variety.

2.3.3 Flapping

Flapping is a phonological process typical of American English, where the alveolar stops /t/ and /d/ are pronounced as a tap [ɾ] when they occur between two vowels, and the second vowel is unstressed. For example, *butter* is pronounced [ˈbʌɾər], and *ladder* and *latter* are both pronounced as [ˈlæɾər] in American English¹³⁰.

Among Nigerian speakers of English, flapping is not a native phonological feature, particularly for those whose accents are influenced by British English or Nigerian English norms. In most Nigerian English varieties, speakers tend to articulate /t/ and /d/ fully and distinctly, regardless of their position in a word. For example, *butter* would be pronounced [ˈbʌtə] or [ˈbɒ:tə], with a clear /t/, avoiding the American-style flap.

However, with increased exposure to American media, online content, and study abroad trends, there is evidence that some younger Nigerian speakers, especially those in urban or elite educational settings, are beginning to adopt features of American English pronunciation, including flapping. This is often unconscious and stylistic, reflecting a form of accent shift or convergence. Yet, such adoption is not widespread and tends to be limited to individual lexical items rather than systemic across the speaker's phonology.

In general, flapping remains a marginal feature among Nigerian speakers and does not yet define the core phonological identity of Nigerian English. Its presence, when observed, indicates global linguistic influence rather than an internal development within the Nigerian English variety.

2.3.4 Rhoticity

Rhoticity refers to the pronunciation of the post-vocalic /r/ sound (i.e., when /r/ occurs after a vowel), as in car, hard, or mother. In rhotic accents, such as General American English, the /r/ is pronounced in all positions. For example, car is pronounced as /kar/ and hard as /hard/. In contrast, non-rhotic accents, like British Received Pronunciation (RP) and Nigerian English, typically do not pronounce the /r/ after a vowel unless it is followed by another vowel. In Nigerian English, which has been traditionally influenced by British English norms due to historical and colonial ties, rhoticity is generally absent. Most Nigerian speakers, regardless of their mother tongue, tend to exhibit non-rhotic speech patterns. Words such as car, doctor, or teacher are commonly pronounced as /ka:/, /'dɒktə/, and /'ti:tʃə/ respectively, omitting the final /r/ sound^{131,132}.

However, with increasing exposure to American English through media, the internet, and international education, a growing number of urban Nigerian youths and educated speakers have begun to adopt rhotic pronunciations, either partially or fully. This trend is particularly observable among those who consciously model their accents after American norms or those involved in voice-over, broadcasting, or digital content creation. Such speakers may pronounce /r/ more consistently, especially in word-final and intervocalic positions¹³³.

Nonetheless, rhoticity among Nigerian speakers remains variable and sociolinguistically marked. While it does not represent the standard Nigerian English norm, its use can reflect an individual's linguistic exposure, identity aspirations, or stylistic preference.

2.3.5 R-liaison

R-liaison, also known as linking /r/, is a phonological phenomenon wherein an /r/ sound is inserted or retained between two words when the first ends in a non-rhotic (r-less) vowel and the second begins with a vowel. This is particularly prominent in non-rhotic varieties of

English like British Received Pronunciation (RP), where /r/ is typically not pronounced at the end of words unless followed by a vowel sound. For instance, in British English, law and order might be pronounced as [lɔːr ən 'ɔːdə] with an inserted /r/ to link the vowel-final word law and the vowel-initial¹³⁴.

In American English, which is generally rhotic, R-liaison is less of an issue because the /r/ is usually retained at the end of the word, regardless of what follows. For example, car engine is naturally pronounced [kɑr 'ɛndʒɪn], with a pronounced /r/.

Among Nigerian English speakers, R-liaison is not a prevalent feature. Nigerian English is typically non-rhotic, but unlike British RP, Nigerian speakers do not generally apply linking /r/ between words. For instance, in the phrase law and order, a Nigerian speaker is more likely to say [lɔː ænd 'ɔːdə] without inserting the /r/ sound. This absence reflects both a lack of native phonological motivation for liaison and limited modeling of British RP where the feature is found.

However, under the influence of American media and digital platforms, some urban and educated Nigerian speakers are beginning to show patterns of American-style rhoticity, which indirectly results in retained or inserted /r/ sounds in connected speech. For example, a Nigerian speaker influenced by American English may say father is here as ['fɑðər ɪz hɪər] rather than the more local ['fɑːðə ɪz hɪə]. Nevertheless, this trend remains limited and generally restricted to code-switching contexts, mimicry, or speakers with international exposure¹³⁵.

/r/-liaison refers to the insertion or preservation of the /r/ sound between words to maintain fluidity of speech, especially in non-rhotic accents where /r/ is typically not pronounced unless followed by a vowel. There are two types: *linking /r/*, where an underlying /r/ is

pronounced (e.g., "far away"), and *intrusive* /r/, where /r/ is inserted even though it is absent in spelling (e.g., "idea[r] of"). Factors influencing its variability include sociolinguistic variables like gender, social class, and education, with women and higher-class speakers reportedly use intrusive /r/ less, likely due to its stigma as a non-standard or "vulgar" feature. Phonetic conditions also play a role, with intrusive /r/ more likely after back vowels due to acoustic similarities with /r/, and less likely when followed by another /r/-initial word due to dissimilation effects. A usage-based cognitive linguistic perspective emphasizes that such patterns reflect actual language use shaped by both social norms and articulatory-perceptual constraints¹³⁶.

/r/-liaison in English refers to a phonological process occurring in non-rhotic accents, where an /r/-sound is inserted at morpheme boundaries to facilitate smoother transitions between vowels. Two primary types are recognized: linking /r/, where a historically present but now silent final /r/ (e.g., in *car* or *winner*) is reinserted between a word ending in a non-close vowel (like /ɑ:/, /ɔ:/, /ɜ:/, /ə/, or diphthongs ending in /ə/) and a vowel-starting word (e.g., *car industry* → /'kɑ:r ɪndəstri/); and intrusive /r/, where an /r/ is inserted even though no historical /r/ exists in the spelling (e.g., *idea is* → /aɪ'dɪər ɪz/). While linking /r/ is tied to etymology, intrusive /r/ arises analogically due to phonetic similarity. Empirical research has explored various phonetic and prosodic factors influencing /r/-liaison, such as vowel quality, tongue constriction, /r/ length, surrounding /r/ sounds, and stress. However, findings are often mixed—for instance, some studies show intrusive /r/ is favored after /ɔ:/, while others suggest the opposite or find no consistent pattern, indicating that the phenomenon is influenced by both linguistic and stylistic variables¹³⁷.

2.4 Vowel Variations

2.4.1 Monophthongisation

Monophthongisation is the phonological process by which a diphthong (a complex vowel sound involving a glide from one vowel quality to another) is simplified into a monophthong (a single, stable vowel sound). In Nigerian English, this phenomenon is widely observed and is shaped by ethnic language backgrounds, especially in how speakers from different regions simplify diphthongs found in Standard British or American English varieties.

In many varieties of Nigerian English, diphthongs such as /eɪ/, /əʊ/, and /aʊ/ are frequently monophthongised. For instance:

The diphthong /eɪ/ in day [deɪ] may be realised as a monophthong [de] by Yoruba or Igbo speakers. /əʊ/ in go [gəʊ] is often rendered as [go] or [gɔ], especially among Hausa and Yoruba speakers. /aʊ/ in now [naʊ] might be simplified to [na] by speakers from several ethnic groups.

The ethnolinguistic influence is key in these variations. For example, the Yoruba language lacks diphthongs, which partly explains Yoruba speakers' tendency to monophthongise diphthongs when speaking English. Similarly, Igbo speakers also exhibit monophthongisation due to the influence of their first language's vowel system, which favours distinct, non-gliding vowel sounds.

This trend is not merely a case of simplification but reflects a systematic phonological adaptation to accommodate English sounds within the constraints of indigenous phonologies.

While intelligibility is generally maintained, these pronunciations can sometimes result in miscommunication or accent-based judgments, especially in formal or international contexts.

Monophthongisation in Nigerian English also contributes to the growing body of research on Nigerian English as a nativised variety, where features like these are not viewed as errors but as legitimate linguistic innovations within a localized variety of English¹³⁸.

Monophthongisation refers to the phonological process by which diphthongs, complex vowel sounds characterised by a glide from one vowel quality to another, are simplified into monophthongs, or single, stable vowel sounds. This process is commonly observed across various Englishes, both native and non-native, due to linguistic and articulatory factors. It is observed that monophthongisation among younger native English speakers in Tyneside, particularly among females, as part of a broader sociolinguistic trend toward dialect leveling¹³⁹.

The observation was extended to African Englishes. For example, native Shona speakers in Zimbabwe replace English diphthongs with monophthongs or epenthetic forms like /j/ and /w/ to suit their native phonological constraints, which lack diphthongs and long vowels. This shift leads to pronunciation patterns such as /keki/ for *cake* or /tawun/ for *town*, resulting in syllable restructuring and lexical reinterpretation. These global instances of monophthongisation, including its presence in indigenized Englishes, underline both the adaptive nature of English phonology and the sociolinguistic legitimacy of localized variants. The phenomenon becomes especially relevant in underexplored contexts like Pashto, where the absence of prior research necessitates examining diphthongal variation as a feature of local identity rather than as mere deviation from Standard English¹³⁹.

Monophthongisation refers to the phonological process by which diphthongs such as /eɪ/ and /əʊ/ in Standard British English (SBE) are simplified into long monophthongs [e:] and [o:], respectively, in Educated Urhobo English (EUE). Drawing from moraic theory

transformation analysis revealed a weight-conserving mechanism, where the second element of the diphthong (/ɪ/ or /ʊ/) is deleted but its corresponding mora remains structurally active. This residual mora is then filled by lengthening the surviving vowel to maintain syllable weight and prosodic balance. Spectrographic evidence from F0 measurements confirms that the rise-fall contour of the diphthong's pitch is preserved in the long monophthong, suggesting that the intonational properties of the original diphthongs are retained despite phonemic reduction. The findings show that nearly all EUE speakers substitute diphthongs with their long vowel counterparts ([e:] and [o:]), indicating that monophthongisation is a systematic and predictable feature of EUE phonology driven by both structural and prosodic considerations¹⁴⁰.

Monophthongisation in Educated Ibibio English (EIE) refers to the phonological process in which English diphthongs, particularly /ei/ and /əʊ/, are reduced to the monophthongs [e] and [o], respectively. This process is commonly observed among literate Ibibio speakers in Akwa Ibom State, Nigeria, and typically affects final open stressed syllables. The second vowel element (the off-glide) of the diphthong is deleted, leaving the first element (the on-glide) stranded and subsequently lengthened to maintain syllable weight and intonational features. The lengthening of the remaining vowel is motivated by the need to preserve the moraic structure of the syllable, in line with Hyman and Hayes' Moraic Theory, which posits that syllable weight is mora-based rather than dependent on onset-rhyme structure. Acoustic analysis using Speech Filing System (SFS/WASP) tools supports this by showing a compensatory lengthening of [e] and [o] in place of the diphthongs. The findings reveal that monophthongisation in EIE is not merely a simplification of vowel sounds but a

phonologically driven adjustment to maintain the rhythmic and intonational structure of English, especially in stressed syllables¹⁴¹.

