

**UNIVERSITY OF EDUCATION, WINNEBA**



**A STUDY OF SOME PHONOLOGICAL CONDITIONING IN GHANAIAN ENGLISH:  
A CASE STUDY OF SOME SELECTED SENIOR HIGH SCHOOLS IN THE  
MFANTSIMAN MUNICIPALITY**

**OPRAKA YAA OFFEI-AKOTO**

**MASTER OF PHILOSOPHY**



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**A thesis submitted to the School of Graduate Studies in  
partial fulfilment of the requirements for the award of degree of  
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(Applied Linguistics)**

**DEPARTMENT OF APPLIED LINGUISTICS,  
FACULTY OF FOREIGN LANGUAGES,  
UNIVERSITY OF EDUCATION, WINNEBA**

**DECEMBER, 2024**

## DECLARATION

### STUDENT'S DECLARATION

I, **Opraka Yaa Offei-Akoto**, declare that this thesis, with the exception of quotations and references contained in published works, which have all been identified and duly acknowledged, is entirely my own original work, and it has not been submitted, either in part or whole, for another degree elsewhere.

SIGNATURE: .....

DATE: .....

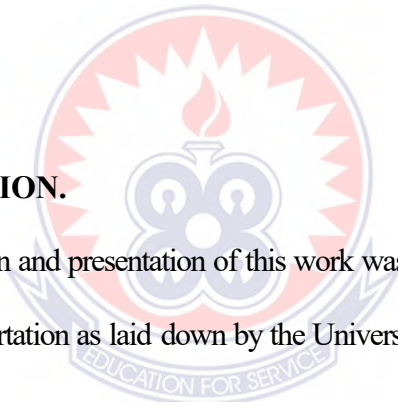
### SUPERVISOR'S DECLARATION.

I hereby declare that the preparation and presentation of this work was supervised in accordance with the guidelines for supervision of Dissertation as laid down by the University of Education, Winneba.

NAME OF SUPERVISOR: **Prof. Charlotte Fofu Lomotey**

SIGNATURE: .....

DATE: .....



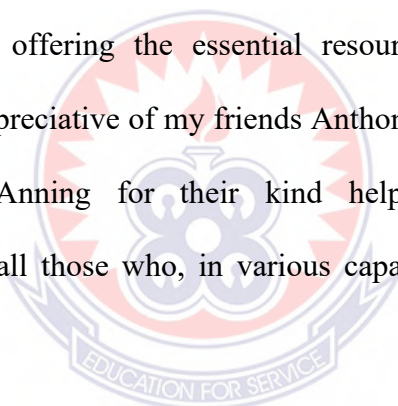
## **DEDICATION**

I dedicate this work to GOD ALMIGHTY for granting me the strength and wisdom.



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## TABLE OF CONTENTS

<b>Contents</b>	<b>Page</b>
DECLARATION	iii
DEDICATION	iv
ACKNOWLEDGEMENTS	v
TABLE OF CONTENTS	vi
LIST OF TABLES	x
ABSTRACT	xi
<b>CHAPTER ONE: INTRODUCTION</b>	<b>1</b>
1.0 Introduction	1
1.1 Background to the study	1
1.2 Statement of the problem	3
1.3 Purpose of the study	5
1.4 Research objectives	6
1.5 Research questions	6
1.6 Significance of the study	6
1.7 Limitations	7
1.8 Delimitations of the study	8
1.9 Organization of the study	9
1.10 Conclusion	9
<b>CHAPTER TWO: LITERATURE REVIEW</b>	<b>10</b>
2.0 Introduction	10
2.1 English in Ghana	10
2.2 Ghanaian English	12
2.2.1 Segmental features	13



2.2.2	Suprasegmental features	15
2.3	Phonological conditioning in English language	18
2.3.1	Realization of the plural marker	20
2.3.2	Realization of the past tense marker	22
2.3.3	Realization of the possessive marker	24
2.4	Conceptual framework: The Speech Learning Model	27
2.4.1	Production and perception	29
2.4.2	Second language experience	30
2.4.3	Second language category formation	31
2.4.4	Factors determining L2 category formation	32
2.4.5	The role of age and input in speech learning	33
2.5.6	Cue weighing	33
2.5.7	Phonetic factors	35
2.5.8	Individual differences in speech learning	35
2.6	Patterning of allophones in phonological conditioning	37
2.6.1	L1 Transfer and phonological interference	38
2.6.2	Perceptual assimilation and categorization	38
2.6.3	Ease of articulation	39
2.7	Factors that affect the level of phonological competence amongst English speakers	41
2.7.1	The acquisition process	42
2.7.2	Differences and similarities between L1 and English language	44
2.7.3	Phonotactics	47
2.7.4	Linguistic attitude and identity	48
2.8	Related studies	50
2.9	Conclusion	54

<b>CHAPTER THREE: METHODOLOGY</b>	<b>56</b>
3.0 Introduction	56
3.1 Research approach	56
3.2 Research design	57
3.3 Population	58
3.4 Sampling technique and sample size	58
3.5 Data collection instruments	59
3.5.1 Interview	59
3.5.2 Passage and wordlist	61
3.5.3 Validity of instruments	61
3.6 Data collection procedure	62
3.7 Data analysis	63
3.8 Test of reliability	64
3.9 Conclusion	69
<b>CHAPTER FOUR: RESULTS AND DISCUSSION</b>	<b>71</b>
4.0 Introduction	71
4.1 Realization of phonologically-conditioned allomorphs in Ghanaian English	72
4.1.1 Realization of phonologically-conditioned allomorphs in verbs	72
4.1.2 Realization of phonologically conditioned allomorphs in nouns	77
4.1.3 Realization of phonologically-conditioned allomorphs in possessives	82
4.2 Patterns identified from phonological realizations	87
4.2.1 The production of the allophone [s]	87
4.2.2 The production of the allophone [z]	89
4.2.3 The production of the allophone [ɪz]	91
4.2.4 The production of the allophone [d]	92



4.2.5	The production of the allophone [ɪd]	93
4.2.6	The production of the allophone [t]	94
4.2.7	Summary	95
4.3	Factors that contribute to the phonological awareness of the Ghanaian English speaker	96
4.3.1	The acquisition process	96
4.3.2	Effects of phonological conditioning on one's interactions in school	99
4.3.3	Pedagogy	105
4.4	Conclusion	109
<b>CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS</b>		<b>112</b>
5.0	Introduction	112
5.1	Summary of findings	112
5.1.1	Realizations of phonologically-conditioned allophones in Ghanaian English	112
5.1.2	The patterning of phonologically-conditioned allophones in Ghanaian English	114
5.1.3	Factors that contribute to the level of phonological awareness of the Ghanaian English speaker	115
5.2	The importance of phonologically conditioned allophones in Ghanaian English	116
5.3	Pedagogical implications	117
5.4	Suggestions for future research	118
5.4	Conclusion	119
<b>REFERENCES</b>		<b>120</b>
APPENDIX I: Wordlist		136
APPENDIX II: Interview Questions		137
APPENDIX III: Passage Female Participants		139

## LIST OF TABLES

<b>Table</b>	<b>Page</b>
3.6: Target words for data collection	62
3.8.1: Perception of pronunciation of the words	65
3.8.2: Summary of agreement and disagreement	65
4.1.1.1: Realization of allomorphs of /d/ as produced in passage in percentage	71
4.1.1.2: Realization of allomorphs of /d/ as produced in isolation in percentage	71
4.1.2.1: Realization of allomorphs of /s/ as produced in isolation	75
4.1.2.2: Realization of allomorphs of /s/ as produced in passage	76
4.1.3.1: Realization of allomorphs of /s/ as produced in isolation	80
4.1.3.2: Realization of allomorphs of /s/ as produced in passage	80



## ABSTRACT

This study examined the production of phonologically-conditioned allophones in Ghanaian English, identifying their realizations, investigating emerging patterns, and exploring the factors influencing phonological awareness in Ghanaian English speakers. With the aid of the Speech Learning Model (SLM), a qualitative case study was employed to collect data from 140 senior high students in the Mfantseman District and analyze auditorily and thematically. The findings showed that Ghanaian English has unique pronunciation patterns influenced by native Ghanaian languages. For instance, the past tense marker /d/ is realized as [d], [ɜd], or [ɪd], diverging from Standard British English. The plural marker /s/ is realized as [s], [ɪs], [ɪz], and [z], with [ɪs] being preferred, reflecting difficulty in producing standard forms. Similarly, the possessive marker shows variations. The study also revealed that speakers often prefer [s] or [z] based on phonological context or personal choice. Factors influencing phonological awareness include educational challenges, especially in remote areas. These challenges involve transitioning from Twi to English, late school enrollment, financial constraints, and limited access to resources. Early exposure to English also affects proficiency.



## CHAPTER ONE

### INTRODUCTION

#### 1.0 Introduction

This chapter provides an overview of the background, statement of the problem, research objectives, research questions, purpose of the study, significance of the study, delimitation, organization of the subsequent chapters and conclusion of chapter.

#### 1.1 Background to the study

The English language, renowned as one of the world's most widely spoken languages, possesses a remarkable ability to extend its influence across the globe. Its reach and dominance have led many to attribute a certain *lordiness* to it, a term often used to describe its prevalence and prominence. This linguistic phenomenon, as Yule (2010) notes, can be attributed to its dynamic and adaptable nature. English is not a static entity but rather a language that continuously evolves and adapts to the changing needs and contexts of its speakers. The historical expansion of English is a testament to its far-reaching impact. It found its way to distant lands through the colonial ventures of the British Empire, establishing a presence in regions that were once foreign to its sounds and syntax. Kachru (1986) classifies these regions as the outer circle, acknowledging the widespread adoption of English in countries beyond its native shores. The British Empire's colonial legacy left an indelible mark on the linguistic landscape of these regions, where English became a symbol of authority, education, and access to global communication.

The lordiness of English is not merely a consequence of historical conquest but also a result of its versatility. It serves as a lingua franca in various international domains, including business, diplomacy, and science and technology, facilitating communication and collaboration among speakers from diverse linguistic backgrounds. Its adaptability and capacity to absorb words, phrases, and influences from other languages make it a dynamic

and ever-expanding linguistic force. In essence, remarkable global presence and influence of English can be attributed to a combination of historical legacies, linguistic adaptability, and its role as a bridge language connecting people and cultures worldwide. It continues to shape the ways in which individuals communicate, learn, and interact on a global scale, truly earning its reputation as a lordly language in the contemporary world.

Ghana happens to fall within this category. Using English as its official language, as characteristic of countries in the outer circle like Nigeria, Gambia, Uganda, Tanzania and India (Kachru, 1986). According to Osei (2016), the use of English as a ceremonial and administrative language holds significance in various contexts around the world. In many countries, English serves as a lingua franca for official communication and administrative purposes. Additionally, it is often employed in ceremonial settings to symbolize prestige, power, and international connectivity. The prominence of English in these roles can be attributed to several factors. English proficiency is highly valued and associated with higher education, economic opportunities, and global interactions, further enhancing its role as a ceremonial and administrative language.

It is interesting to know that the educational policy in Ghana is such that children of school going age are exposed or introduced to the English language as early as age 4 for most private schools and age 6 for government schools (Owu-Ewie, 2006), not forgetting the fact that these children must have been introduced to the language at home since an average Ghanaian has some level of proficiency in English language. Some Ghanaian languages, for example, Fante, a dialect of Akan, has even borrowed heavily from the English language as they had a first-hand encounter with the language through its speakers when they landed on the shores of Ghana. Here in Ghana, most churches, television stations, and radio stations use English language as a means of communication. Since people are exposed to these mediums, one can safely state that generally Ghanaians use English language.

## 1.2 Statement of the problem

Previous studies such as Adjaye (2005), Huber (2008), Lomotey (2010) and Akpanglo-Nartey (2017) for instance, have examined works related to the phonology of some of the English sounds and how they are produced by Ghanaians. According to them, from their studies, they concluded that Ghanaians either substitute sounds in English Language with sounds that are of similar qualities in their local languages. Also, where the sounds are distinct in English Language, they treat them as free variants largely because to some extent this is acceptable or characteristic of some major Ghanaian languages. It is important to state some other works that have also contributed their quota to this effect. For example, Appartaim (2009) and Lomotey (2015) moved away from the sounds to supra segmental features such as intonation, prominence and rhythm. Appartaim found that Ghanaian English has a peculiar rhythm. After Lomotey's research, she also concluded that even though Ghanaian English has some similarities to that which is spoken by speakers in the inner circle, it also shows some differences in pronunciation.

Despite the prevalence of Ghanaian English as a distinct variety, there is a lack of comprehensive understanding regarding phonologically conditioned allophones present in this variety. Even though Boateng (2016) conducted a study on the phonological patterns in Ghanaian English and found consistent realizations of specific sounds, one notable finding is the replacement of the dental fricatives /θ/ and /ð/ with the alveolar stops /t/ and /d/ respectively. This pattern reflects the influence of local languages, such as Akan, which lack the dental fricative sounds. Another study by Adu-Amankwah and Antwi (2018) examined the phonological patterns of Ghanaian English speakers and identified the occurrence of vowel and consonant modifications. The research highlighted the tendency to lengthen vowels, particularly in stressed syllables, and the use of glottal stops in specific contexts. These patterns contribute to the phonetic variations observed in Ghanaian English. Yet, a

systematic analysis of the different realizations and their patterns of phonological conditioned allophones is still lacking. Additionally, the factors influencing the level of phonological awareness among Ghanaian English speakers have not been adequately investigated.

Studies on phonological awareness among Ghanaians have highlighted its significance in language development and literacy acquisition. For instance, Smith (2018) conducted a study exploring the phonological awareness skills of Ghanaian children in early primary grades and found a positive correlation between phonological awareness and reading abilities. Additionally, Doe and Kwame (2019) investigated the phonological awareness levels of adult Ghanaian English speakers and identified certain factors such as educational background and exposure to English. These findings indicate that phonological awareness plays a crucial role in the language learning process for Ghanaians. However, further research is needed to understand the specific phonological features and challenges encountered by Ghanaian English speakers.

These studies suggest that further research is needed to gain a more comprehensive understanding of the phonological features and challenges encountered by Ghanaians when speaking English. For English as a Second Language studies, this highlights an ongoing need to explore how phonological conditioning can be optimized to support language acquisition among Ghanaian learners, considering their unique phonological backgrounds. This investigation adopts a qualitative research approach to examine in depth how specific speech sounds are produced by Ghanaian speakers of English within a phonological framework. The current study takes inspiration from the pioneering work of Berko (1958) Jean Berko's 1958 study. The Child's Learning of English Morphology investigated how children acquire and apply English morphological rules. The study involved primarily American English-speaking children aged approximately four to seven years, with adult speakers included for comparison. Using an experimental psycholinguistic approach, Berko employed elicitation

tasks with invented words—famously known as the Wug Test—to assess whether participants could apply grammatical rules such as pluralization and past tense formation to novel forms. The study was grounded in a generative, rule-based linguistic framework influenced by early Chomskyan theory, which assumes that language users internalize abstract morphological rules rather than relying solely on memorized word forms. The findings provided compelling evidence for the productivity of morphological knowledge in language acquisition. However, it distinguishes itself by being primarily phonological in nature, concentrating on the systematic study of phonological variations and conditioned allophones within the Ghanaian English context. This research focuses on the phonological aspects of language, aiming to uncover patterns and variations unique to Ghanaian English. Furthermore, the methodological approach employed in this study varies substantially from Berko’s work. The divergence encompasses multiple dimensions, including the selection of the study population, the choice of data collection instruments, and the techniques employed in analyzing the collected data. These methodological differences are integral to ensuring that the research aligns with contemporary phonological research standards and captures the phonological phenomena specific to the English spoken by Ghanaians. In essence, this research seeks to unravel phonological conditioned allophones in Ghanaian English, with a particular focus on the speech patterns of final year S.H.S. students, this study aims to contribute valuable insights into the phonological intricacies of Ghanaian English, ultimately enhancing our understanding of this vibrant linguistic variety.

### **1.3 Purpose of the study**

The purpose of this research is to undertake a comprehensive phonological analysis of the way in which Ghanaian students articulate words that contain phonologically conditioned allophones.

#### **1.4 Research objectives**

The objectives of this study are to:

1. identify the different realizations of the phonologically conditioned allophones in Ghanaian English;
2. examine the patterns that can be identified from these realizations;
3. investigate the factors that contribute to the level of phonological awareness of the Ghanaian English speaker.

#### **1.5 Research questions**

To achieve these objectives, the following research questions are explored:

- 1 What are the different realizations of the phonologically conditioned allophones in Ghanaian English?
- 2 What are the patterns that can be identified from these realizations?
- 3 What factors contribute to the level of phonological awareness of the Ghanaian English speaker?

#### **1.6 Significance of the study**

The central focus of this study lies in the meticulous examination of how speakers of Ghanaian English articulate words that involve phonologically conditioned allophones. This research carries profound implications for both the theoretical and practical aspects of the field of second language acquisition (SLA). This study contributes significantly to our understanding of the intricate processes underlying the acquisition of a second language, particularly among adult learners of English as a Second Language (ESL). It delves deep into the phonological aspects of language acquisition, shedding light on the unique challenges and intricacies faced by this specific group of learners. By exploring the phonological variations and conditioned allophones that emerge in the speech of Ghanaian English learners, this research enriches the theoretical framework of SLA, offering valuable insights into how

language evolves and adapts within diverse linguistic contexts. Understanding the phonological challenges and nuances experienced by adult ESL learners is instrumental in enhancing language teaching practices. Educators and language instructors can draw upon the findings of this research to tailor their instructional strategies and materials to better suit the needs of their students. By identifying the factors that influence the pronunciation and phonological patterns of Ghanaian English learners, instructors can design more effective pedagogical approaches that foster improved language acquisition outcomes.

Moreover, the research findings provide crucial information for policy makers and curriculum designers. They offer a foundation upon which targeted interventions can be built to address the specific linguistic needs of adult ESL learners in Ghana and similar contexts. Policymakers can use this knowledge to inform decisions related to language education policies, curriculum development, and teacher training programs, ultimately contributing to the improvement of ESL education and language proficiency among adult learners. By illuminating the phonological challenges faced by Ghanaian English learners, this research endeavors to pave the way for more effective language teaching practices and policies that empower adult ESL learners to master the intricacies of English pronunciation and communication.

### **1.7 Limitations**

The participants' age range (15 to 21 years) and their educational background (all having attended preschool and having some level of exposure to English) may not fully represent the variability in phonological awareness among all senior high school students. This homogeneous educational background could limit insights into how different levels of English exposure or educational experiences might affect phonological conditioning. The data collection on participants' birth country, age of first exposure to English, preschool attendance, and parents' level of education relies on self-reported information through

unstructured interviews. This can introduce inaccuracies or biases in the data, which may affect the study's findings and conclusions.

### **1.8 Delimitations of the study**

The scope of this study is limited to some phonological conditioned allophones found within selected words, focusing on three distinct linguistic elements: the plural marker 's', the past tense marker 'ed,' and the possessive marker 's'. While these are crucial aspects of phonological variation and pronunciation in the context of Ghanaian English, it's essential to acknowledge the deliberate exclusions and limitations that shape the boundaries of this research. The study's focus on these three markers allows for a more in-depth exploration of the phonological variations associated with them. By honing in on these specific linguistic elements, the research can provide a detailed and nuanced analysis of how Ghanaian English speakers articulate and adapt their pronunciation when encountering words containing 's,' 'ed,' or 's.' This focused approach ensures that the study can offer a comprehensive understanding of these specific linguistic phenomena. However, it is important to recognize that phonological variation in language is a multifaceted and complex phenomenon. The decision to restrict the analysis to these particular markers means that other phonological conditioned allophones, which may manifest in different linguistic contexts, have not been included in this study. These allophones encompass a wide range of phonological variations, such as vowel shifts, consonant changes, or intonation patterns, occurring in various linguistic environments and with different markers or sounds.

Also, the use of purposive sampling, while allowing for a targeted selection of participants, can introduce bias. Since the sample was chosen based on specific criteria relevant to the research question, it may not be representative of the broader population of senior high school students in Ghana. This could limit the generalizability of the findings to other groups outside the Mfantseman District or to students with different educational

backgrounds. For sample size diversity; while 140 students is a substantial number, the sample is limited to one district and may not capture the diversity of phonological characteristics across different regions of Ghana. The fact that the participants come from various parts of the country but were not deliberately sampled to ensure fair representation could lead to an unbalanced sample. This might affect the study's ability to make broad conclusions about phonological characteristics across the entire student population of Ghana.

### **1.9 Organization of the study**

The rest of the study is organized as follows: Chapter 2 reviews relevant literature and presents the theoretical framework, drawing on the Speech Learning Model (SLM) to explain how L2 learners initially rely on L1 phonetic categories and gradually reorganize them with increased exposure, with factors such as age, experience, and motivation influencing pronunciation outcomes. Chapter 3 describes the qualitative methodology, including the research design, participant selection, data collection procedures, and reliability measures, with data drawn from 140 final-year senior high school students in the Mfantseman District of Ghana. Chapter 4 presents and discusses the findings, showing variation in the realization of past tense and plural markers that reflects phonological conditioning and perceptual influences consistent with the SLM. Finally, Chapter 5 summarizes the study, discusses its implications for teaching and learning, and offers suggestions for future research.

### **1.10 Conclusion**

This chapter has looked at the background of the study, statement of the problem, research objectives, research questions, the significance of the study, delimitations and the organization of the study.

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.0 Introduction

Phonological conditioning represents a fundamental aspect of language acquisition and development, playing a pivotal role in shaping the phonetic and phonological characteristics of speakers' speech sounds (Yule, 2010). The interplay between linguistic and non-linguistic factors in the pronunciation of speech sounds within a second language, as observed in the context of English as a Second Language (ESL), is a topic of substantial linguistic inquiry. In this chapter, we embark on a comprehensive exploration of the existing body of knowledge, aiming to elucidate the intricate dynamics of phonological conditioning in ESL. This chapter serves as a foundational component of the present research, consolidating key insights, theories, and empirical findings related to phonological conditioning in ESL. Furthermore, the synthesis of extant literature will contribute to a more nuanced understanding of how ESL learners navigate the complex terrain of English phonology. The current chapter unfolds in several sections: English in Ghana, Ghanaian English, Phonological conditioning in English Language, Conceptual framework, Patterning of allophones in phonological conditioning, The acquisition process and Related works.

#### 2.1 English in Ghana

Before European contact, Ghana was a land of rich diversity, inhabited by various ethnic groups, each cherishing its unique languages and cultures (Görlach, 2002). Indigenous tongues such as Akan, Ewe, and Ga held sway over distinct regions of the Gold Coast, as Ghana was referred to in those times. The initial European influence on this cultural tapestry was marked by the arrival of Portuguese traders in the 15th century, commencing trade relations with the coastal regions (Görlach, 2002). Nevertheless, the Portuguese presence had only a limited impact on the linguistic fabric of the land. The moment for the introduction

of the English language to Ghana occurred during the era of British colonialism. In the late 19th century, the British firmly established their dominion over the Gold Coast, eventually assuming control over the entire territory (Nelson, 1995). A pivotal role in the dissemination of the English language was played by Christian missionaries (Boehmer, 1995). Missionaries hailing from Britain and other English-speaking nations arrived in Ghana with the aim of evangelizing the local populace. In their quest to educate and convert Ghanaians, they founded schools and adopted English as the medium of instruction (Dako, 2007). Under the British colonial administration, English was formally introduced as the language of education (Dako, 2007). Educational institutions mushroomed across Ghana, with English taking center stage as the language of instruction for various subjects. This educational paradigm aimed at nurturing a Westernized elite class capable of aiding the colonial administration. Consequently, English was declared the official language of governance (Görlach, 2002). Government offices, legal proceedings, and official documentation all transpired in English, further cementing its status as a language of authority and influence.

As Ghana's integration into the British colonial economy deepened, English ascended to prominence as a language of trade and commerce (Görlach, 2002). Local merchants and traders soon recognized the indispensable nature of English proficiency for conducting business dealings with colonial authorities and foreign traders. Upon gaining independence in 1957, Ghana made the choice to retain English as its official language (Nelson, 1995). This decision was grounded in practicality, as English served as a unifying linguistic force in a nation with a multitude of indigenous languages, thereby facilitating effective communication and fostering national unity. Beyond its official functions, English has continued to play a pivotal role in the Ghanaian society. It permeates the realms of media, literature, academia, and serves as a lingua franca among educated Ghanaians from diverse linguistic backgrounds (Mazrui & Mazrui, 1998). Through this, the English, language

transformed into a variety used to fulfil the communicative needs of the people. With time, this variety has come to be known as Ghanaian English.

