UNIVERSITY OF CAPE COAST

IDENTIFICATION OF EUE PHONEMES IN THE THREE MAJOR DIALECTS OF EUE

SEYRAM KWAKU ACKUMEY

2021

UNIVERSITY OF CAPE COAST

IDENTIFICATION OF EUE PHONEMES IN THE THREE MAJOR DIALECTS OF EUE

BY

SEYRAM KWAKU ACKUMEY

Thesis submitted to the Department of Ghanaian Languages and Linguistics of the Faculty of Arts, College of Humanities and Legal Studies, University of Cape Coast, in partial fulfilment of the requirements for the award of Master of Philosophy degree in Ghanaian Languages

SEPTEMBER 2021

DECLARATION

Candidate's Declaration

I hereby declare that this thesis is the result of my own original research and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Signature……Date……..

Name: Seyram Kwaku Ackumey

Supervisor's Declaration

We hereby declare that the preparation and presentation of this thesis were supervised in accordance with the guidelines on supervision of thesis laid down by the University of Cape Coast.

Principal Supervisor's Signature……Date……...

Name: Professor Edoh TORGAH.

Co-Supervisor's Signature……Date……

Name: Dr. Vincent Erskine Aziaku

ABSTRACT

Discourse on the Eʋe phonology has provided several studies on the Eʋe phonemes, some of them include Abadzivor and Dzamesi (2008); Agbedoxor (2014); Amegashie (2011); Ansre (1961); Anyidoho (1990); Atakpa (1997); Duthie (1996); Kpodo (2014) and Nyomi (2017). However, the main issues are that most of them have professed varying number of Eʋe phonemes and conflicting description of some of the sound segments. Therefore, using the classical phonemic analysis in a phenomenological approach, this study establishes the number of Eʋe phonemes in the three main Eʋe dialects through interacting with 20 Aŋlɔ, Eʋeme and Tɔŋu native speakers respectively. The results from the phonemic and articulatory analysis of the data show that all the three main dialects of Eʋe have 28 consonant phonemes (/b, p, ß, ɸ, m, w, v, f, d, t, z, s, ʤ, ʧ, n, r, l, ɖ, ɲ, j, g, k, h, x, ŋ, ɯ, gb, kp/) but varied number of vowel phonemes. Aŋlɔ has 14 vowel phonemes (/i, e, ə, a, u, o, ɔ, ĩ, ẽ, ə̃, ã, ũ, õ, ɔ̃/); Eʋeme has 12 vowel phonemes (/i, ɛ, a, u, o, ɔ, ĩ, ɛ̃, ã, ũ, õ, ɔ̃/) while Tɔŋu has 15 vowel phonemes (/i, e, ɛ, ə, a, u, o, ɔ, ĩ, ẽ, ɛ̃, ə̃, ã, ũ, ɔ̃/); totalling 42, 40 and 43 phonemes for Aŋlɔ, Eʋeme and Tɔŋu respectively. The study also ascertains the description of [w], [d], [t], [dz], [ts], [r], [l], [ɖ], [ɯ], [k^w], [a] and [ã] sound segments and asseverates the plausible reasons for the variations in the earlier studies' findings. The findings in this research have some implications for scholarship, pedagogy and theory. In that, imparting phonemic awareness and phonic skills, especially in a cosmopolitan Eʋe class, demands good knowledge of the findings of this study.

KEY WORDS

Allophones

Eʋe dialects

Eʋe phonemes

Free-variants

Standard Eʋe

Variations in Eʋe phonemes

ACKNOWLEDGEMENTS

I truly appreciate my supervisors, Prof. Edoh TORGAH and Dr. Vincent Erskine Aziaku, for their insightful guidance, suggestions and encouragement, without which this work would have been a flop. I am forever grateful.

I am also grateful to Dr. Kofi Busia Abrefa, Dr. Emmanuel Amo Ofori, Dr. (Mrs.) Gladys Mansa Feddy Akyea, Miss Mercy Adzo Klugah, Miss Ernestine Abla Segbedzi, Mr. T. K. Yevu, Mr. G. K. Drorvu and Mr. S. Kpodo for their immerse support and encouragement for the completion of this study. I must mention the selfless support and services of Mr Ben Agbeyesoro and Mr John Atitse during my data collection. Thank you all for all your contributions.

I am forever indebted to my cousins, Prof. Edem Kwasi Bakah and Mr Joseph Gbekle for always pushing me to be the best. I must say all these would not have been realised if not for the motivation from them and my mentors, Prof Edoh TORGAH and Dr. (Mrs.) Gladys Mansa Feddy Akyea.

Finally, I thank my wife, Rejoice Vormawor and my daughters, Fafali Jennifer Ackumey and Aseye Phylis Ackumey for their support and motivation to successfully complete this research within schedule.

DEDICATION

To my wife, Joyce, and my daughters: Fafali and Aseye

TABLE OF CONTENTS

LIST OF TABLES

LIST OF ABBREVIATIONS

SE	Standard Eʋe
VPM	voicing, place and manner of articulation
HBR	height, backness and roundness

CHAPTER ONE

INTRODUCTION

This chapter gives the context in which the work is situated. It provides a background to the study, states the problem at hand, the questions that guide the research, the significance of the study, delimitations and limitations of the study, as well as the thesis organisation. The chapter concludes with a summary of the key issues in the chapter.

Background to the Study

It is of essence for every language that is studied to have a very strong literature in all the aspects of the language. Phonology is considered one of the basic aspects of the human language. Moreover, the language acquisition process itself starts from the phonological aspect (Trask, 2007). This is because pedagogically, one needs to learn to speak a language before learning to write it. It is therefore very crucial to have a comprehensive phonology literature which gives an account of the exact phonemes realised in a language and its main dialects. Although various scholars like Amegashie (2011), Ansre (1961), Atakpa (1997), Duthie (1996) and Kpodo (2014) have identified the phonemes in Eʋe, a lot of variations exist that has to be worked on; hence, this study seeks to identify the number of phonemes in the three main dialects of Eʋe, give a description of each of the sounds identified and find out the reasons for the variations in the findings of the previous studies on the Eʋe phonemes.

Eʋe is one of the main dialect-clusters of the Gbe subgroup of languages belonging to the Kwa family of the Niger-Congo phylum. It is spoken in West

Africa: Ghana, Togo and Benin (Ameka, 1991; Ameka & Essegbey, 2006). Despite its use in these other countries, this study focuses on the Ghanaian variety of Eʋe, which is classified generally into the northern (inland) and southern groups (Ansre, 1961; Kpodo, 2017), with the northern group made up of Eʋeme dialect and the southern group mainly made up of Aŋlɔ and Tɔŋu dialects.

Generally, any study into a language is situated in the linguistic domain. Linguistics, according to Akmajian, Demers, Farmers and Harnish (2010, p. 5), is "the scientific study of human natural language". Linguistics, therefore, focuses on the form of the human language. There are various fields of the human language which have been researched into over the years: phonology, morphology, syntax and semantics. Thence, it has been accepted that there are linguistic universals like grammar and sound system which are crucial properties of a natural language (Chomsky & Halle, 1968). Thus, this study focused on Eʋe phonology, as a subfield of Eʋe Linguistics.

Phonology is basically the scientific study of a particular human language with the focus on its sound system and the patterns they form (Akmajian et al., 2010; Yule, 2014). As affirmed by Katamba (1989, p. 18), "one important aspect of linguistic knowledge is the knowledge of the functional phonological units which occur in one's language - the knowledge of the segments which can be arranged in different patterns to form words". These basic functional phonological units for studying the sound system of a language are the phonemes.

Phonemes are considered a family of sounds with similar distinctive features and they are always meaning distinguishing when used in similar or same environment (Katamba, 1989; Ladefoged & Johnson, 2011). Again, Ladefoged and Johnson (2011) aver that the phonemes serve as the basis for a systematic unambiguous written language. If this is factual, then languages should have a definitive phoneme system which could only be altered by language growth because every living language must grow. More so, linguists have noted that languages that are studied over time are found to have specific number of phonemes (Bizzocchi, 2017).

My motivation for studying the phonemes of the major dialects of Eʋe also stems from my interest in knowing how the sound system works in Eʋe. As a teacher of the language, I observed over the years that the existing literature is not only lacking in terms of the details on phonemes but also exhibits a significant degree of variation among scholars. For instance, the phonemes of Eʋe have been studied over the years by some scholars who have come out with their various findings. Agbedoxor (2014) posits that Eʋe has forty-five (45) phonemes; Kpodo (2014) pegs it at forty-three (43) phonemes, just as Amegashie (2011) avers; Abadzivor and Dzamesi (2008) maintain the existence of forty-seven (47) of them. Atakpa (1997) identifies forty-two (42) phonemes; thirty-eight (38) phonemes are indicated by Duthie (1996) and forty-four (44) by Anyidoho (1990) as Ansre (1961) highlights thirty-nine (39) of them. In all, it has been realized that although some have the same total number of phonemes, the specific phonemes identified to make up the total number differ. This is not definitive enough. These numerical and phonemic variations

reported in the works of the above scholars incite some curiosity to investigate the actual number of phonemes in the main dialects of Eʋe. This research will also establish the relationship between the already identified phonemes and offer explanations for the variations noted.

Statement of the Problem

According to Bizzocchi (2017) and Sarma and Sarma (2013), languages are supposed to have a specific number of phonemes; hence, English is noted to have forty-four (44) phonemes (Bizzocchi, 2017; Clemente, 2012; Cruttenden, 2001) while French, according to Nitze and Wilkins (2016), has thirty-seven (37) phonemes. Phonemes are the starting point for studying the sound system of languages because it is one of those linguistic units which bring about difference in the meaning of words in any language (Katamba, 1989). However, from the findings of the earlier researchers like Abadzivor and Dzamesi (2008); Agbedoxor (2014); Amegashie (2011); Ansre (1961); Anyidoho (1990); Atakpa (1997); Duthie (1996); Kpodo (2014) and Nyomi (2017), the number of Eʋe phonemes ranges from thirty-eight (38) to forty-seven (47), with some variations in even their descriptions of some of the consonant sounds like [t], [d], [r], [l], [ɯ], [w], [d̪], so are the vowels [a] and [ã]. It looks like the exact number of phonemes in Eʋe cannot be determined from their findings. These variances seem to emanate mainly from the fact that they did not focus on the main dialects of Eʋe during the data collection process which caused a dialectal influence on the findings of these scholars. It is against this backdrop that the need arises for more data analysis to be done on the three main dialects, which

are Aŋlɔ, Eʋeme and Tɔŋu, to establish the number of phonemes in the three main Eʋe dialects and the reason(s) for the variations in the previous findings on phonemes.

Objectives of the Study

The specific objectives of this study are to:

1. Establish the number of phonemes in the three major dialects of Eʋe.

2. Find out the possible reasons for the variation in the number of phonemes identified by previous scholars.

Research Questions

This research is guided by the following research questions:

1. How many phonemes exist in each of the three major Eʋe dialects?

2. What factors may account for the variation in the number of phonemes identified by the previous works?

Significance of the Study

This study, in the long run, helps in identifying the number of phonemes in the three major dialects of Eʋe. Prior to this study, it has been difficult to pinpoint a definite number of phonemes in the Eʋe language because of the varying numbers churned out by various Eʋe linguists. Consequently, the exact total number of consonant or vowel phonemes in Eʋe could not be specifically identified; hence, the need for the study on the phonemes in the three major

dialects of Eʋe. It also brought to the fore the similarities and differences in phonemes employed by Aŋlɔ, Eʋeme and Tɔŋu dialects. Knowing the specific number of consonant and vowel phonemes in the main Eʋe dialects is again very important because it serves as the basis for studying the larger units like the clusters, syllables, words and even utterances in Eʋe (Katamba, 1989).

In addition, the study also identifies some of the possible allophones and free variants in the three major dialects of Eʋe. It is very important to distinguish between the meaning distinguishing sounds in the language; those that are in complementary distribution and those that are just used to get different versions of the same semantic lexical unit that are developed from varied pronunciations from the different dialects of Eʋe. In other words, this study highlights how various sounds share their markedness to get variants of sounds in Eʋe. As ascertained by Rice (2007), there are limitations to how sounds could influence the other in a particular environment or language and the patterns they could form, therefore this study brings out some of the possible assimilatory processes among the Eʋe sounds and their limitations.

More so, this work further enriches the phonology of Eʋe. This is because the phonology of Eʋe cannot be exhaustively studied without the complete knowledge of the phonemes and their variants; this study, therefore, provides specific details on the sounds that come to play in the Eʋe phonology, making the Eʋe Phonology literature richer.

Furthermore, this study will be a valuable reference material for both lecturers and students. In this regard, the teachers will find relevant information regarding the various manifestations of phonetic realisations of the various phonemes in the language, which makes teaching easier, even to those who study Eʋe as a second or foreign language. It will also serve as a reference material for teachers who teach various concepts in phonology.

Finally, this study could serve as the basis for further research on the number of phonemes in the various dialects of Eʋe. For the findings that emanated from this study to be authenticated, other researchers ought to work around the same premises. This work will, therefore, be a starting point for those who wish to verify the conclusions of this study.

Delimitations

This study focuses on only the Aŋlɔ, Eʋeme and Tɔŋu dialects because according to Atakpa (1985) and Duthie (1996), the standard Eʋe has linguistic features mainly from Aŋlɔ, Eʋeme and the Lomé variant. This study however excludes the Lomé variant because the focus is on the Ghanaian Eʋe. Kpodo (2017) also affirms the dialectal selections of this study by grouping the Eʋe dialects into two broad groups: The Aŋlɔ and Eʋeme. Tɔŋu seems to be the third main Ghanaian variant of the Eʋe language, in that, the main phoneme and toneme variations seem to occur mostly between the Aŋlɔ, Eʋeme and Tɔŋu dialects as illustrated in some examples of Agbedoxor (2014) and Capo (1991). This is further affirmed by Awoonor-Aziaku (2018) that Eʋe has Aŋlɔ, Eʋeme and Tɔŋu as its main divisions. More so, Ackumey and Folivi (2015)

and Datsa (2012) based their study on the Aŋlɔ, Eveme and Tɔŋu, which are considered by Agbedoxor as the major dialects in Eʋe and each has sub-dialects that are all mutually intelligible; thus, the need to base this study on these 3 dialects. Their inclusion in the work also helped the study to come out with a comprehensive outcome on the phonemes in the language.