2.4.2 Vowel Length

Vowel length, which refers to the duration of vowel articulation, is a significant phonetic feature in many varieties of English. In Standard British English (RP), vowel length often contrasts meaningfully between long vowels (e.g., /i:/ in sheep) and short vowels (e.g., /ɪ/ in ship). However, in Nigerian English, vowel length tends to be neutralised or inconsistently realised, often influenced by the speaker's ethnic language background¹⁴².

Most Nigerian indigenous languages, such as Yoruba, Hausa, and Igbo, do not have a contrastive system of vowel length in the same phonemic sense as English does. Consequently, Nigerian English speakers often fail to maintain phonemic vowel length distinctions, leading to possible homophony between words that are contrastive in native English varieties. For example:

ship /ʃɪp/ and sheep /ʃi:p/ may both be pronounced as [ʃɪp] by many Nigerian speakers.

bit /bɪt/ and beat /bi:t/ may also be realised similarly.

Among Yoruba speakers, vowel length may be slightly better preserved because Yoruba has a system of vowel length and quality, though not identical to that of English. In contrast, Igbo and Hausa speakers are more likely to exhibit vowel length reduction or shortening, resulting in little or no perceptual difference between long and short vowels.

This reduction in vowel length contrast does not typically hinder communication within the Nigerian context, as listeners rely on contextual cues. However, in international contexts,

these differences may lead to comprehension issues or accent discrimination, especially in high-stakes communication or formal presentations.

Vowel length in Nigerian English tends to be neutralised, with significant variation across ethnic lines. This feature, while distinct from native English varieties, reflects the systematic phonological adaptation of English within the Nigerian linguistic environment.

An analysis of the diphthong /uə/ in Nigerian English highlights how vowel length and diphthongal glide are often compromised due to first-language (L1) interference. In Received Pronunciation (RP), diphthongs like /uə/ are characterized by a glide from a tense, strong vowel (/u/) to a more central and weaker vowel ([ə]), with much of the vowel's length and stress concentrated on the first element. However, in Nigerian English (NigE), the absence of the schwa [ə] in the native phonological inventory often leads to the monophthongization or outright replacement of the diphthong, effectively shortening the vowel and eliminating its glide¹⁴³.

This substitution often results in shorter, flatter vowels such as [u:], which lack the nuanced length and movement that define the RP diphthong. This confirms that the length and quality of diphthongs are not only phonetic features but also sociolinguistic markers, and their alteration in NigE arises from both systemic constraints of the L1 and the lack of exposure to native-like pronunciation models. Thus, vowel length in this context is significantly affected by language transfer and phonological adaptation¹⁴³.

Vowel length in Nigerian English plays a critical role in shaping its speech rhythm, which has been widely debated among linguists. Unlike British English, where vowel reduction is common—especially in unstressed syllables, Nigerian English tends to maintain fuller, more

evenly timed vowels. This results in syllables that are often longer and more consistent in duration, a characteristic associated with syllable-timed languages. It is argued that Nigerian English exhibits features typical of syllable-timing, citing the relative absence of vowel reduction and the longer duration of vowels, including schwa¹⁴⁴.

Also, reduced vowels in Nigerian English last almost twice as long as those in British English, indicating a rhythmic pattern where vowels are articulated with more prominence and uniformity. This contrasts with the stress-timed rhythm of British English, where stressed syllables are lengthened and unstressed syllables are compressed. Additionally, the influence of tonal native Nigerian languages, such as Yoruba, Igbo, and Hausa, which feature level tones and place less emphasis on stress, further contributes to the lengthening of vowels and a more even distribution of syllabic timing. Consequently, vowel length in Nigerian English is not merely a phonetic phenomenon but a key component of its prosodic identity, shaped by both linguistic transfer from local languages and a distinctive rhythm that challenges traditional binary classifications like stress- vs. syllable-timing¹⁴⁴.

Vowel length (VL) in speech perception operates at the intersection of multiple phonological and acoustic influences, serving as both a cue to speech rate and, potentially, as an independent phonological marker of voicing. While much of the research on VL has focused on English, where VL co-varies systematically with stop consonant voicing (shorter before voiceless stops and longer before voiced ones), this covariation is not universally present across languages. Crucially, the role of VL is complicated by its susceptibility to several factors beyond speech rate, such as stress, segmental context, and speaker physiology, which

suggests that listeners may interpret VL in multiple ways depending on linguistic experience¹⁴⁵.

In English, listeners appear to use VL both as a rate cue (normalizing VOT boundaries based on vowel duration) and as a redundant phonological cue to voicing. In contrast, Spanish lacks a strong VL-voicing correlation, and Spanish listeners are unlikely to treat VL as a voicing cue. Moreover, because speech rate differentially affects VOT in these languages, particularly altering long-lag VOTs in English and prevoicing in Spanish, the extent to which VL reflects rate rather than voicing category itself may differ across language backgrounds. Thus, vowel length should be conceptualized not merely as a passive indicator of speaking rate but as a potentially language-specific perceptual cue that listeners integrate with VOT differently depending on their native phonological system¹⁴⁵.

Vowel length, as conceptualized in this study, plays a pivotal role in phonological identity and cross-linguistic perception, particularly among speakers of Australian English (AusE). Unlike many other English varieties that primarily rely on spectral cues, AusE listeners exhibit heightened sensitivity to vowel duration, both in native and nonnative contexts. This is evident from their ability to discriminate Japanese long and short vowels based on duration alone, as well as their categorization of these vowels into native AusE categories where duration is contrastive (e.g., /e:/–/e/, /ɛ:/–/ɛ/). The study's design, using Japanese vowels varying only in duration across controlled consonantal contexts, allows for the isolation of length as a perceptual cue¹⁴⁶.

Two theoretical models frame the interpretation of these findings: a segment-based framework, which posits that acoustic cues like duration are category-specific, and a feature-

based framework, which assumes that such features are available across the phonological system. The outcome of the experiment, whether AusE listeners' use of duration is limited to vowels with native durational contrasts or extends to all vowel types, will clarify whether vowel length in AusE functions as a localized segmental cue or as a system-wide phonological feature.

Vowel length refers to the duration a vowel sound is held during speech and plays a significant role in pronunciation and meaning across languages. It is commonly categorized into tense vowels, which are longer, and lax vowels, which are shorter. In many languages, especially African ones, vowel length is phonemic, meaning it can alter word meanings or grammatical categories. For instance, languages like Lamba, Luvale, and Chichewa rely on vowel length distinctions, whereas others such as Tonga and Cinsenga do not. The Nyakyusa language of southwestern Tanzania features seven vowel sounds that can occur in both tense and lax forms, often indicated orthographically by vowel doubling. While vowel length is a familiar feature in many Bantu languages, its phonemic status in Nyakyusa remains uncertain. This ambiguity limits full linguistic insight into the language. Therefore, determining whether vowel length in Nyakyusa changes meaning or grammatical class is essential for deepening understanding of its phonological structure and its place within Bantu linguistic patterns¹⁴⁷

Vowel length, defined as the duration a vowel is held during speech, is a critical phonological feature influencing pronunciation, meaning, and overall intelligibility in language learning. Within the intricate phonological structure of English, which includes both segmental elements like vowels and consonants, and suprasegmental elements such as

rhythm, stress, and intonation, vowel length plays a distinct role, especially in differentiating minimal pairs (e.g., /i:/ vs. /ɪ/). For learners from languages with fewer vowel distinctions, which lacks the tense-lax contrasts of English vowels, mastering vowel length can be particularly challenging. This difficulty often results in phonological interference, where native language constraints lead to pronunciation errors like vowel neutralization or inappropriate vowel duration¹⁴⁸.

Effective pronunciation instruction must therefore address both the perceptual and productive aspects of vowel length, incorporating methods such as minimal pairs training, articulatory instruction, and rhythm-based activities. Emphasizing vowel length not only improves learners' phonemic awareness but also enhances oral communication, aiding intelligibility in academic, social, and professional contexts¹⁴⁸.

Vowel length operates as a phonological feature that interacts intricately with syllable type to influence rhyme duration, which is crucial for tonal realization. Both vowel length and syllable structure contribute independently and sometimes equally to rhyme duration, as demonstrated by the tonal distinctions between CVO (short vowel) and CVVO (long vowel) syllables. These contrasts are not merely additive but reflect co-dependent phonetic expressions, where longer vowels naturally extend rhyme duration unless overridden by structural constraints such as nasal codas or final obstruents¹⁴⁹.

Moreover, comparisons with other languages like Thai and Cantonese underscore that vowel length can retain phonological relevance even in systems where syllable type also plays a significant role. In Du'an Zhuang, this dual relevance suggests that vowel length is not

simply a phonetic byproduct but a phonologically contrastive feature that coexists with syllable structure to shape tone distribution and duration-based tonal patterns¹⁴⁹.

In the study of Plains Cree prosody, vowel length has historically been discussed as both a potential cue to stress and as a separate phonological feature, but recent accounts largely downplay its role in stress assignment. Early descriptions suggested that syllables with long vowels, particularly penults, might attract stress, implying a quantity-sensitive system. This view was echoed in some early analyses that proposed long vowels influence perceptual prominence¹⁵⁰.

It is recently argued that vowel length does not determine stress placement and is not a reliable acoustic cue to prominence. Instead, vowel length appears to be phonemic and independent of stress, with long vowels occurring in both stressed and unstressed positions. The confusion in earlier work may stem from non-native speaker bias, where pitch or vowel length is misinterpreted as stress. Pitch changes associated with prominence, even they deny a systematic link between vowel length and stress, instead suggesting that duration, pitch, and intensity should be considered in combination to understand prosodic patterns. Therefore, vowel length in Plains Cree is best understood not as a stress-driven phenomenon but as a phonemic property that coexists with rather than determines word-level prominence¹⁵⁰.

Vowel length in Pakistani English is best understood through the lens of linguistic hybridity and phonological adaptation influenced by native languages such as Urdu, Punjabi, Sindhi, Pashto, and Balochi. These indigenous languages, many of which possess phonemic vowel length contrasts, exert a significant influence on the articulation and perception of vowels in Pakistani English. As a result, vowel length in this variety often diverges from Standard

British English (SBE) norms, both in duration and phonemic distinction. For example, long vowels in SBE may be shortened in Pakistani English due to interference from local languages that lack equivalent length contrasts, or conversely, short vowels may be pronounced with longer duration where native patterns dictate such articulation. This influence leads to variations in vowel quality and quantity, often resulting in a more open oral cavity setting during vowel production¹⁵¹.

Rather than being perceived as pronunciation errors, these differences should be interpreted as systematic phonological features that reflect the bilingual or multilingual competence of Pakistani speakers. Thus, vowel length in Pakistani English emerges as a key marker of its evolving identity within the framework of World Englishes, shaped by a complex interaction of historical, educational, and socio-cultural forces¹⁵¹.

Vowel length, a key phonetic feature in English, refers to the duration a vowel is held during articulation and plays a crucial role in distinguishing meaning between words. As highlighted in phonetic literature, vowel length varies across dialects and is often influenced by both linguistic and sociolinguistic factors. For instance, Received Pronunciation (RP) and General American English display systematic differences in vowel duration, where long vowels (such as /i:/ in *seat*) are audibly longer than their short counterparts (such as /ɪ/ in *sit*)¹⁵².