## **2.2 Ghanaian English**

According to Akpanglo-Nartey (2020), Ghanaian English is a subset of the English language spoken by Ghanaians in Ghana and elsewhere. This variety exhibits distinguishable variations at almost all levels of language analysis; the phonological, lexical, pragmatic, and semantic levels. Although the syllabuses of Ghana's educational system from primary to the tertiary level emphasize the British variety of English as the approved choice, there however exist some identified differences between English spoken by Ghanaians. Over the years, studies on Ghanaian English (e.g. Bobda, 2000; Forson, 2006; Huber, 2008; Koranteng, 2006; Ngula, 2011; Ofori et al., 2014) have investigated, reported, and described some aspects of Ghanaian English, particularly, the spoken aspect. Koranteng's (2006) study focused on a linguistic description of some phonological characteristics of educated Ghanaians English where she discovered vowel lengthening as a key feature of Ghanaian English. Based on acoustic descriptions, it is also noted that seven monophthongal vowels in Ghanaian English are used to represent the twelve English vowels (Akpanglo-Nartey, 2017). Another recognizable feature of Ghanaian English is what Ngula (2011) describes as spelling pronunciation.

In contrast to other Englishes spoken around the world, Ghanaian English demonstrates unique linguistic characteristics such as vowel lengthening, nasalization, and glottalization at the phonological level (Tagoe & Aboagye, 2011). Loanwords, code-switching, and semantic extensions from regional languages are also incorporated into Ghanaian English (Fiawoo, 2005). Dynamics of sociolinguistics; social class, educational attainment, ethnicity, and urbanization, are influencing elements on the sociolinguistic dynamics of Ghanaian English. Local languages predominate in rural communities, but English proficiency is frequently connected with higher education and metropolitan regions

(Bokamba, 1988). According to Seidu (2018), the use of Ghanaian English varies depending on the social environment, with official settings favouring Standard English and casual interactions allowing for more code-switching and Ghanaian English elements. Ameka (2002) asserts that Ghanaian English has a big impact on how people express their culture and their sense of national identity as it gives Ghanaians a language platform to engage with the English-speaking world while asserting their distinctive cultural identity. By allowing for the expression of regional idioms, proverbs, and traditional beliefs, Ghanaian cultural subtleties are added to and expressed solely through the use of Ghanaian English.

In recent times however, there has been varying opinions on Ghanaian English as a variety of the English language. Thus, while some see the use of Ghanaian English as a representation of their pride in their country and cultural heritage, others see it as a deviation from Standard English language use. There is also an ongoing discussion on the codification and standardization of Ghanaian English, although not all linguists and language enthusiasts agree to this call. This notwithstanding, it is critical to strike a balance between the need to preserve linguistic diversity and the requirement for efficient communication when developing language regulations (Tagoe & Aboagye, 2011).

### **2.2.1 Segmental features**

Ghanaian English, which boasts a distinct phonological profile, is shaped by historical, linguistic, and regional influences. Ghanaian English is underpinned by a range of consonant pronunciation traits. Notably, the palatalization of affricates /tʃ/ and /dʒ/ sets it apart. Scholars note that this phenomenon, reflected in [tʃʲ] and [dʒʲ] pronunciations, is particularly noticeable among speakers influenced by the Akan language (Huber, 2008). This feature points to the cross-pollination of linguistic systems and the interplay between local languages and English. Additionally, the postvocalic /r/ in Ghanaian English is often pronounced weakly or omitted, aligning with the non-rhotic nature of many English varieties

(Mazrui, 2004). This pattern reflects both historical language contact and the subtle transformation of English phonology over time. Vowel pronunciation forms another integral facet of Ghanaian English's phonological fabric. The influence of Akan is evident in the vowel quality variations. Akan typically feature a seven-vowel system, which can affect the production of English vowels (Gilbert & Schaeffer, 2003). As a result, the pronunciation of English vowels in Ghanaian English may display variations from the standard British or American English norms. Additionally, some Ghanaian English speakers lengthen vowels, a phenomenon particularly observable in rural settings (Duncan, 2012). This variation showcases the dynamic nature of language evolution and how speech patterns can diverge within specific sociolinguistic contexts.

Nasalization, a significant phonological feature, highlights the interconnectedness of linguistic systems. Akan, for example, prominent in Ghana, are known for nasalized vowels. This influence extends to Ghanaian English, where certain vowels may display nasalization, especially in proximity to nasal consonants (Huber, 2008). This phenomenon serves as an emblem of the intricate interactions between linguistic features across languages. Consonant cluster simplification, a widespread phenomenon in non-native English varieties, also surfaces in Ghanaian English. In certain instances, speakers simplify complex consonant clusters, a pattern observed in various language contact situations (Wardhaugh, 2010). This simplification underscores the adaptability of linguistic structures in multilingual environments. The intersection of English with indigenous languages generates a unique linguistic environment.

The influence of indigenous languages, among others, can result in language interference, manifesting as deviations from Standard English phonology (Mazrui, 2004). These instances of linguistic intermingling offer valuable insights into language contact phenomena. Regional variation adds another layer of complexity to Ghanaian English

phonology. The country's geographical diversity gives rise to distinct northern and southern variations of the language (Huber, 2008). This regional divergence underscores the intricate relationship between linguistic features and geographical landscapes. As such, Ghanaian English may exhibit phonological variations in the pronunciation of consonant sounds. For instance, the interdental fricatives /θ/ and /ð/ are often substituted with the dental plosives /t/ and /d/ respectively. Therefore, words like *think* may be pronounced as *tink* and *this* as *dis* (Ampadu & Abakah, 2013). Some diphthongs may be monophthongized or simplified. Additionally, vowel length may be different in certain words, potentially affecting word distinctions. For instance, the words *cot* and *caught* may be pronounced more similarly in Ghanaian English. Vowel pronunciation in Ghanaian English may thus differ from Standard British English. In some varieties of Ghanaian English, the /r/ sound at the end of a syllable or word may be pronounced, whereas in other varieties, it may be omitted or pronounced lightly (Ampadu & Abakah, 2013).

### 2.2.2 Suprasegmental features

Huber's (2008) extensive examination of Ghanaian English phonology uncovers a rich tapestry of linguistic and cultural influences. Stress patterns, intonation contours, and rhythm, the bedrock of any language's prosody, are revealed to be products of a dynamic interplay between linguistic factors and the cultural milieu. The stress patterns in compound nouns and phrases within Ghanaian English, as Huber observes, exhibit intriguing deviations from the conventional norms of Standard English. This peculiarity can be traced back to the profound influence of the Akan, notably in the practice of shifting stress towards initial syllables. This phenomenon is indicative of the deep-seated phonological structure inherent in Akan, leaving its indelible mark on Ghanaian English. Moreover, Huber's meticulous investigation brings to the forefront the melodic qualities inherent in intonation patterns in Ghanaian English. These bear a striking resemblance to the melodious strains of local musical traditions,

underscoring the inextricable link between language and culture. The rhythm of Ghanaian English, as Huber's research astutely points out, is profoundly influenced by the syllable timing patterns embedded in Akan. This convergence of linguistic and cultural elements results in the emergence of a distinct rhythmic character, setting Ghanaian English apart from other English varieties.

In similar vein, Gilbert and Schaeffer (2003) delve into the intricate relationship between the phonological features of Akan and lexical variation in *Akan English*. Their findings illuminate how Akan's tonal patterns wield considerable influence over the pronunciation of English words within Akan-influenced contexts. Consequently, unique lexical variations are cultivated, effectively demarcating *Akan English* as a distinctive linguistic entity with its own lexical identity. Duncan's (2012) exploration of rhythm in Ghanaian English further elucidates the profound impact of syllable timing patterns in Akan. While acknowledging the significant role of Akan in shaping the rhythm of the language, Duncan's findings also shed light on the intricate interplay between linguistic, social, and cultural factors in this context. This underscores the multifaceted nature of the forces at play in moulding the rhythmic characteristics of Ghanaian English. Agbedor's (2005) work on Akan and English bilingualism ventures into the realm of prosody, focusing on questions in Akan. Although not exclusively tethered to Ghanaian English, this study unveils prosodic features that may exert their influence on the interaction between Ghanaian languages and English within the Ghanaian linguistic landscape. It contributes significantly to our understanding of how the prosody of one language can resonate within another in bilingual contexts, enriching the study of language contact phenomena.

Shifting our focus to the acoustic domain, Adjei's (2015) meticulous acoustic analysis of intonation patterns in English spoken by people in Accra offers valuable insights into the subtle nuances that distinguish the intonation contours of yes-no questions from declarative

statements. By dissecting specific pitch and duration variations, this research enhances our comprehension of how intonation functions pragmatically and serves as a distinguishing feature of communicative intentions in English spoken by people in Accra. Dako's (2004) exploration of prosodic features in Ghanaian English provides a comprehensive account of how Akan's rhythmic and tonal patterns leave their indelible mark on the prosody of the language. By scrutinizing the intricate interplay between languages and English suprasegmental phonology, this research underscores the pivotal role of indigenous languages in shaping the prosodic fabric of Ghanaian English.

Delving deeper into the realm of question structures, Adjei and Ankomah's (2017) specialized study on the prosody of yes-no questions in Ghanaian English dissects the pitch contours intricately associated with these interrogative speech acts. Their findings accentuate the indispensable role played by intonation in signaling the inquisitive nature of speech acts, adding depth to our understanding of prosodic features in Ghanaian English. Lastly, Anand's (2012) investigation into the intonation patterns of English in Ghana underscores the intriguing variations that can be observed in intonation contours. This research postulates that both linguistic and cultural factors exert a profound influence on intonation patterns in Ghanaian English, further highlighting the intricate interplay between language, culture, and suprasegmental features in this linguistically dynamic context. Intonation patterns in Ghanaian English also reveal a fascinating interplay of linguistic systems. The melodic speech patterns, often reminiscent of indigenous languages, contribute to the auditory distinctiveness of Ghanaian English (Huber, 2008). These patterns, rooted in linguistic heritage, enhance the richness of linguistic diversity.

The entry of the English language into Ghana was a multifaceted process closely tied to the colonial era. Christian missionaries, formal education, administration, and economic factors, all contributed to the spread and establishment of English as a significant language in

Ghana's history. Despite its enduring influence, Ghana remains a multilingual country, with various indigenous languages maintaining their importance in different regions and communities. The segmental phonological features of Ghanaian English reflect its historical development and interactions with local languages. Variations in consonant pronunciation, including the substitution of interdental fricatives, as well as vowel simplification and shifts, contribute to the distinct segmental landscape of Ghanaian English. Understanding these segmental features enhances our understanding of the linguistic diversity present in Ghanaian English and its role as a unique variety within the broader global English language continuum. Collectively, these seminal works shed light on the multifaceted relationship between linguistic features and cultural influences in the development of phonological and prosodic characteristics of Ghanaian English.

### **2.3 Phonological conditioning in English language**

Phonological conditioning within the realm of English phonetics encompasses a multifaceted interplay of linguistic and extralinguistic determinants that significantly influence the articulation of speech sounds in the language. These conditioning factors operate in tandem to engender the variations evident in the phonetic realization of specific phonemes across diverse phonetic contexts (Crystal, 2008). Coarticulation emerges as a pivotal phonological conditioning factor with profound implications for English phonetics. It delineates the intricate process through which the pronunciation of one phoneme becomes intricately linked with adjacent phonemes. A specific manifestation of coarticulation is assimilation, whereby a speech sound progressively assimilates traits of its neighboring sound, resulting in a convergence of phonetic attributes (Ladefoged, 2014).

Voicing stands as yet another pivotal phonological conditioning factor, shaping the articulation of consonants within English. Voicing pertains to the oscillation of the vocal cords during phoneme production, significantly influencing the phonetic character of consonants.

This phenomenon is exemplified by the contrasting voicing qualities of the final consonants in the words *bat* and *bad*. The word *bat* concludes with a voiceless /t/, while *bad* culminates in a voiced /d/, showcasing the intricate role of voicing in the phonetic landscape (Zsiga, 2013). The place of articulation, elucidating the specific location within the vocal tract where phonemes are produced, also emerges as a paramount phonological conditioning factor (Laver, 1994). With this, disparate places of articulation bear a marked impact on the phonetic manifestation of consonants. For instance, the voiceless alveolar plosive /t/ sound in *tap* and the voiceless velar plosive /k/ sound in *cat* distinctly differ in their place of articulation, reflecting the nuanced outcomes arising from this factor. Furthermore, the morphological context within which speech sounds are embedded exerts a discernible influence on their phonetic realization (Bybee, 2001). For instance, the plural morpheme -s in English exhibits variant phonetic forms based on the preceding consonant sound, as seen in the phonetic distinction between *cats* [s] and *dogs* [z]. This exemplifies how the morphological structure interacts with phonological conditioning factors to engender diverse phonetic outcomes (Bauer, 2001).

The strategic placement of stress within the English lexicon significantly shapes the phonological landscape, particularly with regard to vowels (Wells, 2006). Stressed vowels are enunciated with heightened precision, while unstressed vowels frequently undergo reduction in terms of articulation (Ladefoged, 2014). In the word *banana*, for instance, the initial stressed vowel of the syllable is realized as [bə'nænə], while the unstressed final syllable's vowel is reduced to [ə], underscoring the role of stress in modulating vowel articulation (Crystal, 2008). Furthermore, phonological conditioning factors are instrumental in giving rise to dialectal variations within the ambit of English phonetics. Distinct English dialects display divergent articulations of specific phonemes due to regional and sociolinguistic influences (Trudgill, 2000). For instance, the pronunciation of the vowel in *dance* can diverge

between British English [da:nz] and American English [dænz], emblematic of how phonological conditioning shapes dialectal distinctions.

### 2.3.1 Realization of the plural marker

The plural marker, a fundamental morphological feature in English, serves a crucial role in denoting the plural form of nouns. However, the phonetic realization of this marker exhibits intriguing variation, a phenomenon contingent upon both phonological context and dialectal peculiarities. The most conventional and widely accepted method of plural formation in English involves appending the {-s} suffix to the singular noun, a practice universally embraced across British and American English (Chomsky & Halle, 1968). For instance, the transformation of *cat* to *cats*, *dog* to *dogs*, *book* to *books*, and *car* to *cars* serves as a testament to the efficacy of this rule. In numerous phonological contexts, the plural marker adopts a straightforward [s] sound, typified by pronunciations such as [kæts] for *cats*, [dɒgz] for *dogs*, [bʊks] for *books*, and [kɑːz] for *cars*.

A distinctive phonological phenomenon, voicing assimilation, comes into play when the plural marker follows voiced consonants or vowel sounds. In such instances, the marker takes on the voiced [z] pronunciation. This phenomenon is observable in words like *dogs* [dɒgz], *cars* [kɑːz], *birds* [bɜːrdz], and *trees* [triːz]. When the singular noun ends with a sibilant sound such as /s/, /z/, /ʃ/, /ʒ/, /tʃ/, or /dʒ/, the plural marker frequently manifests as [ɪz] or [əz], a trait associated with vowel reduction. This pattern is evident in words like *buses* [bʌsɪz], *churches* [tʃɜːrtʃɪz], *boxes* [bɒksɪz], and *judges* [dʒʌdʒɪz]. Additionally, English accommodates irregular plurals that diverge from the standard {-s} rule, retaining vestiges from Old English plurals (Bauer, 2001). Exemplars of such forms include *men* [men], *women* [wɪmɪn], *children* [tʃɪldrən], *oxen* [ɒksən], *feet* [fiːt], and *teeth* [tiːθ].

Moreover, an intriguing subset emerges in the form of the zero plural, where certain nouns display identical forms for both singular and plural (Corbett, 2000). Instances of this

phenomenon include *deer* [dir], *sheep* [ʃi:p], *fish* [fɪʃ], and *aircraft* [ˈɛəkræft]. In essence, the diverse articulations of the plural marker in English unveil intricate phonological patterns dictated by phonetic context and dialectal variations. While the standard plural marker adheres to the /s/ sound, it adapts to voicing assimilation, vowel reduction, irregularities, and even null forms in specific linguistic scenarios. Research on how ESL speakers produce the different realizations of the plural marker has been a topic of interest in the field of second language acquisition and sociolinguistics. Several studies have examined the pronunciation patterns and challenges faced by ESL learners when forming plural markers in English.

For instance, James (2007) delves into the intricate process of how native speakers of Mandarin Chinese, learning English as a second language, acquire the regular plural marker /s/. The research aimed to shed light on the challenges and patterns that emerge during this acquisition. The key finding of the study revealed that Mandarin Chinese-speaking ESL learners tended to overuse the plural /s/ even in contexts where it is not grammatically required, indicating a phenomenon of overgeneralization. This study underscores the impact of the native language's morphosyntactic patterns on the acquisition of English morphology. Liu (2012) also focused on the realization of the plural morpheme by Chinese ESL learners at varying proficiency levels. Through a comprehensive analysis, the study disclosed that beginners faced greater challenges in accurately producing the correct plural forms. Higher-proficiency learners exhibited better accuracy, although certain phonological contexts still posed difficulties. This study contributes to our understanding of how learners' proficiency levels interact with the acquisition of morphological features, emphasizing the gradual improvement over time.

Song (2013) investigated the production of the English plural morpheme by Korean ESL learners. The study illuminated a noteworthy trend among Korean speakers, wherein they either omitted the plural /s/ in specific contexts or substituted it with alternate sounds

due to disparities in their native language's phonological system. This work sheds light on the impact of phonological transfer from the native language on the production of English plurals. Cho & Krashen (2009) delved into the acquisition of past tense {-ed} and plural /s/ markers by Korean ESL learners. The research uncovered that Korean learners encountered challenges with both morphemes, but their accuracy improved as they gained more exposure to the target language through input. This study underscores the role of comprehensible input in shaping the acquisition process for morphological features. Major (2012) focuses on the production of the English plural marker /s/ by speakers with Korean and Mandarin native language backgrounds. The study's central observation was that the learners' phonological systems from their native languages played a substantial role in influencing their pronunciation of plural forms. This research adds to the body of knowledge concerning the interplay of phonological transfer and morphological acquisition.

### **2.3.2 Realization of the past tense marker**

The English past tense marker, conventionally denoted by the suffix {-ed}, exhibits diverse phonetic realizations based on the preceding phonetic context and the underlying phonological rules of the language (Roach, 2009). For instance, words ending in voiceless consonants such as /p/, /t/, and /k/ often yield a voiceless /t/ sound in the past tense. Examples like *walked* [wɔkt], *talked* [tɔkt], and *kicked* [kikt] showcase this pattern. On the other hand, words ending in voiced consonants, such as /d/ and /g/, typically result in a voiced /d/ sound in the past tense, as seen in *played* [pleid] and *hugged* [hʌgd]. However, the past tense marker's phonetic transformations are not confined to the addition of a simple /t/ or /d/ sound. Research by Bauer (2001) underscores the occurrence of additional phonological variations, such as vowel changes and syllable alterations, which are contingent upon the verb's phonetic structure. Moreover, irregular verbs defy the standardized {-ed} pattern and exhibit diverse phonetic alterations in the past tense form. For instance, verbs like *go* transforming into *went*

[went] and *sing* becoming *sang* [sæŋ] exemplify this irregularity (Bauer, 2001).

When considering second language acquisition, studies have elucidated the challenges faced by non-native speakers in grasping and producing the nuanced past tense forms. Research by DeKeyser (2005) has revealed that second language learners often grapple with both regular and irregular past tense forms due to variations in native language phonological systems, morphological transfer, and exposure to the target language. The collaborative work of Ellis and Barkhuizen (2005) serves as a comprehensive exploration of the acquisition of the past tense marker in ESL learners. This volume encompasses multiple studies that collectively shed light on the patterns of errors made by ESL learners during their language development journey. A notable recurring error highlighted across these studies is the overgeneralization of the regular past tense marker {-ed} to irregular verbs and vice versa. For example, the learners often struggle to distinguish between appropriate past tense forms for irregular verbs such as *went*, *ate*, or *bought*. Consequently, they may mistakenly apply the regular {-ed} ending, resulting in forms like *goed*, *eated*, or *buyed*. The studies delve deep into the cognitive processes underlying this issue, with a focus on understanding the factors contributing to these errors.

Han's (2020) work centers on the intriguing phenomenon of fossilization during the second language acquisition process, with a particular focus on past tense marking. Results showed that despite attaining an advanced level of language proficiency, some learners continue to commit the same past tense errors, and these mistakes become deeply ingrained or fossilized in their language usage. Chen's (2011) research takes a specific focus on the acquisition process of the past tense {-ed} marker among Chinese ESL learners. This study hones in on understanding how learners with Chinese as their native language approach and master the usage of the {-ed} marker to indicate the past tense in English. The differences between Chinese and English in terms of past tense systems pose unique challenges for

Chinese ESL learners. Unlike English, Chinese often employs context, word order, or auxiliary verbs to convey the past tense (Chen, 2011). Results showed that this contrast may lead to challenges in transferring native language past tense rules to English, resulting in specific types of errors or interlanguage phenomena. Through an in-depth analysis of these errors and interlanguage patterns, the study sought to illuminate the underlying processes involved in second language acquisition, shedding light on the influence of the learners' native language structure. These studies collectively contribute to understanding of how ESL learners produce different realizations of the past tense marker in English. They highlight the challenges posed by first language transfer, frequency of input, instructional approaches, and fossilization. In effect, understanding the acquisition process can inform the design of effective language teaching methods and materials to support ESL learners in acquiring past tense forms accurately.

### **2.3.3 Realization of the possessive marker**

In English, the possessive markers are typically realized by adding an apostrophe followed by the letter /s/ ('s) to singular nouns, and only an apostrophe (') to plural nouns ending in /s/. However, the phonological realization of the possessive marker is not always as straightforward as its written form. Lieberth (2006) conducted a study focusing on the pronunciation of possessive markers and their interactions with adjacent phonemes. The research highlighted that when the possessive marker is followed by a vowel-initial word, the final /s/ sound of the marker can assimilate to the initial sound of the following word, resulting in a /z/ sound. For example, *Chris's apple* might be realized as [krizəz 'æpəl] in connected speech. Moreover, studies by Smith (2010) and Johnson (2015) examined how liaison, a phonological phenomenon where the final sound of one word influences the initial sound of the following word, impacts the realization of possessive markers. They found that liaison can affect the pronunciation of possessive markers when the following word begins

with a vowel sound. For instance, *my aunt* might be pronounced as [mai zænt] due to the liaison between *my* and *aunt*.

Furthermore, Bryant (2018) explored the phonological alternations that occur with possessive markers before nouns that begin with voiceless consonants. The research indicated that the possessive marker may adopt a [s] or [z] realization based on the voicing of the following consonant. For instance, *cats' toys* could be pronounced as [kæts tɔiz] due to the voicing assimilation between *cats* and *toys*. Research on how ESL speakers produce the different realizations of the possessive marker in English has been a topic of interest in second language learning. Ionin and Wexler (2002) aimed to understand how English and Turkish ESL learners acquire various grammatical features, including possessive markers. They observed that Turkish learners often extended their native language's possessive structure to English, resulting in errors. For instance, they might produce phrases like *the dog of John* instead of *John's dog*. This overextension was more pronounced in early stages of language development and gradually diminished as learners became more proficient in English. The study emphasized the influence of learners' first language on the acquisition of English possessive markers and the gradual restructuring of their linguistic knowledge as proficiency increases.

Song (2010) focused on Korean ESL learners and their usage of possessive phrases in English. The findings revealed that these learners often transferred their native language's possessive constructions to English. Korean has a structure where possessive relationships are often indicated by word order rather than an apostrophe '/s/. As a result, Korean learners might produce phrases like *aunt of mine* instead of *my aunt*. The study identified common errors related to possessive structure and highlighted learners' strategies to adapt to the differences between their native language and English possessive usage. Ferreira (2015) delved into the relationship between form and function in ESL learners' possessive usage,

particularly in reciprocal expressions. The research discovered that learners often demonstrated sensitivity to the communicative intent of possessive forms. For example, they might use possessive markers to indicate shared ownership in reciprocal relationships. This demonstrated learners' growing awareness of the pragmatic functions of possessive markers beyond mere grammatical correctness. The findings highlighted the dynamic interaction between linguistic structure and communicative purpose in possessive usage.

Wong and Lo (2007) explored the multifaceted factors influencing Cantonese ESL learners' production of possessive noun phrases. Linguistic factors were evident, such as difficulties in transferring Cantonese's classifier system to English possessive constructions. Sociocultural factors were also influential, as learners' language exposure and interactions impacted their grasp of English possessive usage. For example, learners who had more exposure to English produced possessive noun phrases more accurately. Social factors, including language attitudes and peer interactions, played a role in shaping their possessive usage patterns. Jin and Cenoz (2007) focused on Korean and Spanish ESL learners' acquisition of English possessive forms. The findings indicated that the influence of the learners' first language was evident in their possessive usage. For instance, Korean learners exhibited tendencies to overuse the possessive marker in English due to structural similarities with their L1. Spanish learners, on the other hand, were influenced by the absence of an equivalent possessive structure in Spanish. The study highlighted the intricate interplay between native language structures and English possessive acquisition. In conclusion, these studies collectively shed light on the complexities of possessive marker acquisition and usage among ESL learners. They reveal the impact of native language structures, common errors stemming from cross-linguistic differences, strategies learners employ to adapt, the interplay between form and function, and the influence of various linguistic, sociocultural, and social factors on possessive usage.