Again, this work focuses on just the phonemes and their variants in Eʋe with less attention on the suprasegmental features. Therefore, this study describes the various sound segments in the language. The study is mainly targeted at affirming the already identified sounds but opened to identifying new ones thereof.

Limitations

A worldwide pandemic called Covid-19, a novel corona virus that swept through all the corners of the world led to the restriction of movement of people because of its contagious nature. This delayed the data collection process because of the issue of social distancing and the policy of staying at home to avoid the spread of the virus.

Some respondents noted they had no time to partake in the interaction and they were not ready to be convinced otherwise too. Some were also apprehensive that their voices might be published to the public. I and the assembly members of the areas involved in the study had to do more education on how confidentiality would be respected and safeguarded to alley their fears, some still refused to participate though. Some were again of the view that the researcher was just going to make money out of them, therefore, they ought to

be compensated for participating in the study. This, with transportation and accommodation expenses, increased the resources invested in the study. I had to spend more days at Tavieʃe because most of the respondents were farmers who spent most part of the day on the farm, this also delayed the data collection process.

The interactions and recordings were not done in a lab where interruptions could have been avoided. There were therefore some level of interferences and disruptions during the data collection processes. Children, for instance, came in with various forms of disruptions, so were birds and other animals because some respondents would not allow the use of their rooms as mini labs. I therefore had to pause the recordings to minimise these interferences, which made some of the interview sessions longer than usual.

Organisation of the Study

This work is structured in five chapters. Chapter one, which is the introduction, includes the background of the study; statement of the problem; research objectives and questions; the significance of the study; delimitation; limitation; organization of the study and a summary of the chapter. Chapter two covers the reviewed related literature: the theoretical and conceptual framework of the study and the empirical review. Chapter three is constituted by the methodology: the research method, the study area, the population, sampling process, data collection instrument and procedure; data processing and analysis procedures. The fourth chapter presents the results and discussions while the final chapter entails summary of the findings, implications of the study and some suggestions for further studies.

Chapter Summary

This chapter provided a background to the study. It also defined the gap in the literature, the objectives of the study and the questions that guided the study. The significance of the study was highlighted with the delimitations and limitations. The chapter finally outlined how this thesis was structured.

CHAPTER TWO

LITERATURE REVIEW

Introduction

This chapter concentrates on the theoretical framework, the conceptual and empirical review of literature related to the study. The theoretical framework explains the basic principle underlying the study; the conceptual review clarifies the key concepts in the study while the empirical review brings to fore the findings of previous scholars.

Theoretical Framework of the Study

This study mainly employs the phonemic theory as the framework for the research.

The phonemic theory

The classical phonemic theory, which was initially expounded by Jan Niecislaw Baudouin de Courtenay and Nikolaj Kreszewski, is the first significant basic phonological theory in the twentieth century. The phonemic theory is basically concerned with the identification and classification of phonemes and their variants that exist in a currently-spoken language based on contrast and predictability (Brown & Miller, 2013; Dresher, 2011; Katamba, 1989; Zsiga, 2013). A phoneme, from the various phonemic theorists' point of view, is not just an abstract family of phonetically similar speech sounds but also a meaning distinguishing unit based on distributionalism, which is one of the basic principles of the phonemic theory. This principle mainly emanates from the functionalist point of view.

Another core principle that underpins this study, according to the phonemic theory, is that for sound segments to be considered as allophones of the same phoneme, they must share some phonetic similarity (Dresher, 2011; Katamba, 1989). This is to prevent the lumping of sounds that are complementary in distribution but differ phonetically as allophones of a phoneme. A common example is the English phonemes /h/ and /ŋ/ that appear to be in a complementary distribution because /h/ typically occur at syllable initial as /ŋ/ occurs syllable final. However, they are completely phonetically different hence they are not variants of the same phoneme.

Lui (1994) posits that the classical phonemic theory is "a practical tool for describing the relationship between the sounds of a language and its meaning" (p. 39). However, Kenstowicz (2006) postulates that the generative linguists like Chomsky and Halle (1968) have raised some critical issues why the phoneme should not be the core focus of studying phonology. Key among them is the phoneme not being the basic unit of phonology but the distinctive features (Lui, 1994). The phoneme and its variants nonetheless are crucial to language teaching and learning because of their basic but practical orientation, especially at the pre-tertiary level. Dresher (2011) further underscores the concept of phoneme as a key element for linguistic description. This study focuses on establishing the phonemes in the three main dialects of Eʋe hence the phonemic theory, according to Isa (2011), is the framework to use. Trauth and Kazzazi (Eds.) (1996) again ascertain the use of taxonomic or phonemic analysis as the means to classify the phoneme which is one of the linguistic units. Every sound that is used in a language belongs to a particular phoneme.

According to Dresher (2011); Katamba (1989) and Zsiga (2013), the minimal pair test (commutation test), that involves the use of minimal or near-minimal pairs and contrast in analogous environment test are approaches to identifying the phonemes and their variants in a language. The minimal and near-minimal pairs (sub-minimal pairs) are used in this study. The minimal and near-minimal pairs are further discussed under the concept of phoneme.

Conceptual Reviews

Since the study boarders on phonology and the Eʋe phonemes, it is important to discuss some phonological concepts that have direct relevance for the analysis and conclusions in the subsequent chapters. The discussion begins with Eʋe phonology. Phonemes, allophones, free-variants, phones and the standard Eʋe are other concepts in focus.

Eʋe phonology

Phonology as a form of structural linguistics can be used specifically or universally according to Akmajian, Demers, Farmers and Harnish (2010). Specifically, it refers to the sound patterns of a particular language, where Eʋe Phonology can be categorized. When used universally, phonology encompasses the general underlying principles of the natural human language sound systems. Crystal (2008) and Gut (2009) further divide the phonology of a specific language into segmental and suprasegmental phonology. In view of the above, the working definition adopted for Eʋe Phonology is the scientific study of the sound patterns in Eʋe, which has the segmental and suprasegmental aspects. This study specifically focuses on the segmental phonology of Eʋe.

Segmental phonology, according to Crystal (2008) and Gut (2009), deals with the distinctive units referred to as phonemes. Therefore, the segmental phonology of Eʋe is the study of the sound segments in Eʋe while the suprasegmental phonology of Eʋe studies the units beyond the segment level like the syllable, tone, pitch, length, stress and intonation.

The syllable is a key phonological concept that is central in determining the pattern of sound segments (phonotactics) of a particular language (Wiese, 2006; Zec, 2007). The sound segments (consonantals and nonconsonantals) with tonemes mainly interact to form syllables that form words and ultimately utterances. This is affirmed by Ansre (1961) that the phonemic features and the tonemes of Eʋe are inextricably but systematically interrelated. Thus, a clear grasp of the sound system which is the segmental aspect of the language is the basics to better understand the suprasegmental concepts.

Phonemes

Phonemes, according to Akpanglo-Nartey (2002) and Yule (2014), are a set of contrastive sounds of a language. In other words, they are meaning-distinguishing sounds in a particular language which are always in a contrastive distribution; therefore, they occur in a similar or same environment. Again, a phoneme, as an abstract concept, is considered a family of similar sounds that are considered a unit (Katamba, 1989; Meyer, 2009; Mullany & Stockwell, 2010). A phoneme can therefore be referred to as a family of similar sounds which are represented by a symbol and can bring about difference in meaning. This abstract phoneme is represented with slash brackets /k/ while the physical representation of a phoneme is represented with a phonetic or square brackets

[k]. Languages, and even dialects of the same language, have some form of variation in the set of phonemes and the numbers that constitute these sets range from 15 to 80 (Brown & Miller, 2013; Crystal, 2008). However, the variation may just be allophonic especially in the dialects of the same language.

The phonemes in a language, according to Brown and Miller (2013) and Crystal (2008), can be identified through the use of minimal pairs or sets. This is employed in what Crystal refers to as Minimal Pair Test. Minimal pairs are two words with the same sound segments but differ in only one sound segment and meaning (Brown & Miller, 2013; Crystal, 2008; Hickey, 2014). They note that when the words are more than two, then they are referred to as minimal sets. Minimal pairs are not always available to test the contrastive nature of some unique sound segments; the near-minimal pair is useful in such contexts (Verma & Krishnaswamy, 1989). The near-minimal pair, according to Fromkin (Ed.) (2000), "can be defined as pairs which would be minimal except for some quite irrelevant difference" (p. 535), for instance, [bəl] and [bʰəla] are near-minimal pairs contrasting /b/ and /bʰ/ in Hindi. An English example of near-minimal pair that contrasts /ʒ/ and /ð/ are [ɪ'luʒən] and ['smuðən]: they differ in more than one segment. Generally, a phoneme could have only an allophone that dominates in all environment or a number of them. The minimal pair test, according to Crystal (2008), can be carried out by a native speaker or a linguist.

Allophones

Allophones are the variants of a phoneme. Therefore, an allophone is a family member of a particular phoneme as averred by Katamba (1989, p. 18) that "the various physically distinct sounds which count as executions of a given

phoneme are called the ALLOPHONES (or VARIANTS) of that phoneme". Allophones are known to occur at different environments (Atakpa, 1985), thus, they are always in complementary distribution. They are usually used in representing phonetic transcriptions in square brackets (Ladefoged & Johnson, 2011).

Free variants

Free variants are sounds that can be substituted for the other in the same environment without changing the meaning of the word. This is corroborated by Mompean (2008, p. 1) saying "free variation is a well-known phonological phenomenon that occurs when two (or more) phonemes – the free variant – may replace each other in the same position in a word without any change in meaning". Sounds are therefore identified as being in free variation based on their substitutability without any semantic change in the words formed. Thus, free variants only bring about different pronunciations for the same lexical item, for instance, *asi* (hand) could be pronounced as [àʃĩ] or [àsí]. [ʃ] and [s] are therefore in free variation.

Phones

Crystal (2008) avers that phones, according to segmental phonology, are the physical realizations of phonemes which are considered to be abstract. The various manifestations of a phoneme in a particular phonetic environment can be considered a phone.

In all, it could be concluded from these concepts that, depending on the environment and influence on lexical semantics, a sound segment could be

referred to as a phoneme, allophone, free variant or phone in segmental phonology.

Standard Eʋe

The Standard Eʋe (henceforth SE) has a standard written form which is sometimes referred to as Book Eʋe. This standard written form is mostly read using the local accents (Duthie, 1996). This was developed by North German Missionaries to facilitate the spread of the gospel and teaching in their schools as affirmed by Crystal (2008), Trask and Stockwell (Ed.) (2007) and Trauth and Kazzazi (Eds.) (1996) that a standard language has published grammars, dictionaries and it is used in the educational systems. SE, according to Duthie (1996), is a blend of the linguistic features of Aŋlɔ and Eʋeme dialects. There is therefore, a somewhat standard form used in the classroom instructions to create phonemic awareness in the learners of the Eʋe language, which Ameka (1991) acknowledges. To buttress this, observation of teachers of Eʋe language at the basic level throughout the USAID Learning Early Grade Reading Program carried out in Ghana from 2017 to 2019 affirms that some form of SE is employed in enhancing the reading skills of the learners, which starts from the phonological awareness skills. USAID Learning (2017) explains phonological awareness skills as "the ability to hear, distinguish, produce and manipulate the individual sounds in words" (p. 12).

It has become obvious that there is the drive to promote literacy, with the mother tongues as the starting point, especially in Africa through the support of international bodies like The World Bank, USAID, and UNICEF (GES,

2020; Trudell & Adger, 2014). Trudell & Adger (2014) again ascertain that to achieve the level of reading competences demanded of the learners, the focus ought to be on the phonological awareness and phonic skills. The knowledge of the phonemes in such languages is therefore very crucial for teachers to impart these skills into the learners.

A critical look at Eʋe, one of the African languages in focus, affirms the fact that there is a somewhat simple letter-sound relationship in the Eʋe language as compared to other languages like the English language: the letter names of the Eʋe alphabet almost correspond with their letter sounds, as in, the name of the letter 'k' is mostly the same as the sound it produces, which is [k]. Eʋe can therefore be considered as one of the languages that use much of phonemic spelling, unlike English that Ashby (2011) describes as 'a learner's nightmare' (p. 2) because of the complexities in its letter-sound relations. Westermann (1930:16) expresses this saying, "The spelling of actual written Ewe is preponderatingly etymological, i.e., each word is written as it sounds'. Kpodo (2014: 21) further ascertains this saying, "Eɖe dzesi be vovototo boo aɖeke mele Eʋegbe ƒe ŋɔŋlɔdzesiwo kple gbediɖiawo ƒe dzesi siwo míeyɔna be 'IPA SYMBOLS' la dome o". This translates as there is no much difference between the SE and the IPA symbols, a stance Agbedoxor (2014) also holds.

There is therefore a somewhat standard variety which is taught in the classroom when helping the learners acquire the reading competences. Just like the Eʋe language, Eme and Uwaezuoke (2015) notes that the standard Igbo, a

blend of Owerri Igbo and Onitsha Igbo varieties, is what is taught in schools and used in the literature. A standard form of the Eʋe language exists hence, for instance, it will not be very standard if a teacher presents a word like *alo* [àló] (which means 'or') as [àró], which is a typical pronunciation of *alo* among the people of Anlo-Afiadenyigba to the learners of the Eʋe language.

Empirical Review

The empirical review highlights findings of previous scholars on the number of phonemes identified in some languages of the world and narrows it down to Eʋe.

Studies on the Phonemes in English and French

Every language has a specific number of phonemes. English, according to Bizzocchi (2017); Clemente (2012) and Cruttenden (2001), generally has 24 consonant phonemes and 20 vowel phonemes. So, English has a total of 44 phonemes. However, Clemente posits that there are some variations in the number of phonemes in English based on the dialect under discussion, for instance, the Received Pronunciation, General American and General Australian for United Kingdom, United States and Australia respectively have some variation in the number of phonemes they use. This indicates that each standard version of the English language has its specific number of phonemes but it has been generally accepted that English has 44 phonemes. In French, Alphabet Phonétique Association (2020); Nitze and Wilkins (2016) and Walker (2001) assert that French has 37 phonemes which comprise 16 vowels, 3 semi

consonants and 18 consonants. The 16 vowels are made up of 12 oral vowels and 4 nasal vowels.