Acoustic analyses using tools like *Praat* allow researchers to measure these durational contrasts objectively by examining vowel formants and temporal properties. Moreover, vowel length is not only a phonemic distinction but is also affected by prosodic features like stress and intonation stressed syllables tend to have longer vowels, contributing to the stress-timed rhythm of English. In sociolinguistic contexts, vowel length may signal regional

identity or social affiliation, as seen in phenomena such as vowel shifts in American English. Consequently, studying vowel length provides insights into both the structural and social dimensions of spoken English, making it a central focus in phonetic and sociophonetic research¹⁵².

2.4.3 Vowel Substitution

Vowel substitution in Nigerian English refers to the systematic replacement of standard English vowel sounds with approximations drawn from the phonological inventories of Nigeria's indigenous languages. This occurs due to the influence of mother tongues (L1), most of which possess fewer vowel contrasts than English, resulting in predictable substitution patterns across ethnic groups¹⁵³.

2.4.3.1 Common Substitution Patterns

2.4.3.1.1 Substitution of /ɪ/ and /i:/

Most Nigerian speakers do not differentiate between the short /ɪ/ (as in bit) and long /i:/ (as in beat). Both are often realised as [i], leading to homophones like bit and beat → [bit]. This pattern is common among Yoruba, Igbo, and Hausa speakers¹⁵³.

2.4.3.1.2 Substitution of /ʌ/ with /ɔ/ or /ɒ/

The central vowel /ʌ/ as in cup or luck does not exist in most Nigerian languages. It is commonly replaced with /ɔ/ or /ɒ/, leading to pronunciations like luck → [lɔk] and cut → [kɒt]. This pattern is prominent among Igbo speakers.

2.4.3.1.3 Substitution of /æ/ with /a/

The vowel /æ/ as in man is typically rendered as /a/, resulting in man → [man]. This simplification reflects the absence of /æ/ in many Nigerian languages. It is widespread across all major ethnic groups¹⁵⁴.

2.4.3.1.4 Substitution of Diphthongs with Monophthongs

Diphthongs like /eɪ/, /aɪ/, and /əʊ/ are frequently monophthongised, leading to vowel substitution. For instance, day /deɪ/ may be pronounced as [de], and go /gəʊ/ as [go].

2.4.3.1.5 Neutralisation of /ɜ:/

The mid-central vowel /ɜ:/ (as in bird) is often substituted with /ɛ/ or /e/, resulting in bird → [bɛd] or [bed]. This occurs across ethnic groups, with some variation in quality depending on the L1.

2.4.3.2 Ethnic Influence

Yoruba speakers tend to favour high front vowels and substitute English central and back vowels with fronted equivalents. Igbo speakers are more likely to reduce vowel contrast and substitute with back vowels like /ɔ/ and /o/. Hausa speakers may exhibit vowel harmony patterns that influence their vowel choices in English.

Vowel substitution in Nigerian English reflects the interference of indigenous phonologies, particularly due to the lack of one-to-one correspondence between English and Nigerian vowel systems. While these substitutions may deviate from native English norms, they have become systematic and predictable, contributing to the identity and intelligibility of Nigerian English.

Features of accent include the vowel and consonant pronunciations as well as intonation patterns. It also includes acoustic and perceptual dimensions which entails formant

frequencies, vowel duration, and spectral tilt. It has been observed that accents differ in the sounds they use, the frequencies of their formants, and the durations of their segments.

Vowel substitution, particularly in language contact scenarios such as English loanwords in Bemba, refers to the replacement of non-native vowels with phonetically similar vowels from the recipient language's inventory. For instance, /ə/ is variably realised as /a/, /e/, /i/, /o/, or /u/ depending on the word and context, resulting in forms such as *butter* → *baata* or *camera* → *kaamela*. This variability stems from the schwa's central and unmarked articulatory position, allowing it to approximate multiple vowel qualities. The process is driven not only by the absence of certain vowel phonemes in Bemba but also by the language's phonotactic constraints and preference for maintaining a pronounceable and familiar phonological shape, aligning with broader linguistic theories that describe substitution as a natural strategy for adapting foreign phonemes¹⁵⁵.

Vowel substitution is a prevalent phonological adaptation strategy employed when languages with differing vowel inventories come into contact, particularly in the process of borrowing. It arises from the tendency to preserve sounds rather than delete them, reshaping borrowed words using the closest phonemes available in the recipient language. This phenomenon occurs because certain sound combinations in the source language may be absent or disallowed in the borrowing language's phonological system. A study illustrates this process in Punjabi and Urdu, where English words like *road* /rəʊd/ are adapted to /ro:d/, conforming to native phonological patterns. Similarly vowel substitutions is observed in Egyptian Arabic, noting consistent alterations such as replacing /o/ with /a/ and /i/ with /e/ to align with the phonetic norms of the borrowing language. These patterns confirm that vowel substitution is

a systematic and predictable strategy used to resolve phonological mismatches in language contact situations¹⁵⁶.

2.5. Theoretical Review

This research adopted the source-filter theory of speech production to analyze and model the acoustic and perceptual characteristics of human speech. By examining the sound generation at the vocal cords (source) and the subsequent modulation by the vocal tract (filter), we aim to better understand the mechanisms underlying phonetic variation and to develop more accurate speech synthesis and recognition systems.

The Source-Filter Theory remains a central model in understanding speech production, offering insight into how sounds are produced and shaped. It provides a simple yet effective framework for exploring the interaction between the glottal source and the vocal tract filter, influencing a wide range of applications from speech synthesis to phonetic analysis¹⁵⁷.

First formulated in 1960, the source-filter model provides an acoustic description of speech. The idea is that a simple sound from the vocal folds has to travel through the throat and the mouth, passing all sorts of obstacles in order to produce a meaningful sound. In the 1960s, Fant's work, particularly his book "Acoustic Theory of Speech Production", provided a comprehensive and quantitative description of how the vocal tract shapes the sound produced by the vocal cords. Fant's model has been fundamental in the fields of phonetics, linguistics, and speech technology, including areas such as speech synthesis and recognition¹⁵⁸.

According to this model, speech production involves two stages; the source stage and the filter stage.

1. Source Stage: In this stage, the vocal cords (or vocal folds) in the larynx generate a sound source. This source is often described as a buzzing sound, which is produced by the vibration of the vocal cords. The fundamental frequency (pitch) and harmonic structure of the sound are determined here. The airflow from the lungs sets the vocal cords into vibration, creating the raw sound that will be shaped into speech.

2. Filter Stage: In the filter stage, the raw sound produced by the vocal cords is then modified by the vocal tract, which acts as a filter. The vocal tract includes the throat (pharynx), mouth (oral cavity), and nasal passages. By changing the shape and configuration of the vocal tract (through movements of the tongue, lips, jaw, and soft palate), different resonant frequencies are emphasised, which shapes the sound into distinct speech sounds or phonemes. This filtering process determines the timbre and quality of the speech sounds¹⁵⁸.

Together, these two stages-sound generations at the source and modification by the filter-explain how diverse speech sounds are produced from a relatively simple initial sound.

The source-filter (or acoustic) theory of speech production is an explanation of the two-stage process of creating speech sounds. For voiced phonemes (vowels, liquids, nasals, and glides), the source is the complex glottal tone produced by the vibration of the vocal folds. The vocal tract, which consists of the throat, mouth, and nose, filters or shapes the tone produced by the vocal folds into speech sounds. The vocal tract filter allows some frequencies of that multi-frequency glottal tone pass through to the outside air and reduces the intensity of other frequencies. When you change the shape of your vocal tract by moving your tongue, lips, and jaw, you change the frequencies that pass through or are filtered out. For fricative, stop, and affricate consonants, the source created by turbulent airflow at the site of vocal tract constriction is also filtered by the vocal tract¹⁵⁹.

The source-filter theory is important for understanding differences among vowel sounds. Different vocal tract shapes result in different patterns of formant frequencies, the bands of acoustic energy that we use to perceive vowel phonemes. For example, the vowel /i/ as in “heat” is produced with the tongue positioned high (close to the roof of the mouth) and relatively forward in the mouth. It has a low-frequency first formant, around 300 Hz, and a high-frequency second formant, around 2500 Hz. If you keep your tongue high in position but move it back toward the soft palate to produce the vowel /u/ as in “hoot,” the first formant remains low (300 Hz), and the second formant moves lower in frequency (around 900 Hz). Changes in the shape of the vocal tract result in changes in the patterns of acoustic energy that pass through the mouth, and those acoustic patterns are perceived by listeners as different vowel sounds¹⁶⁰.

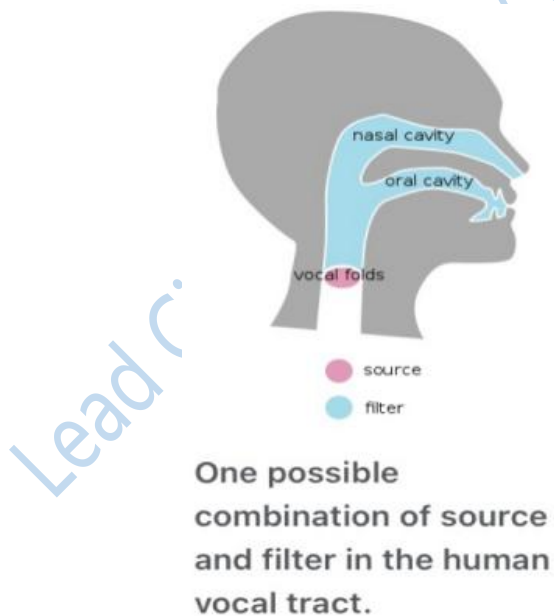


Fig 1

In the above diagrams, the source-filter theory of speech production, provides a comprehensive framework for understanding how human speech sounds is generated. According to this theory, speech production involves two key processes: the generation of a sound source and the modification of this sound by the vocal tract, which acts as a filter. These processes occur in tandem, shaping the raw sound into the distinct phonetic elements of speech. At the heart of the source-filter theory is the concept of the sound source, which is typically the vibration of the vocal folds within the larynx. When air from the lungs is pushed through the trachea and passes through the vocal folds, these folds can come together and vibrate, producing a periodic sound wave that serves as the primary source of voiced sounds, such as vowels and many consonants. This vibration creates a series of harmonics, giving the sound its initial pitch and timbre¹⁶⁰.

The vocal folds themselves are finely controlled by various muscles within the larynx, allowing for changes in pitch and volume. For instance, tension in the vocal folds can be adjusted to produce higher or lower pitches, and the force of airflow from the lungs can influence the loudness of the sound.

Once the initial sound is produced by the vocal folds, it enters the vocal tract, which includes the pharynx, oral cavity, and nasal cavity. These anatomical structures form the filter component of the theory. The shape and configuration of the vocal tract can be altered significantly by the movement of the tongue, lips, soft palate (velum), and jaw. Each of these articulators can change the resonance characteristics of the vocal tract, selectively amplifying or attenuating certain frequencies of the sound wave¹⁶¹.