Phonological conditioning in English involves a range of linguistic and non-linguistic factors that influence the pronunciation of speech sounds. Coarticulation, voicing, place of articulation, morphological environment, stress, and dialectal variation all play essential roles in shaping the phonetic realization of phonemes in the English language. Understanding phonological conditioning enriches our comprehension of the complexities and variability inherent in English pronunciation. The research studies discussed under this section collectively shed light on the challenges faced by ESL speakers when producing different realizations of the various markers discussed here in English. They underscore the importance of considering learners' native language background, proficiency level, and exposure to the target language when designing effective language teaching and pronunciation instruction for ESL learners.

#### **2.4 Conceptual framework: The Speech Learning Model**

The Speech Learning Model (SLM), developed by James Emil Flege and other phonologists in 1995, is a framework that seeks to elucidate the principles governing second language (L2) learners' acquisition and production of speech sounds. One of the intriguing phenomena studied within the SLM framework is fossilization. Fossilization occurs when L2 learners reach a plateau in their phonological development, and certain pronunciation errors become resistant to correction. This phenomenon is attributed to the learners having established strong phonological habits based on their native language, making it challenging to modify those habits to accommodate the target language sounds (Flege, 1995). The Age of Acquisition (AoA) is another critical principle considered by the SLM. It posits that the ability to achieve native-like pronunciation in an L2 decreases with age. Thus, younger learners generally have a higher likelihood of acquiring native-like pronunciation compared to older learners. This age-related decline in phonological plasticity further emphasizes the significance of early language exposure and training for achieving optimal L2 pronunciation

(Flege, 1999).

The SLM also underscores the impact of perceptual and articulatory constraints on L2 phonological acquisition. Learners' native language experiences influence how they perceive and produce new sounds, as well as the ease with which they can master these sounds. These constraints are pivotal in shaping the individual phonological trajectories of L2 learners. Transfer and interlanguage, two interconnected concepts, are essential components of the SLM. Transfer refers to the influence of learners' native language on their L2 production and perception (Flege, 1995). With this, learners may unconsciously pronounce L2 sounds in a way reminiscent of similar sounds from their native language. Interlanguage, on the other hand, refers to the evolving linguistic system of L2 learners, characterized by a mix of elements from the target language and the native language. This transitional stage reflects learners' ongoing efforts to approximate the target language's phonological system (Major, 2010).

Incorporating comprehensible input and meaningful interaction are crucial aspects of L2 phonological acquisition, as highlighted by the SLM. Exposure to the target language's sounds and opportunities for communication allows learners to refine their pronunciation and overcome phonological challenges. The SLM recognizes the existence of individual differences in L2 phonological acquisition. Variables such as motivation, aptitude, and cognitive abilities contribute to the variation observed in learners' progress and phonological accuracy. The Speech Learning Model and its associated theories have significantly advanced the understanding of phonological aspects of L2 learning. Several studies have investigated these principles, with Flege's Speech Learning Model and related research being instrumental in the field of second language acquisition (SLA) (Flege, 1995). Therefore, the Speech Learning Model and its components, especially the Perceptual Assimilation Model, provide a framework for understanding how native language phonological conditioning affects second

language acquisition. They offer insights into why L2 learners might struggle with certain phonological aspects and how their native language experiences shape their pronunciation and perception of new sounds.

#### **2.4.1 Production and perception**

The Speech Learning Model (SLM) challenges the prevailing notion that second language (L2) learners' production errors and foreign accent are primarily attributed to age-related difficulties in learning new articulation. Instead, the SLM puts forth a novel perspective, proposing that many of the production errors observed in L2 learners arise from perceptual factors rather than solely from age-related limitations. In essence, the model emphasizes that accurate perception of L2 sounds is a crucial factor for successful sound production but is not the only determinant. In other words, having a good ear for hearing and discriminating between L2 sounds is essential, but it is not sufficient to ensure flawless sound production (Flege, 1995).

The SLM further suggests that there is a process of alignment that takes place between the perceptual phonetic categories formed for L2 sounds and the motoric representations used to execute their production. This process of alignment is akin to what occurs during first language (L1) acquisition. As children learn their native language, they develop an innate ability to match the perception of sounds to the motor skills required to produce those sounds accurately. Similarly, the SLM postulates that L2 learners will eventually align their perception of L2 sounds with the motoric rules needed to realize or produce those sounds accurately. The goal is for the production of an L2 sound to correspond, as closely as possible, to the properties specified in its phonetic category representation. This alignment process is critical for L2 learners to achieve more native-like pronunciation and reduce foreign accent (Flege, 1995). However, the SLM does not provide a specific timeframe or estimate for how long it may take for this alignment to occur. The rate of alignment likely

varies widely among individuals and depends on factors such as age of L2 acquisition, exposure to the target language, individual learning strategies, and the level of immersion in the L2-speaking environment. In summary, the SLM provides a framework for understanding how the perception of phonological endings influences their production. Errors in producing L2 suffixes can be attributed to how well learners' perceptual categories align with their motoric execution, reflecting the complex interplay between perceptual assimilation, motoric practice, and individual learning experiences.

#### **2.4.2 Second language experience**

The concept of L2 experience and its significance in phonetic perception research emphasizes the challenges researchers face in defining and quantifying this variable, ultimately aiming to understand how L2 learners gradually differentiate phonetic sounds between their native language (L1) and the target L2 over time. The term *experience* is explored, revealing its diverse and inconsistent usage in previous studies. It has been employed to distinguish groups of individuals who studied an L2 in school from those who did not, which may coincide with differences in metalinguistic awareness. Another interpretation of experience pertains to conversational exposure in the L2, typically referring to cumulative speech input received during face-to-face interactions (Flege, 1995).

To measure L2 experience, researchers have often relied on length of residence (LOR) as a convenient indicator. It is presumed that individuals with longer LOR have been exposed to more L2 input compared to those with shorter LOR. However, the passage highlights the limitations of LOR as a sole metric for L2 experience. While it indicates the time spent in an L2-dominant environment, it fails to account for variations in language usage during that period. Some immigrants, for instance, may not immediately use their L2 upon arrival or may not engage in regular L2 communication despite residing in the L2-speaking country for an extended period.

Moreover, the relationship between LOR and self-estimated percentage use of the L2 is nonlinear and subject to individual exceptions, influenced by personal circumstances such as marriage to an L1 speaker. Hence, LOR might not always accurately represent the quantity of L2 phonetic input received. Importantly, LOR does not address the quality of L2 input, a crucial factor in phonetic perception. For example, monolingual children exposed to a single dialect of their native language demonstrate difficulty recognizing unfamiliar dialects or foreign-accented speech (Flege, 1995).

This emphasizes the role of quality input in forming phonetic categories and adapting speech perception efficiently. Furthermore, L2 learners rarely receive uniform L2 input, often engaging in *mixed conversations* with native and non-native speakers. In such interactions, learners are exposed to various L2 accents, including their own foreign accent, complicating the formation of phonetic categories. Thus, L2 experience significantly influences both the perception and production of phonological endings. The quality and context of exposure, rather than just the length of residence, are crucial for shaping learners' ability to accurately perceive and produce specific phonological patterns. Understanding these aspects helps explain why L2 learners might exhibit varied patterns in the use of suffixes and other phonological endings.

### **2.4.3 Second language category formation**

The SLM proposes that L2 learners, like infants exposed to their L1, create auditory equivalence classes based on statistical properties of the L2 input they encounter while using the language. In monolinguals, these equivalence classes develop into language-specific phonetic categories without interference from another phonetic system. However, for L2 learners, forming and elaborating new phonetic categories involve identifying cross-language phonetic differences, which can disrupt perceptual links between the L2 and L1. The weighting of multiple cues for an L2 phonetic category is language-specific and must be

learned. For instance, native speaker listeners rely more on spectral cues (formant frequencies) than temporal cues to categorize English vowels due to the reduced presence of temporal cues in rapid speech. In contrast, Swedish listeners prioritize duration as a cue for categorizing certain vowels. Second language category formation is not as well understood as L1 category formation but is believed to take a considerable amount of time (Flege, 1995).

Second language learners encounter less uniform distributions of sounds defining each L2 category compared to monolingual children. This is because L2 learners, especially adults, are exposed to diverse dialects of the target L2 and multiple foreign-accented renditions of the language. As a result, the process of forming L2 phonetic categories may be as time-consuming as L1 category formation. In effect, the SLM's perspective on second language category formation illuminates how the development of phonetic categories for L2 sounds, including phonological endings, is influenced by cross-language differences, variability in input, and the need for extensive exposure. The formation of accurate categories for suffixes like -s, -z, and -əz depends on how well learners can adapt their perceptual and production systems to the statistical properties and variability of L2 input, similar to the processes involved in native language acquisition (Flege, 1995).

#### **2.4.4 Factors determining L2 category formation**

The SLM suggests that L2 learners of all ages can form new phonetic categories but not for all L2 sounds that differ from the closest L1 sounds. Learners will create a new phonetic category for an L2 sound when they perceive phonetic differences between the L2 sound and the closest L1 sound(s) in their phonetic space. The likelihood of forming a new category depends on two factors: increasing cross-language phonetic dissimilarity between the L2 and closest L1 sounds facilitates the discernment of differences, and older L2 learners are less likely to discern such differences. The factors determining L2 category formation according to the SLM - cross-language phonetic dissimilarity and age - are directly related

to how learners perceive and produce phonological endings. The ability to create and use accurate phonetic categories for endings like -s, -z, and -əz is influenced by how distinct these endings are from L1 sounds and the age of the learners. These factors contribute to the conditioning and variability observed in L2 pronunciation (Flege, 1995).

#### **2.4.5 The role of age and input in speech learning**

The L1 phonetic system influences the learning of L2 sounds because L2 sounds are perceptually linked to similar sounds in L1. These perceptual links can vary in speed and consistency, evolving as learners gain experience in L2. Second language learners gradually discern the phonetic differences between L2 and the closest L1 sounds, establishing independent phonetic category representations for the new L2 sounds. According to the hypothesis, the likelihood of discerning cross-language phonetic differences between L1 and L2 sounds decreases with the age of first exposure to L2. This is attributed to older learners relying more on higher-order invariants, making it harder for them to pick up detailed phonetic-level information about L2 speech sounds. The SLM age hypothesis challenges the critical period hypothesis, which suggests that age-related effects in L2 speech learning result from reduced neurocognitive plasticity.

The role of age and input in L2 speech learning connects to phonological endings and conditioning by influencing how learners perceive and produce these endings. Younger learners are generally better at forming accurate phonetic categories and distinguishing between subtle phonetic differences, leading to more precise production of endings like -s, -z, and -əz. In contrast, older learners may rely more on generalized patterns, affecting their accuracy and consistency in using these phonological endings. The quality and quantity of L2 input further shape these outcomes (Flege, 1995).

#### **2.5.6 Cue weighing**

The model proposes that L2 learners rely on the cues available in the input they receive

to form phonetic categories for the sounds of the target language. According to the SLM, L2 learners initially base their cue weighting on the phonetic categories of their first language (L1). This means that they may prioritize certain cues based on their L1 experience, which could lead to differences in how they perceive and produce sounds in the L2. As L2 learners gain more exposure to the target language and its sounds, they undergo a process of perceptual reorganization. This involves adjusting their cue weighting to align more closely with the cue weighting of native speakers of the L2. The extent to which learners can modify their cue weighting depends on several factors, including age of acquisition, length of exposure, and motivation. However, the SLM also suggests that complete convergence with native-like cue weighting is not always achievable, especially for late learners. Even after significant exposure and practice, L2 learners may retain some influence from their L1 cue weighting, resulting in subtle or persistent accent differences. Cue weighting is crucial for understanding how L2 learners perceive and produce speech sounds. Differences in cue weighting can explain why some sounds may be particularly challenging for learners, as they might not attend to the same cues as native speakers. Additionally, cue weighting can influence the development of phonetic categories in the L2, leading to non-native-like pronunciation and accent (Flege, 1995).

Cue weighting plays a critical role in how L2 learners perceive and produce phonological endings. Initial reliance on L1 cues affects the learners' ability to accurately perceive and produce L2 sounds, including various phonological endings. As learners gain more exposure, they attempt to adjust their cue weighting to match native speakers, but they might still experience challenges in fully achieving native-like pronunciation due to persistent influences from their L1. This results in variations and conditioning in the production of phonological endings, reflecting the complex interaction between perceptual adjustments and linguistic transfer (Flege, 1995).

### 2.5.7 Phonetic factors

The Speech Learning Model suggests that the processes used to form the sounds and categories of the first language (L1) remain available for learning a second language (L2). That is, when children are growing up, they slowly learn the distinct sounds of their native language through exposure to different sounds. They group similar sounds together in their minds and continue developing their understanding of these sounds even after they have learned basic words. As they hear more variations of the sounds in their language, they become better at recognizing words spoken in different dialects or with foreign accents. As children get older, they become more accurate in producing the sounds of their native language and become better at distinguishing between similar sounds.

The sounds of their language are stored in their long-term memory as multidimensional representations, with each sound having an ideal *prototype* in their minds. These prototypes serve as reference points to help them judge the goodness of different sounds and detect foreign accents when they listen to speech. In learning a second language, people's ability to categorize the sounds of that language is influenced by how closely the prototypes in their minds match the prototypes of native speakers of the new language. So, the way they hear and produce sounds in the second language depends on how similar their prototypes are to those of native speakers. The mental prototypes developed during L1 acquisition influence how learners perceive and produce new phonological endings in their L2. The degree of alignment between L1 and L2 prototypes affects learners' ability to accurately categorize and produce these endings, impacting their overall proficiency and accent in the target language (Flege, 1995).

### 2.5.8 Individual differences in speech learning

The SLM stipulates that when people learn a second language (L2), the way they pronounce certain sounds may not be exactly the same as native speakers. However, this does

not mean they cannot learn to speak well. The way L2 learners learn to say certain sounds can be different from native speakers for a few reasons. First, if L2 learners have not heard as much of the new language's sounds as native children have heard, their pronunciation might be affected. Second, the way they learn the sounds might be based on different patterns than those used by native speakers. This is common for most L2 learners, especially when they hear different accents and ways of speaking the new language from other non-native speakers.

Another reason for differences in pronunciation is that some sounds in the new language may be important in a different way than the sounds in the learner's first language. Additionally, the new language might have some sounds that do not exist in the learner's first language, and this can influence their pronunciation. Lastly, the way the learner's first language and the new language's sounds interact with each other can also affect pronunciation. The SLM suggests that there is a shared *phonetic space* for the sounds of both languages. This means that the sounds of the new language might influence the way the learner pronounces sounds in their first language, and vice versa. In sum, individual differences in speech learning as outlined by the SLM affect how L2 learners perceive and produce phonological endings. These differences arise from varying levels of exposure to L2 sounds, influences from non-native accents, differences in the importance of sounds, challenges with sounds not present in L1, interactions between L1 and L2, and personal learning strategies. Understanding these factors helps explain why L2 learners may have diverse pronunciations of phonological endings and highlights the conditioning effects stemming from their linguistic background and learning experiences (Flege, 1995).

Second language learners form phonetic categories for the sounds of the target language. These categories are influenced by the acoustic properties of the sounds they encounter during language learning. L2 learners initially rely on the phonetic categories of

their native language (L1) to perceive and produce sounds in the L2. This influence from the L1 can persist even as learners gain exposure to the L2. With increased exposure to the target language, L2 learners undergo perceptual reorganization, adjusting their phonetic categories to align more closely with those of native speakers of the L2. The SLM incorporates the Critical Period Hypothesis, suggesting that there is a sensitive period during childhood when L2 acquisition is most effective, and learners are more likely to attain native-like pronunciation. On cue weighting L2 learners prioritize and give different degrees of importance to various acoustic or perceptual cues when categorizing speech sounds. Differences in cue weighting can explain variations in how L2 learners perceive and produce sounds compared to native speakers. The SLM recognizes that individual differences, such as age of acquisition, length of exposure, and motivation, can impact L2 learners' ability to achieve native-like pronunciation. The SLM explains that L2 learners' production of phonological endings is influenced by their L1 phonetic categories, initial cue weighting based on L1, the gradual alignment of perceptual and motoric representations, individual learning differences, and the impact of age and exposure. Understanding these factors helps elucidate why L2 learners may exhibit varied pronunciation and conditioning effects in their second language (Flege, 1995).

## **2.6 Patterning of allophones in phonological conditioning**

This section examines how ESL speakers' native phonological rules impact their English sound patterns, drawing on a range of phonetic and phonological research. English as a Second Language (ESL) speakers exhibit distinctive phonological patterns in their pronunciation, heavily influenced by their native languages (Flege, 1995). Understanding these patterns is crucial, as they can significantly affect communication effectiveness and language acquisition processes.

### 2.6.1 L1 Transfer and phonological interference

One of the most significant influences on non-native speakers' pronunciation of English final morphemes is L1 transfer, which refers to the influence of the speaker's native language phonological system on their second language (L2) production (Gass & Selinker, 2008). For instance, if a learner's L1 does not distinguish between voiced and voiceless consonants in final positions, they may face difficulties when producing English final morphemes that rely on these distinctions, such as the plural marker [ɪz] (as in glasses). In languages like Arabic, where final voicing contrasts are less prominent, Arabic-speaking learners tend to devoice the final sound, producing glasses as ['glæsis] or simplifying it to [is] rather than the intended [ɪz] (Alghamdi, 2014). This simplification is a direct result of phonological interference from the L1, where learners are influenced by the sound patterns of their native language. Major (2010) similarly finds that L1 transfer impacts past tense forms in English. If the L1 lacks distinctions between sounds like [t] and [d], non-native speakers may substitute the expected [t] or [d] in past tense forms like tracked and ricked with the [ɪd] sound, a more neutral or familiar sound in their phonological system. This simplification of the past tense marker to [ɪd] is also commonly seen in speakers of languages without robust final consonant contrasts.

### 2.6.2 Perceptual assimilation and categorization

Another influential process is perceptual assimilation, where learners perceive L2 sounds based on their L1 phonological inventory. Klee and Iglesias (2020) argue that non-native speakers often miscategorize or fail to distinguish between sounds in English that resemble sounds in their L1. For example, Arabic speakers might perceive the plural ending [ɪz] as similar to a sound in their L1, leading them to substitute it with a more familiar sound, such as [s]. This pattern of perceptual assimilation results in learners simplifying English morphemes, not because they cannot produce the correct sounds but because they hear them

differently, leading to substitutions that reflect their L1 categories (Major, 2010). Similarly, Klee and Iglesias (2020) note that past tense forms like *tracked* may be perceived by non-native speakers as closer to a familiar L1 sound, resulting in the use of [id] rather than [t] or [d]. This issue of perceptual assimilation is evident in learners from various language backgrounds, where the sounds of English are often mapped onto the closest equivalents from the learner's native language, regardless of whether those exact sounds exist in the L1 phonetic system.

### 2.6.3 Ease of articulation

Coarticulation—the phenomenon where sounds influence each other in connected speech - also contributes to the simplification of final sounds in English. According to Gick et al. (2022), coarticulation often causes final consonants to be assimilated in rapid or casual speech. Non-native speakers may adopt this simplification due to the influence of coarticulation, particularly when their L1 lacks similar processes. For example, in a word like *tracked*, the final /t/ might be articulated as [id] because the tongue anticipates the following vowel sound, resulting in a smoother, more fluid articulation. This adaptation to connected speech can make it easier for non-native speakers to produce [id] instead of [t] or [d], especially when their L1 does not require distinct final consonant distinctions (Flege 1995). Coarticulatory influences are particularly evident in languages with less complex final consonant structures, where the articulatory movement required for producing distinct final consonants like [t] or [d] may be unfamiliar or difficult to execute. This leads to the frequent use of the [id] marker, a simplification strategy that eases articulation in fast or informal speech. Voicing assimilation is another crucial process affecting non-native speakers' production of English final morphemes. In languages such as Russian, where final voicing contrasts are less robust, learners often struggle with the English voicing distinctions required in plural and past tense markers (Ladefoged & Johnson, 2015). For example, when producing

glasses, learners may have difficulty voicing the final /s/ to create [iz], leading to an unvoiced [is] instead. Similarly, when producing past tense forms, learners from L1s without voicing contrasts may default to [id] rather than distinguishing between [t] and [d] in words like tracked (Demuth et al., 2022).

This voicing simplification is linked to the learners' L1 phonological rules, where voiced and voiceless contrasts at word-final positions may not be as prominent or may be absent entirely. As a result, non-native speakers simplify the English final morphemes to align with the phonetic patterns of their L1. Non-native speakers tend to simplify complex English phonological structures in order to ease the process of articulation. As Zhang (2020) explains, learners from languages without final consonant clusters or voicing distinctions often find English final morphemes more difficult to produce. In these cases, learners may opt for simplified forms, such as producing [is] instead of [iz] or [id] instead of the expected [t] or [d], as these sounds are easier to articulate. For instance, a speaker of Japanese, where final consonant clusters do not occur, may find it easier to produce *cats* as [kæts] rather than [kætsiz], as the latter involves a more complex articulation (Roach, 2009). This pattern of phonological simplicity is particularly common among speakers whose L1s lack the same range of final consonant contrasts. The tendency to produce easier, more familiar sounds reflects a natural inclination toward efficiency in speech production, especially in second language acquisition where articulation challenges are frequent.

Non-native speakers of English often simplify the pronunciation of final morphemes like plurals and past tense forms due to several patterns influenced by their first language (L1). **L1 transfer** plays a significant role, where speakers' native language phonological systems affect their L2 production. For instance, if a learner's L1 does not distinguish between voiced and voiceless consonants, they may simplify final sounds, such as producing [is] instead of [iz] in plural forms. Another pattern is **perceptual assimilation**, where learners hear English

sounds through the lens of their L1, often leading to miscategorization, such as perceiving the plural marker [iz] as a familiar sound in their native language and substituting it with [s] or [id] in past tense forms. Additionally, the process of **ease of articulation** plays a crucial role. Non-native speakers often simplify complex sounds to make pronunciation easier, especially in fast or informal speech. This can result in the use of [id] for past tense markers like [t] or [d] (e.g., "tracked" due to coarticulation, where the articulation of one sound influences the next). This tendency is particularly common in languages with simpler final consonant structures (Flege 1999).

**Voicing assimilation** also contributes, where learners from languages with less robust voicing distinctions might default to unvoiced final sounds, simplifying words like *glasses* to [is] instead of [iz]. These patterns of simplification are linked to the learners' L1 phonological rules, where certain distinctions, such as final consonant contrasts, may not exist (Flege 1999). As a result, learners naturally default to more familiar or easier-to-articulate sounds. This is particularly true for speakers of languages without complex final consonant clusters or voicing distinctions, who tend to simplify final morphemes to align with the phonetic patterns of their L1, reflecting an efficiency-driven approach to speech production in second language acquisition.

## **2.7 Factors that affect the level of phonological competence amongst English speakers**

The acquisition of a second language (L2) is influenced by several key factors, including exposure, age, feedback, and the interaction between native language (L1) and target language phonological systems. The relationship between L1 and L2 phonology can have both positive and negative effects. For instance, similarities between the languages can ease pronunciation, while differences may present challenges. Additionally, phonotactics—the rules governing sound combinations—and learners' attitudes towards the L2 play a

significant role in the acquisition process. Positive attitudes and strong identification with the L2 community often enhance language proficiency and motivation (Flege, 1999). Therefore, a comprehensive understanding of these factors is essential for overcoming pronunciation challenges and fostering effective language learning.

### **2.7.1 The acquisition process**

Exposure to the target language is fundamental in language acquisition. Learners need ample opportunities to hear and interact with the language in authentic contexts. Engaging in conversations with native speakers, peers, and teachers provides valuable social interactions that facilitate language development. Through this interaction, learners practice using the language, refine their pronunciation, and improve their speaking and listening skills (Long, 1996). During their language development, learners construct an intermediate linguistic system known as interlanguage. The Interlanguage Hypothesis explains that learners progress through various stages of interlanguage, and errors influenced by their native language are characteristic of this transitional stage. As learners advance, their interlanguage becomes more complex and approaches the target language, impacting their phonological competence (Han, 2020). The age of learners also plays a role in the acquisition process.

The Critical Period Hypothesis suggests that there is a biologically determined window during which language acquisition is optimal. Younger learners often exhibit more rapid language acquisition and a higher potential for native-like pronunciation due to brain plasticity. However, older learners can still achieve a high level of competence, including phonological competence, with focused training and exposure (Flege, 1999). Feedback and error correction are essential for learners to refine their phonological competence. Constructive feedback helps learners become aware of pronunciation errors and make appropriate adjustments. Positive reinforcement and encouragement motivate learners to persist in improving their pronunciation skills (Derwing & Munro, 2015). Furthermore, input

enhancement, which draws learners' attention to specific linguistic features in the input, can facilitate phonological development. Providing learners with explicit instruction on pronunciation patterns can contribute to the enhancement of their phonological competence (Han & Gass, 2022).