Studies on the Phonemes in Yoruba and Igbo

Some researchers have analysed the phonemes of some African languages as well. For instance, Eme and Uba (2016) have researched on Yoruba and Igbo, which are West African languages spoken mainly in Nigeria. The standard Yoruba, according to Eme and Uba (2016), is made up of 30 phonemes, comprising 18 consonants and 12 vowels, which is corroborated by Okanlawon (2019). The Yoruba vowels comprise of 7 oral vowels and 5 nasal vowels. Eme and Uba (2016) and Eme and Uwaezuoke (2015) posit that the standard Igbo, on the other hand, has 28 consonant sounds and 8 vowels, making a total of 36 phonemes. They again note that variations exist between the standard form of the language and their variants in terms of the number of phonemes because Edda Igbo, a dialect of Igbo, for instance, has 38 phonemes which consist of 29 consonants and 9 vowels. This implies that the speakers of Edda Igbo use two more phonemes that are not used in the standard Igbo. Clearly, although languages may have a number of dialects, the standard form of the language, ideally, should have a definite number of phonemes that could differ from that of its other dialects.

Studies on the Phonemes in Eʋe

The phonemes in Eʋe are of two types: consonants and vowels.

Eʋe Consonants Identified in Previous Studies

Many scholars, including Abadzivor and Dzamesi (2008), Agbedoxor (2014), Amegashie (2011), Ansre (1961), Anyidoho (1990), Atakpa (1997), Duthie (I996), Kpodo (2014) and Nyomi (2017) have worked on the Eʋe phonemes and have come out with various findings. They all concur that [b, d, ts, dz, ɖ, f, ɸ, g, gb, ɯ, h, x, k, kp, l, m, n, ɲ, ŋ, p, r, s, t, v, ß, w, j, z] are Eʋe consonants. However, Duthie notes that [p] is not part of the Eʋe consonants because it is only found in loan words; but loan words help expand the register of the language and they are part of it. Ansre, Duthie and Kpodo take out [r] on the grounds that it is in complementary distribution with [l]. Duthie again considers [j], [b], [w] and [ɖ] as allophones of /ɲ/, /m/, /ɯ/ and /n/ respectively. Duthie suggests that /ɲ/, /m/ and /n/ only occur before a nasalised vowel, which seems not to be the case because they typically occur with oral vowels. However, progressive assimilation occurs causing the oral vowel to be nasalised, this makes the nasalised vowel variants rather the allophones of their oral family members.

Abadzivor and Dzamesi (2008), Agbedoxor (2014), Anyidoho (1990), Duthie (1996) and Nyomi (2017) add [dzy] and [tsy] as Eʋe consonants; but, [dzy] and [tsy] seem to have some relation with [dz] and [ts] because [dz] and [ts] combine with [j] to get [dzy] and [tsy] and they also appear to be allophones of /ts/and /dz/ respectively. Abadzivor and Dzamesi and Nyomi again, add [kw] which also looks more like an allophone of /k/. Kpodo further identifies [ʃ], [ʒ], [ʤ], [ʧ] and [ɱ] as consonant sounds in Eʋe, indicating [ʤ] and [ʧ] as

phonemes. A critical look at [ʃ], [ʒ], [ʤ], [ʧ] and [ŋ] suggests they may just be free variants or allophones of [s], [z], [dz], [ts] and [ŋ] respectively, a statement Kpodo alludes to when he notes again that [ʃ], [ʒ] and [ŋ] are just allophones. This is because *hand*, for example, could be articulated as [àsí] or [àʃí], which makes [s] and [ʃ] free variants. In all, the scholars identify total consonants ranging from 22 to 31 in number. It could therefore be cumulatively concluded from their findings that Eʋe has 33 consonantal phonemes.

Eʋe Vowels Identified in Previous Studies

Anyidoho (1990), Duthie (1996), Atakpa (1997), Abadzivor and Dzamesi (2008), Amegashie (2011), Agbedoxor (2014), Kpodo (2014) and Nyomi (2017), again, list /a, e, ɛ, i, o, ɔ, u, ã, ẽ, ɛ̃, ĩ , õ, ɔ̃, ũ/ as vowel phonemes in Eʋe. Abadzivor and Dzamesi, Agbedoxor, Amegashie, Kpodo and Nyomi add /ə/ and /ə̃/ as vowel phonemes, making a total of 16 Eʋe vowel phonemes; but Atakpa (1985) sees [ə] as an allophone of /e/. Amegashie (2011) and Agbedoxor (2014) also excluded /ẽ/, making theirs a total of 15, while the others peg it at 14. Ansre (1961) however suggests that [ẽ] and [õ] are not in Eʋe and therefore identifies just 12 vowel phonemes. But analysing words like [lő], [ló], [sé] and [sé] seems to contradict Ansre's stance on [ẽ] and [õ] because [ẽ] and [õ] operate as phonemes in the two minimal pairs ([sé] [sé] and [lő] [ló]) respectively, especially in Aŋlɔ dialect.

In summary, Ansre (1961) accounts for 39 while Anyidoho (1990) identifies 44 Eʋe phonemes, Duthie (I996): 38, Atakpa (1997): 42, Abadzivor

and Dzamesi (2008): 47, Amegashie (2011): 43, Agbedoxor (2014): 45, Kpodo (2014): 43 and Nyomi (2017) also affirms 47. Therefore, the total number of Eʋe phonemes, according to these scholars, ranges from 38 to 47. Thus, summing up all the phonemes identified by these scholars amounts to 49 phonemes in the Eʋe language. It is apparent from the analysis that all the Eʋe linguists do not agree that the sounds [p], [b], [j], [ɖ], [r], [dzy], [tsy], [ʃ], [ʒ], [ʤ], [ʧ], [ŋ], [kw], [ɯ], [ə], [ə̃], [ẽ], and [õ] are phonemes in the Eʋe language. This study consequently intends to look at whether or not the three major Eʋe dialect speakers use these sounds as meaning distinguishing segments or they are just variants of others.

Description of Consonant Sounds

Consonants are described using various parameters. According to McMahon (2002), identification of these parameters in describing a particular phone demands a critical observation and analysis. Three main systems account for these parameters. They are the respiratory, phonatory and articulatory systems as affirmed by Gut (2009) and MacMahon (1990). The respiratory system provides the airstream—in this case, the pulmonic airstream mechanism: the source of energy or power—which is used in the production of sounds in most languages including the Eʋe language; the phonatory system gives 'voice' to the airstream while the articulatory system contains the articulators that cause the final obstruction of the airstream from the respiratory system (Catford & Esling, 2006; Ladefoged & Johnson, 2011; McMahon, 2002).

Although there are three different airstreams used in sound production in the languages of the world, Akamatsu (2010) and Ladefoged (1968) posit that most world languages use the pulmonic airstream mechanism just like the Ghanaian languages (Agbedoxor, 2014). Comparatively, the velaric and glottalic airstream mechanisms are sparingly used by few languages, especially in some West African languages (Ladefoged, 1968). In terms of the source, the pulmonic airstream mechanism is initiated by the lungs; the velaric airstream mechanism is initiated by the velic closure which involves the pharyngeal wall and the velum while the glottalic airstream mechanism is from the closed glottis or larynx (Akamatsu, 2010; Katamba, 1989; Rogers, 2000). All these types of airstream mechanisms are of two types. There is the ingressive and the egressive airstream mechanism. Nonetheless, Ghanaian languages such as Eʋe are noted by Agbedoxor (2014) and Kpodo (2014) to use the pulmonic egressive airstream mechanism. In summary, the pulmonic egressive airstream mechanism is first modified in the larynx through the activities of the vocal folds during the production of consonant sounds. It then progresses to the vocal track where it is modified again by the articulators. Hence, Fuchs & Birkholz (2019) posit that consonants could generally be classified as either pulmonic or non-pulmonic consonants as suggested by the International Phonetic Association chart. The non-pulmonic consonants could be an implosive, ejective or a click, where the implosives and clicks are produced using the ingressive airstream mechanisms.

Therefore, to describe a consonant, phonation, place of articulation and manner of articulation ought to be incorporated in the three-label description (Akamatsu, 2002; Kpodo, 2014; Meyer, 2009), a label Knight (2012) refers to as the 'VPM label' (p. 66). However, a detailed description of the consonant,

according to Katamba (1989) includes a step-by-step description of the airstream, the phonation process, the state of the velum, the place of articulation and the manner of articulation. There is therefore the need to discuss these parameters.

Phonation

Akmajian et al. (2010) and Dobrovolsky (2016) postulate that phonation, which is another name for *voicing*, occurs at the larynx. The larynx is thus "the first point where the airflow from the lungs encounters a controlled resistance" (Akmajian et al. 2010, p. 71). This controlled resistance is effected by the activities of the vocal cords which determine the state of the glottis during a particular speech sound production. Thence, the condition whereby the vocal cords vibrate rapidly when they are close to each other during the passage of the airstream is phonation or voicing (Akmajian et al., 2010; Jansen, 2004; Lobeck & Denham, 2013). Catford and Esling (2006) and Ladefoged and Johnson (2011) further broaden the scope of the term *phonation* to mean the various forms of modifications of the airstream that occur when the airstream passes through the glottis. Generally, consonants are classified into two categories based on phonation, that is, they could either be voiced or voiceless, which are the focus of this study, although there are other types of phonation which are used by some languages of the world. In the first instance, voiceless sounds are produced when the vocal cords are far apart creating an open glottis; hence, the airstream flows out through the glottis without any constriction. On the other hand, voiced sounds are produced with a close glottis which leads to the vibration of the vocal cords. The voiceless consonants identified in the Eʋe

language by linguists, although not with consensus, are [s, ʃ, x, ɸ, f, ʦ, ʦy, ʧ, t, k, kp, p] while the voiced ones are [z, ʒ, h, ß, v, dz, dzy, ʤ, d, ɖ, g, gb, b, n, ɲ, ŋ, m, ɱ, r, l, j, ɯ, w, kw].

Katamba (1989), Lobeck and Denham (2013) and McMahon (2002) propose that an easy way to identify and differentiate between a voiced and a voiceless sound in any language is by placing one's fingers firmly on one's larynx and producing the sound. The fingers would slightly vibrate when producing a voiced sound but would not when producing a voiceless sound. An alternative approach, again described by Akpanglo-Nartey (2002), Katamba (1989) and Knight (2012) is by inserting one's index fingers into one's ears while producing the sound. A voiced sound would produce a buzzing sound while a voiceless sound would not. These approaches make it somewhat easy to compare and contrast a voiced sound with a voiceless sound. Applying these two approaches to [gb] and [kp] proves that [gb] is a voiced consonant sound while [kp] is a voiceless consonant sound. However, sticking one's index fingers into one's ears while producing the sounds seems to better show the contrast between voiced and voiceless sound than the placement of the fingers on the larynx. Consequently, this study adopts the insertion of the index finger into the ears during the production of the sound to determine those to categorise as voiced or otherwise. Applying this approach to [kw], which is identified by Nyomi (2017) as voiced sound, seems to suggest that [kw] is a voiceless sound.

Place of articulation

Another crucial parameter in describing a consonantal sound is the place of articulation. Catford and Esling (2006), Fuchs and Birkholz (2019), Katamba

(1989) and Yule (2014) explain place of articulation as the point in the vocal tract where the articulators interact to cause the articulatory stricture. For the constriction to occur, an active articulator (like the lower lip and the tongue) which is typically located along the base of the vocal tract ought to move towards a passive one (like the alveolar ridge and the hard palate). This is affirmed by Skandera and Burleigh (2005) when they postulate that "to produce a consonant, there is usually one active, mobile, lower speech organ that moves and makes contact with a passive, immobile, upper speech organ" (p. 13). Consequently, depending on the point where the modification or obstruction of the airstream mechanism transpires in the vocal tract, a different sound segment may be realised. Roach (2009) further asserts that there are various muscles in the human body that help in the movement of the articulators that in the end help change the shape of the vocal tract to produce the various speech sounds in a language. Consonant phonemes in languages across the world are therefore articulated at various points in the vocal tract.

Carr (2008) and Ladefoged and Johnson (2011) posit that all the places of articulation are located in the oral cavity and are of three categories: labial, coronal and dorsal. This classification is very general because the three categories could further be put into sub-categories. According to Brown & Miller (2013), Carr (2008), Crystal (2008), Ladefoged and Johnson (2011) and Rogers (2000), labial sounds, for instance, includes all the sounds that are produced with the lip(s) as the articulator hence it encompasses bilabials, labiodentals and linguolabials; coronal sounds subsume all the sounds articulated with a raised tongue blade (or tip) as in the dental, alveolar, retroflex and palato-alveolar sounds while dorsal sounds refer to sounds produced with a

raised body (front, back or root) of the tongue as in palatal, velar, uvular and pharyngeal sounds (Skandera & Burleigh, 2005). Specifically, the IPA pulmonic consonant chart revised in 2015 names 11 different labels based on the places of articulation that could be used in the articulation of consonant sounds in the world languages. They are bilabial, labiodental, dental, alveolar, postalveolar, retroflex, palatal, velar, uvular, pharyngeal and glottal. There is however another which is very rarely used in languages identified as epiglottal (Rogers, 2000).

Bilabial sounds are sounds produced with both lips hence the label bilabial. The lower lip is the active articulator while the upper lip is the passive articulator. This implies that it is the lower lip that moves to the upper lip to obstruct the airstream during the production of the bilabials (McMahon, 2002). Trask and Stockwell (Ed.) (2007) nonetheless suggest that the bilabial label is unsystematic; hence, prefer the use of the label labio-labial although it seems the use of labial is common among linguist than the use of labio-labial. This is because they are of the view that the two articulators involved in the production of the consonant sound is better encompassed in the latter than the former. But, the *bi* in bilabial caters for both lips. It is therefore not out of place to use the term bilabial. Consonants sounds produced at this spot as shown on the IPA Chart are [p] [b] [m] [ʙ] [ɸ] and [ß]. In Eʋe, which is the focus of this study, [ʙ] is not included among the bilabial sounds but the others on the IPA Chart are. Some scholars also identified [w] as another bilabial sound in Eʋe. Labiodental sounds are produced with the active lower lip moving to the upper front teeth to cause some form of stricture. The labiodental sounds on the IPA chart are [ɱ]

[ⱱ] [f] [v] and [ʋ], which are all identified in the Eʋe language except [ⱱ] and [ʋ].