For example, when producing different vowel sounds, the position of the tongue is crucial. Raising the tongue toward the roof of the mouth while narrowing the oral cavity can create a

high vowel sound, like [i] as in "see." Conversely lowering the tongue and widening the oral cavity produces a low vowel sound, like [a] as in "father." Similarly, lip rounding, as seen in the vowel [u] as in "blue," alters the resonance properties by lengthening the vocal tract.

Consonant sounds also rely heavily on the filter aspect of the vocal tract. The place of articulation (where the airflow is constricted) and the manner of articulation (how the airflow is constricted) are critical. For instance, a bilabial sound like [p] involves both lips coming together to block and then release the airflow, whereas a dental sound like [θ] (as in "think") involves the tongue touching the upper teeth¹⁶².

Furthermore, the nasal cavity plays a role in producing nasal sounds like [m] and [n]. When the velum is lowered, air is directed through the nasal cavity, adding nasal resonance to the sound.

The interplay between the source and the filter is dynamic and continuous, allowing for the vast array of human speech sounds. Variations in vocal fold vibration, combined with the flexible shaping of the vocal tract, enable speakers to produce the distinct sounds that form the basis of language¹⁶³.

The source-filter theory elegantly explains how these complex processes work together to produce intelligible and varied speech.

2.5.1 Sound Source: The Vocal Folds

The sound source in human speech production primarily involves the vocal folds, also known as vocal cords, located within the larynx. These folds are made of muscle and ligament covered by mucous membrane. When air from the lungs is pushed through the glottis (the space between the vocal folds), the folds can either remain apart, allowing

unimpeded airflow (resulting in voiceless sounds), or they can come together and vibrate to produce a sound wave (resulting in voiced sounds)¹⁶⁴.

This vibration occurs in a quasi-periodic manner for voiced sounds. The fundamental frequency of this vibration determines the pitch of the sound and is controlled by the tension and length of the vocal folds. For example, tighter and longer vocal folds produce higher-pitched sounds, while shorter and looser folds produce lower-pitched sounds.

2.5.2 The Filter: The Vocal Tract

Once the sound is generated at the vocal folds, it passes through the vocal tract, which acts as a resonating filter. The vocal tract includes the pharynx, the oral cavity, and the nasal cavity. Each segment can alter its shape and size to modulate the sound wave passing through it, thus changing its acoustic properties¹⁶⁵.

2.5.2.1 The Pharynx

The pharynx is a muscular tube that extends from the larynx up to the base of the skull. It plays a crucial role in resonating sound. Its shape and volume can be adjusted by the position of the larynx and the movement of surrounding muscles¹⁶⁶.

2.5.2.2 The Oral Cavity

The oral cavity is perhaps the most dynamic part of the vocal tract filter. The tongue, lips, teeth, and jaw all contribute to shaping the sounds. The position of the tongue is especially critical for vowel sounds. For instance: High vowels like [i] (as in "see") are produced with the tongue positioned high in the mouth.

Low vowels like [a] (as in "father") involve a low tongue position. Front vowels like [e] (as in "bed") have the tongue positioned towards the front of the mouth. Back vowels like [u] (as

in "blue") have the tongue positioned towards the back. The lips also play a role, particularly in rounding vowels. Rounded vowels like [o] and [u] involve the lips being protruded, which lengthens the vocal tract and modifies the resonance characteristics¹⁶⁷.

2.5.2.3 The Nasal Cavity

The nasal cavity becomes part of the vocal tract when the velum (soft palate) is lowered, allowing air to pass through the nose. This is essential for producing nasal sounds like [m], [n], and [ŋ] (as in "sing"). The nasal cavity adds resonance and gives these sounds their characteristic nasal quality¹⁶⁸.

2.5.2.4 Articulation of Consonants

Consonant sounds are produced by obstructing the airflow at various points along the vocal tract¹⁶¹. The place and manner of this obstruction define the specific consonant sound:

- Bilabial sounds like [p], [b], and [m] involve both lips coming together.
- Labiodental sounds like [f] and [v] involve the lower lip touching the upper teeth.
- Dental sounds like [θ] (as in "think") and [ð] (as in "this") involve the tongue touching the upper teeth.
- Alveolar sounds like [t], [d], [s], and [z] involve the tongue touching the alveolar ridge (the area just behind the upper front teeth).
- Palatal sounds like [j] (as in "she") and [ʃ] (as in "measure") involve the tongue approaching the hard palate.
- Velar sounds like [k], [g], and [ŋ] involve the back of the tongue touching the velum.
- Glottal sounds like [h] are produced at the glottis.

2.5.2.5 Resonance and Formants

The shaping of the vocal tract alters the resonant frequencies, or formants, of the sound wave produced by the vocal folds. Formants are the resonant frequencies of the vocal tract and are crucial for distinguishing different speech sounds, especially vowels. The first formant (F1) is influenced by the height of the tongue, and the second formant (F2) is influenced by the front-back position of the tongue¹⁶⁸. For instance:

- High front vowel [i] has a low F1 and a high F2.
- Low back vowel [a] has a high F1 and a low F2.

By changing the shape of the vocal tract, speakers can manipulate these formant frequencies to produce different vowels and consonants.

In summary, the source-filter theory elegantly explains how the raw sound generated by the vocal folds is shaped and filtered by the vocal tract to produce the wide variety of human speech sounds. The interaction between the sound source (vocal fold vibration) and the dynamic filter (vocal tract shape) allows for the production of distinct and intelligible speech, demonstrating the remarkable flexibility and precision of the human speech apparatus.

Resonance and formants are closely linked in the study of speech acoustics, particularly when analyzing vowel production with spectrograms. Resonance refers to the natural frequencies at which the vocal tract vibrates when air flows through it, and these resonances shape the sound into recognizable vowels. The peaks in the frequency spectrum of a vowel, its formants, are the acoustic result of these resonances. For instance, children often have higher first formant (F1) values than adults because their shorter vocal tracts produce higher resonance frequencies, much like how a shorter tube in a musical instrument yields a higher

pitch. Tools such as Interactive Physics make it easier for beginners to grasp these concepts by simulating the vocal tract as a series of masses and springs, illustrating how resonance “modes” emerge without needing precise physical measurements. This allows learners to see how changes in tract length or configuration shift resonance frequencies, and consequently, vowel formant patterns, grounding abstract acoustical physics in a clear, visual, and interactive way¹⁶⁹.

In speech analysis, formants which are the local peaks in a wideband sound spectrum, are often used as stand-ins for vocal tract resonances, but the two are not identical. Resonances represent the actual physical frequencies at which the vocal tract amplifies sound, whereas formants are the spectral features we measure. Formant estimates can be biased by the influence of strong harmonics, a phenomenon known as harmonic attraction, where the measured formant align more closely with a nearby harmonic than with the true resonance center. This bias persists even with modern algorithms and manual measurements, potentially introducing systematic errors in large datasets. While techniques like the reassigned spectrogram reduce such errors more effectively than linear predictive coding, they remain impractical for large-scale automated analysis. Until better methods emerge, careful reporting of analysis settings, justification of parameter choices, and inspection of the relationship between fundamental frequency (F0) and the first formant (F1) are recommended to mitigate misinterpretation of resonance data¹⁷⁰.

Formants are resonant frequency peaks created when the vocal tract filters a sound source, amplifying certain frequencies while damping others. They are not unique to human speech as recent research shows that many vertebrates, including reptiles, birds, and mammals,

produce and perceive formants, using them to convey cues about identity, body size, and emotional state independently of pitch. Because larger vocal tracts produce lower formants, species often evolve anatomical adaptations, like laryngeal lowering, tracheal elongation, or air sacs, to exaggerate perceived size for social or mating advantages. However, formant study is tricky: accurate detection requires a suitable sound source (broadband noise or a dense harmonic series), and misleading “pseudo-formants” can arise from non-resonant spectral peaks. Understanding formants thus demands careful application of source–filter theory, attention to measurement pitfalls, and awareness of their broad evolutionary and communicative significance¹⁷¹.

Formants refer to distinct resonance peaks in the loss spectrum that arise from the interaction between guided light modes in the hollow-core anti-resonance fiber (ARF) and surface plasmon waves (SPWs) on a gold-coated inner surface. These resonances occur at specific wavelengths where the phase-matching condition between the core mode and the surface plasmon mode is satisfied, producing strong energy transfer and characteristic spectral dips or peaks. In the designed ARF-SPR sensor, two such formants appear over a wide wavelength range, each exhibiting high wavelength sensitivity, up to 20,000 nm/RIU and 36,400 nm/RIU, and extremely fine resolution, enabling precise detection of refractive index changes in the range of 1.310–1.445. Formants act as signature frequency features linked to resonant behavior, but instead of vocal tract resonances shaping sound, the resonances are optical, governed by fiber geometry, material properties, and plasmonic coupling¹⁷².

Formants, in the context of speech science and phonetics, are resonant frequency bands shaped by the supralaryngeal vocal tract which are primarily the oral and nasal cavities that

modify the sound generated by the vibrating vocal folds. They can be defined and analyzed from multiple perspectives: acoustically, as concentrated bands of spectral energy visible in spectrographs (especially for vowels and sonorants); spectrally, as amplitude peaks in a frequency slice caused by vocal tract resonances; and articulatorily, in relation to the place of articulation and degree of constriction within the vocal tract. Traditionally, research emphasizes the first three formants (F1–F3) for their strong role in speech intelligibility, while higher formants (F4, F5) are less relevant to everyday linguistic analysis. Measured using tools like Fast Fourier Transform and spectrographic analysis, formants provide crucial data for understanding speech production, perception, and intelligibility, making them essential in linguistic description, hearing science, speech synthesis, and voice research¹⁷³.

Formants are resonance frequencies shaped by the length and configuration of the vocal tract, with lower formant frequencies generally corresponding to a longer vocal tract and thus a larger apparent body size. While static changes in vocal tract length (VTL) uniformly shift formants and influence perceived size, many animals, including humans, can dynamically adjust VTL during a single vocalization through actions like lip protrusion or larynx movement, altering formants in real time. Static cues tend to signal size, whereas dynamic shifts can convey emotional states or intentions, such as anger when formants fall or happiness when they rise. This dual role means that listeners may interpret low, steady formants as an indicator of consistently large size, but perceive changing formants—especially a gradual lowering, as an expressive, motivational signal, blending size exaggeration with nuanced social or emotional communication¹⁷⁴.

Resonance in the human voice occurs when sound waves generated by vocal fold vibration travel through the vocal tract and are shaped, reflected, and amplified by its physical

structure. As air passes through the vocal folds, the resulting sound waves—comprised of cycles of compression and rarefaction move upward into the pharynx, oral, and nasal cavities (the supra-glottal spaces), where they interact with the tract’s dimensions to create a series of overtones and formants. The fundamental frequency (f_0) determines pitch, while the arrangement and strength of resonances shape vocal timbre, allowing voices within the same pitch range (e.g., bass, tenor, soprano) to sound distinct. Resonance also interacts with vocal registers, which are influenced by muscle dominance: the thyroarytenoid (TA) muscles for lower-range “chest” voice (M1/modal), producing a fuller, heavier sound, and the cricothyroid (CT) muscles for higher-range “head” voice (M2/falsetto), producing a lighter tone, with transitions managed through the *passaggio*. This dynamic interplay between source vibration and resonating cavities is central to both speech and singing tone quality¹⁷⁵.