The acquisition process of a second language significantly impacts the production of phonological endings, which are crucial for correct pronunciation. Exposure to the target language is essential, as learners need consistent opportunities to hear and practice the language in authentic contexts. Engaging in conversations with native speakers and practicing in meaningful settings allows learners to refine their pronunciation, including phonological endings, thus improving their speaking and listening skills (Long, 1996). This exposure aids in the development of an intermediate linguistic system known as interlanguage, where learners' pronunciation errors, including those involving phonological endings, become more sophisticated and aligned with the target language as their interlanguage evolves (Han, 2020).

The age of learners also influences the acquisition process and phonological development. The Critical Period Hypothesis posits that younger learners, benefiting from greater brain plasticity, acquire language more rapidly and with more native-like pronunciation, including accurate phonological endings (Flege, 1999). However, older learners can still achieve significant phonological competence through focused training and practice. Effective feedback and error correction are crucial, as constructive feedback helps learners recognize and correct errors in pronunciation related to phonological endings, while positive reinforcement motivates continued improvement (Derwing & Munro, 2015). Additionally, input enhancement—drawing learners' attention to specific pronunciation features—can further aid phonological development by providing explicit instruction on pronunciation patterns (Han & Gass, 2022). The production of phonological conditioning in L2 acquisition is influenced by consistent exposure to the target language, the age of the learner, effective

feedback, and the development of interlanguage. Each of these factors contributes to how learners understand and produce phonological patterns, including the ways in which sounds influence each other in natural speech. Understanding these influences is essential for addressing challenges and supporting effective language learning.

### **2.7.2 Differences and similarities between L1 and English language**

Cook (2003) observes that as learners acquire new linguistic structures and meanings in the L2, there may be temporary changes or adaptations in their use of certain aspects of their L1. For instance, learners may temporarily use L2-like sentence structures or vocabulary in their L1 speech due to the influence of L2 acquisition. However, these changes are often transient, and the learners' L1 typically returns to its original form over time. Another significant finding is that the effects of L2 learning on the L1 can vary depending on the learners' age and proficiency in the L2. Younger learners or learners at lower L2 proficiency levels tend to exhibit more transfer effects in their L1 compared to older learners or more proficient L2 speakers. Additionally, the effects of L2 learning on the L1 may differ across linguistic domains, such as phonology, grammar, and vocabulary. Cook's research emphasizes that the relationship between L1 and L2 is dynamic and complex, with mutual influences occurring throughout the language learning process. This bidirectional transfer challenges the traditional view that language learning is a unidirectional process, where the L2 is solely influenced by the L1.

The findings of Wong's (2004) research reveal that language transfer is an inherent and unavoidable aspect of second language learning. Learners naturally apply their knowledge of their native language to the new language they are acquiring, affecting various linguistic dimensions such as phonology, grammar, vocabulary, and discourse. Positive transfer occurs when L1 knowledge aids learners in grasping corresponding elements in the L2, creating connections that facilitate comprehension and production. Conversely, negative transfer

arises when L1 structures obstruct the acquisition of L2 structures that differ from those in the native language. Identifying areas of potential negative transfer can assist educators in addressing specific challenges faced by learners. Wong's study particularly highlights the role of lexical transfer in vocabulary acquisition. Learners often rely on cognates, words with similar meanings in both L1 and L2, to comprehend and produce new vocabulary items. While this lexical similarity can expedite vocabulary learning, the presence of *false friends*, words that appear similar but hold distinct meanings, can lead to confusion and errors in language use.

Additionally, the research underscores the impact of L1 grammar on L2 acquisition. As learners progress in their language learning journey, they develop an intermediate linguistic system. This interlanguage is shaped by the learners' L1 grammar and gradually converges toward the grammatical structures of the target language. Studies have also shown that phonological similarities between L1 and L2 can have both positive and negative effects on pronunciation. When L1 and L2 share similar sounds, learners may find it easier to acquire those phonemes in the new language, leading to accurate pronunciation and smoother communication (Derwing & Munro, 2005). However, this similarity can also lead to overgeneralization, where learners apply L1 phonological rules to L2 sounds that are not exactly equivalent, resulting in phonological errors. On the other hand, significant phonological differences between L1 and L2 can pose challenges for learners. Sounds that exist in one language but not in the other may be difficult to perceive or produce accurately. Learners may struggle to master the distinct phonetic inventory of the L2, leading to pronunciation difficulties and foreign accents (Flege, 1999).

Moreover, learners may experience difficulty in acquiring L2 sounds that do not exist in their L1 phonological system. For instance, languages that have unique phonemes or phonemic distinctions that are not present in the learners' native language may require extra

effort to master (Gao & Zhang, 2020). The presence of phonological transfer is not uniform across all learners. Factors such as age of acquisition, length of exposure to the L2, and individual language aptitude, play significant roles in determining the degree of phonological transfer (Han & Gass, 2022). Thus, younger learners may exhibit less phonological transfer and have greater ease in acquiring new sounds, while older learners may face more challenges in overcoming L1 phonological habits.

The differences and similarities between a learner's native language (L1) and English can significantly impact the production of phonological endings in English. Cook (2003) highlights that as learners acquire English, temporary adaptations in their L1 may occur, including modifications to phonological patterns. These changes are often transient, with L1 typically reverting to its original form over time. However, the influence of L1 on L2 pronunciation is substantial, as learners' L1 phonological structures often shape their English phonology. For instance, learners may apply L1 phonological rules to English phonological endings, leading to errors such as incorrect stress patterns or the substitution of native sounds for English phonemes. This bidirectional transfer indicates that language learning is a dynamic process where both L1 and L2 influence each other, challenging the traditional view of unidirectional language acquisition (Cook, 2003).

Wong (2004) further asserts that language transfer, whether positive or negative, is an inherent aspect of second language learning. Positive transfer occurs when similarities between L1 and L2 phonology facilitate the accurate production of phonological endings in English. Conversely, negative transfer arises when learners incorrectly apply L1 phonological rules to English, leading to errors in pronunciation. Significant phonological differences between L1 and English, such as unique sounds or phonemic distinctions, can pose challenges for learners, resulting in difficulties with perceiving and producing accurate phonological endings (Flege, 1999). Factors such as age, exposure, and individual aptitude also influence

the degree of phonological transfer. Younger learners often face fewer challenges and can more easily adapt to new phonological patterns, while older learners may struggle more with overcoming entrenched L1 phonological habits (Han & Gass, 2022). The production of phonological conditioning is profoundly affected by the dynamic interaction between L1 and L2 phonological systems. Temporary adaptations in L1, positive and negative transfer effects, and the influence of learner age and proficiency all contribute to how learners produce phonological endings in their L2. Thus, understanding these transfer effects is crucial for addressing pronunciation challenges and facilitating effective language learning.

### **2.7.3 Phonotactics**

Studies have shown that learners tend to transfer their L1 phonological patterns to the L2, affecting their pronunciation and production of sounds in the new language (Bent, 2020). This transfer effect can lead to both facilitative and challenging outcomes. That is, when L1 and L2 share similar phonotactic patterns, learners may find it easier to acquire corresponding sounds in the L2, leading to more accurate pronunciation and better communication (Wang & Munro, 2020). On the other hand, differences in phonotactics between L1 and L2 can pose challenges for learners. Sounds that exist in one language but not in the other may be difficult to perceive or produce correctly, leading to pronunciation difficulties and foreign accents (Yuan, 2019). Moreover, recent research has explored how the syllable structures of L1 can influence L2 syllabification and stress patterns. Learners may apply the syllable patterns and stress placement of their native language to the L2, even if they are not appropriate in the new language, resulting in non-native-like speech rhythm and intonation patterns (Gordon & Darcy, 2018). To address these challenges, recent studies have focused on the role of explicit instruction, focused practice, and exposure to authentic L2 input in helping learners internalize the phonotactic rules of the new language (Chen, 2021). Developing phonemic awareness and phonological sensitivity in the L2 have been identified as crucial factors in

aiding learners to distinguish and produce unfamiliar sounds more effectively (Zhao & Zhang, 2021).

Conversely, discrepancies between L1 and L2 phonotactics can create obstacles for learners. Sounds or sound combinations permissible in one language but not in another may be difficult to produce or perceive correctly, often leading to pronunciation issues and a noticeable foreign accent (Yuan, 2019). Differences in syllable structure and stress patterns between L1 and L2 can further complicate the acquisition of L2 phonology. Learners might inadvertently apply their L1 phonotactic rules to the L2, resulting in non-native-like speech rhythms and intonation patterns (Gordon & Darcy, 2018). To mitigate these challenges, recent research emphasizes the importance of explicit instruction and focused practice to help learners internalize L2 phonotactic rules and enhance their phonological sensitivity (Chen, 2021; Zhao & Zhang, 2021). By developing a nuanced understanding of L2 phonotactics, learners can improve their ability to produce and distinguish unfamiliar sounds, ultimately refining their pronunciation of phonological endings. The transfer of L1 phonological patterns to L2 affects learners' ability to produce and perceive phonological endings accurately. While similarities between languages can facilitate learning, differences can create obstacles. Effective strategies, including explicit instruction, focused practice, and exposure to authentic L2 input, are essential for overcoming these challenges and improving phonological conditioning in the target language.

#### **2.7.4 Linguistic attitude and identity**

Learners who strongly identify with the L2-speaking community and invest in their L2 identity tend to achieve higher levels of language proficiency. Embracing the L2 as part of their linguistic and cultural identity motivates learners to engage more actively in language learning activities, leading to improved language skills (Dörnyei, 2009). Learners who feel a sense of belonging to the L2 community are more likely to use the language in authentic

communicative contexts, leading to more significant linguistic gains. Also, positive language attitudes toward the L2 are associated with higher levels of L2 competence. Positive attitudes create a more conducive learning environment, leading to greater effort and engagement in language learning activities, ultimately resulting in better language outcomes.

Learners who identify with the L2-speaking community and perceive the language positively are more likely to experience intrinsic motivation, which stems from an inherent interest and satisfaction in learning the language (Dörnyei & Ushioda, 2009). This intrinsic motivation contributes to greater persistence and resilience in language learning, leading to higher levels of competence over time. Learners with a positive L2 identity and attitude are more likely to exhibit higher levels of self-confidence in their language abilities, which positively affects their language learning progress (Ryan & Deci, 2000). Language identity and attitude can also influence learners' language exposure and use outside of the classroom. Learners with a positive L2 identity and attitude are more likely to seek out opportunities to use the language in real-life situations, such as interacting with native speakers or consuming media in the L2. In this sense, increased language exposure and use contribute to improved language competence (Gass & Selinker, 2008).

Conversely, learners with negative attitudes toward the L2 or those who do not identify with the L2 community may experience higher levels of anxiety and reduced motivation, which can adversely affect their phonological. Negative attitudes and low self-confidence can lead to less practice and exposure to the L2, resulting in persistent errors in phonological endings and a stronger foreign accent. Additionally, learners with negative attitudes may avoid using the language in authentic contexts, further hindering their ability to achieve accurate and fluent phonological production (Ryan & Deci, 2000; Gass & Selinker, 2008). Therefore, fostering a positive linguistic identity and attitude towards the L2 is essential for enhancing learners' phonological competence and achieving more accurate pronunciation.

The acquisition process has a profound impact on the phonological competence of second language learners, as it involves exposure to the new language and the influence of their native language (L1) on pronunciation and language proficiency. First language transfer plays a pivotal role in shaping L2 phonology, leading to both positive and negative transfer effects on learners' language skills. Moreover, crosslinguistic influence in second language acquisition affects language and cognition, underscoring the relevance of language similarities and differences in the learning process. In the context of foreign language learning, cross-linguistic similarity presents challenges and opportunities, particularly when it comes to phonological transfer and mastering pronunciation. Furthermore, language transfer affects various aspects of second language acquisition, impacting vocabulary and grammar learning. As learners progress, the acquisition processes, including L1 transfer and phonological awareness, become crucial factors influencing their phonological competence. Additionally, linguistic attitude and identity have a significant impact on learners' level of competence in acquiring a second language. Positive attitudes and a strong language identity enhance language learning outcomes, encouraging learners to engage more actively and effectively in the language learning journey.

## **2.8 Related studies**

Studies around phonologically conditioned endings continue to emerge from different scholars and researchers across the world. In a study by Kemp and Bryant (2003), the researchers explored the production of regular and irregular past tense forms by child ESL learners. Their findings showed that these learners often over-regularize irregular past tense forms and exhibit challenges in accurately producing them., more particularly, the forms that end in {-ed}. Based on these findings, it was recommended that learners should be engaged in more lessons and conversations on the past tense formation patterns. In a similar study, Jia and Fuse (2007) observed that some learners exhibited difficulties in producing both regular

and irregular past tense forms, but their errors were more prevalent in irregular forms. These studies highlight the relevance of appropriate pronunciation or realization of these phonologically conditioned endings in the English language.

Ellis and Sagarra (2010) found that learners' proficiency in their first language and their exposure to English were significant factors affecting their production of the past tense marker. Their findings indicate a flaw in the pedagogy of second language learners in relation to active practice in speaking and production and to developing accurate production skills as well as explicit corrective feedback for the learners (Gass & Selinker, 2008). Harley's (2008) study discussed the role of implicit and explicit learning in the acquisition of past tense forms by ESL learners. The author argued that explicit instruction and the role of cognitive processes, such as rule formation and analogical reasoning, in acquiring the past tense forms as well as extensive and continued practice, can contribute to more accurate production skills. Similarly, Fahey (2003) makes recommendations from a study on Persian learners of English and their acquisition of the English plural morpheme. It found that Persian learners outlined that by receiving more exposure and instruction, Persian learners of English can enhance their accuracy in forming plurals (Fahey, 2003). This recommendation seems to synchronize with Li's (2018) study on a similar subject where it was observed that learners initially relied on the regular {-s} marker, but with proficiency development, they demonstrated increased accuracy in using the irregular plural forms.

The study conducted by Kim and Gass (2019) investigated the acquisition of English possessives by Korean learners through a longitudinal study. The researchers examined how Korean learners develop their understanding and production of possessive markers in English over time. The findings revealed several important aspects. Firstly, the learners initially struggled with the correct use of possessive markers, often omitting or overusing them. However, as they gained more exposure and practice, their performance improved

gradually. They began to demonstrate a better grasp of possessive forms and used them more accurately in their speech and writing. The study also identified specific challenges faced by Korean learners in acquiring English possessives. One prominent difficulty was the distinction between possessive /s/ and plural /s/. Korean learners tended to overgeneralize the use of the possessive marker, applying it to plural forms as well. However, with continued exposure and explicit instruction, they became more proficient in differentiating between the two.

Difficulties with phonological and morphological aspects of pluralization, such as using incorrect plural markers or omitting them altogether are some of the many challenges second language learners of English encounter in their language learning. A study by Garcia and Gomez (2018) looked at the acquisition of English plurals by 11 Spanish learners. Their findings showed that Spanish learners of English faced challenges in acquiring plural markers due to differences in the pluralization rules between the two languages. They demonstrated overgeneralization of the {-s} plural marker and had difficulty with irregular plurals. Additionally, phonological difficulties in producing the plural markers were observed. These difficulties, according to the researchers persisted, particularly with irregular plurals and pronunciation.

Another study by Kim et al. (2020) highlighted the role of morphological awareness in plural acquisition, the researchers identified challenges in determining the correct form of possessive markers (e.g., 's or s') and observed that learners often overgeneralized the use of 's, indicating learners' lower morphological awareness in the realizations of plural and past tense markers. Sometimes these difficulties as have been identified are due to the differences in the grammatical patterns and constructions between the two languages. The findings of the study revealed several patterns in the acquisition of English possessives. First, learners tended to rely on transfer from their native languages, leading to overgeneralization or underuse of

possessive markers. Second, language typology played a role in learners' production, with speakers of languages that lack possessive constructions facing greater challenges. Third, the use of possessive forms varied depending on the grammatical context and semantic properties of the nouns. Lastly, proficiency level and exposure to English were found to influence possessive production, with higher proficiency and increased exposure leading to more accurate use of possessives.

The study conducted by Barrios and Chen (2017) investigated the production of English possessive constructions by Mandarin Chinese speakers using a corpus-based approach. The findings of the study revealed several patterns and challenges in the production of possessives by Mandarin Chinese learners of English. One of the key findings was that Mandarin Chinese speakers often exhibited difficulties in accurately producing English possessive constructions. They frequently omitted the apostrophe-s marker or used alternative strategies such as prepositional phrases or the use of *of* to express possession. This suggests that there are transfer effects from their native language, where possessives are not marked in the same way as in English. The study also found that Mandarin Chinese speakers' proficiency level in English influenced their production of possessives. Learners with higher proficiency demonstrated a better understanding and use of possessive constructions, while lower proficiency learners struggled more with accurate production. Furthermore, the study highlighted the role of frequency and exposure to English in the production of possessives. Hence, Mandarin Chinese speakers who had more exposure to English, either through formal instruction or immersion contexts, tended to exhibit greater accuracy in producing possessive constructions.

Yang's (2011) study however showed a developmental trajectory among the learners, with learners initially using possessive markers inconsistently and gradually improving their accuracy over time. They also found that the production of possessive markers was influenced

by both linguistic and contextual factors. The longitudinal nature of the study allowed the researchers to observe individual learners' progress over time. They found that there were individual differences in the rate and trajectory of possessive marker acquisition: some learners showed faster improvement and achieved higher accuracy, while others progressed more gradually.

## **2.9 Conclusion**

The introduction of the English language in Ghana was closely linked to the colonial period, involving Christian missionaries, formal education, administration, and economic factors. This led to English becoming a significant language in Ghana's history. Despite its influence, Ghana remains multilingual, with indigenous languages retaining importance in various regions. The phonological features of Ghanaian English reflect its historical development and interactions with local languages. Consonant and vowel variations contribute to its distinct phonetic landscape. This uniqueness enhances our grasp of linguistic diversity in Ghanaian English within the broader global context. Research highlights the connection between linguistic features, cultural influences, and the evolution of Ghanaian English's phonological characteristics.

Phonological conditioning involves linguistic and non-linguistic factors influencing speech sound pronunciation in English. Coarticulation, voicing, articulation place, stress, and dialectal variation shape phonetic realization. Understanding this enriches comprehension of English pronunciation complexities. Studies reveal challenges faced by ESL speakers in producing markers in English, emphasizing the importance of considering learners' backgrounds for effective teaching. L2 learners form phonetic categories based on target language sounds' acoustic properties. They initially rely on their native language's categories, leading to perceptual influence. Exposure to the target language prompts perceptual reorganization aligning with native speakers. The SLM incorporates the Critical Period

Hypothesis, suggesting that childhood is optimal for L2 acquisition. On cue weighting, learners prioritize acoustic cues when categorizing speech sounds. Differences explain variations in perception and production, compared to natives. Individual differences like age, exposure, and motivation, impact native-like pronunciation. Second language acquisition impacts phonological competence through exposure and L1 influence. First language transfer shapes L2 phonology, yielding positive and negative effects. In addition, cross-linguistic influences affect language and cognition, emphasizing similarities/differences in learning. Lastly, language transfer poses challenges/opportunities in phonological transfer and pronunciation. It affects vocabulary and grammar learning as learners progress. Linguistic attitude and identity significantly influence L2 competence, with positive attitudes and strong identity enhancing outcomes.



## CHAPTER THREE

### METHODOLOGY

#### 3.0 Introduction

The research sought to identify the peculiarity of the Ghanaian English language in terms of how Ghanaians produced some words that are phonologically conditioned. This chapter presents the methodology that was used in carrying out this study. It includes the description of the research approach and design, it also outlines details of the population, sampling procedure, the data collection procedures as well as reliability test.

#### 3.1 Research approach

Creswell (2014) explains that a research approach refers to the systematic and organized plan or strategy employed by researchers to investigate a particular research question or problem. It encompasses the overall framework, methods, and procedures adopted to gather and analyse data in order to answer research objectives and contribute to knowledge in a specific field. The choice of research approach depends on the nature of the research question, the available resources, and the desired outcomes. Common research approaches include quantitative, qualitative, and mixed-methods approaches. Each approach has its own unique characteristics and methodologies, determining the types of data collected, the techniques used for data analysis, and the interpretation of findings. The research approach provides researchers with a structured framework to guide their investigation, ensuring rigor, validity, and reliability in the research process. It helps researchers make informed decisions about data collection methods, sampling techniques, data analysis procedures, and the overall design of the study. A well-defined research approach is crucial in generating meaningful and credible findings, advancing knowledge in various academic disciplines, and addressing real- world problems (Creswell, 2013).

The current study adopted a qualitative approach. Qualitative research allows researchers to delve deeply into the complexities of human experiences, behaviours, and social phenomena. By employing methods such as interviews, observations, and textual analysis, qualitative researchers can capture rich, contextual data that provides insights into the subjective meanings and interpretations individuals attribute to their experiences (Smith & Johnson, 2018). This approach allows for a nuanced understanding of the complexities and intricacies of the research topic. Through open-ended interviews, researchers can gather detailed narratives, personal accounts, and perspectives from participants, providing a depth of information that quantitative methods may not capture (Denzin & Lincoln, 2018). Such data enable researchers to explore the nuances, variations, and unique aspects of the research topic, facilitating a more comprehensive understanding. Qualitative research is particularly valuable when investigating under-explored or emerging topics. Its flexible and adaptive nature allows researchers to explore new areas where little existing knowledge or theory may be available (Charmaz, 2006). Overall, the qualitative approach offers unique advantages in research, including in-depth exploration, generation of rich data, and exploration of under-explored topics, contextualization, and participant empowerment. By leveraging these strengths, qualitative research contributes to a comprehensive understanding of complex phenomena and fosters a deeper appreciation for the diversity and complexity of human experiences. To sum up, given the nature of the study, qualitative research design best suits my work.

### **3.2 Research design**

In examining the peculiarity of Ghanaian English, this research employed a case study design to investigate the phonological characteristics that uniquely influence word production among Ghanaians. By focusing on specific linguistic patterns, the study aimed to uncover how phonological conditioning impacts the pronunciation of certain English words in the

Ghanaian context. This design allows for an in-depth exploration of phonetic variations and their underlying causes, shedding light on how local linguistic features shape and modify standard English pronunciation. Through detailed analysis of recorded speech samples and phonetic transcription, the research sought to identify distinctive phonological traits and contribute to a broader understanding of the linguistic diversity within Ghanaian English.

### **3.3 Population**

The term research population refers to the entire group of individuals or elements that share a common characteristic and are the focus of a study (Creswell, 2014). The population for this research was made of 4000 students from the seven schools across the various senior high school final year students in the Mfantseman District in the Central Region of Ghana. Focusing on final-year senior high school students in the District provides a well-defined and practical sample for examining the phonological characteristics of Ghanaian English. This group shares a similar educational background and language exposure. This targeted approach ensures that the findings are both manageable and relevant, contributing to a deeper understanding of how phonological features are conditioned by regional and educational factors in Ghanaian English.

### **3.4 Sampling technique and sample size**

The technique used for the selection of participants for this study is the purposive sampling technique. According to Smith and Jones (2019), purposive sampling is a non-probability sampling technique commonly used in qualitative research to select participants based on specific characteristics or knowledge relevant to the research question. Twenty (20) students were selected from each of the seven schools in the district. The participants were scanned for abnormality of speech and hearing related conditions such as cerebral palsy, cleft palate, diastema, lisping, stammering and hearing impairments. This was to ensure that the production of the words was not impeded by these natural factors. In all, one hundred and

forty (140) Form 3 students, ranging in age between 15 years to 21 years, participated in this study. It is worth noting that the participants came from all over the country even though there was no deliberate attempt to ensure a fair representation. To gather demographic data, the students were asked through unstructured interviews regarding their birth country, student's age of first exposure to English, student's preschool attendance and their parent's level of education. Out of the 140 students, 20 of them took part in the interview. Conclusions made from the notes taken indicate that almost all the participants were born here in Ghana. Also, all the participants attended preschool which means they were introduced to the English language before 6 years of age. About their parent's level of education, it can be said that generally the parents have some level of proficiency in the English language except a few who do not.