The next place labelled dentals are articulated using the tip of the tongue and the upper front teeth. The tip of the tongue therefore does the movement while the upper front teeth is the passive articulator. Based on the articulators involved, Trask and Stockwell (Ed.) (2007) use apico-dental to identify the dentals. This implies that dentals are also known as apico-dentals and examples are [θ] and [ð]. Catford and Esling (2006), Lobeck and Denham (2013) and Yule (2014) assert that these sounds could also be made with the tip of the tongue between the front teeth. When this happens, they are referred to as interdentals. Catford and Esling (2006) maintain that interdentals, for example, are mostly used in American English but the British use dentals. In all, dental, apico-dental and interdentals refer to the same category of consonant phonemes. [t] and [d] are considered dental sounds in Eʋe, an idea opposed by some Eʋe scholar on the grounds that they are alveolar sounds.

A bit further into the oral cavity is the alveolar place of articulation. The sounds articulated here come about as a result of the blade of the tongue moving to obstruct the airstream at the alveolar ridge located at the roof of the mouth. Thus, the blade of the tongue is the active articulator whereas the alveolar ridge is passive. Alveolar sounds listed on the IPA Chart are [t] [d] [n] [r] [ɾ] [s] [z] [ɬ] [ɮ] [ɹ] and [l]. [t] [d] [n] [r] [s] [z] and [l] are noted in Eʋe. Other alveolar sounds listed in Eʋe are [ts] and [dz]. More so, some (like Agbedoxor, 2014; Amegashie, 2011 and Duthie, 1996) controversially added [ɖ] to the alveolar sounds in Eʋe.

The next category of consonants based on the place of articulation is the postalveolars. A consonant is classified as a postalveolar when the airstream is modified by the tongue blade and the back of the alveolar ridge (Ladefoged & Johnson, 2011). Ladefoged and Johnson ascertain that, "the tip of your tongue may be down behind the lower front teeth or up near the alveolar ridge, but the blade of the tongue is always close to the back part of the alveolar ridge" (p. 12). In addition to this, the front of the tongue also typically raises towards the hard palate during the production of postalveolar sounds (Rogers, 2000). They again note that postalveolar sounds are also referred to as palato-alveolar sounds. This is corroborated by Carr (2008) and Trask (1999) that the IPA now recommend the use of the term postalveolar in place of palato-alveolar, although some scholars argue that postalveolars are different from palato-alveolars. The postalveolar sounds on the IPA Chart are [ʃ] and [ʒ], which Kpodo (2014) claims are also in Eʋe including [ʧ] and [ʤ]. Other consonantal sounds classified under this parameter by some Eʋe linguists are [tsy] and [dzy].

Another place of articulation category is retroflex. In the production of retroflex sounds, a curled tongue tip, which is the active articulator, articulates with the back of the alveolar ridge which could also be referred to as the front of the hard palate (Brown & Miller, 2013; Crystal, 2008; Ladefoged & Johnson, 2011; Rogers, 2000), which is in line with the description by The International Phonetic Association (1999). Nonetheless, there seems to be some level of variation in the degree of retroflection during the production of some of the retroflex sounds, especially in dialects (Crystal, 2008). Some retroflex sounds

on the IPA Chart are [ʈ] [ɖ] [ɳ] [ʂ] [ʐ] [ɽ] [ɻ] and [ɭ]. Out of all these sounds, only [ɖ] is noted to be used by Eʋe speakers.

Further along the vocal tract is the hard palate. Sounds that are produced through the interaction of the front of the tongue and the hard palate are the palatals. The front of the tongue and the hard palate are either in contact or in some form of approximation (Brown & Miller, 2013; Crystal, 2008). The IPA Chart identifies seven palatal sounds which are [c] [ɟ] [ɲ] [j] [ç] [j] and [ʎ] but only [ɲ] and [j] are claimed to be used in Eʋe. The velum is the region after the hard palate which serves as another spot for the production of consonants although it plays other vital roles in speech production, which are to determine whether a sound is oral or nasal and to help in the production of the velaric airstream mechanism. Noted among the velar sounds are [k] [g] [ŋ] [x] [ɣ] [ɯ] and [ʟ] on the IPA Chart. According to some of the Eʋe linguists, Eʋe as a language has six velar sounds which are [k] [g] [ŋ] [x] [h] and [ɯ]. At the tail end of the velum is the uvula which also serves as a passive articulator. The back of the tongue articulates with the uvula to produce sounds like [q] [ɢ] [ɴ] [ʀ] [ʁ] and [χ], which are known as the uvular sounds. No uvular sound is yet to be identified in the Eʋe language.

Getting close to the bottom of the vocal tract, the tongue root could also interact with the pharyngeal wall in articulating some consonant sounds in the world languages. Sounds produced through this modification are termed pharyngeal sounds because the primary stricture occurs in the pharynx (Akamatsu, 2010; Crystal, 2008; Trask, 1996). The phonemes /ħ/ and /ʕ/ are

pharyngeal sounds, which have also not been identified by any previous scholar in Eʋe.

The last primary place of articulation to focus on is the category referred to as glottal although there are others which are not commonly used by languages. Just like the velum, the glottis, which is the space between the vocal folds, also plays multi-function in speech production. One of them being the place of articulation, which could also be named laryngeal because the whole process occurs in the larynx. According to Catford and Esling (2006),

> 'Laryngeal' articulation takes place in the glottis and is thus generally termed 'glottal.' Glottal stop [ʔ], voiceless fricative [h], and voiced fricative [ɦ] occur. In the voiced glottal fricative [ɦ] the arytenoid cartilages at the rear of the vocal folds are separated, allowing passage of part of the pulmonic egressive airstream, but the forward, ligamental, part of the vocal folds is in vibration, producing voice. Both [h] and [ɦ] could thus be described as the phonation types breath (voiceless) and breathy voice (voiced). However, when they function in languages as consonants, that is, as marginal elements in the structure of syllables, they are usually described as glottal fricatives. (p. 437)

The articulators in the production of the glottal sounds are basically the vocal folds. Just like the uvular sounds, Eʋe has no known pharyngeal or glottal sounds.

However, some sounds could be articulated using a combined place of articulation (Cruttenden, 2001). During this process both strictures occur simultaneously at different places in the vocal tract (Catford & Esling, 2006; Rogers, 2000). This phenomenon of two primary articulations occurring during the production of a sound segment is referred to as double articulation. Some examples that are common in West African languages according to Roger (2000) are the labial-velars [kp] [gb] and [ŋm]. Other possible examples are labial-alveolar sounds ([pt, bd, mn]). Labial-velar sounds are articulated through the co-occurrence of occlusion at the lips and at the velum. The two lips as well as the back of the tongue and the velum modify the airstream at the same time. Relatedly, Eʋe linguists note [kp] and [gb] as sounds in the Eʋe language, which is affirmed by Ladefoged and Johnson (2011).

Apart from the double articulation that deals with the same level of strictures, there is also the case where a secondary place of articulation could also co-occur with the primary place of articulation, an instance Catford and Esling (2006) refer to as modified articulation. These modifiers of the primary articulations, which are generally named secondary articulation, lead to labialisation, palatalisation, velarisation, pharyngealisation or nasalisation (Akpanglo-Nartey, 2002; Catford & Esling, 2006; Rogers, 2000).

Labialisation occurs when some form of lip rounding is added to the primary articulation. Although this phenomenon could be inherent, it is usually conditioned because Roger (2000) posits that consonants are typically labialised when next to a rounded vowel. Catford and Esling (2006) postulate that labialisation of velar and uvular sound is very common in languages. Hence, a

labialised velar plosive would be represented as [k^w]. The second secondary articulation crucial in this study is palatalisation which is the imposition of a high front tongue position on the initial place of articulation of the consonant. Catford and Esling (2006) again asseverate that palatalisation is common with labial sounds. In the production of a palatalised [t], for instance, the main point of stricture is at the alveolar ridge but it is accompanied by the upward movement of the tongue front towards the hard palate. The palatalised [t] is represented by [t^j].

On the identification of the place of articulation, Ladefoged and Johnson (2011) indicate that one could easily detect the place of articulation very distinctly if one maintains the position of the articulatory process while breathing in through one's mouth. The inhaled air significantly cools down the point with the greatest narrowing. Therefore, when producing a velar sound with this experiment, the back of the tongue and the soft palate would be cooled down, hence, facilitating the pinpointing of the place of articulation.

Manner of articulation

Varied forms of strictures occur at the various places of articulation aforementioned during the production of consonant sounds. The nature and degree of these strictures or the extent of contact between the articulators in the articulatory channel is one of the typical determinants of the manner of articulation (Catford & Esling, 2006; Crystal, 2008; Knight, 2012; Trask & Stockwell, Ed., 2007). Manner of articulation, as affirmed by Knight (2012) and The International Phonetic Association (1999), deals with the relationship between the active and passive articulators and to a large extent the state of the

velum, which could be raised (causing velic closure) or at the normal position (with no velic closure). All these imply that the manner of articulation simply describes the flow of the airstream through the vocal tract and the various forms of interferences that occur due to the actions or inactions of the articulators in the production of a consonant sound. The stricture types could generally be of five categories. Adopting a blended version of the classification by Carr (2008), Cruttenden (2001) and Crystal (2008), there is the stricture of complete closure, partial closure, close approximation, open approximation and intermittent closure.

Stricture of complete closure

The stricture of complete closure occurs when the articulators completely obstruct the flow of the airstream in the vocal tract for a period. This type of closure has three sub-categories: complete closure with sudden release, complete closure with gradual release and complete oral closure. The first type of stricture in this category comes with a velic closure which forces the air to flow through the oral cavity. The articulators then completely block the air at a point causing a build-up of pressure behind the occlusion. The occlusion is suddenly removed causing the sound to come out with plosion. Sounds articulated in this manner are called plosives. Hence, plosives are produced in three phases: the closing (which some refer to as the approach phase), the hold phase (or the closure stage) and the release phases (Davenport & Hannahs, 2005; Lodge, 2009). The plosives identified on the IPA Chart are [p, b, t, d, ʈ, ɖ, c, ɟ, k, g, q, ɢ, ʔ]. Seven of these, which are [p, b, t, d, ɖ, k, g] are identified

as sounds in Eʋe. Some Eʋe linguists further add [kp], [gb] and [kw] as Eʋe plosives.

The second category which is the complete closure with gradual release leads to the production of sound segments named affricates. Just like the plosives, the affricates are produced with a complete blockage of the airstream with pressure building behind the blockage. The air is however released gradually with homorganic friction noise (Akamatsu, 2010; Carr, 2008; Trask & Stockwell, Ed., 2007) not with plosion, which is the difference between an affricate and a plosive. No specific affricate is identified on the IPA consonant chart but some Eʋe linguists describe [ts] [dz] [ʧ] [ʤ] [tsy] and [dzy] as affricates in Eʋe. The final manner of articulation that involves a complete closure is the one in which there is no velic closure but a complete closure of the oral cavity and thereby allowing the airstream to flow out through the nasal cavity. Consonants articulated with the stricture of complete oral closure are named nasal sounds and the nasals listed on the IPA Chart are [m] [ɱ] [n] [ɲ] [ɳ] [ŋ] and [ɴ]. In Eʋe, [m] [n] [ɲ] and [ŋ] are the ascertained nasals, with Kpodo (2014) adding [ɱ] to them.

Stricture of partial closure

The stricture of partial closure involves the articulators blocking the airstream at some central point in the oral cavity firmly but not completely and therefore allowing the air to flow out through the sides of the contact obstructing it. This process involving the stricture of partial closure helps in articulating the lateral consonants. Akpanglo-Nartey (2002) further posits that the lateral articulation could apply to the other manners of articulation nonetheless the IPA

Chart only exemplified lateral fricative (e.g. [ɬ]) and lateral approximants (e.g. [l] as used in Eʋe).

Stricture of close approximation

Another form of stricture used in the production of consonants is the one engineered by articulators which are very close to each other to the extent that the airstream ought to force through them with audible friction (Akpanglo-Nartey, 2002; Cruttenden, 2001). The articulators are said to be in close approximation during this process and the sounds articulated with this degree of occlusion are termed fricatives. Clearly, from the IPA chart, this degree of occlusion occurs at every point of articulation aforesaid. The fricatives, as listed on the IPA chart are [ɸ, β, f, v, θ, ð, s, z, ʃ, ʒ, ʂ, ʐ, ç, ʝ, x, ɣ, χ, ʁ, ħ, ʕ, h, ɦ]. Those used in the Eʋe language according to the various studies are [ɸ, β, f, v, s, z, ʃ, ʒ, x, h].

Stricture of open approximation

The stricture of open approximation is used to produce approximant. With the stricture of open approximation, the active articulator approaches the passive one just as in the close approximation but creates a wider channel for the airstream to escape through without any audible friction (Catford & Esling, 2006; Cruttenden, 2001; Crystal, 2008). Consonants that are articulated by this type of stricture are called approximants. Based on the almost free nature of the articulatory channel during the production of the approximants, they are also known as semivowels. The IPA Chart labels [ʋ] [ɹ] [ɻ] [j] and [ɰ] as approximants but [j] [ɰ] and [w] are the noted Eʋe approximants.

Stricture of intermittent closure

The last type of stricture is caused by an intermittent closure which results in the production of a consonant sound classified as either a tap or a trill. Taps, just as the name suggests, are produced with a single apical contact with the passive articulator while a trill, also called a roll, is produced with two or more rhythmic apical contact with the other articulator. Celata, Vietti & Sprafico (2019) postulate that trills could even be reduced to taps in some languages through the change of the apical taps to a tap. Most linguists also refer to taps as flaps, as done on the IPA chart too. Examples of tap sounds are [ⱱ] [ɾ] and [ɽ] while [ʙ] [r] and [ʀ] are trill sounds although only [r] is typically used in Eʋe.

From the descriptions of the stricture types, it is affirmed that consonant sounds could be classified as either plosive, affricate, nasal, lateral, fricative, approximant, tap or trill depending on the occlusion type. This could be the result of a complete blockage with sudden release, complete blockage with gradual release, complete oral blockage, partial blockage, close approximation, open approximation or intermittent blockage by the articulators involved. Combining the voicing, place and manner of articulation therefore gives a simple label for the consonant sounds.