In high-pitch singing, particularly for professional sopranos producing notes above C6 (1047 Hz), vocal resonance involves complex strategies that are not strictly tied to vocal register boundaries. Typically, the first and second vocal tract resonances (R1 and R2) shape vowel quality in speech, but when the fundamental frequency (f_0) surpasses these resonance frequencies, singers may retune resonances to align with harmonics of the voice source. Research using dynamic 3D MRI and acoustic modeling shows that, for pitches from C5 to C7, sopranos sometimes maintain stable vocal tract shapes without major adjustments, or employ an $fR_1:f_0$ tuning, where the first resonance boosts the fundamental, up to around F6 (1396 Hz). No evidence was found for $fR_2:f_0$ tuning, and crossing points between f_0 and R1 did not consistently mark register shifts. This suggests resonance in extreme high-range singing is flexible and context-dependent, blending vowel shaping and selective tuning rather than relying on a single, fixed strategy¹⁷⁶.

Formants are resonant frequencies of the vocal tract that shape the distinctive qualities of vowel sounds and other vocalizations. They occur when sound waves produced by the vocal folds interact with the vocal tract's shape, creating constructive interference at specific wavelengths. These resonances, most often measured as the first four formants (F1–F4), are typically estimated using linear predictive coding (LPC), a mathematical approach that models the current sound signal based on its past values. LPC identifies both the frequency and bandwidth of each formant, with narrower bandwidths indicating stronger, longer-lasting resonances¹⁷⁷.

While widely used in speech analysis software such as Praat or R packages like *phonTools* and *soundgen*, LPC is prone to bias, especially in high-pitched or noisy recordings where harmonic structure can distort measurements. Manual verification, aided by spectrogram adjustments and auditory feedback, remains the most reliable way to ensure accuracy. Tools like *formant_app* streamline this process by enabling researchers to annotate vowel-like segments, check LPC estimates visually and aurally, and correct them as needed, ensuring that formant data reflect the true resonant properties of the vocal tract rather than artifacts of the analysis method¹⁷⁷.

Formants are prominent resonant frequency peaks in the short-term magnitude spectrum (ST-MS) of speech, created by the filtering effect of the vocal tract on the sound produced by the vocal folds. These peaks, typically stronger in magnitude than surrounding frequencies, represent the acoustic signature of vowel and certain consonant sounds, with their positions influenced by the shape and length of the vocal tract. In speech processing, formants are crucial because they help distinguish between different speech sounds and can reflect speaker-specific traits such as age, gender, and vocal tract length. Variations in formant

spacing occur due to differences in vocal tract length (e.g., between children and adults), and these differences can degrade system performance in tasks like keyword spotting (KWS). By emphasizing formant peaks in the ST-MS, it is possible to both reduce the impact of pitch-related high-frequency variations and address formant dispersion, leading to more robust acoustic features. This makes formants not only valuable for speech recognition accuracy but also for improving cross-speaker and cross-condition robustness in applications such as children's speech processing¹⁷⁸.

Formants are resonant frequencies of the vocal tract that shape the acoustic identity of speech sounds, especially vowels, by amplifying certain frequency regions in the voice spectrum. In vowel production, the first three formants, F1, F2, and F3, carry most of the perceptual information: F1 inversely relates to vowel height (higher F1 for lower vowels), F2 correlates with tongue advancement (higher F2 for front vowels), and F3 is often linked to lip rounding or retroflexion. These frequencies emerge from the complex interaction of articulatory configurations, such as tongue position, jaw height, and lip shape, with the acoustic properties of the vocal tract's resonance cavities. While traditional studies examine how articulatory changes influence formants, recent research also investigates the reverse—how targeted formant changes map to specific articulatory strategies, which may vary between speakers due to differences in vocal tract morphology. This dual perspective connects the physical structure of the vocal tract with the acoustic patterns that listeners perceive as distinct vowel qualities¹⁷⁹.

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Chapter Three

Methodology

This chapter explains the methods, systems, processes, and techniques adopted in this research work. It also examines the research philosophy that was posed by the objectives of this research to create a meeting point to achieving the aims and objectives created by the researcher through its method and tools of analysing the collected data.

3.1 Research Design

This study adopted a descriptive survey research design. It was designed to study the socio-phonological factors accounting for the accentual variation among the students of the Faculty of Science, University of Ibadan with a focus on examining and analysing how different social factors affect the accentual variations among these students.

3.2 Population of the Study

The population for this study comprised all students of the Faculty of Science at the University of Ibadan. This faculty comprises 10 departments namely: Botany, Microbiology, Chemistry, Geography, Mathematics, Physics, Statistics, Computer Science, Geology, and Zoology. Below is a statistic of admitted students in the faculty in the last five years.

Table 3.1: Statistics of Students' Admission into Faculty of Science, University of Ibadan

SN	Department	Sessions	300 Level	400 Level
1	Archeology and Anthropology	2022/2021	25	15
		2021/2022	20	10
		2022/2023	21	10
		2023/2024	—	—
2	Botany	2022/2021	65	60
		2021/2022	55	65
		2022/2023	49	70
		2023/2024	—	—
3	Chemistry	2022/2021	70	66
		2021/2022	76	65
		2022/2023	55	70
		2023/2024	—	—
4	Computer Science	2022/2021	55	45
		2021/2022	46	41
		2022/2023	40	32
		2023/2024	—	—
5	Geology	2022/2021	60	50
		2021/2022	53	52
		2022/2023	58	47
		2023/2024	—	—
6	Mathematics	2022/2021	63	57
		2021/2022	51	50
		2022/2023	46	63
		2023/2024	—	—
7	Microbiology	2022/2021	50	48
		2021/2022	55	53
		2022/2023	56	52
		2023/2024	—	—

8	Physics	2022/2021	44	39
		2021/2022	35	42
		2022/2023	16	34
		2023/2024	—	—
9	Statistics	2022/2021	58	51
		2021/2022	40	58
		2022/2023	42	59
		2023/2024	—	—
10	Zoology	2022/2021	45	40
		2021/2022	39	44
		2022/2023	31	38
		2023/2024	—	—
Grand Total			1,419	1,426 = 2485

Source: Field Survey, 2025

3.3. Sample and Sampling Technique

The purposive sampling technique was used to sample 30 students from five different departments in the Faculty of Science at the University of Ibadan, Ibadan, Oyo State. Inclusion in the study was restricted to 300 and 400-level undergraduate students from the ten listed departments within the Faculty of Science, while all other levels and faculties were excluded.

Table 3.2: Sampled Students

Department	Female	Male	Total
Microbiology	4	2	6
Chemistry	3	4	7
Physics	2	3	5

Computer Science	3	4	7
Botany	3	2	5
Total:	15	15	30

Source: Field Survey, 2025

3.4. Research Instrument

The research instrument for this study was a read-aloud test, the Undergraduates Accentual Variation Achievement Test was adapted from DIBELS (Dynamic Indicators of Basic Early Literacy Skills).

3.4.1 Undergraduates Accentual Variation Read-aloud Test

The read-aloud test is divided into two sections to gather data on accentual variation among participants. Section A collects socio-demographic information, including age, gender, ethnicity, academic level, department, languages spoken fluently, and the locations of primary and secondary education. This section provides contextual details that may influence pronunciation. Section B evaluated general pronunciation by having participants read a selection of words, phrases, and short passages featuring commonly mispronounced sounds and homophones. This allowed researchers to analyse pronunciation patterns and their potential connections to the socio-demographic factors identified in Section A.

3.5. Validity of the Instrument

To determine the instruments' validity, the operationalisation of the construct was done and converted to items of the read aloud texts. Mainly, some words and a passage were picked at random but were ensured to cut across the vowel and consonant sounds. The text was issued to the participants to read aloud for recordings.

The supervisor and other specialists were shown the texts before being used on the field to ascertain the instrument's face and content validity in educational management. The experts examined if the instruments were appropriate for measuring what they were intended to measure and checked to make sure the instruments contained the proper items that might genuinely elicit the desired responses. Using the scientific approach, the validity was obtained at 0.78 Cronbach's coefficient.

3.6. Reliability of the Instrument

The reliability of the instrument was determined through a pilot test of 5 randomly selected students in the Faculty of Arts, University of Ibadan. It was administered to these students to examine the possible responses. The response of these students to the research questions was subjected to the Cronbach reliability test and 0.87 was obtained accordingly.

3.7 Administration of Instrument

The researcher visited the Faculty of Science, University of Ibadan to gather the data needed for this research work. The gathering of the data was made easier with the help of the Faculty officers and the student leaders who gave directions and recommendations on how to effectively conduct this research in the faculty. Their recommendations and guide paved the way for the easy recognition of students in the Faculty of Science. The instrument was presented to the respondents in a face-to-face interaction during the read-aloud presentation test. Phone and portable tape recorder were used to record the read aloud test..

3.8 Method of Data Analysis

The recorded read aloud tests were transcribed phonetically in front each each word accordingly. It was listened over and over again with specific attention to variations at

segmental and suprasegmental levels. WASP Sound Filing System (SFS) was used to analyse selected expression to validate accentual variation acoustically. The study combines acoustic and descriptive analyses to examine accentual variations in English pronunciation of students of faculty of science, university of Ibadan along the corridor of social factors.

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Chapter Four

Results and Discussion of Findings

This chapter contains the result and a brief description of the findings. Specifically, it present demographic of student in faculty of science university, Ibadan.

4.1 Demographic Data Analysis

Table 4.0: Demography of Respondents

Variable	Category	Frequency	%
Age	16–20	5	16.66
	21–25	17	56.66
	26–30	5	16.66
	31 and above	3	10.00
	Total	30	99.98
Gender	Male	15	50.00
	Female	15	50.00
	Total	30	100
Department	Microbiology	5	16.66
	Botany	5	16.66
	Chemistry	5	16.66
	Physics	5	16.66
	Computer Science	5	16.67
	Total	30	100
Ethnicity	Yoruba	10	33.33
	Hausa	10	33.33
	Igbo	10	33.33

Variable	Category	Frequency	%
	Total	30	99.99
Languages Spoken	Yoruba / English	10	33.33
	Hausa / English	7	23.33
	Igbo / English	6	20.00
	Igbo / Yoruba / English	4	13.33
	Hausa / Yoruba / English	3	10.00
	Total	30	99.99

Source: Field Survey, 2025

Table 4.0 presents the demographic distribution of respondents. The majority of participants (56.6%) were between the ages of 21–25, while 16–20 and 26–30 years each accounted for 16.6%, and only 10% were 31 years and above. Gender distribution was equal, with 50% male and 50% female respondents, ensuring balanced representation. In terms of academic departments, participants were evenly drawn from Microbiology, Botany, Chemistry, Physics, and Computer Science, with each contributing 16.6% to 16.7% of the sample. Ethnic distribution was also balanced, with Yoruba, Hausa, and Igbo each representing 33.3% of the respondents. Regarding languages spoken, 33.3% spoke Yoruba/English, 23.3% Hausa/English, 20% Igbo/English, while smaller proportions spoke multiple language combinations such as Igbo/Yoruba/English (13.3%) and Hausa/Yoruba/English (10%).