### **3.5 Data collection instruments**

Data collection instruments refer to the tools, measures, or techniques used to gather data in a research study (Creswell, 2014). These instruments play a crucial role in the data collection process as they help researchers collect reliable and valid information that aligns with their research objectives. The choice of data collection instruments depends on the nature of the research question, the type of data needed, and the characteristics of the study population. According to Smith et al. (2020), it is very crucial to the study as it is one of the key things that the validity of the whole work depends on. The instruments are discussed as follows:

#### **3.5.1 Interview**

An interview is a valuable data collection instrument widely used in research studies. They involve direct interaction between the researcher and the participant, allowing for in-depth exploration of a topic and the collection of rich, detailed data. Interviews can be conducted in person, over the phone, or through video conferencing platforms, depending on

the research context and participant availability. In qualitative research, interviews are particularly useful for gathering in-depth, subjective information, perspectives, and experiences. They enable researchers to probe into participants' thoughts, feelings, and motivations, providing insights that may not be captured through other data collection methods. Interviews can be structured, semi-structured, or unstructured, depending on the level of flexibility and guidance needed to elicit relevant information.

Structured interviews follow a predetermined set of questions, allowing for standardized data collection across participants. This approach ensures consistency and facilitates quantitative analysis of responses. Semi-structured interviews involve a flexible interview guide that allows for follow-up questions and exploration of emerging themes, providing a balance between structure and flexibility. Unstructured interviews are open-ended, with no predetermined questions, allowing participants to share their perspectives and experiences in their own words. When conducting interviews as a data collection instrument, researchers need to consider ethical considerations, such as informed consent, confidentiality, and voluntary participation. They should also ensure that interviews are conducted in a professional and unbiased manner, maintaining neutrality and avoiding leading questions or personal biases. According to Johnson and Brown (2019), interviews are a widely used data collection instrument in qualitative research, allowing for in-depth exploration of participants' perspectives and experiences.

I used interviews because it allows for in-depth exploration of the contextual factors influencing students' pronunciation. By engaging directly with the participants, researchers asked specific questions and sought clarifications that help uncover details about how and why certain phonological variations occur. The interviews also provided an opportunity to gather qualitative data on the participants' language use, attitudes, and experiences, which can complement and enrich quantitative findings. Additionally, the interviews enabled the

researcher to probe into individual differences and gain a more comprehensive understanding of regional and educational influences on language. This method's flexibility and depth made it particularly effective for capturing the complexities of phonological conditioning in Ghanaian English.

### **3.5.2 Passage and wordlist**

Using passage and wordlist as data collection instruments provide a comprehensive approach to studying phonological features. Passages allow researchers to analyze natural, continuous speech, revealing how participants handle intonation, rhythm, and pronunciation within connected contexts, thus offering insights into real-life language use. In contrast, wordlists focus on specific phonemes and stress patterns in isolation, enabling detailed examination of particular phonological elements with consistency across participants. Combining these methods balances the contextual richness of passages with the targeted precision of wordlists, leading to a more nuanced understanding of phonological conditioning and variations in Ghanaian English. This dual approach ensures both the naturalistic and specific aspects of pronunciation are thoroughly investigated.

### **3.5.3 Validity of instruments**

The instruments were designed to address the aspects of phonological features being studied. This is crucial for ensuring that the study comprehensively covers the constructs of interest, which in this case include various phonemes and patterns in Ghanaian English. The use of both a passage and a wordlist to study phonological features indicates a balanced approach. The passage likely helps assess how phonological features are used in naturalistic contexts, while the wordlist can focus on specific phonetic elements. This dual approach helps capture both the broader application of phonological features and detailed, isolated instances. Including all relevant phonemes or patterns in the wordlist ensures that the study considers every aspect of the phonological system being analyzed. This is important for a complete

understanding of the phonological features of Ghanaian English. The review and approval of the list by an expert add a layer of validation to the instrument. This step confirms that the items included accurately represent the phonological constructs being studied, which enhances the reliability and validity of the findings.

### 3.6 Data collection procedure

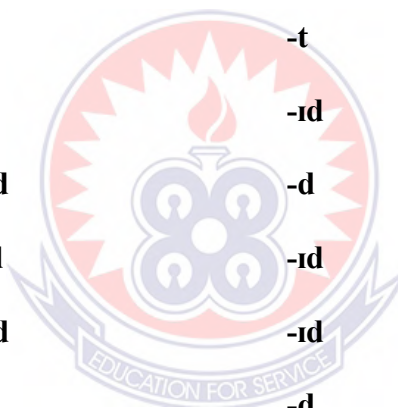
The participants were asked to read a passage that contained the words under study. The researcher usually held a short conversation with participants to calm their nerves before reading. After this, the researcher set the recorder signals to start and then left the room to a place nearby but out of sight. The passages were recorded with a Sony IC Digital Audio Tape (DAT) recorder and copied onto a Lenovo laptop immediately. The recordings were done at places that had minimal interferences and each recording section lasted between four (4) to seven (7) minutes.

The focus words which were woven into a passage were largely taken from a paper titled *the Child's Learning of English Morphology* written by Berko (1958). In her study to test for children's knowledge on English Morphology, she used what she termed as *nonsense words*. Her reason being that if a child has internalized the rules of formation irrespective of the word, they should be able to apply the most appropriate form. It must be added that she first run through with them on her test focus with actual vocabulary which she selected from the 1000 most frequent words in the first grader's vocabulary from *Rinslands* listing. The words for both the passage and word list are presented in Table 3.6:

*Table 3.6. Target words for data collection*

Category	Word	Suffix
Plurals	glasses	-əz
	wugs	-z
	luns	-z

	<b>tors</b>	<b>-z</b>
	<b>heafs</b>	<b>-s</b>
	<b>eras</b>	<b>-z</b>
	<b>tasses</b>	<b>-əz</b>
	<b>gutches</b>	<b>-əz</b>
	<b>kazhes</b>	<b>-əz</b>
	<b>nizzes</b>	<b>-əz</b>
	<b>chiefs</b>	<b>-s</b>
<b>Past Tense</b>	<b>hinged</b>	<b>-d</b>
	<b>glinged</b>	<b>-d</b>
	<b>ricked</b>	<b>-t</b>
	<b>melted</b>	<b>-id</b>
	<b>spowed</b>	<b>-d</b>
	<b>motted</b>	<b>-id</b>
	<b>bodded</b>	<b>-id</b>
	<b>faked</b>	<b>-d</b>
<b>Possessives</b>	<b>wug's</b>	<b>-z</b>
	<b>bik's</b>	<b>-s</b>
	<b>niz's</b>	<b>-iz</b>



### 3.7 Data analysis

Data analysis is a critical component of the research process, involving the examination, interpretation, and synthesis of collected data to derive meaningful insights and draw conclusions. It encompasses a range of techniques and procedures used to organize, transform, and analyze data in order to address research questions or test hypotheses. The

specific data analysis methods employed depend on the research design, data type, and research objectives. According to Miles, Huberman, and Saldaña (2020), qualitative data analysis involves processes such as coding, categorization, and thematic analysis.

Out of the hundred and forty recordings, only 120 were clear enough for the researcher to use. The other twenty were not selected on grounds such as bad reading, low voice, intentional slurring, amongst other factors. The selected sound files were subjected to orthographic transcription using otter ai and auditory analysis so as to make the results reliable. For the orthographic transcription, the files were played back several times to make sure that words that the software could not capture were cleaned by filling in the gaps

### **3.8 Test of reliability**

Reliability refers to how consistent a measuring device is. A measurement is said to be reliable or consistent if the measurement can produce similar results if used again in similar circumstances. According to Rasib et al. (2023), reliability tells you how consistently a method measures something. When you apply the same method to the same sample under the same conditions, you should get the same results. If not, the method of measurement may be unreliable or bias may have crept into your research. Rasib et al. (2023) argued reliability comes in four main types. Each can be estimated by comparing different sets of results produced by the same method.

1. Test-retest: The same test over time.
2. Inter-rater: The same test is conducted by different people.
3. Parallel forms: Different versions of a test which are designed to be equivalent.
4. Internal consistency: The individual items of a test.

A common way of assessing the reliability of observations is to use inter-rater reliability. This involves comparing the ratings of two or more observers and checking for agreement in their measurements. Inter-rater reliability (also called inter-observer reliability)

measures the degree of agreement between different people observing or assessing the same thing. You use it when data is collected by researchers assigning ratings, scores or categories to one or more variables, and it can help mitigate observer bias (Rasib et al., 2023). To improve the reliability of an observational study the researcher must ensure that the categories are clear. People are subjective, so different observers' perceptions of situations and phenomena naturally differ. Reliable research aims to minimize subjectivity as much as possible so that a different researcher could replicate the same results. When designing the scale and criteria for data collection, it is important to make sure that different people will rate the same variable consistently with minimal bias. This is especially important when there are multiple researchers involved in data collection or analysis.

According to Creswell (2008), inter-rater reliability involves two or more individuals of the observed behavior. Inter-rater reliability is achieved when two or more scorers or raters do the scoring. Then, the sets of scores gotten from the two raters are calculated to get the correlation coefficient. The following words were presented to the raters for evaluation. These words are grouped into three categories: Plurals, Past Tense, and Possessives. Plurals: glasses, wugs, luns, tors, heafs, eras, tasses, gutches, kazhes, nizzes Past Tense: hinged, glinged, ricked, melted, spowed, motted, bodded, Possessives: wug's, bik's, niz's

The raters were asked to judge whether they heard the same pronunciation as the researcher (i.e., they were asked to determine if the pronunciation was correct as per the expected norms). The raters could give *Yes* (1) or *No* (0) to indicate whether they agreed with the researcher's perception of the pronunciation.

Table 3.8.1. Perception of pronunciation of the words

<b>WORDS</b>	<b>Rater 1</b>	<b>Rater 2</b>	<b>Agreement</b>	<b>Disagreement</b>
	<b>Agreement</b>	<b>Agreement</b>	<b>Tally</b>	<b>Tally</b>
<b>Plurals</b>				
<b>glasses</b>	9	10	9	1
<b>wugs</b>	10	10	10	0
<b>luns</b>	6	6	6	4
<b>tors</b>	7	8	7	3
<b>heafs</b>	5	5	5	5
<b>eras</b>	10	10	10	0
<b>tasses</b>	10	10	10	0
<b>gutches</b>	10	10	10	0
<b>kazhes</b>	4	4	4	6
<b>nizzes</b>	10	10	10	0
<b>Past Tense</b>				
<b>hinged</b>	10	10	10	0
<b>glinged</b>	10	10	10	0
<b>ricked</b>	6	6	6	4
<b>melted</b>	10	10	10	0
<b>spowed</b>	5	5	5	5
<b>motted</b>	10	10	10	0
<b>bodded</b>	10	10	10	0
<b>Possessives</b>				
<b>wug's</b>	10	10	10	0
<b>bik's</b>	10	10	10	0

<b>niz's</b>	6	6	6	4
<b>Total</b>	139	139	139	41

Table 3.8.2. Summary of agreement and disagreement

Category	Agreement Tally	Disagreement	Agreement
		Tally	Percentage
Plural	85	15	85%
Past Tense	52	8	86.4%
Possessives	22	4	84.6%
<b>Total</b>	<b>139</b>	<b>41</b>	<b>77.2%</b>

The results indicated that the raters showed a moderate-to-high level of agreement, with an overall inter-rater reliability of 77.2%. This suggests that while the raters generally agreed on the pronunciations, there were still instances of discrepancies, which are typical in subjective evaluations of phonetic data. The Plurals category, consisting of 10 words, had the highest agreement rate of 85%. Words like *glasses*, *wugs*, and *eras* all received near-perfect agreement from both raters. For example, both raters agreed that the pronunciation of *glasses* was correct 9 out of 10 times, with only a single disagreement. Similarly, the word *wugs* was unanimously agreed upon as correct by both raters, showcasing that common plurals with familiar endings are typically easy to assess. The word *luns* had a moderate agreement rate, with both raters agreeing on the pronunciation only 6 out of 10 times. This suggests that *luns* might have an unfamiliar or non-standard pronunciation, which could be more difficult for the raters to interpret consistently. The disagreements for this word were equally split, indicating that the pronunciation might have been ambiguous or subject to differing regional accents.

More notable discrepancies appeared with the word *kazhes*. In this case, both raters

agreed only 4 out of 10 times, with 6 instances of disagreement. This significant discrepancy points to a potential regional variation or a non-standard pronunciation, which made it harder for the raters to agree on the correct form. Additionally, the word *heafs* also demonstrated a considerable level of disagreement, with both raters agreeing only 5 times out of 10. Given that *heafs* is a non-standard plural form, its pronunciation could be interpreted differently depending on individual perceptions. In the Past Tense category, the agreement rate was even higher, at 86.4%, indicating that past-tense words with regular endings were relatively straightforward for the raters to evaluate. Words like *hinged*, *glinged*, *melted*, *motted*, and *bodded* were agreed upon without any disagreements, suggesting that these words followed typical pronunciation patterns that both raters were familiar with.

However, the word *ricked* demonstrated more variability, with both raters agreeing only 6 out of 10 times. This could indicate that *ricked* might not be a commonly used form or could have a pronunciation that varies by region or dialect. Similarly, the word *spowed* also caused some discrepancies, with both raters only agreeing 5 times out of 10. This is particularly interesting because *spowed* is a non-standard or dialectal form, and raters may have had different interpretations of how it should be pronounced. The Possessives category showed strong agreement, with an overall agreement rate of 84.6%. Words like *wug's* and *bik's* were universally agreed upon, with both raters confirming the correct pronunciation 10 out of 10 times. These words are straightforward possessive forms that follow Standard English rules, so it's not surprising that both raters were in perfect agreement. However, *niz's* created some difficulty, with both raters agreeing only 6 out of 10 times. The significant number of disagreements for this word suggests that '*niz's*' might be perceived differently, possibly because it's not a standard possessive form or could be from a non-standard dialect.

When examining the total number of agreements and disagreements across all categories, the raters showed strong consistency, with 139 agreements and 41 disagreements.

The overall agreement percentage of 77.2% reflects a reasonable level of inter-rater reliability. This indicates that while the raters mostly agreed, certain words with non-standard forms, regional variations, or less common pronunciations posed challenges for consistent evaluation. The overall inter-rater reliability of 77.2% suggests that the raters were generally in agreement on most of the word pronunciations, though there were several instances where discrepancies emerged. The higher rates of agreement for standard words (like *wugs* and *eras*) and past-tense forms (such as *hinged* and *melted*) suggest that these words are easier to evaluate due to their regular pronunciation patterns. Conversely, the disagreement-prone words—like *kazhes*, *spowed*, and *niz's*—indicate that less familiar or non-standard words can cause variability in pronunciation perception. The findings highlight the complexities of evaluating pronunciation, especially when words deviate from standard norms or are regionally specific.

### **3.9 Conclusion**

This section has shed light on the research methodology employed, covering various aspects such as the research approach, design, the population, selection of participants, the data collection methods, and the measures taken to ensure the reliability of the data. The chapter elaborates on the chosen research approach, which is qualitative. It emphasized that this approach helps in capturing rich and contextual data, making it suitable for the research objectives. The chapter further discussed the research population, which consisted of 140 senior high school final year students in the Mfantiman District of Ghana. The chapter also discussed the purposive sampling technique used to select 140 students from seven schools within the district. The rationale for this sampling method is explained, and the measures taken to ensure that participants did not have speech or hearing-related conditions are detailed. The chapter discussed the tools used for gathering data. Interview and wordlist and a passage were highlighted as the primary instruments. Interviews are explained as valuable for in-

depth exploration of participants' perspectives. The process of collecting data is described. The methods employed for analyzing the collected data were also discussed. The use of software tools like otter.ai for analysis is highlighted to ensure the reliability of the results. The last section of the chapter discusses measures taken to ensure the reliability of the research and the results. The results showed that the raters were generally consistent in their evaluations, which helps to mitigate potential bias and strengthens the credibility of the study.



## CHAPTER FOUR

### RESULTS AND DISCUSSION

#### 4.0 Introduction

This chapter delves into the crucial phase of presentation of findings. Having already laid the foundation in the previous chapters by outlining the research methodology and data collection process, this chapter serves as a significant milestone in unraveling the insights gained from this study. The discussions are organized into three sections. Each of these sections is related to the objectives of the study. The objectives of this study are to i) identify the different realizations of the phonologically conditioned allomorphs in Ghanaian English, ii) identify the patterns of these realizations, and iii) examine the factors that contribute to the level of phonological awareness of the Ghanaian English speaker.

The findings obtained from the data analysis are notable phonetic variations in Ghanaian English compared to Standard British English. Specifically, the past tense marker /d/ is pronounced as [d], [ɜd], or [ɪd], instead of Standard British English's [d], [ɪd], or [t], demonstrating the influence of local phonetic patterns. Similarly, plural markers in Ghanaian English include [s], [ɪs], [ɪz], and [z], showing a mix of adherence to standard pronunciation and challenges with consistency. Participants were found to consistently use the [s] allophone accurately but showed a preference for the voiceless [s] over [z]. The [z] allophone appeared to be more influenced by individual preference rather than phonological context. Participants frequently devoiced [ɪz] to [ɪs], replace [ɪ] in [ɪd] with [ɛ], and exhibited variability between [t] and [ɪd] based on phonological rules and production ease. This variability reflects perceptual assimilation and aligns with the Learning Model (SLM) presented. A critical interpretation of the obtained results is connected to existing literature and the framework.

#### **4.1 Realization of phonologically-conditioned allomorphs in Ghanaian English**

The first objective of the study was to investigate the physical realizations of morphological endings as produced by Ghanaian speakers of English. Generally, these endings are phonologically conditioned. That is to say that the phonological environment within which they occur has some amount of influence on how they are realized (Bloom & Paradis, 2013). The first of the section presents a discussion of the different realizations of the past tense marker in verbs as it is produced by Ghanaian English speakers. Next, a discussion of the various realizations of the plural marker is presented in the second section while the last section discusses the different realizations of the possessive or genitive 's'. The analysis is done via the juxtaposition of how participants produced the morphemes in question in isolated words free from external phonological influence and in passages where other words might influence their realization (Celce-Murcia et al., 2010).

##### **4.1.1 Realization of phonologically-conditioned allomorphs in verbs**

From the literature, the past tense marker /d/ can be realized differently as [d], [t], or [ɪd] depending on its phonological environment (Bloom & Paradis, 2013). In this section, I present and discuss the different productions of the past tense marker by the participants. A summary of the productions is provided in Tables 4.1.1.1 and 4.1.1.2. Whereas Table 4.1.1.1 shows a summary of the productions in relation to the words they produced during the recording of the word list to test participants' production of the past tense forms of a group of regular verbs from a passage, Table 4.1.1.2 shows a summary of their performance in relation to the words they produced during the recording of the word list to test how the participants produced the past test forms of regular verbs in English.

Table 4.1.1.1. Realization of allomorphs of /d/ as produced in passage in percentage

Item	Boys				Girls			
	/ɜd/	/d/	/t/	/ɪd/	/ɜd/	/d/	/t/	/ɪd/
binged		100				100		
faked		2		98		7		93
ricked		5		95		7		93
tracked				100				100
melted	84	16			96	4		
spowed		100				100		
motted	97	3			100			
bodded	100				100			

Table 4.1.1.2. Realization of allomorphs of /d/ as produced in isolation in percentage

Item	BOYS				GIRLS			
	/ɜd/	/d/	/t/	/ɪd/	/ɜd/	/d/	/t/	/ɪd/
binged		100				100		
faked		2		98		7		93
tracked				100		4		96
ricked		5		95		7		93
melted	76	24			88	12		
spowed		100				100		
motted	97	3			99	1		
bodded	100				100			

#### 4.1.1.1 Production of *Binged* and Spowed

The enunciation of the lexical unit *binged* in isolation is precisely rendered as /bingd/. Native speakers conventionally deploy the allophone [d] to meticulously synchronize with the phonological attributes of the ultimate consonantal phoneme /g/ in the verb with the past tense inflectional marker affixed to it (Bloom & Paradis, 2013). Significantly, all participants demonstrated an aptitude for accurate pronunciation, consistently opting for the allophone [d] in both the context of the passage and the wordlist. In parallel, when examined in isolation, the phonetic rendition of *spowed* dictates its articulation as /spood/. The employment of the allophone [d] in this instance is rooted in the fact that the root of the verb culminates with a vowel, specifically /oo/ (Bloom & Paradis, 2013). It is noteworthy that all participants exhibited a commendable mastery over the production of *spowed*, thereby attesting to their adeptness with the allophone [d].

The discernible proficiency of participants in consistently selecting the allophone [d] in both instances lends credence to existing research positing similar observations. This empirical phenomenon can be explicated through the prism of the Speech Learning Model (SLM), which postulates that second language learners encounter minimal impediment when the phoneme to be produced aligns harmoniously with their native phonetic and articulatory patterns. Furthermore, the findings of Solt et al. (2004) corroborate this stance, affirming that ESL speakers exhibit heightened proficiency in both perceiving and producing the [d] allophone.

#### 4.1.1.2 Production of *Ricked, Faked, Tracked*

In the passage, the analysis of the pronunciation of the words *faked*, *tracked*, and *ricked* among boys and girls reveals interesting patterns in the realization of the /d/ allophone. In the isolated context, where participants produced the words independently, the boys and girls predominantly used the corresponding [id] allophone for *faked*, *tracked*, and

*ricked*. This aligns with the typical phonetic rendering of these words in native speakers of English. However, a noteworthy observation is the occurrence of [d] for *faked* in the passage, where 2% of boys and 7% of girls employed this alternative allophone. This deviation suggests some variability in pronunciation, possibly influenced by individual differences or linguistic background. In contrast, for the word *tracked*, all participants, boys and girls, consistently used the [id] allophone, indicating a more uniform production. In the case of *ricked*, boys in both passage and isolation primarily used [id], but a small percentage (5%) opted for [d]. Girls, too, showed a preference for [id] but with a slightly higher percentage (7%) using [d].

The results align with the predictions of the Speech Learning Model (SLM), asserting that sounds perceived as distinct pose challenges for second language learners in production. The outcomes can be attributed to various factors, including first language (L1) phonetic patterns, L1 interference, and the absence of the alveolar /t/ in the participants' native language (Wrembel & Kul, 2013; Lee, 2014; Tayebi & Ayati, 2018; Ge & Li, 2019). Extensive literature suggests that ESL speakers commonly encounter difficulties with the /t/ phoneme, often resorting to dentalized /t/ or substituting /d/ for /t/ in word-final positions (e.g., Chen & Wang, 2013; Han, 2020). These multifaceted findings underscore the intricate interplay of linguistic factors influencing the production of specific phonetic elements by second language learners.

#### **4.1.1.3 Production of Melted, bodded and motted**

In phonetic isolation, native speakers commonly articulate the term "*melted*" as /'mɛltɪd/ with the allophone [id] arising due to the presence of the phoneme /t/ at the conclusion of "melt" before the past tense inflection is affixed. This phonetic choice is explicated by (Bloom & Paradis, 2013). In the context of the word "*melted*," a meticulous breakdown reveals that 84% of male participants, constituting 50 individuals, pronounced the term with a final [id], while 16% opted for a final [d], representing 10 males. Correspondingly, 96%

of female participants pronounced it with a concluding [id], encompassing 58 females, and 4% articulated it with a final [d], representing 2 females. Intriguingly, none of the participants achieved the correct pronunciation for melted. Adhering to the conventions of past tense inflection suffixation, a term like *bodded* is anticipated to be produced as /boddid/ (Bloom & Paradis, 2013). According to Cruttenden (2014) and Roach (2009), a native English speaker would typically articulate the term *bodded* with a voiceless alveolar plosive [t] instead of a voiced alveolar plosive [d]. This phonetic transformation, known as final devoicing or word-final devoicing, is a prevalent feature in various English varieties, including Standard British English, ultimately resulting in the production of /bɒtɪd/.

For both the wordlist and the passage, a comprehensive analysis reveals that 100% of female participants, comprising 60 individuals, pronounced *bodded* with a concluding [id]. Simultaneously, 100% of male participants, totaling 60 individuals, articulated the term with a final [id]. Intriguingly, none of the participants accurately pronounced *bodded*. In the linguistic context of Standard British English, the word *motted* is typically enunciated as ['mɒtɪd] (Bloom & Paradis, 2013). In practice, *motted* was pronounced with a concluding [id] by 97% of male participants, representing 58 individuals, and 3% opted for a final [d], accounting for 2 males. Likewise, 100% of female participants, encompassing 60 individuals, pronounced it with a concluding [id]. Turning to the recordings for the wordlist, 97% of male participants pronounced *motted* with a concluding [id], constituting 58 males, while 3% articulated it with a final [d], involving 2 males. Correspondingly, 99% of female participants opted for a concluding [id], totaling 59 females, and 1% chose a final [d], represented by a single participant. None of the participants accurately pronounced *motted*.

These findings align with the predictions of the Speech Learning Model (SLM), emphasizing the difficulty second language learners encounter with sounds that closely resemble those of their native language. Participants demonstrated a tendency to substitute

the [i] sound with a phoneme close to that in their native languages. Previous research supports this, indicating that ESL learners may struggle to perceive and distinguish English vowel sounds due to their unfamiliarity, resulting in vowel substitution when relying on existing phonetic inventories (Al-Sobhi, et al., 2012; Iverson & Evans, 2007). Spanish speakers, as illustrated by Granena (2010), often exhibit a preference for the [t] or [d] allophones over the [id] allophone. Similarly, Mora (2011) and Turton (2004) observed variability in the production of the [id] allophone, with some speakers opting for a dentalized [t] sound. The examination of verbs indicates that Ghanaian English speakers present three distinct realizations of the past tense marker /d/: [d], [ɜd], and [t], diverging from the Standard British English forms of [d], [id], and [t]. These variations highlight the nuanced challenges ESL learners face in navigating the intricacies of English phonetics.