Three label description of Eʋe consonants by Previous Scholars

Apart from the variation in the identified number of phonemes in Eʋe, the description (the VPM label) of some of the consonants also vary. The earlier works seem to disagree on where and how some of the consonant sounds are

produced. The following are those that Abadzivor and Dzamesi (2008), Agbedoxor (2014), Amegashie (2011), Ansre (1961), Anyidoho (1990), Atakpa (1985), Duthie (1996), Kpodo (2014) and Nyomi (2017) agree on:

[b] voiced bilabial plosive

[p] voiceless bilabial plosive

[ß] voiced bilabial fricative

[ɸ] voiceless bilabial fricative

[m] voiced bilabial nasal

[w] voiced bilabial approximant

[v] voiced labiodental fricative

[f] voiceless labiodental fricative

[d] voiced alveolar plosive

[t] voiceless alveolar plosive

[dz] voiced alveolar affricate

[ts] voiceless alveolar affricate

[z] voiced alveolar fricative

[s] voiceless alveolar fricative

[n] voiced alveolar nasal

[ɲ] voiced palatal nasal

[j] voiced palatal approximant

[g] voiced velar plosive

[k] voiceless velar plosive

[h] voiced velar fricative

[x] voiceless velar fricative

[ŋ] voiced velar nasal

[ɰ] voiced velar approximant

[gb] voiced labiovelar plosive

[kp] voiceless labiovelar plosive

However, Duthie (1996) describes [t] and [d] as laminal-dental sounds and not alveolar sounds, which Ansre (1961) corroborates that [t], [d], [ts] and [dz] are dental sounds. Furthermore, Atakpa (1985) contradicts the others on the manner in which [ɰ] is articulated. He categorises it as a fricative hence the need for it to be investigated as to whether [ɰ] is a fricative or an approximant. This is because there is another critical issue, in that, if [ɰ] is a fricative, then it is produced the same way as [h], per their descriptions. Both of them would then be voiced velar fricatives, which should not be because two different phonemes could not be produced with the same voicing, at the same place and in the same manner. In the description of [ɖ], Abadzivor and Dzamesi (2008), Anyidoho (1990), Kpodo (2014) and Nyomi (2017) describe it as voiced retroflex plosive; Agbedoxor (2014) and Duthie say it is voiced alveolar plosive while Amegashie

(2011) and Atakpa (1985) identify it to be voiced apico-alveolar plosive. Clearly, Agbedoxor, Amegashie, Atakpa and Duthie do not concur that there is some backward curling of the tongue during the articulation of [ɖ], which breeds some controversies over [ɖ]. Again, Agbedoxor, Anyidoho and Atakpa just categorise [l] and [r] as voiced alveolar liquids but Abadzivor and Dzamesi, Amegashie, Duthie, Kpodo and Nyomi differentiate between them. They name [r] as voiced alveolar trill and [l] as voiced alveolar lateral, except Duthie who describes [l] as an approximant, which somewhat agrees with the IPA description that [l] is a lateral approximant. Ansre and Kpodo in their analysis note that [r] is not an Eʋe phoneme because it is usually in a complementary distribution with [l].

Anyidoho (1990) and Nyomi (2017) name [dzy] as voiced palato-alveolar affricate and [tsy] as voiceless palato-alveolar affricate while Agbedoxor (2014) suggests they are alveolar sounds. Duthie (1996) describes them as palatal sounds, Abadzivor and Dzamesi (2008) gave no description while the others do not consider them as phonemes in the Eʋe language. Kpodo (2014) then describes the rest as follows:

[ɱ] voiced labio-dental nasal

[ʒ] voiced palato-alveolar fricative

[ʃ] voiceless palato-alveolar fricative

[ʤ] voiced palato-alveolar affricate

[ʧ] voiceless palato-alveolar affricate

From all the descriptions, it is obvious that there are variations in the description of [t] [d] [ɖ] [ɰ] [ts] [dz] [l] and [r] by some of the scholars. Moreover, Abadzivor and Dzamesi (2008) give no name to [kw] while Nyomi (2017) describes it as voiced labialized velar plosive. However, producing [kw] seems to indicate that it is voiceless and an allophone of /k/.

Description of Vowel Sounds

The description of vowels takes a different dimension when compared to the consonants. A view Davenport and Hannahs (2005) and McMahon (2002) asseverate that the voicing, place of articulation and manner of articulation classifications of consonants are completely inappropriate for classifying vowels because they are articulated in a relatively different manner. This is so because vowels are typically voiced in world languages, they have limited and similar place of articulation referred to as the vowel space, which is somewhat the channel from the hard palate to the velum, and they would be considered approximants when adopting the consonant classification parameters (Davenport & Hannahs, 2005; McMahon, 2002). Therefore, some vowels would have the exact same label if the consonant parameters are used in labelling them, which would be inapposite. Consequently, the taxonomy of vowels employed is based on the overall configuration of three main articulators: the lips, the tongue and the velum (Akpanglo-Nartey, 2002; Catford & Esling, 2006; Cruttenden, 2001; Ladefoged & Johnson, 2011). Hence, the parameters in the taxonomy of vowels are the height of tongue, part of the tongue (which Rogers, 2000 refers to as backness), the shape of the lips (the lip posture) (which Rogers names rounding) and the position of the soft palate. Just

like the consonants, the position of the velum determines whether the vowel is oral, nasal or nasalised. This study however adopts the terms employed by McMahon (2002) and Rogers (2000) which are height, backness and rounding.

Height dimension

The height of the tongue is one of the key parameters used in describing vowels. This is crucial, in that, the posture of the tongue and the lips mainly determine the shape of the resonating chambers: the oral and pharyngeal cavities (Catford & Esling, 2006). The height of the tongue deals with the position of the convex body of the tongue in relation to the roof of the mouth. The closer the body is to the roof of the mouth the higher the vowel quality. Using the height categorisation, a vowel is described as high, mid or low. Alternatively, the vowel could be classified as close, close-mid (half close), open-mid (half open) and open. Examples of close vowels on the IPA Chart are [i] and [u], which are also identified in Eʋe with their nasal forms, [ĩ] and [ũ] respectively. Close-mid vowels are [e] and [o], open-mid vowels are [ɛ] and [ɔ] while open vowels are [a] and [ɒ] on the IPA Chart, which are just guidelines for world languages to describe their vowels. Eʋe linguists note all these as Eʋe vowel sounds used by Eʋe speakers except [ɒ]. [ə] is also considered an open-mid vowel. All the Eʋe vowel sounds aforementioned have their nasal forms which are also considered phonemes in the language, although this view is contested by some scholars such as Agbedoxor (2014) and Ansre (1961).

Backness dimension

Another dimension used in classifying vowel sounds is the part of the tongue which is raised during the production of the vowel sound. More so, the convex mass of the tongue is either thrusted forward, at the centre or backwards in modifying the mouth aperture to produce the various types of vowels (Catford & Esling, 2006; Ladefoged & Johnson, 2011; Skandera & Burleigh, 2005). Vowels are therefore either classified as front, central or back vowel depending on the part of the tongue raised the most and the direction of the tongue thrust (Roach, 2009). A front vowel is produced when the front of the tongue is involved and is pushed to the front of the mouth typically at the palatal region at the time of the articulation. Typical examples from the IPA Chart are [i] and [e] but the Eʋe front vowels recorded are [i] [e] [ɛ] [ĩ] [ẽ] and [ɛ̃]. When the back of the tongue is involved as the tongue body is pulled back, back vowels are produced as in [u] [o] [ɔ] [ũ] [õ] and [ɔ̃]. If the production occurs with the medial portion of the tongue and at the cental part of the mouth, the vowels are central vowels. [ə] and [ɐ] are examples of central vowels on the IPA Chart. In Eʋe however [ə] [a] [ə̃] and [ã] are the central vowels identified.

Rounding dimension

The posture of the lips also plays a vital role in shaping the resonating chambers (vowel space) and are therefore essential in the description of vowels. This deals with the degree of aperture created by the extent of spreading or rounding of the lips (Cruttenden, 2001). This gives rise to two basic categorisations of vowels, which are rounded and unrounded vowels. According to The International Phonetic Association (1999), [i] [e] [ɛ] and [a] are

unrounded vowels whereas [ɔ] [o] and [u] are rounded increasingly. Rounded vowels in Eʋe are [u] [o] [ɔ] [ũ] [õ] and [ɔ̃], which means all the back vowels are rounded. Their unrounded counterparts are [i] [e] [ɛ] [ə] [a] [ĩ] [ẽ] [ɛ̃] [ə̃] and [ã], which also implies that all the front and central vowels are unrounded in Eʋe. The rounding parameter could easily be observed as compared to the other parameters (Cruttenden, 2001).

Three label description of Eʋe vowels by Previous Scholars

The three label description of vowels could be referred to as the *HBR Label* considering the height, backness and rounding parameters. Applying this in Eʋe, the Eʋe vowels, except Nyomi (2017) that names [a] and [ã] as half open vowel, are described the same way by the other scholars as follow:

[i] close front unrounded oral vowel

[e] half close front unrounded oral vowel

[ɛ] half open front unrounded oral vowel

[ə] half open central unrounded oral vowel

[a] open central unrounded oral vowel

[ɔ] half open back rounded oral vowel

[o] half close back rounded oral vowel

[u] close back rounded oral vowel

Changing the *oral vowel* at the end of each description to *nasal vowel* gives the name of their nasal counterparts respectively. The description given by Nyomi implies that [a] and [ə] are produced the same way, which is not likely. Agbedoxor (2014), Amegashie (2011) and Ansre (1961), on their part, do not consider [ɛ̃] as an Eʋe phoneme. [ɔ̃] is also contested by Ansre. Apart from these contentions, Ansre (1961), Anyidoho (1990) and Atakpa (1985) do not consider [ə] and [ə̃] as phonemes. But, the articulation of the words *kpe* and *kpɛ̃* seems to contradict the views of Ansre, Anyidoho and Atakpa. Hence, collecting data on all these sound segments and finding out more on them helped confirm what is or otherwise.

Chapter Summary

The empirical review so far affirms the fact that although some languages have a specific number of phonemes, the exact number of phonemes in Eʋe cannot be pegged at any fixed number because most studies done on the phonemes came out with varied figures. Phonemes are generally either consonants or vowels, which are both classified using different taxonomies. Using the three label system, consonants are described using the phonation type, place of articulation and degree of occlusion while vowels are basically named based on the height of the tongue, backness and roundness. Based on the descriptions of the phones by the various scholars, it is evident that the specific descriptions of sounds like [a] [ã] [l] [r] [t] [d] [ɖ] [ts] [dz] and [ɯ] have some variations that need harmonising. The study therefore employs the phonemic theory and the auditory perception approach to help resolve the issues identified. Table 1 summarises the sound segments identified by previous works and those

with controversies are asterisked. The controversies revolve around whether they are phonemes or not and how they are produced.

Table 1: Eʋe Sound Segments Identified by Previous Scholars

Consonants

Place / Manner	Bilabial		Labio dental		aveolar		Retroflex	Palato-alveolar		palatal	Velar		Labiovelar		Labialised velar
Plosive	*b	*p			*d	*t	*ɖ				g	k	gb	kp	*kw
Fricative	ß	ɸ	v	f	z	s		*ʒ	*ʃ		h	x			
Affricate					*dz	*ts		*ʤ *dzy	* ʧ *tsy						
Nasal	m		*ɱ		n					ɲ	ŋ				
Approximant	*w									*j	*ɥ				
Trill					*r										
Lateral					l										
Voicing	Voiced	Voiceless	voiced	Voiceless	voiced	Voiceless	Voiced	Voiced	Voiceless	voiced	Voiced	Voiceless	voiced	Voiceless	Voiced

Vowels

	Front Unrounded		Central Unrounded		Back Rounded	
Close	i	ĩ			u	ũ
Half Close	e	*ẽ			o	*õ
Half Open	ɛ	ɛ̃	*ə	*ə̃	ɔ	ɔ̃
Open			*a	*ã		
	Oral	Nasal	Oral	Nasal	Oral	Nasal

Note: **Sound segments not agreed on are asterisked.**

CHAPTER THREE

METHODOLOGY

Introduction

This study mainly seeks to comparatively identify the number of phonemes in the three main dialects of Eʋe through the phonemic approach. This chapter explicates the means by which the research questions are answered. The chapter brings to the fore the research method, the study area, the population and the data collection and analysis processes.

The Research Method

This research adopts phenomenology which falls within the qualitative paradigm. According to Bryman (2012), Creswell (2014) and Tracy (2013), qualitative research is a means of exploring societal issues, challenges or realities. As such, qualitative data typically provides an overview or insight into a range of cultural phenomena that might be overlooked by experimentation (Tracy, 2013). Again, Bryman (2012) and Darlington and Scott (2002) stridently espouse the fact that a good qualitative research helps gather first-hand information that are always rich, comprehensive and illuminating about other's behaviour and societal phenomena and analysing them.

Creswell (2014) and Newby (2014) postulate that phenomenology, as an approach in qualitative research, is a design of inquiry that the researcher interacts with individuals to get their collective experiences about a common phenomenon. It therefore focuses on analysing and interpreting social issues (Trotman, 2006). In this research, the aim is to listen to and comprehensively

gather data on how the three main Eʋe dialects articulate some sound segments and phonemically analyse them. This study therefore employs the phenomenological approach to this qualitative research. The main aim of this study is to identify and describe the phonemes in the three major dialects of the Eʋe language as espoused by Adams and Manen (2008), Lester (1999) and Limberg (2008) that a typical phenomenological research mainly looks to describe than to explain. This study therefore employs the qualitative approach because the focus is to narratively describe what pertains in the three main dialects of Eʋe and not necessarily collect, analyse and present numerical data which is basically the focus of the quantitative research (Bryman, 2012; Donmoyer, 2008), although some basic form of the quantitative research was used because the study dealt with the number of phonemes and the number of participants that articulated a particular sound segment to give credibility to the findings.