Research Question 1: What are the common accentual variations in the speeches of students of the Faculty of Science, University of Ibadan?

It has been stated earlier that there are two perspectives to accentual variation, while one refers to it as prosodic variations occasioned by the variety of English the person speaks, the other, in a broader sense, covers phonological elements at both segmental and suprasegmental levels. The latter was adopted in this study. Hence, accentual variation is referred to as common phonological elements that varied in the speeches of students of the Faculty of Science, University of Ibadan, as identified in the read aloud test and observation.

The common accentual variations in the speeches of students of the Faculty of Science, University of Ibadan are grouped into vowel variations, consonant variations and suprasegmental variations.

Vowel Variations

These are differences observed in the articulation of the same vowel sounds by the students of the Faculty of Science, University of Ibadan. The study observed different vowel qualities from different participants based on their gender, background and context etc. The vowel variations observed include:

- i. Monophthongisation –This is the articulation of a diphthong as a monophthong.
- ii. Vowel Length –This captures the difference in the articulation short and long vowel sounds by the students of the Faculty of Science, University of Ibadan.
- iii. Vowel Substitution – This section deals with how the students of the Faculty of Science, University of Ibadan, substitute a sound that is difficult for them to articulate with another sound similar to it especially in their first language.

Vowel Variations

Table 4.1 Showing the Result of Monophthongisation among the Respondents

Token	Tribes	Gender	Monophthong		Diphthong		Total
			Frequency	%	Frequency	%	
Plough /aʊ/	Yoruba	Male	-	-	5	100	
		Female	-	-	5	100	
	Hausa	Male	-	-	5	100	
		Female	-	-	5	100	
	Igbo	Male	-	-	5	100	
		Female	-	-	5	100	
Identify /ai/	Yoruba	Male	5	100	-	-	
		Female	2	40	3	60	
	Hausa	Male	5	100	-	-	
		Female	4	80	1	20	
	Igbo	Male	4	100	-	-	
		Female	3	60	2	40	
Go /əʊ/	Yoruba	Male	5	100	-	-	
		Female	4	80	1	20	
	Hausa	Male	5	100	-	-	
		Female	5	100	-	-	
	Igbo	Male	5	100	-	-	
		Female	5	100	-	-	

Baby/ei/	Yoruba	Male	5	100	-	
		Female	3	60	2	40
	Hausa	Male	5	100	-	
		Female	5	100	-	
	Igbo	Male	5	100	-	
		Female	5	100	-	
Tear (v) /eə/	Yoruba	Male	-		5	100
		Female	2	40	3	60
	Hausa	Male	-		5	100
		Female	1	20	4	80
	Igbo	Male	3	60	2	40
		Female	4	80	1	20

Source: Field Survey, 2025

All the 30 respondents across the ethnic poles monophthongise the diphthong /ei/ except 2 Yoruba respondents representing 6.66%. Another diphthong that is difficult for Nigerian speakers of English across ethnic poles is /əʊ/. All the 30 respondents across the ethnic poles, except 1 Yoruba female respondent representing 3.3%, monophthongise the diphthong /əʊ/. This showed that /ei/ and /əʊ/ are the most difficult diphthongs for Nigerian speakers of English to articulate. /ai/ is not one of the diphthong difficult to articulate for Nigerian speakers of depending on its phonological position and environment. However, at word initial position like 'identify', 25 respondents representing 83.3% produced it as monophthong. This is a testament that /ai/ in some phonological environment may pose difficulty to Nigerian speakers of English. 66.6% of the respondents also realised 'tear' (v) as diphthong while 33.3% realised it as monophthong. 7 (70%) out of 10 total monophthong

occurrences were made by females. Also, the result showed that 7 (70%) occurrences of the 10 monophthong were made by Igbo speakers of English. This implies that Igbo speakers monophthongise the diphthong /eə/ than any other ethnic affiliation in Nigeria. Monophthongization of diphthongs is another phonological variation phenomenon observed in the speeches of students of the Faculty of Science, University of Ibadan. Monophthongization of diphthongs is a process of realising a diphthong (two-vowel qualities that glides into one) as a monophthong (single-vowel quality). Table 4.7 showed that the respondents monophthongised and diphthongised as occasion demands. The fact that they realised the sound as diphthong does not mean they articulate the sounds correctly. For instance tear (v) is realised by most respondent as /tia/ instead of /teə/ (but that is not the focus of this study). Some, especially Igbo female speakers realised tear as monophthong /tɜ:/. The study observed that while some diphthongs are not difficult to articulate for Nigerian speakers of English though they are not in the phonological inventory of their first language) some pose a great deal of difficulty. All the 30 respondents did not monophthongise the diphthong in 'plough'. This corroborates previous findings¹ that Nigerian educated speakers of English monophthongise /əʊ/, because of its absence in their first languages.

Table 4.2 The Result of Vowel Length among the respondents

Token	Tribe	Gender	Short	Long	Mid	Total
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			Frequency	%	Frequency	%	Frequency	%
Bit /ɪ/	Yoruba	Male	-	-	-	-	5	100
		Female	-	-	-	-	5	100
	Hausa	Male	-	-	-	-	5	100
		Female	-	-	-	-	5	100
	Igbo	Male	-	-	-	-	5	100
		Female	-	-	-	-	5	100
Beat /i:/	Yoruba	Male	-	-	-	-	5	100
		Female	-	-	3	60	2	40
	Hausa	Male	-	-	-	-	5	100
		Female	-	-	1	20	4	80
	Igbo	Male	-	-	-	-	5	100
		Female	-	-	1	20	4	80
cat /æ/	Yoruba	Male	-	-	-	-	5	100
		Female	1	20	-	-	4	80
	Hausa	Male	-	-	-	-	5	100
		Female	-	-	-	-	5	100
	Igbo	Male	-	-	-	-	5	100
		Female	-	-	-	-	5	100
Cart /ɑ:/	Yoruba	Male	-	-	4	80	1	20
		Female	-	-	5	100	-	-
	Hausa	Male	-	-	2	40	3	60
		Female	-	-	3	60	2	40
	Igbo	Male	-	-	-	-	5	100
		Female	-	-	-	-	-	-

pull /ʊ/	Yoruba	Female	-	-	3	60	2	40
		Male	-	-	-	-	-	-
	Hausa	Female	2	40	-	-	3	60
		Male	-	-	-	-	5	200
	Igbo	Female	1	20	-	-	4	80
		Male	5	100	-	-	-	-
	Yoruba	Female	1	20	-	-	4	80
		Male	-	-	-	-	-	-
	Hausa	Female	2	40	3	60	-	-
		Male	-	-	5	100	-	-
	Igbo	Female	-	-	3	60	2	40
		Male	-	-	2	40	3	60
Pool /u:/	Yoruba	Female	-	-	3	60	2	40
		Male	-	-	-	-	-	-
	Hausa	Female	-	-	-	-	-	-
		Male	-	-	-	-	-	-
	Igbo	Female	-	-	-	-	-	-
		Male	-	-	-	-	-	-

Source: Field Survey, 2025

Different vowel length distinctions were observed in the spoken English of the respondents as captured in the read aloud test. Table 4. 2showed that there is no significant difference in accentual variation of respondents across gender and ethnic poles. Though, they did not differentiate between short and long vowels, their articulation is neither long nor short, they operated at mid level. The table showed that in ‘bit’ and ‘cat’, all the respondents did not produce short or long sound rather they produced a variant that is at the middle. In all, the result showed that the respondents produced long sound better than short vowel sounds.

Table 4.3 Vowel Substitution

		Yoruba		Hausa		Igbo		Total
		Male	Female	Male	Female	Male	Female	
Cup /ʌ/	Correct	2	3	1	2	1	2	11
	Substitute	3	2	4	3	4	3	19
Nurse /ɜ:/	Correct	1	3	2	3	1	2	12
	Substitute	4	2	3	2	4	3	18
Observe /ə/	Correct	-	2	1	2	-	1	6
	Substitute	5	3	4	2	5	3	24
Ago /ə/	Correct	1	2	-	3	1	2	9
	Substitute	4	3	5	2	4	3	21
Turn /ɜ:/	Correct	2	3	1	2	1	2	11
	Substitute	3	2	4	3	4	3	19
Total	Correct	6 (24%)	13 (52%)	5 (20%)	10 (40%)	4 (16%)	9 (36%)	
	Substitute	19 (76%)	12 (48%)	20 (80%)	15 (60%)	21(84%)	16 (64%)	

Source: Field Survey, 2025

Table 4.3 showed that all the respondents exhibit substitution in their articulation of vowel sounds. Igbo male speakers of English substitute more than others leading with 84%, closely followed by Hausa male speakers of English, 80%, Yoruba male speakers followed with 76%. Among the female speakers Igbo female had 64% vowel substitution, followed by Hausa female speakers with 60%, while Yoruba female speakers had the least substitution with 48%.

b. Consonant Variations

The second segmental aspect where variations are noticeable in speech of students of the Faculty of Science, University of Ibadan is consonant sound production. These are phonological variations observed in the articulation of the respondents. It is further classified as follows:

- i. **Voicing** (the behaviour of vocal cord whether it vibrate or not). Some speakers exhibit a tendency to devoice voiced consonants, particularly among female speakers. It was

observed that many of the speakers across ethnic and gender poles always devolve a voiced consonant.

- ii. **R-Liaison:** The use of linking and intrusive /r/ is a phenomenon described as influx of Americanism in the spoken English of Nigerians. This is observed more in the speeches of female speakers compared to their male counterparts.
- iii. **Rhoticity:** This refers to the pronunciation or articulation of the /r/ sound, particularly in **post-vocalic** positions, that is, when the /r/ occurs after a vowel, such as in words like *car*, *hard*, or *mother*. The /r/ sound is pronounced clearly in all positions, including after vowels. Rhoticity often serves as a sociolinguistic marker, distinguishing regional, social, or educational backgrounds. In some contexts, being rhotic or non-rhotic can indicate one's origin or level of formality. Rhoticity is about whether or not the /r/ sound is pronounced after vowels. It is a crucial feature in the phonological analysis of English accents and plays a role in identity and regional variation.
- iv. **Flapping**
- v. **Consonant Deletion:** Another phonological phenomenon observed in the spoken English of the students of Faculty of Science, University of Ibadan, is consonant deletion.