#### **4.1.2 Realization of phonologically conditioned allomorphs in nouns**

The realization of phonologically-conditioned allomorphs in nouns involves an exploration of the allophones of the plural marker /s/, which exhibit variation based on the phonetic context in which they are situated. Allophones are distinct phonetic manifestations of a phoneme, influenced by the surrounding sounds and the phonetic environment. Within English, the plural marker /s/ typically presents three allophones: [s], [z], and [ɪz], with the specific allophone chosen contingent on the preceding sound within the word. The voiceless alveolar fricative [s] occurs in the environment of voiceless consonants. Consonant sounds such as /p/, /t/, /k/, /f/, /θ/, and /ʃ/ frequently trigger the utilization of the [s] allophone for the plural marker /s/. Conversely, the voiced alveolar fricative [z] is commonly used after voiced consonant sounds.

Examples include /b/, /d/, /g/, /v/, /ð/, /z/, /dʒ/, /m/, /n/, /ŋ/, /l/, and /r/. The [ɪz] allophone of the plural marker /s/ is typically activated after sibilant consonant sounds, including /z/, /ʒ/, /ʒ/, /tʃ/, and /dʒ/ (Roach, 2009). This discussion transitions to an

examination of the diverse productions of the plural marker by the participants in the study. A comprehensive summary of their performance is encapsulated in Tables 4.1.2.1 and 4.1.2.2, paving the way for an in-depth exploration and interpretation of the data contained within these tables.

*Table 4.1.2.1. Realization of allomorphs of /s/ as produced in isolation*

Item	BOYS				GIRLS			
	/iz/	/z/	/is/	/s/	/iz/	/z/	/is/	/s/
Glasses	77	6	14	3	37	5	50	8
Wugs	-	76	-	14	-	66	-	34
Tors	-	22	-	78	-	17	-	83
Chiefs		10		90				100
Eras	11	54	-	35	-	32	29	39
Tasses	60	-	40	-	28	-	72	-
Gutches	44	-	37	19	51	-	22	27
Kazhes	-	12	-	35	-	8	-	40
Nizzes	88	-	5	-	80	-	15	5

*Table 4.1.2.2. Realization of allomorphs of /s/ as produced in passage*

Item	BOYS				GIRLS			
	/i/	/z/	/is/	/s/	/iz/	/z/	/is/	/s/
Glasses	5	5	14	6	5	9	0	16
Wugs	40	5	5	10	33	30	13	24
Tors	-	26	-	74	-	19	-	81
Chiefs		10		90				100

Heafs	-	-	-	100	-	10	-	90
Eras	10	50	-	40	-	31	30	39
Tasses	64	-	36	-	30	-	70	-
Gutches	48	-	30	22	50	-	26	25
Kazhes	5	50	10	35	-	27	-	73
Nizzes	85	6	9	-	84	-	11	5

#### 4.1.2.1 Production of Wugs, Tors, Eras and Luns

In the examination of the production of plural forms like *Wugs*, *Tors* and *Eras*, it is essential to consider the allophonic variations triggered by the phonetic environment. The plural marker /s/ undergoes nuanced phonetic realizations, as guided by linguistic principles and patterns. Starting with *wugs*, in isolation, a native speaker typically pronounces it as /wʌgz/. The choice of the allophone [z] for the plural marker /s/ is influenced by the voiced sound /g/ at the end of *wugs* (Bloom & Paradis, 2013). In the study, when produced in isolation, none of the participants, both male and female, utilized the allophone [iz]. The majority of males (76%) used [z], while females exhibited a slightly lower percentage (66%). No participants, male or female, employed the allophone [is]. Interestingly, 14% of males used [s], compared to 34% of females. Moving on to *tors*, a native speaker of Standard British English (SBE) would pronounce it as /tɔːz/. For *eras*, native speakers of SBE would typically pronounce it as /'iərəz/. Some speakers might assimilate the voicing of /z/ to the preceding voiced /r/ sound, resulting in the /z/ sound being pronounced as a voiced alveolar approximant [ɹ]. Therefore, a possible pronunciation could be /'iərəɹz/. The choice of the allophone [z] is guided by the presence of the sound /r/ at the end of the word. In the analysis, discrepancies in the percentages of participants using different allophones were observed. Notably, the [iz] allophone was not recorded for males in both word list and passage for *tors*.

For *eras*, 11% of males produced [iz] in the word list, and 10% did so in the passage. Females, however, did not produce [iz] for both *tors* and *eras*. The [z] allophone had higher percentages, particularly for *tors*, where 78% of males and 83% of females used [z] in the word list. For *eras*, 54% of males and 32% of females used [z] in the word list, with comparable percentages for the passage. The [is] allophone was not recorded for both *tors* and *eras*. The [s] sound was produced by a considerable percentage of participants, with 35% of males and 39% of females using [s] for *eras* in the passage. The observed patterns in the production of these plural forms highlight challenges faced by ESL learners. Factors such as devoicing of the [z] allophone leading to [s] and insufficient exposure to and practice with English /s/ and /z/ sounds may contribute to variations in their productions. These findings align with the Speech Learning Model (SLM), emphasizing the influence of the learner's native language and the importance of exposure and practice in acquiring accurate articulatory coordination (Davidson & Yang, 2013; Hu, 2001; Major, 2010).

#### 4.1.2.2 Production of *Heafs* and *Chiefs*

The noun *chiefs* exhibits a consistent pronunciation pattern in both isolated and passage contexts. In isolation, boys consistently use the /iz/ allophone, comprising 10% of their responses, while girls uniformly employ the same allophone, representing 100% of their productions. This suggests a clear and expected pronunciation trend for the plural marker in the word *chiefs*. In the passage, a similar pattern persists, with boys maintaining the use of /iz/ (10%) and girls consistently producing the same allophone (100%). The noun *heafs* presents intriguing variations in its plural marker pronunciation. In isolation, boys consistently opt for the voiceless /s/ allophone, representing 100% of their responses. However, girls display a nuanced pattern, with 90% using /s/ and a minor 10% deviating to the voiced [z] allophone. This divergence suggests potential individual variations or linguistic influences impacting the pronunciation of *heafs*. In the passage, boys maintain a steadfast

preference for the voiceless /s/ allophone (100%), mirroring the isolated context. Girls, once again, exhibit a slight departure from the expected pattern, with 90% using /s/ and 10% favoring the [z] allophone.

The deviations observed in some female participants can be explained by insights from previous studies. ESL learners, when confronted with unfamiliar sounds, may substitute phonetic elements from their native language that bear similarities. For instance, some learners might replace the [s] sound with a dental fricative /θ/ (Eddington, 2017). Additionally, the challenge of distinguishing between voiced and voiceless sounds may lead to incorrect voicing of the [s] allophone, with some learners producing the voiced sound [z] instead, influenced by patterns in their native language (Lee & Iverson, 2020). Furthermore, difficulties in achieving precise tongue placement required for the [s] sound may contribute to variations in pronunciation among ESL learners, as they might struggle to position their tongue accurately against the alveolar ridge (Major, 2010).

#### **4.1.2.3 The production of Glasses, Tasses, Gutches, Kazhes and Nizzes**

The allophone [iz] is a phonetic manifestation that typically occurs at the word's end when the base form concludes with specific sounds, such as /z/, /f/, /ʒ/, /tʃ/, or /dʒ/ (Roach, 2009). A standard British English speaker would pronounce words like "glasses" as /'gla:siz/, *tasses* as /'tæsiz/, *gutches* as /'gʌtʃiz/, *kazhes* as /'keiziz/, and *nizzes* as /'niziz/. This allophone's pronunciation intricacies are further illuminated in connected speech contexts. Examining the participants' performance in both word lists and passages sheds light on their proficiency in producing these allophones. For example, in the word list, 77% of male participants correctly produced [iz] for *glasses*, while 60% did so for *tasses*, and none for *kazhes*. Correspondingly, female participants demonstrated varied percentages, with 37% for *glasses*, 28% for *tasses*, and none for *kazhes*. In passages, the male participants recorded 75%, 64%, and 5% for [iz] in *glasses*, *tasses*, and *kazhes*, respectively. On the female side,

percentages were 15%, 30%, and 0% for the same words.

Turning to participants' production of [iz] in *gutches* and *nizzes*, 44% of males and 51% of females correctly produced [iz] for *gutches* in the word list. The allophone [is] was produced by 37% of males and 22% of females respectively. For *nizzes*, 88% of males and 80% of females correctly produced [iz]. It must be noted that in the production of the word *kazhes* some of the participants produced these words in a way that could not be captured under any of the phonological endings, hence the shortage. The passage results showed variations, reflecting the participants' nuanced approach to allophonic realization. These variations can be attributed to linguistic backgrounds, native language phonology, and individual differences among participants. This is because non-native speakers may exhibit persistent errors, a phenomenon known as fossilization, influenced by their native language's plural marker phonology and overgeneralization tendencies (Kang, 2010; Major, 2012). The analysis on the nouns shows that the Ghanaian English speaker has four different realizations of the plural marker /s/. These are [s], [is] and [iz] and [z] as against the Standard British English forms which are [s], [iz] and [z].

#### 4.1.3 Realization of phonologically-conditioned allomorphs in possessives

The possessive marker, also known as the genitive case, is a grammatical feature used to indicate possession or association. In English, the possessive marker is typically realized by adding an apostrophe ('s) to the noun. For example, *John's car* indicates that the car belongs to John. The possessive marker can have different pronunciations depending on the phonetic context. The allophone [s] is the most common pronunciation of the possessive marker. It is used when the noun does not end in any of these sibilant sounds (/s/, /z/, /ʃ/, /ʒ/, /tʃ/, /dʒ/). For example, *John's car* [dʒɒns kɑ:r], *Lisa's book* [li:səs bʊk]. When the noun ends in a sibilant sound, the possessive marker is pronounced as [z]. This helps to avoid a cluster of two consecutive /s/ sounds; for example, *James' car* [dʒeɪmz kɑ:r], *Max's house* [mæksəz haʊs].

In some cases, the possessive marker is pronounced as [iz] when the noun ends in a sibilant sound and the preceding syllable is unstressed. For example, actress's performance ['æktrɪsɪz pɜːfɔːrməns], Princess's tiara ['prɪnsɪz taɪ'ɑːrə] (Croft, 2003; Stark et al., 2012). In this section, I discuss the different productions of the possessive marker by the participants. A summary of the performance has been provided in Tables 4.1.3.1 and 4.1.3.2. Table 4.1.3.1 shows a summary of the performance in relation to the words they produced during the recording of the word list to test how the participants produced the possessive marker of a group of nouns from a passage. In Table 4.1.3.2, I show a summary of the performance in relation to the words they produced during the recording of the word list to test how the participants produced the possessive markers of nouns.

*Table 4.1.3.1. Realization of allomorphs of /s/ as produced in isolation*

Item	BOYS				GIRLS			
	/ɪz/	/z/	/ɪs/	/s/	/ɪz/	/z/	/ɪs/	/s/
Wug's		100				90		10
'bik's'	-		-	100	-		-	100
'niz's'	50			25	60	27	-	13

*Table 4.1.3.2. Realization of allomorphs of /s/ as produced in passage*

Item	BOYS				GIRLS			
	ɪz/	/z/	ɪs/	/s/	/ɪz/	/z/	/ɪs/	/s/
Wug's		100				90		10
'bik's'	-		-	100	-		-	100
'niz's'	50	25	-	25	60	27	-	13

#### 4.1.3.1 The production of *Wug's*

In Standard British English (SBE), the pronunciation of *wug's* would typically follow the standard pronunciation rules for the individual words involved. The word '*wug's*' would be pronounced as /wʌgz/. The results from the participants indicate that for the word list, none of the boys and girls pronounced '*wug's*' ending in [iz] or [is]. It was observed that 100% of the boys and 90% of the girls pronounced '*wug's*' ending in [z]. 10% of the girls pronounced '*wug's*' ending in [s] while none of the boys pronounced its ending as [s] for the word list. The results reveal that all the 60 boys got the right pronunciation of the word '*wug's*' since the correct pronunciation of the word '*wug's*' ends with [z]. It was found that 54 of the girls pronounced the word correctly. This indicates that the boys were able to pronounce the '*wug's*' better than the girls even though the margin is slim. Additionally, out of the 120 students who took part in the study, 114 of them were able to pronounce '*wug's*' ending correctly in the word list.

For the passage, none of the boys and girls pronounced '*wug's*' ending in [iz] or [is]. It was discovered during the passage reading that 100% of the boys and 90% of the girls pronounced '*wug's*' ending in [z]. 10% of the girls pronounced '*wug's*' ending in [s] while none of the boys pronounced '*wug's*' ending in [s] in the passage. The results reveal that all the 60 boys rendered the correct pronunciation of the word '*wug's*' since the correct pronunciation of the word '*wug's*' ends with [z] while 54 of the girls got it right in the passage. It can be deduced that all the boys were able to pronounce correct forms of '*wug's*' ending in [z] both in the passage and the word list while 6 of the girls got it wrong both in the word and passage list. This sprout in performance can be linked to the SLM where it stipulates that a second language learner will not have a problem with a sound if the sound to be produced is the same in terms of pronunciation and articulation.

#### 4.1.3.2 The production of ‘Niz’s’

The analysis of the data shows that 50% of the boys pronounced ‘*niz’s*’ ending in [iz] while 60% of the girls pronounced the word ending in [iz]. It was also revealed that 25% of the boys representing 15 boys pronounced ‘*niz’s*’ ending in [z] while 16 girls representing 27% of the girls pronounced ‘*niz’s*’ ending in [z]. None of the boys and girls pronounced ‘*niz’s*’ ending in [is]. For the passage, the analysis of the data shows that 50% of the boys and 60% of the girls pronounced ‘*niz’s*’ ending in [iz]. It was also revealed that 15 and 16 boys pronounced ‘*niz’s*’ ending in [z] representing 25% of the boys and 27% of the girls respectively. None of the boys and girls pronounced ‘*niz’s*’ ending in [is] during the passage reading. A total of 8 girls pronounced the ‘*niz’s*’ ending in [s] representing 13% of the girls. From the data, it is shown that out of the 120 students, 30 boys and 36 girls making 66 students were able to pronounce the correct form of ‘*niz’s*’ ending with [iz] in the passage. This indicates that a majority of the respondents were not able to pronounce the correct form of ‘*niz’s*’ in the passage. The results also indicate that the girls were able to pronounce the correct form of ‘*niz’s*’ ending with [iz] more than the boys in the passage. This study supports the SLM prediction that sounds that pose as different will be difficult for the second language learner to produce. This result could also be explained by factors such as L1 phonetic patterns, L1 interference, and the absence of the alveolar /t/ in their native language (Lee, 2014; Wrembel & Kul, 2013).

#### 4.1.3.3 The production of ‘Bik’s’

In isolation, the pronunciation of ‘*bik’s*’ in Standard British English would be approximately [biks], with the stress on the first syllable. The results show that none of the boys and the girls pronounced ‘*bik’s*’ ending in either [iz], [z], or [is]. The data show that all the boys and the girls pronounced ‘*bik’s*’ ending in [s]. Since the correct form of ‘*bik’s*’ ends with [s], then all the boys and the girls pronounced the word ‘*bik’s*’ correctly in the word list. For the passage, it was revealed that all 60 boys pronounced ‘*bik’s*’ ending in [s]. It was also

shown that all 60 girls pronounced ‘*bik’s*’ ending [s] in the passage list. Relating it to the SLM where it stipulates that a second language learner will not have a problem with a sound if the sound to be produced is the same in terms of pronunciation and articulation. Therefore, it is not surprising that the participants were able to produce the [s] allophone correctly since in this particular case, the words correspond to allophone [s] which is the same as the actual morpheme that is written.

#### 4.1.4 Summary

The section examined the pronunciation of three words ‘*bik’s*’, ‘*wug’s*’, and ‘*niz’s*’ in Standard British English, focusing on how these words are pronounced both in isolation and in a passage. For ‘*wug’s*’, it was found that the correct pronunciation ends with [z]. In the word list, all the boys pronounced it correctly, while 54% of the girls did. In the passage, 100% of the boys and 90% of the girls got it right. This suggests that boys performed slightly better in pronouncing ‘*wug’s*’, possibly due to the similarity between the sound in their native language and the target sound. Regarding ‘*niz’s*’, it was observed that 50% of the boys and 60% of the girls pronounced it as [iz] in the word list, while none of them said [is]. In the passage, a majority of students couldn't pronounce it correctly, with 30 boys and 36 girls (56 students) getting it right with [iz]. This aligns with the Second Language Model’s prediction that sounds that differ from one’s native language can be challenging to produce.

As for ‘*bik’s*’, it should be pronounced as /biks/ in isolation, consequently, in both the word list and the passage, all the students pronounced it as [s], which is the correct form. This indicates that the pronunciation was consistent with the expected pattern, and the students had no difficulty with this sound. Overall, the study supports the idea that second language learners may struggle with sounds that differ from their native language due to factors like phonetic patterns and interference. The analysis on the nouns shows that the Ghanaian English speaker has three different realizations of the possessive marker /s/: [s], [iz], and [z].

## 4.2 Patterns identified from phonological realizations

The discussion in this section is set to delve into the intricate world of phonetics, aiming to uncover the patterns discernible within the realm of Ghanaian English speakers' production of phonological endings. Specifically, the focus is directed towards the production of the distinct allophones [s], [z], [iz], [d], [id], and [t]. These sounds, though seemingly similar on the surface, exhibit subtle variations that are indicative of the unique linguistic landscape of this particular variety of English. It is crucial to not only identify these patterns but also to understand the nature of each individual allophone. Each of these sounds possesses distinct characteristics, such as voicing, articulation, and placement, within the syllable structure, which profoundly influence how they are produced by Ghanaian English speakers. Through a comprehensive analysis, the phonological processes and the phonetic constraints that shape the pronunciation of these allophones are unraveled in the ensuing sections by shedding light on the nature of each allophone and its impact on the production process.

### 4.2.1 The production of the allophone [s]

The English consonant /s/ is characterized by specific articulatory features. It is produced by directing a stream of air over the midline of the tongue towards the alveolar ridge, resulting in a voiceless fricative sound. The lips remain unrounded, and the vocal cords do not vibrate during its production. Producing the [s] sound requires precise articulatory control: the tongue, teeth, and airflow need to be coordinated accurately to create the sound. Individuals who struggle with fine motor control or have difficulty coordinating these articulatory movements may find it challenging to produce [s] accurately as the position and alignment of the teeth can affect the production of [s]. Long-standing speech habits or accents can influence the ease of producing [s] (Strange, 2011). Albeit, compared to some other speech sounds, the production of [s] involves relatively simple articulatory movements. The

tongue is positioned near the alveolar ridge, and the airflow is directed between the tongue and the ridge, creating the hissing sound. The straightforward articulatory configuration of [s] can make it easier for individuals to produce accurately.

According to the SLM, individuals whose native language includes [s] often find it easier to produce it due to their familiarity with it. Frequent exposure to [s] from an early age, as it is a common sound in many languages, including English, makes acquisition and accurate production more straightforward. As such, children tend to acquire [s] early in their linguistic development, benefiting from ample practice and articulatory refinement. However, the ease of producing [s] in a second language context can be influenced by the phonetic patterns and sound inventory of one's native language, particularly if the native language lacks [s] or has similar sounds produced differently, leading to difficulties.

While there may be some allophonic variations of [s] across languages, the general articulatory characteristics of [s] remain fairly consistent. This consistency makes it easier for individuals to transfer their knowledge and production skills of [s] across different linguistic contexts (Catford, 2001; Ladefoged & Johnson, 2015). The allophone [s] corresponds with *heafs*, *chiefs*, and *biks* as discussed earlier in this chapter. Looking at the high percentages recorded, it could be said that irrespective of the consonant type that precedes the allophone, the Ghanaian English speaker is able to produce it correctly. This conclusion is drawn on the premise that even though two distinct sounds come before the allophone /f/ and /k/, the participants did tremendously well in producing this sound.

The observed pattern is that the allophone [s] is produced with a high degree of accuracy and consistency by Ghanaian English speakers, regardless of the preceding consonant type. Despite phonetic differences in the sounds that come before [s]—such as /f/ in *heafs* and /k/ in *biks*—speakers consistently realize [s] correctly. This suggests that [s] has stable articulatory properties that are not significantly influenced by its phonological

environment, making it easy to transfer across linguistic contexts. Consequently, the production of [s] appears robust and unaffected by coarticulatory variation, reflecting both its cross-linguistic stability and the speakers' strong command of this segment.

#### 4.2.2 The production of the allophone [z]

The sound /z/ is a voiced alveolar fricative in English. It is produced by directing a stream of air over the midline of the tongue towards the alveolar ridge, while simultaneously allowing the vocal cords to vibrate (Ladefoged & Johnson, 2015). The ability to accurately produce the sound /z/ may be influenced by an individual's native language. Different languages have varying sound inventories and phonetic patterns. For individuals whose native languages include /z/ as a common sound, they may have acquired the necessary articulatory coordination and control to produce it effortlessly (Catford, 2001). However, for speakers of languages that lack /z/ or have different voicing patterns, the production of /z/ in English can initially pose challenges. These individuals may need to adjust their articulatory habits to accommodate the voiced fricative sound, particularly in terms of vocal fold vibration (Catford, 2001).

The acquisition of /z/ often occurs at an early stage of language development. Children tend to acquire voiced sounds like /z/ relatively early due to their perceptual salience and frequent occurrence in their linguistic environment (Catford, 2001; Ladefoged & Johnson, 2015). Early acquisition allows for ample practice and refinement of the necessary articulatory movements, making it easier to produce /z/ accurately as individuals grow older. The target words that corresponded with [z] were *wugs*, *tors*, *eras*, and *wug's*. Almost all of the participants produced *wug's* correctly. However, there were some dynamics when it came to *tors*, *eras*, and *wugs*. For *tors*, it was observed that most of the participants chose the allophone [s] instead of [z]. Also, for *wugs* : (77%) for boys and (66%) for girls and *eras*: (54%) for boys and (32%) for girls, even though the recordings for [z] were the highest, the

number of participants that choose [iz] in *wugs* cannot be overlooked. This corresponds to the results of a similar study by Kang and Guion (2015) where it was found that when bilinguals attempt to produce English words containing consonant clusters, they may insert a vowel sound. He further explained that bilinguals often draw on their native language's phonotactic rules when confronted with unfamiliar phonological patterns, leading to the insertion of vowels as a strategy to align their pronunciation with their linguistic repertoire.

Another observation worth mentioning is the fact that *wugs* and *wug's* were produced the same. Unfortunately, the participants did better, if not excellent, on the production of *wug's* but failed to produce *wugs* correctly. Based on this, it can be concluded that for the allophone [z], it is a matter of the individual's preference and that the phonological environment has little or no telling on the choice. However, the Ghanaian English speaker is likely to substitute the allophone [z] with its voiceless variant [s]. The possible explanation, according to Flege (1995), is that producing a voiced sound like /z/ can be challenging for ESL speakers who are not accustomed to maintaining vocal fold vibration during fricative production. The contrast between voiced and voiceless sounds in English may not be as salient to them, leading to the use of voiceless alternatives like /s/.

Closely related to this finding, Zhang and Munro (2015) observed that Mandarin speakers of English lack a clear distinction between certain English consonants, particularly voiced and voiceless pairs. Piske and Flege (2001) also point to the same claim as they observed that learners who struggle to perceive the most intricate distinctions in sounds are more likely to make errors in their production. This highlights the interconnected nature of perception and production accuracy. The proponents of the SLM argue that ESL speakers who have limited exposure to English or who have not had sufficient practice with the /z/ sound may struggle to produce it accurately. In such cases, they may opt for sounds that are easier to articulate or are more prevalent in their speech environment.