The Study Area

Since the main focus of this study is on the phonemes in the three main dialects of Eʋe, the Eʋe community in Ghana is the focal point as mentioned earlier in the introduction. Specifically, the people of Aŋlɔ, Eʋeme and Tɔŋu were sampled because, as aforementioned, Duthie (1996) affirms that the SE is mainly the composition of Aŋlɔ, Eʋeme and another variant from Lome. Tɔŋu was also selected because it has become the third of the trio main Eʋe dialects usually researched into by most scholars (e.g., Ackumey & Folivi, 2015; Datsa, 2012; Duthie, 1996; Kpodo, 2017). Again, these dialects are selected because some of the phonemes identified by previous studies seem to be peculiar to one

of these respective dialects. The specific study areas were Aŋlɔga, Taviefe and Dabala. Based on the preliminary interactions with some of the native speakers, after a random selection of these places, it was realised that the basic forms of the Aŋlɔ, Eʋeme and Tɔŋu dialects are spoken at these places respectively. To further cover and account for the dialect varieties, Agbozume and Dzodze (for Aŋlɔ); Kpando and Kedjebi (for Eʋeme) and Adidome and Kpotame (for Tɔŋu) were added to the study area.

Population and Sampling Procedure

The study used the non-probability sampling techniques of quota and purposive sampling. The quota system was adopted to have equal representation from all the dialects involved (Kumekpor, 2002; Newman, 2014). The study then sampled 60 individuals purposively from Aŋlɔ, Eʋeme and Tɔŋu so as to cater for the three main Eʋe dialectal varieties that would help acquire the best data to answer the research questions (Bryman, 2012; Newman, 2014). 20 individuals were sampled from each dialect based on their linguistic competence and health status. Linguistic competence, in this context, refers to that innate ability of a speaker of a language to grammatically and contextually use the language correctly and identify when others use the language correctly or otherwise (Crystal, 2008; Hickey, 2014). Health fitness, on its part, has to do with the absence of any physical disability or infection that can influence speech production like severe hypodontia and flu.

Apart from all these, there is the issue of performance on another hand which deals with the actual use of language in the real context. Whereas

competence basically deals with the speaker's or listener's knowledge of the language, performance stresses the use of that competence in real situations or utterances (Brown & Miller, 2013). It is a plausibility that various factors could affect a linguistically competent person during performance. Some of these factors could be a slip of the tongue, sound segment substitution, poor syntactic constructions and inappropriate register usage. All these errors may be spontaneous or may occur due to the effect of extra or non-linguistic factors like pressure, ill health or short memory (Akmajian et al., 2010; Brown & Miller, 2013; Carr, 2008; Fowler & Magnuson, 2012; Hickey, 2014). It is therefore critical for some of these factors to be taken into consideration during the course of gathering data from the respondents who are considered to be linguistically competent.

Twenty people made up of 10 males and 10 females were sampled because data from this number were enough to generate ideas on how particular words and sounds are articulated in each dialect. Moreover, Creswell (2014) posits that phenomenology mostly samples three to ten respondents. The selection of the respondents, both literates (had some level of formal education) and nonliterates (had no formal education), was done in consultation with the assembly members from the study areas where the three dialects are rooted to get the best sample of respondents who had lived mostly in their locality: Aŋlɔga, Agbozume and Dzodze for Aŋlɔ; Tavieʃe, Kpando and Kedjebi for Eʋeme and Dabala, Adidome and Kpotame for Tɔŋu respectively. Ten respondents were sampled from each of the three main study areas: Aŋlɔga, Tavieʃe and Dabala while 5 respondents were later sampled from Agbozume,

Dzodze, Kpando, Kedjebi, Adidome and Kpotame respectively. More so, the linguistic competence and good health status of the respondents were very crucial on the basis that the absence of these would have affected the articulation of the respondent.

The respondents were between the ages of 16 and 70 because the quality of speech can be affected by age and, again, linguistic competence increases with age and experience (Trask & Stockwell, 2007). In all, the data from this sample size is capable of identifying the number of phonemes employed in the three major dialects of Eʋe and consequently Eʋe as a language.

Data Collection Instrument and Procedure

The main instruments used in this research were conversational interview guide, audio recorder and video recorder. Conversational interview, as a means for data collection, is a relaxed and flexible interaction between an interviewer and a respondent, so it is more than a mere strict question and answer section, and therefore, very adaptable to situation (Bell, 1999; Kumekpor, 2002; Newman, 2014). However, it can be very biased and time consuming, if not well planned. This work adopted the one-on-one conversational interview to avoid one respondent from influencing the other. This also facilitated the chance to compare all the ten responses from the main study areas and the five responses from each of the additional study areas so as to get the true articulation of the words used. The data collection started from Aŋlɔga to Dabala and ended at Tavieƒe. An additional data was also later collected from Agbozume, Dzodze, Kpotame, Adidome, Kpando and Kedjebi to have a comprehensive data on all the three main dialects.

The interview was semi structured because the respondent's main task was to give the exact pronunciation of the 94 words provided in Appendix A in their dialects. The 94 words were carefully selected to cover all the sounds identified by the previous scholars. The respondent was further required to either provide the semantic difference between each minimal or near minimal pair pronounced or the meaning of the individual word pronounced; which was recorded with both the audio and video recorders. The interaction with each respondent lasted between 18 minutes and 37 minutes 57 seconds.

Both audio and video recorders were used so as to avoid any disappointment in the quality of the recordings (Creswell, 2014). The video recorder was very essential because the shape of the mouth and other important visible articulatory features were important during the analysis of the data collated, that is, in the description of the individual phones. The audio recorder was also utilised because, from experience, the quality of sound is sometimes better on audio recorders than video recorders. Again, Creswell (2014) and Morgan and Guevana (2008) acknowledge the effectiveness of recordings in providing accurate summary of interactions although recordings could cause respondents to be apprehensive in providing feedbacks during the conversation. For the sake of quality, some of the interactions transpired at a secluded location to avoid unwanted interferences that would affect the sound quality of the data. However, some interferences were unavoidable because of the rural nature of some of the settings. Some interferences came from animals, birds and children, which necessitated pausing of the process for some time in few cases before resumption.

Again, telephone interactions were later done with some of the respondents to fill in some gaps in the data collected. This became necessary because some of the words were skipped during the interview sections. More so, the pronunciations of some words which were not part of the initial data, like *ye*, *kli*, *kristo*, *wòe*, and *ɣee* were later needed to enrich the analysis of the phonemes. All these necessitated the telephone conversation, which also helped to reduce cost and resource involved in the study.

Data Processing and Analysis

First and foremost, I backed-up the audio and video data collated so as to avoid any loss. I then transcribed the audio data collated from each respondent dialect by dialect and coded them using initial coding system. The various pronunciations for each word were then extracted and ordered based on frequency of use by the 20 respondents as in Appendix B, C and D for Aŋlɔ, Eʋeme and Tɔŋu respectively. The most recurring pronunciations in all the dialects were further put together, as shown in Appendix E, for easy comparison. The extracted transcriptions with their pronunciations were later given to three linguist consultants to authenticate the accuracy of the transcriptions. The transcribed scripts were then compared and analysed based on each minimal or near minimal pair using the phonemic analysis (distributionalism) and the inductive approach. The phonemic and inductive approaches also helped identify the various phonemes and their variants articulated and noted in the transcriptions in order to come out with the conclusions and generalizations on the phonemes in the three main dialects of the Eʋe language (Trauth & Kazzazi, Eds., 1996). Newman (2014) and Tracy

(2013) allude to the fact that the inductive approach to qualitative data analysis helps to identify specific and refined phenomenon, which is the phonemes in this case.

Before the establishment of the phonemes, the various phones identified from the minimal or near minimal pairs are rearticulated with the help of the audio and video recordings and classified based on the three parameters for consonants and the four parameters for the vowels. The re-articulation of the consonant with the insertion of fingers in the ears as suggested by Akpanglo-Nartey (2002), Katamba (1989) and Knight (2012) is used to differentiate the voiced from the voiceless sounds. The place of articulation is located through Ladefoged and Johnson (2011)'s approach, that is, holding the articulatory position and breathing in through the mouth while the degree of stricture is identified through feeling the closeness between the articulators and the cavity(ies) through which the airstream escapes from the vocal tract. An instance is by placing the hand close to the mouth and nostrils during the articulation of the sounds. All these were done with the support of the IPA chart.

The description of the vowels involves observing the shape and degree of mouth opening that occur, using a mirror, during the articulation process. Feeling of the shape and position of the tongue and comparing the vowel sounds articulation processes helped in the description of the vowel sounds. The video recordings also presented some of the visible articulatory features for the description of the identified phones, allophones and free variants.

The various analyses were done based on the research questions guiding the study so as to achieve the research objectives. All these were then presented

through tables and narrations, which helped me come out with the findings and conclusions.

Chapter Summary

This chapter presents the research method, population, instruments, data collection process and analysis used in achieving the specific objectives of this research. It indicates that a qualitative approach was employed in a phonemic theory framework using conversational interview guide as the principal tool and an inductive approach in the analysis of the data so as to answer the research questions. The next chapter presents the results and discussion.

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

The main purpose of this study is to identify the number of phonemes in the three main dialects of Eʋe and consequently the Eʋe language. The study employed the phenomenological approach to gather oral data from 60 respondents between the ages of 16 and 70 to answer the two research questions: (1) How many phonemes exist in each of the three major Eʋe dialects? (2) What may account for the variation in the number of phonemes identified by the previous works? This chapter used the phonemic analysis to highlight the phonemes in the three major dialects of Eʋe and the plausible reasons for the variations in the Eʋe phonemes outlined in previous studies.

Phonemes in the Three Major Dialects of Eʋe

The phonemic analysis of the words articulated by the 60 respondents brought to the fore the phonemes that are employed in the three main dialects of Eʋe. In the presentation of the respondents' pronunciation of the various words, some dialects have multiple pronunciations for the same word. In such cases, the one with the highest frequency, based on usage among the 20 respondents from each dialect, comes first before the less frequent one(s). The Eʋeme respondents' articulation of *ƒe* as seen in Table 2 is a typical example where *ƒe* is either pronounced with [ɛ] bearing a low tone, which is more common, or with a high tone which is less common than the use of [e] with low

tone, which is mostly used by Eʋeme speakers at Kpando. Nonetheless, the focus is on the phonemes but not the tonemes. Before a phoneme is established, there is a description of the focused sound segment(s) as identified from the word articulations.

Consonant phonemes in the three major dialects of Eʋe

This section presents the Eʋe consonant sound segments and Eʋe consonant phonemes identified from the respondents' pronunciations of the words presented to them as shown in Appendix A in this study. The phonemes are presented in pairs based mostly on the place of articulation and sometimes on the manner of articulation.

/ɸ/ and /ß/

The sound [ɸ], as in *fe* [ɸə̀], [ɸɛ̀] or [ɸè], is produced in all the three main dialects of Eʋe with the main obstruction occurring between the lips. During this obstruction, there is an open glottis which allows the pulmonic airstream to flow through without any vibration. The two lips however come sufficiently close together enough leaving just a small opening between them as the velum shuts off the nasal resonator. The airstream then forces its way through the two lips with some frictional noise. The VPM (voicing, place and manner of articulation) label for [ɸ] is voiceless bilabial fricative, which affirms the findings of earlier scholars.

The sound [ß] as in *ʋe* [ßə̀], [ßɛ̀] or [ßè] differs from [ɸ] in terms of phonation. [ß] is articulated with close glottis which causes the continuous

vibration of the vocal cords with the main obstruction occurring between the lips. During this obstruction, the two lips come sufficiently close together enough leaving a small opening between them as the velum shuts off the nasal cavity. The airstream then forces its way through the two lips with some frictional noise. The VPM label for [ß] is voiced bilabial fricative which corroborates the earlier findings on [ß].

The articulation of the words presented to the sampled population shows that these two sounds, [ɸ] and [ß], contrast in the varieties under study as displayed in Table 2.

*Table 2: Respondents' Pronunciations of **ƒe** and **ve***

Word	Aŋlɔ	Eveme	Tɔŋu	Meaning
ƒe	[ɸə̀]	[ɸɛ̀][ɸè][ɸé]	[ɸə̀]	year
ve	[ßə̀]	[ßɛ̀][ßè]	[ßə̀]	hole

The various articulations in Table 2 show that replacing [ɸ] with [ß] in the two words, that is in the same phonetic environment, leads to the realisation of two semantically different words, *ƒe* and *ve*. In this instance, [ɸ] and [ß] are therefore two different phonemes in the three main dialects of Eve, which corroborates the findings of other linguists that [ɸ] and [ß] are Eve phonemes, although there are some variations in the dialects' pronunciations of *ƒe* and *ve* to the extent that the Eveme dialect has two different tonemic structure for *ƒe*. [ɸɛ̀] is the most used, which is by 14 out of the 20 Eveme respondents. In the

pronunciation of *fã* [ɸ̰á] (to begin to ripe) and *vã* [ʂ̰á] (matured), there is a regressive assimilation causing [ɸ] and [ß] to be nasalised as [ɸ̰] and [ʂ̰] respectively. Again, they become labialised when the are found before the [u] sound segment as in [ɸʷù] (meaning *hook*) and [ßʷù] (meaning *open* or *blood*). All these imply that /ɸ/ is a phoneme in all the three main Eʋe dialects with [ɸ], [ɸ̰] and [ɸʷ] as its allophones. Same is the case with /ß/ that has [ß], [ʂ̰] and [ßʷ] as its manifestations.

/p/ and /b/

The [p] sound segment in the three major Eʋe dialects, as in *apa* [àpà][àpă], is produced with the vocal cords usually wide apart allowing a free flow of the airstream into the vocal tract, which causes [p] to be a voiceless sound segment. During its articulation, both lips close firmly to block the airstream after the velum raises to shut off the nasal resonating chamber. The air builds up pressure behind the occlusion at the lips. This is suddenly released allowing the airstream to come out with some form of plosion through the lips. As described in previous studies, [p] is a voiceless bilabial plosive sound in all the three main dialects of Eʋe.

The vocal cords are close to each other when articulating the [b] sound segment, as in *aba* [àbà][àbă], creating a close glottis which makes [b] a voiced sound. During the articulation of [b] in all the three main dialects, both lips close firmly to block the airstream after the velum raises to shut off the nasal resonating chamber. Pressure then builds up behind the blockage at the lips. This is suddenly released allowing the airstream to come out with some form of

plosion through the lips. Hence, just as described in previous studies, [b] is a voiced bilabial plosive sound.

The [p] and [b] sound segments used in the words *apa* and *aba* respectively, according to the respondents' pronunciations in Table 3, led to the difference in the meaning of these words.