Consonant deletion, the omission of consonants in connected speech, can occur at varying

Table 4.4 Consonant Substitution

Token	Tribe	Gender	/t/		/f/		/d/		/θ/		/ð/	
			Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Think /θ/	Yoruba	Male	4	80	-				1	20		
		Female	2	40	1	20			2	40		
	Hausa	Male	4	80					1	20		
		Female	2	40	2	40			1	20		
	Igbo	Male	4	100	-							
		Female	3	60	1	20			1	20		
With /ð/	Yoruba	Male	3	60	1	20	1	20				
		Female	1	20	1	20			2	40	1	20
	Hausa	Male	3	60	1	20	1	20				
		Female	1	20	1	20	1	20	1	20		
	Igbo	Male	3	60	1	20	1	20				
		Female	2	40	2	40	1	20				
Thomas /t/	Yoruba	Male	3	60					2	40		
		Female	1	20					4	80		
	Hausa	Male	3	75	-				1	25		
		Female	1	25	-				3	75		
	Igbo	Male	4	100	-							
		Female	2	50	-				2	50		
Very /v/			/v/		/f/		/p/					
	Yoruba	Male	1	20	4	80						
		Female	3	60	2	40	-					
	Hausa	Male	3	60	1	20	1	20				

zoo /z/		Female	2	40	2	40	1	20		
	Igbo	Male	-		3	60	2	20		
		Female	2	40	3	60				
			/z/		/s/					
	Yoruba	Male	2	40	3	60				
		Female	5	100	-					
	Hausa	Male	5	100	-					
		Female	5	100	-					
	Igbo	Male	5	100	-					
		Female	5	100	-					
Measure /ʒ/			/ʒ/		/ʃ/		/z/	/j/	Omission	
	Yoruba	Male	-	-	5	100	-	-		
		Female	1	20	3	60	-	-	1	20
	Hausa	Male	-	-	5	100	-	-		
		Female	1	20	3	60	-	-		
	Igbo	Male	-	-	5	100	-	-		
		Female	-	-	3	60	-	-	2	40

Source: Field Survey, 2025

Consonant Substitution: Consonant substitution is observed in the speeches of the students of faculty of science, University of Ibadan. Dental fricatives (voiceless and voiced) illustrate this phenomenon. Some students substitute phonemes that are not in their L1 phonological inventory or difficult for them to articulate with other consonant that share similar qualities in

their L1 phonological inventory. Others articulate the sounds correctly in spite of their absence from their L1 phonological inventory.

Table 4.5 Showing Result on Accentual Variation because of the Context of Speaking

Do you vary your accent because of the context of speaking?

Tribe	Gender	Yes		No	
		Frequency	%	Frequency	%
Yoruba	Male	3	60	2	40
	Female	5	100	-	-
Hausa	Male	3	60	2	40
	Female	5	100	-	-
Igbo	Male	2	40	3	60
	Female	4	100	-	-
Total	Male	9	60	6	40
	Female	5	100	-	-

Source: Field Survey

Table 4.5 showed participants responses to whether they varied their pronunciation because of the prevailing context of conversation or not. All the female sampled agreed that they varied their pronunciation because of the prevailing context of conversation while 60% of male answered in the affirmative.

Table 4.6 Showing General Trends in Gendered Intonation Use in Nigeria

Feature	Female Speakers	Male Speakers
Pitch Range	Wider (more expressive)	Narrower (more monotone)
Rising Intonation	Common in polite requests and uncertainty	Mostly restricted to yes/no questions
Falling Intonation	Softer, fall-rise used for engagement	More abrupt and final
Emotional Intonation	Frequently used to express friendliness	Often suppressed or minimized
Influence of Education	Females in formal settings approximate Standard English more closely	Males tend to retain local or informal intonation patterns

Source: Field Survey, 2025

Table 4.6 outlines gender-based intonational variation in Nigerian English. Female speakers tend to use a wider, more expressive pitch range, with rising intonation appearing in polite requests and uncertainty, and softer falling intonation often shaped into fall-rise patterns for engagement. They also show more emotional expressiveness and align more closely with Standard English intonation in formal contexts. In contrast, male speakers generally use a narrower pitch range, reserve rising intonation for yes/no questions, favor abrupt falling intonation, suppress emotional cues, and retain more local or informal intonation patterns regardless of context.

Table 4.7: Ethnic and Gender Intonation Deployment

Group	Statement Intonation	Yes/No Question	WH-Question
Yoruba Male	High or level	High final tone	Level
Yoruba Female	Slight fall	Rising tone	Falling tone
Igbo Male	Rising	Rising	Rising
Igbo Female	Rising-falling	Rising	Falling
Hausa Male	Flat	Slight rise	Flat
Hausa Female	Mild fall	Rising	Falling

Source: Field Survey, 2025

Table 4.7 denotes ethnic and gender-based variations in intonation patterns among Nigerian English speakers. Yoruba males tend to use high or level tones in statements and yes/no questions, while females show more varied intonation with slight falls and rising tones. Igbo speakers, particularly males, consistently use rising intonation across all sentence types, while females use rising-falling for statements and falling tones for WH-questions. Hausa speakers display flatter intonation, with males using mostly flat tones and females showing mild falls and slight rises, indicating generally less intonational variation.

Both unidirectional and bidirectional intonation patterns were observed in the spoken English of the students of faculty of science, University of Ibadan. Nigerian English often favours unidirectional intonation patterns, where tones move in one direction (e.g., high-low), whereas RP uses more bidirectional intonation patterns, with tones moving both up and down.

While both stress-timing and syllable-timing are present in English, Nigerian English tends towards stress-timing, where syllables receive more stress than others. The accentual variations in the spoken English among students of faculty of science, university of Ibadan is largely influenced by the phonology of Nigerian languages (like Hausa, Yoruba, and Igbo). This leads to variations in vowel quality, consonant articulation, and intonation. However, the study found that other social factors contribute to accentual variation among the respondents.

Individuals with higher levels of education and exposure to Standard English may exhibit greater conformity to RP intonation patterns and pronunciation. Female Speakers: Some research suggests that female speakers in Nigeria may have a tendency to devoice voiced consonants and use a different intonation pattern than male speakers. Variations in phonology are influenced by linguistic background, educational background, and gender. These variations are often observed in vowel quality, consonant articulation, and intonation patterns.

The results of the study showed that there are voluntary (intentional) accentual variations and involuntary accentual variations. Both voluntary and involuntary variations mark identity. The Voluntary accentual variations occur when a speaker intentionally varied their accents to suit the context of a particular communication while the speakers have no power over involuntary accentual variations. Involuntary accentual variations revealed the speakers' real phonological performance. The respondents agreed that their pronunciation vary from one context to another. In the classroom interaction, they maintain strict compliance to formal phonological features, to the best of their knowledge, while their pronunciations vary when in a casual and informal conversation outside the classroom. This corroborates the

submission of other scholar that speakers of English switch between different pronunciation patterns or dialects either consciously or unconsciously depending on the situation, the audience or the speakers' intentions².

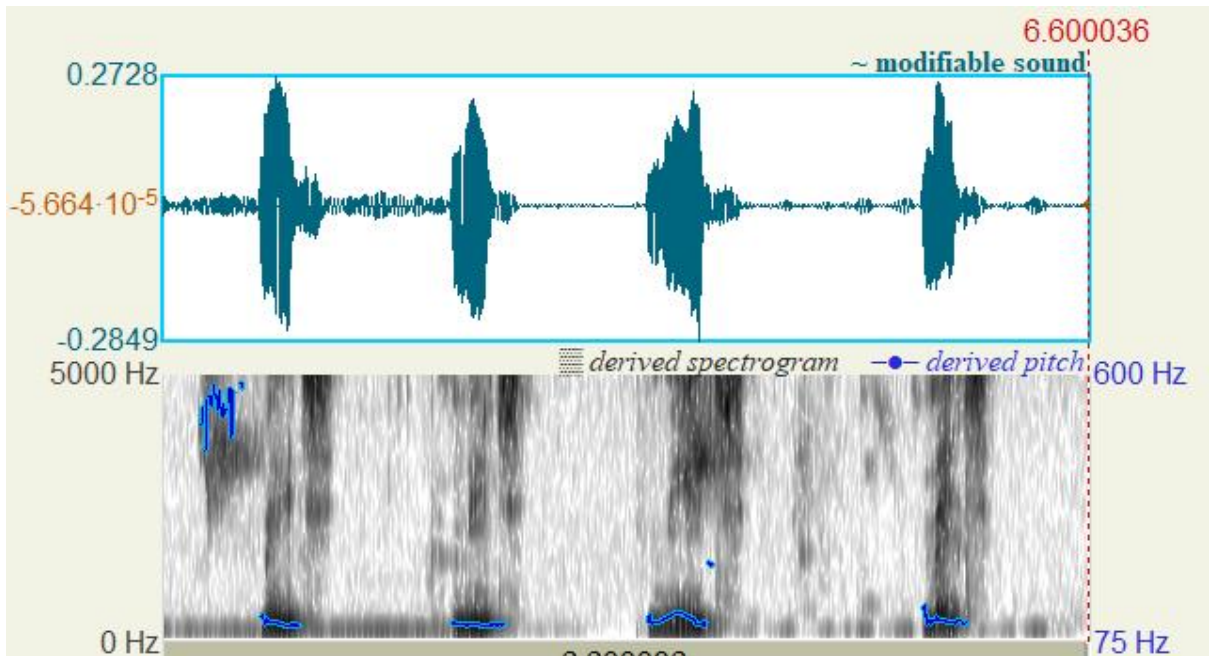


Figure 1a. Spectral and Pitch Analysis of Male Respondent Pronunciation of "mate", "meat", "meet", "met"

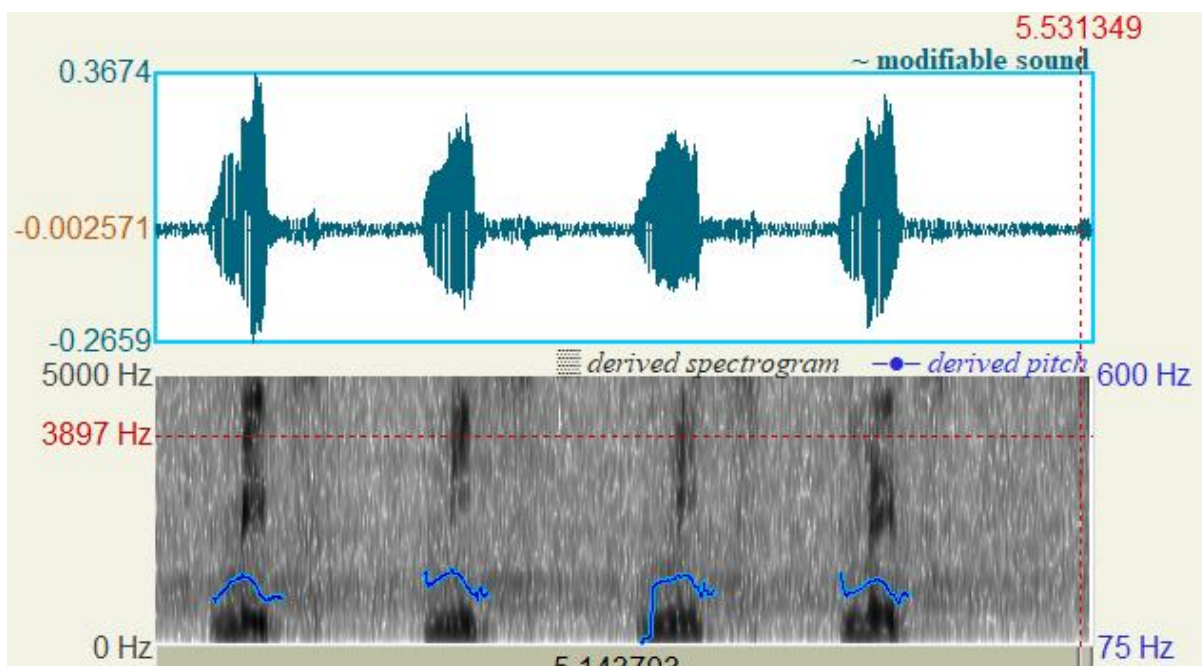


Figure 1b. Spectral and Pitch Analysis of Male Respondent Pronunciation of "mate," "meat," "meet," "met"

4.2 Discussion of Findings

Accentual variation among the respondents underscores the complex interaction between linguistic competence and sociolinguistic factors. The observation of monophthongisation, vowel length differences, and vowel substitution suggests a transfer from the phonological structures of indigenous languages into English usage. For instance, Yoruba and Igbo languages do not make distinctions in vowel length in the same way English does, which could explain the shortening or neutralisation of vowels. Such phonological interference illustrates how first language structures act as filters through which English is learned and spoken. This finding has significant pedagogical implications, as it calls for a more contrastive approach to the teaching of English phonology in Nigerian schools.