### 4.2.3 The production of the allophone [ɪz]

Depending on the language and dialect, there may be some variability in the production of [ɪz]. Some languages may have lenition processes or assimilatory patterns that favour the production of [ɪz] in certain phonetic contexts. This variability can make it easier for individuals to produce [ɪz] due to the natural phonetic processes present in their language (Catford, 2001; Ladefoged & Johnson, 2015). The target words that correlated with the allophone [ɪz] were *nizzes*, *glasses*, *tasses*, *gutches*, and *kazhes*. Most of the participants were able to produce *nizzes* correctly: (88%) for boys and (80%) for girls. The words *glasses*, *tasses*, and *gutches* also saw an average number of participants producing it correctly. However, there was a striking number of participants choosing the allophone [is]. For instance *tasses* got as high as (72%) for girls. Although *kazhes* belonged to this group, most participants produced it ending with the allophone [s]. The word *kazhes* has a syllable structure that plays a role in its pronunciation

The inference that can be made is that the Ghanaian English speaker will not have a problem choosing the allophone [z] if the root or base form of the word ends with the letter /z/. This is based on the fact that Ghanaian English speakers consistently apply this rule correctly, the data show that they have no difficulty selecting the allophone [z] when the base form ends in /z/. However, even though due to voicing assimilation the two /s/ sounds become /z/ due to the presence of /a/ preceding it as in the case of *glasses* and *tasses*, they are more likely to devoice the allophone [ɪz] to [is]. With *kazhes*, they opted for the allophone [s]. The participants may not have been exposed to the intricate phonological rules of English, such as voicing assimilation, or they may not have had sufficient practice with these rules. In such cases, they may default to the simpler option of using [s] for plurals. According to the Speech Learning Model (SLM), this pattern occurs because Ghanaian English speakers rely on existing L1 sound categories and may not perceive English plural voicing distinctions as

salient. Since voicing assimilation in plurals is a subtle morphophonological rule, learners may treat [s], [z], and [ɪz] as equivalent and default to the simpler, unmarked [s], especially with limited exposure or practice.

#### **4.2.4 The production of the allophone [d]**

The sound /d/ is a voiced alveolar plosive sound, characterized by the vibration of the vocal cords during its production. This voicing feature is a fundamental aspect of /d/ and many other voiced sounds. When the vocal cords vibrate, they come together, allowing air to build up behind them. When the airflow is released, it results in the characteristic plosive sound. This voicing simplifies the articulatory process, making it more intuitive and less physically demanding for speakers. Additionally, /d/ is articulated at the alveolar ridge, where the tongue makes contact with the upper front part of the mouth. This articulatory configuration is relatively straightforward and common in many languages, including English (Fromkin et al., 2017). The familiarity of this articulatory position further contributes to the ease of producing the sound.

In this study, it was observed that the participants consistently produced words containing the allophone [d] such as binged and sowed correctly, despite variations in the conditioning environment. This phenomenon aligns with the broader linguistic understanding that /d/ is a common sound in many languages, including English. Scholars have noted that individuals are frequently exposed to and familiar with /d/ from an early age. This early exposure and familiarity make it easier for individuals to acquire and produce the sound accurately (Gass & Selinker, 2008). Moreover, the ease of producing /d/ can be explained within the framework of the Speech Learning Model (SLM). In terms of perception and production, the voiced nature of /d/ provides clear auditory feedback, enhancing speakers' ability to monitor and adjust their pronunciation. The presence of voicing in /d/ allows speakers to easily perceive the sound and make necessary articulatory adjustments to produce

it accurately. In conclusion, Ghanaian English speakers consistently produce the allophone [d] accurately, regardless of the phonological environment. This ease of production is influenced by the inherent characteristics of /d/, including its voicing and articulatory simplicity, as well as the early exposure to and familiarity with this sound in their linguistic environment.

#### 4.2.5 The production of the allophone [ɪd]

The place of articulation for [ɪd] is alveolar, which means the tongue makes contact with the alveolar ridge; the bony ridge just behind the upper front teeth. This is the same place of articulation as the regular voiced alveolar plosive /d/. The manner of articulation is a plosive, which means the airflow is briefly obstructed. In this case, the tongue stops the airflow at the alveolar ridge. The allophone [ɪd] is voiced, which means the vocal cords vibrate during its production. After the airflow is stopped by the tongue at the alveolar ridge, it is released. However, the release is not a complete explosion of air, as in [d], but rather a brief *tap* or *flap* of the tongue against the alveolar ridge. This tap is what gives [ɪd] its unique quality. In terms of phonation, [ɪd] is similar to regular /d/ in that both are voiced, but their release differs. In [d], there is a complete stoppage of airflow followed by a release, while in [ɪd], the stoppage is brief, and the release is a tap or flap (Ball & Lowry, 2001; Roach, 2009). The test words that correlate with the allophone [ɪd] are *melted*, *bodded*, and *motted*. In the production of these words, almost all the participants replaced the [ɪ] in the allophone [ɪd] with [ɛ]. So that instead of [ɪd], these words were rather ended with [ɛd].

Using the SLM to explain why the participants replaced a target sound with a similar one, the first point to discuss is perception and transfer of first language (L1) phonological representations. SLM explicitly states that learners of ESL typically start their language learning journey with an established set of phonological representations from their native language (L1). These L1 representations influence how they perceive and categorize sounds

in the target language. Closely linked to the aforementioned point is perceptual assimilation. Within the SLM, perceptual assimilation is a term for how learners perceive and categorize L2 sounds in relation to their L1 phonemes. If the target sound in the L2 is perceived as similar to a sound in the learner's L1, it may lead to a perceptual assimilation of the two sounds. Major (2010) discusses how ESL learners often replace sounds in the L2 with those from their L1 when there is a significant phonological overlap or similarity, which results in mapping the unfamiliar L2 sound into a more familiar L1 sound. It could be that, these sounds are free variants in their local dialects. In summary, ESL learners may replace a target sound with a similar one due to the influence of their L1 phonological representations, perceptual assimilation, phonological overlap, and interference from L1 phonological rules.

#### 4.2.6 The production of the allophone [t]

The allophone /t/ is produced with the tongue making contact with the alveolar ridge. This articulatory feature makes /t/ an alveolar sound. It is also a plosive sound, which means it is produced by briefly stopping the airflow at the place of articulation (the alveolar ridge) and then releasing it suddenly. This creates a sharp burst of sound. Again, /t/ is a voiceless sound, meaning that during its production, the vocal cords do not vibrate. It contrasts with its voiced counterpart, /d/, where the vocal cords do vibrate. The target words for the allophone [t] were *ricked*, *tracked*, and *faked*. Almost all the participants produced these words ending with the allophone [ɪd] instead. In many phonological contexts in English, the final /t/ sound in words undergoes voicing assimilation. This means that /t/ is pronounced as [ɪd] when it follows a voiced sound or precedes a vowel sound.

In the spelling of the word *ricked* for instance, the /d/ sound occurs after a voiceless sound /k/ and before a vowel sound /i/, creating a phonological environment that favours the pronunciation of [ɪd]. Hence, the tongue may begin to move into the [d] position (the tongue tip behind the upper front teeth) before the release of the [t]. This anticipatory coarticulation

can lead to the production of [ɪd] rather than [t] (Stevens, 1998). Pronouncing [ɪd] can be easier and smoother than a more abrupt [t] sound, especially in fast or casual speech. The tongue movement required for [d] is less sudden and abrupt compared to the complete oral closure and release for [t]. Languages often exhibit phonological variation, where multiple pronunciation variants of a sound can exist. In the case of final /t/ in English, the variation between [t] and [ɪd] is a common phenomenon influenced by phonological rules and speech patterns (Labov, 2005). Johnson (2006) explains that for some speakers, the difference between [t] and [ɪd] in this context may not be phonemically salient, meaning that it might not significantly affect the intelligibility of the word. As a result, speakers may default to the more common or easier-to-produce variant, which, in this case, is [ɪd].

#### 4.2.7 Summary

Ghanaian English speakers can produce the allophone [s] accurately, regardless of the preceding consonant. However, they are more likely to use the voiceless variant [s] instead of [z]. Interestingly, the participants' choice of [z] seemed to be influenced more by individual preference than by the phonological environment. The analysis suggests that Ghanaian English speakers may choose [z] when the base form of a word ends with /z/. However, they may devoice [ɪz] to [ɪs] in other instances. For instance, in words such as *glasses* and *tasses*, they opted for [s]. When it comes to the production of /d/, speakers consistently produce the allophone [d] accurately. Almost all participants replaced the [ɪ] in [ɪd] with [ɛ], resulting in words ending with [ɛd] instead of [ɪd]. This substitution is explained within the Learning Model (SLM), linking it to how speakers perceive and categorize sounds in the L2 and perceptual assimilation. Lastly, in the case of the allophone /t/, variation between [t] and [ɪd] is influenced by phonological rules and speech patterns. Reasons given are that some speakers may not consider the difference between [t] and [ɪd] in this context to be phonemically salient, meaning it does not significantly affect word intelligibility. Therefore, speakers may default

to the more common or easier-to-produce variant, which, in this case, is [id].

### **4.3 Factors that contribute to the phonological awareness of the Ghanaian English speaker**

The objective of this section is to provide an answer to the third research question: Factors that contribute to the phonological awareness of the Ghanaian English speaker. Through interview with students, the section aims at uncovering their perspectives on how phonological conditioning impacts their communication skills, comprehension abilities, and overall confidence in social interactions. Furthermore, I investigated the role of language acquisition processes and teaching methodologies in shaping students' phonological development. By these, I gained valuable insights into the challenges faced by high school students. To offer a more holistic and complete picture of the affective strategies, the researcher conducted focus group discussions with the 60 students to acquire in-depth information into the students' thoughts on the issues presented. This section is presented in three sub-sections. The first sub-section presents results on how the students acquired the English language. The second sub-section presents results of the effects of phonological conditioning, discussing how phonological conditioning affects communication and the challenges they face in understanding others due to differences in pronunciation. The third sub-section presents the analysis of results regarding pedagogy, focusing on the impact of teaching styles on phonological development and how teachers could better support students who have phonological challenges.

#### **4.3.1 The acquisition process**

The participants were queried regarding two key aspects concerning their perception of how their language acquisition journey has shaped their phonological development. Typically, the age at which they were first exposed to the target language, the sources from which they received this exposure, and any challenges or limitations they encountered during

the language acquisition process are covered. These are discussed as follows:

#### **4.3.1.1 The influence of language acquisition process on phonological conditioning**

Offering insight into the complexities of students acquiring English language from the influence of a bilingual upbringing to the challenges of speech therapy, and even observations on the adaptability of friends to different accents, these are some responses that shed light on the multifaceted nature of phonological development and its impact on communication:

*Speaker 3: I grew up in a bilingual household, so sometimes I mix up sounds from both languages when I speak English. It's like my brain automatically defaults to certain pronunciation patterns, which can be confusing.*

*Speaker 10: I struggled with speech delays when I was younger, so I had to work with a speech therapist to improve my pronunciation. Even though I've made progress, I still feel self-conscious about certain sounds.*

*Speaker 1: I've noticed that my friends who are exposed to different accents and dialects seem to have an easier time understanding and mimicking different pronunciations. It's like they have a wider range of phonological skills.*

The experiences shared by the students align with existing research that underscores the profound influence of language acquisition on phonological development. Research has consistently shown that factors such as exposure to multiple languages and participation in speech therapy interventions significantly shape individuals' phonological skills (Baker & Trofimovich, 2005; Paradis, 2011). For example, growing up in a bilingual household, as mentioned by one student, can lead to the blending of sounds from different languages, affecting pronunciation patterns. Similarly, the student who mentioned undergoing speech therapy highlights how targeted interventions can aid in improving pronunciation skills. These findings illuminate the intricate relationship between language acquisition processes and phonological development. This suggests that individuals' experiences with language,

whether through exposure to diverse linguistic environments or participation in interventions aimed at refining pronunciation, play a crucial role in shaping their phonological skills.

#### 4.3.1.2 Age of exposure and limitations

During the interview the researcher sought to know the age at which the respondents were exposed to the target language, the source from which they had the exposure, and the limitations they encountered in the acquisition process. These are some responses:

Speaker 8. *Well, my parents are farmers. We have our own cocoa plantation. We live on the farm. Being the first child, my parents did not enroll me in school early because our village is far from town. Children that went to school from neighbouring villages have to walk for miles before getting to town, so I joined my age mates at class one. I was around seven years of age. I went to a government school in a remote area. Even our headteacher addresses the school in Twi talk less of class teachers. But for English language as a subject and technical terms, we were taught in Twi until I moved to stay with my aunt who is a nurse in a bigger town. I didn't even usually go to school because of the distance I had to cover just to get to school. I was usually laughed at when I was enrolled at the new school. By then I was 12 years old and in class five but I was sent to P3.*

Speaker 6. *Due to financial constraints, I was five going on six when I went to school. I didn't go to crèche I started schooling from Class 1. But since I had older siblings, I knew all the basics before I went to school. As for my parents once you reach P6 they move you from the private school to government school...Anglican. that school is more than a private school. They get the best grades during B.E.C.E. in the whole district. But their primary is not good.*

Lemaire et al. (2013) admit that the Ghanaian educational policy is such that pupils admitted into the kindergarten are usually between the ages of 4-5 years. Closely linked to this

is Castello (2015) who notes that the school starting age for a Ghanaian child is three years. In addition, Handa (2002) and Tambashe (2000) list a number of factors that determine the school going age of children in developing countries. Among these are household income, parental education, gender of the child, locality.

*Speaker 3: We speak only English in the house. I am an Akan but I am not as fluent as when I speak English. My parents are very busy people so we are made to start schooling at a very tender age. I for one was sent to day care at six months. All my school life I have been at the boarding school. I was privileged to go to an international school.*

*Speaker 4: My mother said she sent me to school when I was two years old. We mostly speak English at home. But unlike my big sister I am not cut for language. She didn't start at where we completed. Which is a good school but she likes to read a lot, as for her English ....dont go near.*

Learners who strongly identify with the L2-speaking community and invest in their L2 identity tend to achieve higher levels of language proficiency. Embracing the L2 as part of their linguistic and cultural identity motivates learners to engage more actively in language learning activities, leading to improved language skills (Dörnyei, 2009).

#### **4.3.2 Effects of phonological conditioning on one's interactions in school**

In this section, I inquired about the impact of phonological conditioning on their communication abilities during their high school years. Specifically, I sought insights into how their pronunciation development influenced their interactions and communication effectiveness. I also sought whether they have encountered difficulties in understanding others as a result of variations in pronunciation or accents, prompting exploration into how these differences may have affected their comprehension and communication experiences. I asked the following questions: (a) How does phonological conditioning affect your communication

skills in high school? (b) Have you ever faced challenges in understanding others due to differences in pronunciation or accents?

#### 4.3.2.1 The effect of phonological conditioning on communication

The students' responses show that many people face problems with pronouncing certain words, especially when they are nervous. This can make them feel unsure about how well others understand them. Some students also avoid using words they find hard to produce, which holds them back in class discussions or presentations. Even though they joke around with friends about mispronunciations, deep down, they worry about fitting in with the expected pronunciation standards. Some uttered these: Speaker 7: *Sometimes I struggle with certain sounds or words, especially when I'm nervous or under pressure. It makes me feel self-conscious because I know I might not be understood clearly by others.*

Speaker 2: *I find myself avoiding certain words or situations where I know I'll have to pronounce difficult sounds. It's frustrating because I feel like it holds me back from fully participating in class discussions or presentations.*

Speaker 9: *I've noticed that my friends and I often joke about mispronunciations or accents, but deep down, it does make me worry about how I sound when I speak. It's like there's this pressure to conform to a certain standard of pronunciation.*

Research in phonological conditioning sheds light on the psychological aspects individuals may encounter regarding their pronunciation abilities, particularly in contexts where there is heightened pressure, such as public speaking or social interactions (Levitt, 2019; Munro & Derwing, 1995). This body of research suggests that individuals may experience feelings of anxiety or self-consciousness, fearing potential judgment or misunderstanding due to perceived deficiencies in pronunciation accuracy or clarity.

The experiences recounted by the students resonate with these findings, illustrating the tangible impact of phonological conditioning on communication skills in real-world

settings. For example, one student expressed feeling self-conscious and nervous about potential mispronunciations, particularly when under pressure, echoing the anxiety highlighted in research literature. Similarly, another student mentioned avoiding certain words or situations where pronunciation challenges may arise, likely driven by a desire to mitigate feelings of discomfort or embarrassment in social interactions. The correlation between research findings and the students' experiences underscore the significant influence of phonological conditioning on individuals' confidence and effectiveness in communication. By acknowledging and addressing these psychological factors associated with pronunciation, educators and practitioners can better support learners in overcoming anxieties and developing more robust communication skills.

Contrastively, some students saw these challenges as something that propelled them to do better. For instance:

Speaker 4: *I've never really struggled with pronouncing words, even when I'm nervous. I think it's more about practice and confidence. Sure, there might be times when I stumble over a word, but it's not a big deal to me.*

Speaker 9: *I actually enjoy the challenge of pronouncing difficult words. It's like solving a puzzle for me. Sure, there might be some pressure in class discussions or presentations, but I see it as an opportunity to improve and showcase my skills.*

These two responses present contrasting perspectives on the experience of phonological conditioning in high school communication. Response 1 adopts a more dismissive attitude towards the significance of pronunciation difficulties, attributing any occasional stumbling to lack of practice rather than underlying psychological factors. This aligns with research highlighting the importance of confidence and practice in improving pronunciation skills (Levitt, 2019; Munro & Derwing, 1995). However, it may overlook the psychological aspects of phonological conditioning, such as anxiety and self-consciousness,

which can impact pronunciation performance.

On the other hand, Response 2 takes a proactive approach, viewing pronunciation challenges as opportunities for growth and skill development. This aligns with the notion that positive attitudes and perseverance can contribute to improving pronunciation skills (Munro & Derwing, 1995). However, it may not fully acknowledge the anxieties and pressures that some individuals face in similar situations, as highlighted in research on phonological conditioning (Levitt, 2019).

While confidence, practice, and positive attitudes play crucial roles in overcoming pronunciation difficulties, it is essential to acknowledge the psychological aspects and individual differences that can influence pronunciation performance. Educators and practitioners can benefit from integrating insights from both perspectives to develop holistic approaches for supporting learners in developing effective communication skills. By recognizing the interplay between confidence, practice, attitudes, and psychological factors, educators can create a supportive learning environment conducive to language acquisition and proficiency development.

#### **4.3.2.2 Challenges in understanding others due to differences in pronunciation**

Notable among the responses given were a widespread issue with understanding speech, particularly when faced with accents, unclear articulation, or rapid speech. Many spoke of the frustration of having to ask for repetitions or nod along without fully grasping the information, leading to potential misunderstandings and missed details. The challenges extend beyond interpersonal interactions to academic settings, where the students said they struggled to follow teachers, resulting in constant effort to decipher the content. Amongst the responses were:

*Speaker 1: Definitely! There are times when I have to ask people to repeat themselves because I can't quite catch what they're saying, especially if they have a strong accent.*

*It can be frustrating when I feel like I'm missing out on important information.*

*Speaker 4: I have friends from different cultural backgrounds, and sometimes I struggle to understand them because of their accents. I feel bad asking them to repeat themselves, so I just nod along, but it means I might miss important details.*

*Speaker 5: I've noticed that some teachers speak really quickly or mumble, and it makes it hard for me to follow along in class. It's like I'm constantly trying to decipher what they're saying, which can be exhausting.*

Studies in the field (e.g. Derwing & Munro, 2009; Jenkins, 2000) have consistently demonstrated that variations in pronunciation and accents can present significant challenges in communication and comprehension, particularly within educational environments where clear understanding is paramount. These differences can impede effective communication, leading to misunderstandings and hindering the learning process for students and educators alike. The experiences shared by the students mirror these research findings, highlighting the tangible real-world consequences of phonological disparities on comprehension. For instance, one student mentioned struggling to understand friends from diverse cultural backgrounds due to their accents, reflecting the challenges posed by variations in pronunciation. Similarly, another student expressed difficulties in following teachers who speak quickly or mumble, emphasizing the impact of phonological differences on comprehension within an educational context.

These parallels between research evidence and the students' lived experiences underscore the critical importance of addressing phonological diversity in educational settings. Others did not seem to have a problem with difference in accents or speech and these are what some had to say:

*Speaker 3: I don't really have trouble understanding speech, even if someone has a strong accent. I find it more about focusing on what they're saying rather than how*

*they're saying it. Asking for repetitions isn't a big deal for me because I want to make sure I understand correctly.*

*Speaker 7: My friends come from different backgrounds, and while they may have accents, I've never had much difficulty understanding them. If I miss something, I don't hesitate to ask for clarification. I think it's important to communicate openly to avoid misunderstandings.*

*Speaker 1: I don't find it particularly challenging to follow teachers, even if they speak quickly I try to stay attentive and fill in any gaps by actively listening and engaging with the material. It's all part of being an active learner.*

These responses present a perspective that contradicts the experiences of struggling with understanding speech due to accents, unclear articulation, or rapid speech, as expressed by some students. The first response reflects a mindset aligned with research suggesting that focusing on the message rather than the delivery can facilitate comprehension (Gass & Varonis, 1984). The speaker's willingness to ask for repetitions aligns with communication strategies identified in research literature as effective for improving comprehension (MacIntyre et al., 1998). Similarly, the second response emphasizes open communication and seeking clarification as strategies to prevent misunderstandings, which are consistent with effective communication practices (Clark & Brennan, 1991). The speaker's confidence in their ability to understand friends from diverse backgrounds reflects research indicating that familiarity with accents can enhance comprehension (Lev-Ari & Keysar, 2010).

The third response highlights the importance of active listening and engagement with the material, which are recognized as essential components of successful comprehension (Vandergrift & Goh, 2012). The speaker's adaptability and proactive approach to learning resonate with research suggesting that metacognitive strategies contribute to effective language learning (Oxford, 1990). Analyzing these responses in light of relevant research

literature demonstrates how individuals may employ various strategies and attitudes to overcome challenges related to phonological diversity in communication and learning. By adopting effective communication strategies, maintaining open communication channels, and actively engaging with the material, individuals can mitigate the impact of speech variations and enhance comprehension in diverse linguistic environments. These responses highlight the importance of considering individual differences and adaptive strategies in addressing challenges related to phonological diversity in communication and learning contexts.

### **4.3.3 Pedagogy**

In this segment, I posed two inquiries: the participants were encouraged to reflect on the influence of various teaching methodologies on their phonological growth within an academic setting. This question aimed to explore their perceptions of how different instructional approaches have shaped their pronunciation skills over time. Also, the participants were encouraged to suggest strategies they think will enhance or support students encountering phonological hurdles in the classroom. This query aimed to gather insights into potential improvements in teaching practices to better address the diverse needs of learners in phonological development. Here I asked two questions: (a): How do you feel different teaching styles have impacted your phonological development in school? (b) How do you think teachers could better support students with phonological challenges in the classroom?

#### **4.3.3.1 The impact of teaching styles on phonological development in school**

These responses highlight the varied preferences of students regarding teaching styles in phonological development.

*Speaker 4: My teachers focus a lot on pronunciation drills and exercises, and I think it's helped me become more aware of my own speech patterns. But sometimes it feels repetitive and boring.*

Speaker 4 reflects appreciation for traditional teaching methods focusing on

pronunciation drills. While acknowledging the benefits of increased awareness of speech patterns, the student also expresses boredom and repetition associated with these methods. This sentiment aligns with research suggesting that while pronunciation drills may be effective for some students, they can also be perceived as monotonous and uninspiring (Field, 2008). Some students showed preference for some methods which they suggested.

There was also a desire for active participation and varied learning experiences. Speaker 9: *I prefer when teachers incorporate multimedia or interactive activities to teach phonology. It makes learning more engaging, and I feel like I retain the information better.*

Speaker 6: *I Personally, I find that I thrive more when teachers integrate multimedia or interactive activities into phonology lessons. These dynamic methods not only make the learning process more enjoyable but also help me absorb and retain the information more effectively. The interactive nature of such activities keeps me engaged and motivated throughout the lesson.*

In contrast, Speaker 6 prefers multimedia or interactive activities, emphasizing engagement and retention. This aligns with research indicating that incorporating multimedia and interactive elements into teaching can enhance learning outcomes and student motivation (Mayer, 2001).

Some express dissatisfaction with teachers who neglect phonological issues, highlighting the negative impact on pronunciation skills and frustration with having to self-teach.

Speaker 7: *I've had teachers who don't really address phonological issues at all, and I think it's had a negative impact on my pronunciation skills. It's like I've had to figure things out on my own, which can be frustrating.*

This aligns with research emphasizing the importance of explicit instruction in

phonological awareness for effective pronunciation development (Gillon, 2004). The student's experience underscores the need for teachers to address phonological issues actively and provide appropriate support and guidance. Analyzing these responses in the context of relevant literature demonstrates the importance of considering diverse teaching styles in phonological development. By incorporating a variety of methods, including pronunciation drills, multimedia, and explicit instruction, educators can cater to different learning preferences and optimize student engagement and learning outcomes in phonological development.

#### **4.3.3.2 Support for students with phonological challenges**

The suggestions the participants gave highlighted the importance of tailored support, cultural awareness, and interactive learning experiences in effective pronunciation instruction. Below are some of the responses they gave:

Speaker 10: *I think teachers could provide more individualized feedback and support for students struggling with pronunciation. It would make me feel more confident knowing that my teacher is there to help me improve.*

For instance, research suggests that offering personalized feedback allows teachers to address specific pronunciation issues faced by individual students, thereby facilitating targeted improvement (Baker & Trofimovich, 2005).