*Table 3: Respondents' Pronunciations of **apa** and **aba***

Word	Aŋlɔ	Eʋeme	Tɔŋu	Meaning
apa	[àpà]	[àpă]	[àpă][àpà]	labour
aba	[àbà]	[àbă]	[àbă][àbà]	bed

[p] and [b] are by the respondents' articulations in a contrastive distribution in all the three main dialects of Eʋe. In that, substituting [b] for [p] in *apa* in the three major dialects produces *aba*, which are two different words in terms of their referent, as illustrated in Table 3. Consequently, [p] and [b] are phonemes in the Eʋe language as Agbedoxor (2014), Anyidoho (1990), Nyomi (2017) and others postulate. Some, like Duthie (1996) and Kpodo (2014), suggest [p] is not an Eʋe phoneme because it occurs in only loan words. However, only one Tɔŋu respondent out of the 60 respondents notes that *apa* is a loan word from Akan but added that the word *apa* is now an integral part of the Eʋe language. If the native speakers consider *apa*, *pasu* (scissors), *aprim* (cannon), *pamplo* (bamboo) and others as part of the Eʋe lexicon, then [p] could also be considered an Eʋe phoneme. Moreover, phones that are used in loan words of a language should be part of the phoneme inventory of that language (Clemente, 2012).

Duthie further asserts that [b] is an allophone of /m/ because [m] only occurs before nasalised vowels and [b] before oral vowels. But a scrutiny of the words he used, like *mɔ* (way), *ma* (divide), *bɔ* (abound) and *ba* (mud), shows both [b] and [m] occur with oral vowel sounds. The oral vowel then acquires some of the nasal features of the nasal consonant sound to become nasalised. In this context, the nasalised vowel rather becomes the allophone of its oral variant that become +nasal. Moreover, [b] contrasts with [p] in the data displayed in Table 3. [b] is thus an Eʋe phoneme employed in all the three dialects although it may be palatalised when it appears before the [i] sound segment: [bʲ], as Atakpa (1985) avers. [p] is also palatalised in a word like *pipi* [pʲípʲì] (a type of animal) in Aŋlɔ dialect. [b] could also be labialised when it occurs before the [u] sound segment as in *bu* [bʷù] (to respect) in all the three major Eʋe dialects. The phoneme /b/ could therefore be represented by [b], [bʲ] or [bʷ] while /p/ has [p] as its allophone in all the dialects under study with Aŋlɔ adding [pʲ].

/w/ and /m/

The [w] sound, as in the pronunciations of *awu* [àwù][áwú] by the three main dialects of Eʋe, is articulated with a close glottis. The soft palate is raised to close the nasal tract as the two lips come together with the back of the tongue rising towards the velum in an open approximation thereby allowing the airstream to escape through the oral cavity without any audible friction. Using the VPM label, [w] is voiced labio-velar approximant in all the three major dialects spoken in Eʋe.

The Eʋe sound [m], as in [àmù][ámú], is produced with a close glottis. The two lips are also involved in obstructing the airstream, causing a complete closure of the oral tract. Because of the absence of velic closure, the air is forced to escape through the nasal tract resulting in the [m] sound. All these are summed up in the VPM label for [m] as voiced bilabial nasal sound.

All the respondents' pronunciation of *awu* and *amu* in Table 4 confirms [w] and [m] to be in a contrastive distribution in all the three Eʋe dialects

*Table 4: Respondents' Pronunciations of **awu** and **amu***

Word	Aŋlɔ	Eʋeme	Tɔŋu	Meaning
awu	[àwù]	[áwú]	[àwù]	dress
amu	[àmù]	[ámú][àmù]	[àmù]	lagoon

Replacing [m] with [w] in *amu* leads to the realisation of *awu*, which are semantically unrelated words. This makes [w] a phoneme in the three major dialects of the Eʋe language and further reiterate [m] as an Eʋe phoneme in the main dialects just as Abadzivor and Dzamesi (2008), Agbedoxor (2014), Anyidoho (1990), Nyomi (2017) and others proffer that /m/ and /w/ are phonemes in Eʋe language.

/m/ also seems to have another variant when it occurs before [f] in words or continuous speech in all the dialects under study. This is seen in 21 respondents' pronunciation of the word *ŋfɔ*, which is [m̩fɔ], the others were not familiar with the word. The bilabial nasal [m] assimilates the dental feature of [f] to become [ɱ]. There is an anticipatory assimilation which leads to the

occurrence of [ŋ] before the voiceless labio-dental fricative [f]. [ŋ] is therefore an allophone of /m/ and not an Eʋe phoneme. Kpodo (2014) concurs that [ŋ] is an allophone but not of /m/. He postulates that [ŋ] is an allophone of /n/, which is not in line with the findings from this study but plausible.

/f/ and /v/

During the production of [f] (as articulated in *fé* [fé][fɛ́]), the glottis is opened so the vocal cords do not vibrate. With a raised velum shutting off the nasal resonating chamber, the air is then obstructed in the oral resonating chamber by the lower lip pressing slightly against the upper front teeth in close approximation thereby allowing the air to flow out through the two articulators with friction. Affirming the description of [f] as in the previous studies, [f] is a voiceless labio-dental fricative.

The glottis is narrowed and the vocal cords vibrating when producing [v] (as in *ve* [vé][vɛ̌]). With a raised velum shutting off the nasal resonating chamber, the air is obstructed in the oral resonating chamber by the lower lip pressing slightly against the upper front teeth in close approximation thereby allowing the airstream to flow out through the two articulators with audible friction. [v], as in the previous studies, is a voiced labio-dental fricative.

All the scholars reviewed in this work assert that [f] and [v] are another pair of sound segments that are uncontroversially considered separate phonemes in Eʋe. The data in this study, as in Table 5, corroborates this assertion.

*Table 5: Respondents' Pronunciations of **fe** and **ve***

Word	Aŋlɔ	Eʋeme	Tɔŋu	Meaning
fe	[fé]	[fɛ́][fé]	[fé]	play
ve	[vé]	[vɛ́][vɛ́]	[vé]	bitter

A glance at Table 5 suggests that a change in the initial [f] to [v] leads to a totally different lexeme in all the dialects, hence, the conviction that these two sound segments are separate phonemes in the three main Eʋe dialects, even though the Eʋeme pronunciations differ from Aŋlɔ and Tɔŋu pronunciations in terms of the vowel segment articulated by the majority. [f] and [v] becomes labialised in all the dialects when they immediately precede [u] as in *fu* [f^{w}ù] (to whiten) and *vu* [v^{w}ù] (to expand) respectively. In all, [f] and [f^{w}] are allophones of /f/ while [v] and [v^{w}] are allophones of /v/ in Aŋlɔ, Eʋeme and Tɔŋu dialects.

/t/ and /d/

With a velic closure, [t] is produced with an open glottis. The tip and blade of the tongue is then pressed against the upper alveolar ridge to completely block the airstream briefly in the oral resonating chamber. The blockage leads to the compression of air behind it, which is released suddenly with some form of explosion to produce [t] as in *ta* [tà]. But Ansre (1961) and Duthie (1996) consider [t] to be a dental sound. This seems to occur occasionally in some Eʋeme respondents' pronunciation of *deti*, which is sometimes articulated as [dɛ̪tí] when rearticulated because of the high front vowel segment's fronting of

the place of articulation of [t]. Therefore, the [t] sound segment, which is a voiceless alveolar plosive sound could have the dental variant [t̪].

[d] is produced with a close glottis and velic closure. The tip and blade of the tongue is then pressed against the upper alveolar ridge to completely block the airstream briefly in the oral resonating chamber. The blockage leads to the compression of air behind it, which is released suddenly with some form of plosion to produce the sound [d] as in *da* [dà]. Ansre (1961) and Duthie (1996) however consider [d] a dental sound. This seems to occur occasionally in some Eʋeme respondents' pronunciation of *adzi*, which is sometimes articulated as [àd̪ĭ] when rearticulated because of the high front vowel segment's fronting of the place of articulation of [d]. Therefore, [d], a voiced alveolar plosive sound, could also have the dental variant [d̪].

The data from the respondents on the pronunciation of *ta* and *da*, as seen in Table 6, again highlights the contrastive nature of the two sound segments in Eʋe.

Table 6: Respondents' Pronunciations of ***ta*** and ***da***

Word	Aŋlɔ	Eʋeme	Tɔŋu	Meaning
ta	[tà]	[tà]	[tà]	wrap/swear
da	[dà]	[dà]	[dà]	throw/to pride oneself

In Table 6, all the three dialects pronounced *ta* and *da* the same way. This shows that [t] and [d] are in a contrastive distribution in each of the three major Eʋe dialects. Typically, these sounds are labialised when they occur before the back close rounded oral vowel [u] as shown in the articulation of *tu* [t^{w}ù] (to erect)

and *du* [dʷù] (town or grow lean). The Aŋlɔ dialect also uses [ʧ] as a variant of /t/ when [t] occurs before [i] as seen in the articulation of *deti* [dèʧĩ] and *ɖeti* [ɖèʧĩ]. The same process happens when [d] precedes [i] as in *di* [ʤí] (to want), which makes [ʤ] a variant of [d] in the Aŋlɔ dialect. In all, the phoneme /t/ could be realised as [t] or [tʷ] in all the dialect or as [t̪] and [ʧ] in Eʋeme and Aŋlɔ respectively while /d/ has [d] and [dʷ] as its allophones in all the three dialects, with [d̪] and [ʤ] as additional variants of [d] in Eʋeme and Aŋlɔ respectively per the data.

/ʧ/ and /ʤ/

[ʧ] as in *atse* [àʧə] [àʧɛ̀] is produced with an open glottis with the nasal cavity shut off. The airstream is completely obstructed by the tip, the blade and the rim of the tongue articulating against the upper alveolar ridge and the side upper teeth as the front of the tongue is moved towards the hard palate. This is then gradually released with audible frictional noise. Using the VPM label, [ʧ] is voiceless palato-alveolar affricate, which affirms the description of Kpodo (2014).

[ʤ] as in *adze* [àdʒə][àdʒɛ̀] is also articulated with a close glottis with the nasal resonator shut off. The airstream is completely obstructed by the tip, the blade and the rim of the tongue articulating against the upper alveolar ridge and the side upper teeth as the front of the tongue is moved towards the hard palate. This is then gradually released with audible frictional noise. Therefore, [ʤ] is a voiced palato-alveolar affricate, which affirms the stance of Kpodo (2014).

The sampled population's various articulations of the minimal pair *tse* and *dze* as transcribed in Table 7 show that /ʧ/ and /ʤ/ are meaning distinguishing sound segments in Aŋlɔ, Eʋeme and Tɔŋu dialects.

Table 7: Respondents' Pronunciations of ***tse*** and ***dze***

Word	Aŋlɔ	Eʋeme	Tɔŋu	Meaning
tse	[ʧé][tsé]	[ʧɛ́][ʧé][tsɛ́]	[ʧé][tsé][tsě]	grow
dze	[ʤé][dzé]	[ʤɛ́][ʤé][dzɛ́][ʤɛ́]	[ʤé][dzě]	visible

Hence, their first set of responses affirm the views of Kpodo (2014) that /ʧ/ and /ʤ/ are Eʋe phonemes. This is because the data indicate that /ʧ/ and /ʤ/ are phonemes in all the three main dialects of Eʋe. The Eʋeme pronunciations that differ in the vowel segment also indicate the contrastive distributionalism of /ʧ/ and /ʤ/.

The foregoing analysis implies that [ts] and [dz], as used in Table 7, are free variants of /ʧ/ and /ʤ/ respectively in all the dialects being studied. This contradicts the findings of all the previous linguists that [ts] and [dz] are phonemes in Eʋe. All these are further corroborated by the articulation of *atse* and *adze* as shown in Table 8 where [ts] and [dz] are in free-variation with [ʧ] and [ʤ] respectively.

Table 8: Respondents' Pronunciations of ***atse*** and ***adze***

Word	Aŋlɔ	Eʋeme	Tɔŋu	Meaning
atse	[àʧə̀][àtsə̀]	[àʧɛ̀][àtsɛ̀]	[àʧə̀][àtsə̀]	keloid
adze	[àʤə̀][àdzə̀]	[àʤɛ̀][àdzɛ̀]	[àʤə̀][àdzə̀]	lie

The main stricture in the articulation of [ts], as an Eʋe sound segment, occurs with the blade of the tongue raising and pressing against the upper alveolar ridge. There is a velic closure, during which the vocal cords are apart when producing [ts] as in *atse* [àtsə][àtsɛ̀], making [ts] a voiceless sound. Pressure is then built behind the obstruction at the alveolar ridge. The tongue then gradually parts ways with the alveolar ridge, allowing the airstream to flow out gradually with some frictional noise. Simply, [ts] is a voiceless alveolar affricate.

There is a velic closure, during which the vocal cords are very close when producing [dz] as in *adze* [àdzə][àdzɛ̀], which makes [dz] a voiced sound. The main obstruction in the articulation of [dz] occurs with the blade of the tongue raising and pressing against the upper alveolar ridge. Pressure is then built behind the obstruction at the alveolar ridge. The tongue then gradually parts ways with the alveolar ridge, allowing the airstream to flow out gradually with some frictional noise. [dz] is therefore a voiced alveolar affricate.

A critical look at Table 9 suggests that the [ts] and [dz] variants are not typically used before [i] as seen in their pronunciations of *atsi* and *adzi* respectively. When they appear before [i], they are palatalised: [tsʲ] and [dzʲ] respectively as seen in Eʋeme and Tɔŋu articulation of *atsyɔ̃* and *atsiã*.

*Table 9: Respondents' Pronunciations of **atsi**, **adzi**, **atsyɔ̃** and **atsiã***

Word	Aŋlɔ	Eʋeme	Tɔŋu	Meaning
atsi	[àʧì]	[àʧì]	[àʃì][àʧì]	indigestion
adzi	[àʤì]	[àʤì][àďì]	[àʤì]	frog/love
atsyɔ̃	[àʧɔ̃][àʧɪ́ɔ̃]	[àtsʲɪ́ɔ̃][àtsɔ́]	[àʧɔ̃][àtsʲìɔ̃]	beauty
atsiã	[àʧìã][àʧã][àʧà]	[àtsʲìã][àʧã]	[àʧà][tsʲìà]	style

From the pronunciations in Table 9, it shows that these palatalised versions of [ts] and [dz] are what Abadzivor and Dzamesi (2008), Agbedoxor (2014), Anyidoho (1990), Duthie (1996) and Nyomi (2017) identified as [tsy] and [dzy] respectively, which from all the indications in Table 9 are not phonemes but variants of [ts] and [dz]. [ʧ] and [ʃ] are also free variants in the Tɔŋu pronunciation of *atsi* just as [ʤ] and [d] are in free variation in the Eʋeme respondents' articulation of *adzi*. Therefore, it could be concluded that [ʧ] and [ʤ] are Eʋe phonemes with [ts], [dz], [tsʲ] and [dzʲ] as variants in the three main dialects of Eʋe.