In addition, consonantal variations such as substitution, voicing, and deletion reflect not only the influence of indigenous phonological systems but also sociolinguistic pressures. For example, the tendency to substitute or delete certain sounds may be reinforced by peer-group acceptance, where localised variants are tolerated and even normalised in academic and informal contexts. However, when placed in wider communication contexts, such as national or international discourse, these variations can affect perceptions of credibility, sophistication, or authority of the speaker. This raises questions about linguistic prejudice and the power of "standard" varieties of English in determining social mobility, especially in academic and professional domains¹.

The gendered nature of accentual variation in this study also reveals deeper social dynamics. The tendency of female respondents to tilt toward American pronunciation, alongside hypercorrection and overgeneralisation, suggests that accent is being employed as a marker of identity and possibly as a tool for upward mobility. Females may be more responsive to globalised linguistic norms due to social expectations about refinement, correctness, and prestige in communication. Conversely, the relative stability in male pronunciation, with more prominent features of localised variation, might reflect a confidence in projecting a Nigerian linguistic identity. These differences imply that accent is not merely a phonological phenomenon but also a socio-cultural resource that individuals manipulate to align with or resist certain identities².

Finally, the broader implication of these findings is that accentual variation in Nigerian English should not be seen merely as "errors" or "deficiencies," but rather as systematic patterns influenced by sociolinguistic realities. Such variations signal the ongoing

nativisation of English in Nigeria, where global norms interact with local identities. This dual process positions Nigerian English as a legitimate variety with its own norms, while still raising questions about intelligibility, standardisation, and the politics of global communication. Recognising this complexity is essential for language policy makers, educators, and researchers who must balance the preservation of local linguistic identities with the need for global intelligibility and academic competitiveness. This is shown in the spectrograph below.

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Endnotes

1. M. O. Gbadegesin, Socio-phonological Analysis of Monophthongisation among Selected Final Year University Students of English in Nigeria. **Journal of the Associations of Phoneticians and Phonologists in Nigeria**, 2021, 162-182
2. Olajide-Buhari & Soneye, *Crucial Connections between Nigerian Inspirational Speakers' Accents and Ethnic Identities*. **Journal of the Associations of Phoneticians and Phonologists in Nigeria**. 2024, 82-99

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Chapter five

Conclusion

5.1 Summary of Findings

This study set out to examine accentual variation among students in the Faculty of Science at the University of Ibadan, focusing particularly on how social factors such as gender, ethnicity, age, and multilingual backgrounds shape phonological expression. Data were gathered using a read-aloud test and a socio-demographic questionnaire. Analysis revealed both segmental and suprasegmental variations, providing insight into the complex interplay between language use and social identity.

From the research activities, it was deduced that there is an existence of voluntary and involuntary accentual shifts from different native speakers of Nigeria. Participants demonstrated both conscious and unconscious adjustments in pronunciation. While formal contexts generally elicited more standardized articulation, informal settings tended to draw out localized or native-influenced speech forms.

Segmental variations were also discovered as a factor of pronunciation among the participants. Prominent segmental features included monophthongisation, vowel substitution, and misapplication of vowel length. These were largely traceable to first-language interference, with notable occurrences among Igbo speakers and female participants, particularly in the realization of diphthongs such as /eə/ and /əʊ/. Another factor that determines variations among the participants is gender-related trends and patterns of pronunciation. Female respondents displayed a tendency to adopt Americanized phonological

patterns, often marked by hypercorrection. In contrast, male participants were observed to maintain more consistent pronunciations aligned with conventional norms.

In the findings, it was discovered that there is suprasegmental influences in the various pronunciation of the participants. Variation in intonation, stress placement, and rhythm was also evident, often reflecting the stress patterns and tonal qualities inherent in the speakers' first languages.

Finally, the ethnicity and multilingualism played a significant role in the pronunciation pattern of the participants. In other words, the role of ethnic influence cannot be underplayed in the pronunciation of the participants. Ethno-linguistic backgrounds significantly influenced articulation, particularly in the realization of vowel sounds and suprasegmental features. Yoruba, Hausa, and Igbo respondents each exhibited distinct accentual characteristics linked to their mother tongues.

5.2 Conclusion

The findings of this research affirm that accentual variation is not merely a phonetic phenomenon but also a reflection of broader social identities. Pronunciation patterns are shaped by both the internalized rules of language and external social influences, including peer interaction, educational exposure, and regional affiliation.

Crucially, the study underscores gender as a more prominent determinant of accentual variation than ethnicity within the studied demographic. This shift may be attributed to a shared academic environment that tempers regional linguistic distinctions. Moreover, the research reiterates the role of accent as a social symbol, capable of signaling prestige, belonging, or difference within academic spaces.

5.3 Recommendations

The following are recommended by this study:

1. There is the need to introduce basic phonetics and pronunciation modules into non-linguistic curricula in science-oriented programmes to improve oral proficiency and help students minimise recurrent phonological errors.
2. Encouraging inclusive teaching practices that recognise diversity in speech forms and minimise bias related to gender, ethnicity, or language background.
3. Ensuring that institutional and national language policies recognise multilingual identity, thereby legitimising diverse accents as valid markers of identity rather than enforcing rigid accent standards.
4. Promoting equity-oriented policies that make pronunciation training, speech workshops, and oral proficiency development accessible to students across socioeconomic strata.

5.4 Contribution to Knowledge

This study:

1. Empirises accentual variation among science students, an area that has received limited attention in sociophonological discourse.
2. Establishes that gender is a more influential factor than ethnicity in shaping phonological choices in a university setting.
3. Provides empirical evidence of both voluntary and involuntary accentual variation, highlighting their significance in spoken interaction.

4. Contributes to the refinement of sociophonological theory and practice by offering new insights into accentual variation in academic contexts.

5.4 Suggestions for Further Studies

However, future inquiries might consider a broader scope in exploring the impact of digital media and global exposure on students' accentual preferences. Also, a comparative phonological analysis between students in science-based and arts-based disciplines.

In same vein, future work can make an investigations into how lecturers and peers perceive and respond to different accent types, particularly in relation to intelligibility and communicative effectiveness.

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APPENDIX

Faculty of Arts

Department of Language and Literature

Lead City University, Ibadan

Undergraduate Socio-phonology and Accentual Variation Achievement Test (USAVAT)

Dear Respondent

I am a master's student in the Department of Language and Literature, Faculty of Arts, Leadcity University Ibadan. I am carrying out a study on socio phonological analysis of accentual variation among the students of the Faculty of Science, University of Ibadan.

Your responses and cooperation are highly needed. Confidentiality to your responses will strictly be adhered to.

Yours Faithfully,

Ismail Ameen

Section A
Socio-demographic Data

Instruction: Please tick () as appropriate to indicate your response.

1. Age: A. 16-20 () B. 21-25 () C. 26-30 () D. 31+ ()

2. Gender: A. Female () B. Male () C. Others ()

3. Ethnicity: A. Yoruba () B. Hausa () C. Igbo () D. others (Please Specify):

4. Level: A. 100 () B. 200 () C. 300 () D. 400 ()

5. Department:

6. How many languages do you speak fluently? Mention them

7. a. Where did you have your primary education?

b. Where did you have your secondary education?

SECTION B
GENERAL PRONUNCIATION

Plough /aʊ/	Cup /ʌ/
Identify /ai/	Nurse
Go /əʊ/	Observe
Baby /ei/	Ago
Tear (v) /eə/	Turn
Bit /ɪ/	Think
Beat /i:/	With
cat /æ/	Thomas
Cart /ɑ:/	Very
pull /ʊ/	Zoo
Pool /u:/	Measure

Bio-data

Name	Ademola Ameen, ISMAIL
Phone Number	08068279442
Email	ameenademola90@gmail.com
Date of Birth	3 rd April, 1994
Place of Birth	Ibadan
Home Address	E1/761 Labiran Area Beyerunka, Ibadan, Oyo State
State of Origin	Oyo State
Local Government	Ibadan, N/E
Nationality	Nigerian
Marital Status	Single
Religion	Islam

Educational Qualifications with Dates

Lead City University, Master of Arts (MA) English Language (In view)	
Teachers' Registration Council of Nigeria, (TRCN).	2023
University of Ibadan, Bachelor of Education (B.Ed.) in English Language	2022
Muftau Lanihun College of Education, Nigeria Certificate in Education (NCE)	2016
National Youth Service Corp Certificate	2024
Atanda International High School, Oluyole Estate, Ibadan, Secondary School	
Leaving Certificate	2012
IMG Primary School, Beyerunka, Ibadan, Primary School Leaving Certificate,	2006

Work Experience

Leaders Secondary School, Ibadan, English Teacher	2018
AN-Nur International School, Olorunsogo, GRA, Ibadan, English Teacher	2017
Godliness Montessorri School, Ogunpa, Ibadan, English Teacher	2015

Articles in Learned Journal

Gbadegesin, M. O. & Ismail, A. A, *Code-switching in Teaching and Learning of English Language among Senior Secondary School Students*, in Odeda Local Government, Ogun State (being reviewed).

Conference Attendance

Ismail, A. A., Social-phonological Analysis of Accentual Variations among the Students of the Faculty of Science at the University of Ibadan. Being a paper presented at the Faculty Conference, Department of Arts and Social Science Education, Lead City University, Ibadan, from 6th-9th October, 2024.

Ismail, A. A, Presentation of the Paper title “Roles of English Teachers in the Effectives use of AI Tools for Pronunciation Proficiency at the 2nd Biennial International Multidisciplinary Conference, with the theme “Artificial Intelligence and Language Processing in the Arts and Humanities: Trends, Prospects and Challenges, 2025.

Workshop

Certificate of Attendance of the Workshop titled “Artificial Intelligence, and Grant Training Workshop organised by the Postgraduate College, Lead City University, Ibadan, 2024

Membership of Professional Bodies

Member, National Association of Nigerian English Language Teachers

Refrees

Prof. David Akinlolu Adeyemo,
Department of Adult Education,
Faculty of Education,
University of Ibadan,
08055823991.

Dr Babatunde Rasaq Ismail
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08033528152.

The University Compliance Certification

This is to certify the thesis by Ameen Ademola ISMAIL, with Matriculation Number **LCU/PG/005181**, in the Department of Language and Literature, Faculty of Arts, Lead City University, Ibadan, Oyo State. is in full compliance with the approved University format and style of thesis.

Signature

Date