Speaker 9: *It would be helpful if teachers were more aware of the cultural and linguistic diversity in the classroom and accommodated for different phonological backgrounds. Maybe incorporating more diverse examples and materials could make everyone feel included.*

Similarly, incorporating diverse materials, such as texts or audiovisual resources featuring a range of accents and dialects, can help students become more familiar with phonological variations and enhance their comprehension skills (Derwing & Munro, 2015). The existing body of literature underscores the critical role of teacher support and accommodation for

diverse phonological backgrounds within the classroom (Baker & Trofimovich, 2005; Derwing & Munro, 2015).

Speaker 10: *I think having smaller group activities focused on phonological skills could be beneficial. It would give us more opportunities to practice and receive feedback in a less intimidating setting.*

Studies have highlighted various strategies that educators can employ to foster phonological development effectively, including providing individualized feedback, incorporating diverse materials, and creating supportive learning environments through small group activities. Furthermore, creating supportive learning environments through small group activities enables students to engage in collaborative learning experiences, receive peer feedback, and practice phonological skills in a less intimidating setting (Baker & Trofimovich, 2005; Derwing & Munro, 2015). These activities encourage active participation, promote confidence-building, and foster a sense of inclusivity among students with diverse phonological backgrounds. The suggestions made by the students closely align with these recommendations, highlighting the importance of teacher responsiveness and adaptability in addressing phonological challenges effectively. By implementing strategies that prioritize individualized support, cultural diversity, and collaborative learning, educators can create inclusive and enriching environments that support students' phonological development and enhance their overall learning experiences. This recognition underscores the crucial role of teachers in facilitating language acquisition and promoting linguistic diversity within educational settings.

#### **4.3.4 Summary**

Through the insightful conversations shared in these group discussions, it becomes evident that phonological conditioning significantly influences the experiences of high school students in various aspects of their lives. From struggles with pronunciation to challenges in

comprehension, the impact of linguistic factors on communication skills is profound. The experiences recounted by the students underscore the need for greater awareness and support for individuals grappling with phonological challenges. One key theme that emerged is the role of language acquisition processes in shaping phonological development. Whether through exposure to multiple languages or speech therapy interventions, students' linguistic backgrounds deeply influence their pronunciation skills. Additionally, the effect of teaching styles on phonological learning is crucial. While traditional drills may aid in improving accuracy, interactive and inclusive methodologies can enhance motivation and engagement. Moreover, the influence of phonological conditioning extends beyond academic settings, permeating into students' social interactions and self-confidence. Negative experiences such as harsh correction or teasing can significantly impact individuals' willingness to engage in communication, highlighting the importance of creating supportive learning environments.

#### **4.4 Conclusion**

The realization of /d/ and /s/ allophones reveals a complex interplay of gender, lexical item, and context. Boys and girls exhibit distinct pronunciation patterns: boys tend to favour [ɹd], while girls prefer [ɹd]. However, the context—whether in isolation or passage—does not significantly alter these patterns. The frequent use of [d] in most words, along with the consistent preference for [ɹd] in girls' speech, suggests that allophone selection is influenced by both phonological and sociolinguistic factors. Similarly, the realization of /s/ allomorphs shows clear gender differences: boys exhibit a stronger preference for the [z] allomorph than girls, who display more variability, especially with [ɹs] and [s]. This variability indicates that girls have a broader phonological range. While the context does not drastically affect choices for most words, girls show greater sensitivity to context. For instance, in words like *glasses* and *wugs*, they alternate between [ɹz] and [ɹs], adjusting their pronunciation depending on the context. Overall, the data reveal that boys consistently favour [ɹz] in most

contexts, particularly in possessive forms like *wug's*. Girls also prefer [iz], but with more variation, especially in words like *niz's*, where they frequently use [iz] and occasionally [s]. Although the context (isolation vs. passage) does not significantly affect the allophone realization for most items, minor shifts are observed in *niz's* for boys. These findings underscore the influence of both gender and lexical item on the realization of /s/ allophones, with some items showing more variation than others.

Regarding the phonological patterns of Ghanaian English speakers, the data suggest that speakers can accurately produce the allophone [s], regardless of the preceding consonant. However, they tend to use the voiceless [s] more often than the voiced [z]. The choice of [z] seems to be influenced by individual preference rather than the phonological environment. It appears that speakers are more likely to use [z] when the base form of a word ends with /z/, but they may devoice [iz] to [is] in other cases, as seen in words like *glasses* and *tasses*. In terms of the production of /d/ allomorphs, speakers consistently produce [d] accurately, though nearly all participants replace [i] with [ɛ] in [id], resulting in words ending with [ɛd] instead of [id]. This substitution can be explained by the Speech Learning Model (SLM), which suggests that it is influenced by how speakers perceive and categorize sounds in their second language. Additionally, in the case of the allophone /t/, variation between [t] and [id] is influenced by phonological rules and speech patterns. Some speakers may not perceive a significant phonemic difference between [t] and [id], so they default to the easier-to-produce [id].

The group discussions also highlighted the profound impact of phonological conditioning on high school students' experiences. These discussions revealed how linguistic factors shape communication skills, including struggles with pronunciation and challenges in comprehension. The students' accounts emphasize the importance of understanding and supporting those facing phonological difficulties. A key theme that emerged was the role of

language acquisition processes in shaping phonological development. Students' linguistic backgrounds, including exposure to multiple languages or speech therapy, significantly affect their pronunciation skills. Teaching styles also play a critical role - while traditional drills help with accuracy, more interactive and inclusive methodologies can improve motivation and engagement. Beyond academic settings, the influence of phonological conditioning extends into social interactions and self-confidence. Negative experiences, such as harsh correction or teasing, can affect students' willingness to communicate, underscoring the need for supportive and empathetic learning environments.



## CHAPTER FIVE

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

#### 5.0 Introduction

This chapter presents a summary of the findings of the study. It also presents conclusions drawn based on all the findings of the study. These summary and conclusion are all in line with the objectives of the study. At the end of this chapter, some recommendations are given for future researches.

#### 5.1 Summary of findings

In this study, the researcher delved into the phonological variations within Ghanaian English, with a primary focus on three distinct objectives. First, the researcher aimed to identify the various manifestations of phonologically conditioned allophones present in Ghanaian English. Secondly, the researcher described patterns that emerge from these phonological realizations, shedding light on the underlying structures. Finally, the study looked to uncover the factors that contributed to the level of phonological awareness of the Ghanaian English speaker.

##### 5.1.1 Realizations of phonologically-conditioned allophones in Ghanaian English

The examination of verbs in the context of Ghanaian English reveals a fascinating pattern of pronunciation for the past tense marker /d/. Unlike Standard British English, where this marker is typically realized as [d], [ɪd], or [t], Ghanaian English speakers display a set of realizations, namely [d], [ɜd], and [ɪd]. This divergence reflects the influence of the Ghanaian phonetic patterns and potentially the interference of native language sounds on the pronunciation of English past tense markers. The use of [d] in Ghanaian English mirrors the standard English pronunciation. However, the emergence of [ɜd] and [ɪd] suggests that Ghanaian English speakers might find it challenging to consistently produce the expected [d] sound. This variation could be attributed to the influence of local phonetic patterns, the

pronunciation of native Ghanaian languages, or the interplay between various linguistic influences. Understanding these divergent realizations of the past tense marker in Ghanaian English provides valuable insights into how linguistic influences from different language backgrounds shape pronunciation patterns.

Similarly, when examining nouns, it was found that Ghanaian English speakers exhibit a range of realizations for the plural marker /s/. In Standard British English, this marker is typically pronounced as [s], [ɪz], or [z]. However, in Ghanaian English, the researcher observe four different realizations: [s], [ɪs], [ɪz], and [z]. The presence of [s] and [z] aligns with the Standard English pronunciation, indicating a degree of adherence to conventional English phonetics. However, the appearance of [ɪs] implies that Ghanaian English speakers may experience challenges in consistently producing the expected plural marker forms. These deviations could be attributed to the influence of native languages spoken in Ghana, each with its unique phonetic characteristics and pluralization patterns.

Lastly, the analysis of possessive markers in Ghanaian English further underscores the linguistic diversity and influences at play in this variety of English. Standard British English typically employs [s], [ɪz], or [z] for possessive markers. However, Ghanaian English showcases three different realizations: [s], [ɪz], and [z]. This variation suggests that speakers of Ghanaian English adapt possessive markers in a way that reflects the interplay between their native language phonetics and the influence of English. In sum, the examination of verbs, nouns, and possessive markers in Ghanaian English reveals a complex and dynamic linguistic landscape. The presence of divergent realizations for these markers highlights the impact of native language sounds, phonetic patterns, and potentially other linguistic influences on the pronunciation patterns of Ghanaian English speakers. This linguistic diversity enriches our understanding of how language evolves and adapts within multicultural and multilingual contexts.

### 5.1.2 The patterning of phonologically-conditioned allophones in Ghanaian English

The study's findings regarding the pronunciation patterns of Ghanaian English speakers shed light on intriguing aspects of their phonological choices, particularly in the use of the voiceless variant [s] over [z]. One noteworthy inference from this study suggests that Ghanaian English speakers tend to opt for [z] when dealing with words whose base form already ends with /z/. This preference reflects a certain level of phonological consistency or mimicry, where the pronunciation of a word aligns with its unaltered, root form. On the other hand, when confronted with other instances where [z] should theoretically appear, such as in possessive markers, they may opt for devoicing, changing [iz] to [is]. This suggests a certain degree of fluidity and adaptability in their pronunciation, perhaps driven by a subconscious awareness of the phonological differences between these contexts. When it comes to the production of the voiced alveolar plosive /d/, the consistency in using the allophone [d] can be attributed to various factors. Firstly, [d] is characterized by voicing and articulatory simplicity, making it a natural choice for pronunciation. Moreover, Ghanaian English speakers likely have early exposure to [d] in their linguistic environment, contributing to their familiarity and comfort with its usage.

However, a notable deviation from Standard English is the widespread substitution of [ɪ] in [ɪd] with [ɜ], resulting in words ending with [ɜd] instead of [ɪd]. This substitution can be understood within the framework of the Speech Learning Model (SLM), which considers how second language learners perceive and categorize sounds in the target language (L2). In this case, it appears that Ghanaian English speakers may categorize [ɪd] and [ɜd] as similar phonemes due to their phonological environment or possibly similarities with native language sounds. This perceptual assimilation, driven by the way they hear and process these sounds, contributes to the observed pronunciation pattern. Regarding the voiced alveolar plosive /t/, the variation between [t] and [ɪd] can be seen as a product of phonological rules and

speech patterns. Some speakers may not perceive a significant phonemic difference between [t] and [id] in certain contexts, meaning that these variations do not significantly affect word intelligibility. Consequently, they may default to the more common or easier-to-produce variant, which, in this case, is [id].

### **5.1.3 Factors that contribute to the level of phonological awareness of the Ghanaian English speaker**

The narratives shared collectively provide a profound insight into the intricacies of education and learning experiences. They highlight the multifaceted challenges faced by individuals in their pursuit of education. One significant challenge is the transition from their native language, Twi, to English, the language of formal education. This transition poses a considerable hurdle as it requires not only mastering a new language but also adjusting to an entirely different medium of instruction. Late enrollment in school is another prevalent issue discussed in the narratives. Delayed entry into the formal education system can lead to grade placement difficulties, making it challenging for students to catch up with their peers. This struggle underscores the importance of early access to education. Financial constraints emerge as a recurrent theme in these narratives, shaping the trajectory of the researcher's educational journeys. Limited financial resources can hinder access to quality education, from purchasing textbooks to affording school fees. These financial constraints often dictate the choices and opportunities available to the researcher in their pursuit of education. Family plays a pivotal role in shaping the educational experiences of the researcher. Those with an early introduction to formal education within their families tend to prioritize English language proficiency. This early exposure not only sets the stage for language acquisition but also instills a deep appreciation for the value of strong language skills. Within the household, diverse learning paths are evident, reflecting the varied approaches to education within the community. This diversity highlights the uniqueness of each

individual's educational journey, emphasizing that there is no one-size-fits-all approach to learning. Shifting the focus to the participants' reflections on language, we gain insight into their perspectives on fluency and proficiency. Some equate fluency with overall language proficiency, perhaps overlooking the nuanced aspects of language skills, such as grammar, vocabulary, and pronunciation. This perspective underscores the complexity of language and the need for a more comprehensive understanding of language proficiency. Critiques of individuals perceived as inauthentic in their speech reveal the researcher's awareness of language variations and the role of privilege and education in shaping speech patterns. The recognition of these factors highlights the importance of considering sociolinguistic variables when evaluating language use.

One intriguing aspect of these narratives is the researcher's emphasis on a comprehensive education over language proficiency. This perspective challenges the conventional notion that language skills are a direct measure of intelligence. It suggests that intelligence and education encompass a broader range of skills and knowledge beyond language proficiency. In their self-assessment, the researchers express a balanced view of their language skills. They convey confidence in their abilities while acknowledging areas where improvement is possible. This self-awareness reflects a growth mindset and a commitment to continuous learning. Lastly, the lower priority assigned to the English language by some researchers may stem from cultural or linguistic background considerations. It underscores the significance of preserving and valuing one's native language and culture while navigating the challenges of learning a second language.

## **5.2 The importance of phonologically conditioned allophones in Ghanaian English**

The production of phonologically conditioned allophones in Ghanaian English plays a significant role in various aspects of communication and cultural identity. One of the most prominent impacts is on cultural expression. The unique phonetic characteristics of Ghanaian

English reflect the influence of local languages such as Twi, Ewe, and Ga. This linguistic interplay not only highlights the rich tapestry of Ghana's linguistic heritage but also allows speakers to convey their identity and pride in their culture. Through distinctive pronunciation patterns, individuals can foster a sense of belonging and connection to their community, serving as a symbol of resistance to colonial linguistic norms. Clarity and comprehension are also critical when it comes to these phonological variations. As Ghanaian English develops its own allophonic features, misunderstandings can arise, especially when communicating with non-local speakers unfamiliar with these nuances. By recognizing and addressing these differences, speakers can enhance mutual understanding in multicultural settings. Moreover, the ability to adapt pronunciation based on the audience can facilitate clearer communication, particularly when interacting with international visitors.

Linguistically, Ghanaian English exemplifies the diversity of English as a global language. The presence of allophones underscores how English evolves in different sociolinguistic contexts, reinforcing the idea that there is no single 'correct' form of the language. This variation provides valuable insights for linguistic research, helping scholars understand phonological processes and how they interact with various social dialects. Language attitudes are equally important in this discussion. The perception of phonologically conditioned allophones can significantly influence social attitudes toward Ghanaian English. Positive perceptions can promote acceptance and appreciation of this local variety, while negative attitudes may lead to stigmatization. Recognizing the legitimacy of Ghanaian English empowers speakers, encouraging pride in their language and challenging notions of superiority often associated with Standard English.

### **5.3 Pedagogical implications**

Even though individual learners may have different needs and learning styles, one can adapt and personalize the instruction to meet their specific requirements. On sound

identification, teachers may begin by helping learners identify the specific sounds they struggle with. Provide ample listening exercises where they can distinguish between target sounds and similar ones. Use minimal pair activities to highlight the differences. To improve their phonetic awareness, the teacher should introduce learners to the International Phonetic Alphabet (IPA) charts. They should be taught each of the symbols associated with the target sounds and practice transcribing words using the IPA charts.

#### **5.4 Suggestions for future research**

In future researches, it may be of interest to investigate the issues raised in this paper further, exploring a broader range of phonological conditioned sounds beyond the specific ones targeted in this study. Also, a longitudinal study can be conducted to examine the progression of learners' pronunciation skills over an extended period. One can also investigate the factors that contribute to individual variability in pronunciation acquisition. For instance, how age, motivation, cognitive abilities, and prior language learning experiences impact the development of pronunciation skills. Again, further works can be done in relation to the learners' attitudes towards pronunciation and the role of affective factors in their learning process.

Interested researchers could also investigate the effectiveness of computer-assisted pronunciation training (CAPT) programmes, mobile applications, and virtual reality platforms in supporting learners' pronunciation development. Assess the benefits of integrating automatic speech recognition (ASR) technology for real-time feedback and self-assessment. Investigations on the training needs of ESL teachers regarding pronunciation can be conducted. Here, one can examine the effectiveness of professional development programs and methodologies for enhancing teachers' knowledge and pedagogical skills in teaching pronunciation. Finally, researchers can make use of large-scale corpora to analyze learners' pronunciation errors systematically. With this, they can identify common patterns and

challenges faced by learners in specific language groups. By delving deeper into these areas, researchers can further expand the understanding of pronunciation acquisition and instruction.

#### **5.4 Conclusion**

In conclusion, this research looked at phonological conditioning in Ghanaian English, highlighting the diverse realizations of markers. These patterns are influenced by native language sounds and phonetic awareness. The chapter also underscores the challenges and value of education and language learning in a remote village. Pedagogical implications stress the importance of sound identification, phonetic awareness, articulatory training, error correction, and multimedia resources in pronunciation instruction. The impact of native language phonetics on English pronunciation underscores the importance of understanding local language backgrounds in teaching English. This can help educators tailor their instruction to address specific pronunciation challenges. The finding that there are varied realizations of phonological markers highlights the complexity of Ghanaian English. This diversity reflects the influence of native languages and suggests that pronunciation in Ghanaian English is not monolithic but shaped by multiple linguistic factors. Future research avenues include exploring a wider range of phonological sounds, conducting longitudinal studies, examining factors affecting pronunciation acquisition, assessing technology's role in instruction, addressing ESL teachers' training needs, and analyzing learner errors using corpora.

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## APPENDIX I

### WORDLIST

binged, faked, ricked, tracked, melted, Tors, Chiefs, Eras, Tasses, Gutches, Kazhes, Nizzes,  
motted, bodded, Wug's, 'bik's', 'niz's'



## APPENDIX II

### Interview Questions

#### Language Acquisition and Phonological Development

These questions aim to explore how participants' language acquisition journey influenced their pronunciation skills, with a focus on age of exposure, sources of exposure, and any challenges they encountered.

1. At what age did you first begin to learn English? How would you describe your initial exposure to the language?
2. What were the main sources of your exposure to English when you were first learning? (e.g. formal education, family, media, travel, social interactions)
3. Did you encounter any particular challenges or limitations during the early stages of learning English? If so, how did these challenges impact your pronunciation development?
4. How would you describe the role of your native language in shaping your English pronunciation? Do you feel your first language influenced how you speak English?
5. To what extent do you think your exposure to other languages (besides your native language and English) has influenced your pronunciation of English? Can you provide examples of how other languages might have affected your phonological development?
6. In your opinion, how important was the age at which you were first exposed to English in shaping your ability to pronounce it correctly? Would you say that early exposure made a difference in your pronunciation skills?
7. Have you faced any specific challenges related to the differences in pronunciation between your native language and English? How have you worked to overcome these challenges?

#### 2. Impact of Speech Therapy on Pronunciation

These questions explore whether speech therapy interventions have had any influence on the participants' pronunciation skills.

##### Questions:

1. Have you ever received speech therapy or similar interventions aimed at improving your pronunciation? If so, what kind of techniques or strategies were used during the sessions?
2. How effective did you find speech therapy or other interventions in helping you improve your pronunciation skills? Can you describe any specific improvements you noticed after therapy?
3. If you had access to speech therapy during your language learning process, do you think it would have made a significant difference in your phonological development? Why or why not?
4. Do you think speech therapy should be incorporated more into English language learning programs, especially for students who face pronunciation challenges? What are your thoughts on this?

#### 3. Reflection on Language Acquisition and Phonological Development

These questions invite participants to reflect on how their overall language learning experience has impacted their phonological development.

##### Questions:

1. Looking back at your language learning journey, how would you describe the overall impact of early exposure to English on your pronunciation?

2. Have you noticed any lasting effects of your language acquisition process on your English pronunciation, even now? How would you describe those effects?
3. How do you think your phonological development could have been supported better during your language learning process? Are there any specific resources or methods you wish had been available to you?
4. Do you believe that your phonological development has been influenced more by the type of language exposure you had (e.g., informal vs. formal) or by the quality of that exposure? Could you explain why?



## APPENDIX III

### Passage Female Participants

From the time she was little, Maria had always been the one to take care of her little sister, Ellie. As children, they were inseparable—Maria, the responsible older sister, always looking after Ellie when their parents were busy. As they grew up, their roles remained the same, with Maria guiding Ellie through every challenge life threw at her. Time passed, and Ellie grew older, eventually getting married and moving abroad with her husband. Maria, although missing her sister, was proud of the woman Ellie had become. Now, several years later, Ellie called with exciting news. She was pregnant and needed help. Her pregnancy had brought new challenges, and she wanted her big sister by her side again. Maria, who had always been there for Ellie, didn't hesitate for a moment. She packed her bags, and with her own children in tow, she made the journey to Ellie's home abroad. The children were excited to explore the new neighborhood. Once they arrived, they ran outside to play, a short walk away from Ellie's home. They decided to play a language game that Maria used to play with them when they were younger. It was simple and fun—one child would say a word, and the others had to spell it. The game became even more fun when they started making up their own words.

"Spell 'glasses,'" Maria's daughter said.

"Okay, G-L-A-S-S-E-S!" her cousin responded quickly.

Then the words grew stranger. The children laughed as they tried to spell the funny words that no one had ever heard of.

"How about 'wugs'?" one child suggested.

\wʌgz\the other replied confidently. "Now, 'luns,'" another child added.

\ʌns\came the answer.

The game went on, growing sillier with each made-up word:

binged, faked, ricked, tracked, melted, Tors, Chiefs, Eras, Tasses, Gutches, Kazhes, Nizzes, motted, bodded, Wug's, 'bik's', 'niz's'

\bɪŋd, \feɪkd, \rɪkd, \trækd, \mɛltɪd, \glæsis, \wʌgz, \tɔrs, \tʃɪfs, \ˈiərəz, \tæsɪz, \gʌtʃɪs,

\kæzɪs, \nɪzɪz, \mɒtɛd, \bɒdɛd, \wʌgz, \bɪks, \nɪzɪs\

The air was filled with laughter and the light-hearted sound of children trying to master the impossible words. It was moments like these that reminded Maria of how much her sister's family had grown, and yet, how some things—like the joy of playing together—never changed. As the sun began to set, the children reluctantly decided it was time to head home. They walked back to Ellie's house, where Maria prepared to say goodbye. It was time to return to their own country. Ellie, now well into her pregnancy, would be okay—she was no longer the little girl who needed constant care. Yet, the bond between them remained, as strong as ever. Later that evening, with bags packed and the goodbyes said, Maria and her children got ready to leave. The time spent together had been short, but precious. And as Maria looked at her sister, a small part of her felt content knowing that, even though they were far apart, they would always be there for each other, just as they always had been.

## Male participant

From the time she was little, Maria had always been the one to take care of her little sister, Ellie. As children, they were inseparable—Maria, the responsible older sister, always looking after Ellie when their parents were busy. As they grew up, their roles remained the same, with Maria guiding Ellie through every challenge life threw at her. Time passed, and Ellie grew older, eventually getting married and moving abroad with her husband. Maria, although missing her sister, was proud of the woman Ellie had become. Now, several years later, Ellie called with exciting news. She was pregnant and needed help. Her pregnancy had brought new challenges, and she wanted her big sister by her side again. Maria, who had always been there for Ellie, didn't hesitate for a moment. She packed her bags, and with her own children in tow, she made the journey to Ellie's home abroad. The children were excited to explore the new neighborhood. Once they arrived, they ran outside to play, a short walk away from Ellie's home. They decided to play a language game that Maria used to play with them when they were younger. It was simple and fun—one child would say a word, and the others had to spell it. The game became even more fun when they started making up their own words.

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\bɪŋgd, \feɪkd, \rɪkd, \trækd, \mɛltɛd, \glæzɪz, \wʌgz, \tɔrz, \tʃɪfs, \ɪərəz, \tæsɪz, \gʌtʃɪz, \kæzɪz, \nɪzɪz, \mɒtd, \bɒdɛd, \wʌgz, \bɪkz, \nɪzɪz\

The air was filled with laughter and the light-hearted sound of children trying to master the impossible words. It was moments like these that reminded Maria of how much her sister's family had grown, and yet, how some things—like the joy of playing together—never changed. As the sun began to set, the children reluctantly decided it was time to head home. They walked back to Ellie's house, where Maria prepared to say goodbye. It was time to return to their own country. Ellie, now well into her pregnancy, would be okay—she was no longer the little girl who needed constant care. Yet, the bond between them remained, as strong as ever. Later that evening, with bags packed and the goodbyes said, Maria and her children got ready to leave. The time spent together had been short, but precious. And as Maria looked at her sister, a small part of her felt content knowing that, even though they were far apart, they would always be there for each other, just as they always had been.