/n/ and /ɲ/

The respondents' production of [n] involves no velic closure but it occurs with a close glottis. The blade of the tongue rises and presses firmly against the upper alveolar ridge and this causes a complete blockage of the oral cavity. The pulmonic air is then forced to escape through the nasal resonating chamber resulting in the [n] sound segment as in ***no*** [nó][nŏ][nɔ̌]. The VPM label for [n] based on the aforementioned description is voiced alveolar nasal.

[ɲ] (as in *nyi* [ɲì]) is also articulated with a close glottis causing the continuous vibration of the vocal cords, which makes it a voiced sound. [ɲ] is produced with the front of the tongue firmly pressing against the hard palate and completely obstructing the oral resonator. The obstruction in the oral cavity forces the airstream to flow out through the nasal cavity because there is no velic closure during the production of [ɲ]. The aforementioned description of [ɲ] corroborates its previous description as voiced palatal nasal.

This study used the minimal pair *no* and *nyo* to test for the distributive nature of /n/ and /ɲ/ in the three main dialects of Eʋe. Table 10 summarised the varied responses from the respondents.

Table 10: Respondents' Pronunciations of ***no*** and ***nyo***

Word	Aŋlɔ	Eʋeme	Tɔŋu	Meaning
no	[nó]	[nó][nǒ]	[nǒ]	breast
nyo	[ɲó]	[ɲó][ɲǒ]	[ɲó][ɲǒ]	good

It is obvious from their responses in Table 10 that /n/ and /ɲ/ are phonemes in Aŋlɔ, Eʋeme and Tɔŋu dialects and more so in Eʋe. This is because substituting the initial phone in any of these two words with the other, results in a different word semantically. Hence, /n/ and /ɲ/ are phonemes in the main dialects of Eʋe, and as previous works posit, they are Eʋe phonemes.

/ɖ/ and /d/

The articulation of [ɖ] involves a close glottis and a velic closure. It is a curled tongue tip that moves to completely block the airstream at the point

between the alveolar ridge and the hard palate briefly. Pressure is then built behind the blockage as the curled tongue tip is then suddenly removed for the sound to come out with plosion. The VPM label for the sound [ɖ] based on this description is voiced retroflex plosive.

The description of [ɖ] in this study contravenes the view of Amegashie (2011), Atakpa (1985) and Duthie (1996). They posit that it is a voiced alveolar plosive. Their stance implies that [ɖ] and [d] are articulated the same way, which is not very plausible because two different consonant phonemes cannot be phonetically similar in all parameters: phonation, place of articulation and manner of articulation.

The sound segment [d] has already been confirmed as a phoneme in the major dialects of Eʋe (cf. Table 6) but it is again tested with the sound [ɖ] using the minimal pair *ɖeti* and *deti* to reaffirm it and to affirm [ɖ] as a phoneme or otherwise. Table 11 displays the articulations of the various respondents.

Table 11: Respondents' Pronunciations of ***ɖeti*** and ***deti***

Word	Aŋlɔ	Eʋeme	Tɔŋu	Meaning
ɖeti	[dèʧĭ][rèʧĭ]	[ɖɛ̀tí][ɖɛ̀tĭ]	[ɖətĭ]	thread/cotton
deti	[dèʧĭ]	[dɛ̀tí][dètí][dɛ̀tĭ]	[dətĭ][dətí]	palm tree

The pronunciations in Table 11 verify that the two sound segments, [ɖ] and [d] are really phonemes in all the three Eʋe dialects. Aŋlɔ pronunciations of *ɖeti* further indicate that replacing [ɖ] with [r] in the same environment during the articulation of *ɖeti* does not change the concept the word *ɖeti* stands for. [ɖ] and

[r] are therefore in free variation just as Duthie (1996) suggests, especially among the Aŋlɔ dialect speakers.

/s/ and /z/

The production of the [s] sound segment as in *asi* [àsí] requires the raising of the velum to shut off the nasal resonator at a moment that the vocal cords are wide apart. The tip of the tongue then slightly makes contact with the upper alveolar ridge letting the air escape with a voiceless friction. The VPM label for [s] is voiceless alveolar fricative. The data again suggest that the voiceless alveolar fricative is sometimes palatalised when it occurs before the [i] sound segment to become [ʃ], as in the Aŋlɔ respondents' pronunciation of *asi* [àʃĩ].

[ʃ] is articulated with an open glottis. The soft palate shuts off the airstream from entering the nasal cavity. The main stricture however occurs with the blade of the tongue moving toward the alveolar ridge and the front of the tongue lightly pressing against the hard palate, making the airstream to force its way through the somewhat wide area of obstruction with frictional noise. [ʃ], using the VPM label, is voiceless palato-alveolar fricative, confirming Kpodo's (2014) view.

[z], as in *azi* [àzĭ], requires a raised velum to shut off the nasal resonating chamber at a moment that the vocal cords are close. The tip of the tongue then slightly makes contact with the upper alveolar ridge letting the air escape with a voiced friction because of the close glottis involved in its production. [z] is thus a voiced alveolar fricative. The data again suggest that [z] is sometimes

palatalised when it occurs before the close front unrounded vowel [i] to become [ʒ].

[ʒ] is produced with a close glottis. The soft palate also shuts off the air from entering the nasal cavity. The main stricture occurs with the blade of the tongue moving toward the alveolar ridge and the front of the tongue lightly pressing against the hard palate, making the airstream to force its way through the somewhat wide area of obstruction with frictional noise. [ʒ] is therefore voiced palato-alveolar fricative sound, which is in line with Kpodo's (2014) descriptions.

To test /s/ and /z/ as phonemes in the language, the respondents were presented with *asi* and *azi* and their responses are presented in Table 12.

*Table 12: Respondents' Pronunciations of **asi** and **azi***

Word	Aŋlɔ	Eveme	Tɔŋu	Meaning
asi	[[àʃǐ][àsí]	[àsí][àsǐ]	[àsǐ]	hand
azi	[àʒì][àzì]	[àzǐ]	[àzǐ]	groundnut

Based on the Eveme and Tɔŋu articulations that differ in only the medial sound segments and the semantic differences exhibited between the two words in Table 12, [s] and [z] are functionally contrastive in the two dialects. Same is the case in the Aŋlɔ dialect that also has another pronunciation that is more common among the Aŋlɔ respondents as shown in Table 12. This validates the previous Eve linguists' identification of these two consonantal sounds as phonemes because they are in contrastive distribution in all the three major dialects of Eve.

Further, based on the Aŋlɔ pronunciation in Table 12, it can be concluded that [ʃ] and [s] are in free variation, same is [ʒ] and [z] in the Aŋlɔ dialect. This stems from the fact that [àʃí] is just another way of saying [àsí] while [àʒì] is also another way of articulating [àzì] among Aŋlɔ speakers. 16 out of the 20 Aŋlɔ respondents use [ʃ] and [ʒ] while 4 out of 20 use [s] and [z]. In conclusion based on the data, /s/ and /z/ are phonemes in the three major dialects but [ʃ] and [ʒ] are free variants of /s/ and /z/ respectively in the Aŋlɔ dialect. The Aŋlɔ dialect typically uses [ʃ] and [ʒ] for /s/ and /z/ respectively when they occur before the [i] sound segment.

/l/ and /r/

The Eʋe sound segment [l] is produced with a close glottis with the velum shutting off the nasal tract, which makes it a voiced sound. The tongue tip firmly articulates against the upper alveolar ridge to partially block the airstream from moving out through the centre. The airstream escapes through the sides, hence, the phone [l] as in *kli* [klí], can be classified as a lateral sound segment. [l] is simply a voiced alveolar lateral sound.

In producing [r] as in *Kristo* [krístò], however, the tip of the tongue intermittently hits the ridge of the upper teeth rhythmically, making [r] a trill sound. There is a close glottis, which makes it a voiced sound and there is also a velopharyngeal closure during the production of [r], which makes the airstream escape through the oral resonating chamber. The VPM label for [r] is voiced alveolar trill, which supports the descriptions of Abadzivor and Dzamesi (2008), Amegashie (2011), Kpodo (2014) and Nyomi (2017).

A minimal pair that could contrast [l] and [r] seems not to exist in Eʋe. Consequently, the study rather employed a near-minimal pair. The near-minimal pair presented to the respondents to articulate are *belibeli* and *beriberi* and their pronunciations are shown in Table 13.

Table 13: Respondents' Pronunciations of ***belibeli*** and ***beriberi***

Word	Aŋlɔ	Eʋeme	Tɔŋu	Meaning
belibeli	[bélíbélí]	[bɛ́líbɛ́lí] [bélíbélí]	[bélíbélí]	weakly/thin
beriberi	[bèríbèrí] [bɛ̀ríbɛ̀rí]	[bɛ̀ríbɛ̀rí] [bèríbèrí]	[bèríbèrí] [bɛ̀ríbɛ̀rí]	rashes

From the pronunciation in Table 13, the sound segments [l] and [r] occur in the same environment: e—i or ɛ—i. So, [l] and [r] are in a contrastive distribution in the articulation of *belibeli* and *beriberi*, which makes them phonemes in all the dialects under study in the language even though Ansre (1961), Duthie (1996) and Kpodo (2014) assert that they only occur in complementary distributions, hence, allophones of the same phoneme. The contrastive distribution is again displayed in the articulation of *kli* [klí] (to break off) and *Kristo* [kristò] (Christ), where [l] and [r] operate in the same environment: k—i. Some argue that *Kristo* is a loan word, but the fact is, it has become an integral part of the Eʋe language and enjoys regular usage, thus, /r/ should be part of the main Eʋe dialects' phoneme inventory. Notwithstanding, [l] and [r] are mostly in complementary distribution in most Eʋe words, for instance, in *dzra* [dzrá] (to sell), *tsra* [tsrà] (to sieve), *gblɔ* [gblɔ̀] (to say) and *kplɔ* [kplɔ̀] (to sweep), [r]

could not occur in the same environment as [l] in all these instances. In all, /l/ and /r/ are phonemes in all the dialects of Eʋe being analysed in this study.

/kp/ and /gb/

The set of words and their articulations represented in Table 14 were used to ascertain the type of distribution [kp] and [gb] exhibit in Aŋlɔ, Eʋeme and Tɔŋu dialects of Eʋe. [kp], as in [kplá], is articulated when the vocal cords are wide apart creating an open glottis. There is then a co-occurrence of obstruction at the lips and at the velum. With the occurrence of a velopharyngeal closure, the two lips as well as the back of the tongue and the velum come together to completely block the airstream. Pressure builds up behind the obstructions which are released suddenly with plosion. Using the VPM label, [kp] is voiceless labiovelar plosive.

[gb], as in [gblá], is produced with a close glottis causing the continuous vibration of the vocal cords. It is therefore a voiced sound segment. There is also a velopharyngeal closure. During its production, the two lips as well as the back of the tongue and the velum come together to completely block the airstream at the lips and the velum. The air then builds up pressure behind these occlusions which are removed suddenly and thereby allowing the airstream to come out with plosion. [gb], as used in all the three major Eʋe dialects, could therefore be labelled as voiced labiovelar plosive sound.

*Table 14: Respondents' Pronunciations of **kpla** and **gbla***

Word	Aŋlɔ	Eʋeme	Tɔŋu	Meaning
kpla	[kplá]	[kplá]	[kplá]	put on/train
gbla	[gblá]	[gblá][gblă]	[gblá]	focus

From the pronunciations in Table 14, which are almost the same if not for the second pronunciation from two Eʋeme respondents that has a toneme variant, [kp] and [gb] at the initial position of the minimal pairs account for the meaning difference in the pair in all the Eʋe variants. Therefore, as alluded to by the literatures, /kp/ and /gb/ are phonemes in the dialects under study. This is further maintained in *akpa* and *agba*, refer to Table 15 where [kp] and [gb] contrast in the medial position in all the dialects.

*Table 15: Respondents' Pronunciations of **akpa** and **agba***

Word	Aŋlɔ	Eʋeme	Tɔŋu	Meaning
akpa	[ākpā]	[àkpă][ákpá]	[ākpā]	fish/tilapia
agba	[āgbā]	[àgbă][àgbà]	[āgbā]	plate

/j/ and /ɲ/

The sound segment [j] (as in *yi* [jì]) is articulated with a close glottis causing the vibration of the vocal cords. [j] is produced when there is a velic closure in the vocal tract, with the front of the tongue moving close to the hard palate but not close enough to cause any audible frictional noise. This type of stricture between the front of the tongue and the hard palate allows the airstream

to come out of the oral cavity in open approximation to produce [j]. This description of [j] corroborates its previous description as voiced palatal approximant.

The articulations of *yi* and *nyi*, as transcribed in Table 16, portray the relationship between [j] and [ɲ] in the Eʋe main dialects.

*Table 16: Respondents' Pronunciations of **yi*** and ***nyi***

Word	Aŋlɔ	Eʋeme	Tɔŋu	Meaning
yi	[jì]	[jì]	[jì]	go
nyi	[ɲì]	[ɲì]	[ɲì][ɲə̀]	nurture

From the transcriptions in Table 16, [j] and [ɲ] operate in the same phonetic environment, which is at the initial position of the minimal pairs. They also cause the semantic change in the lexical items. Clearly, all the dialects used [j] and [ɲ] in a contrastive manner, hence, they are phonemes in the language. This contradicts the view of Duthie (1996) that [j] and [ɲ] are allophones of /ɲ/. He argues that [j] only occurs with oral sounds while [ɲ] occurs with only nasalised vowel segments. However, this study shows in Table 16 that they both occur with oral vowels but due to progressive manner assimilation, the vowels that come after a nasal sound become nasalised. Therefore, /j/ and /ɲ/ are different phonemes in all the three main dialects of Eʋe.

/k/ and /g/

The [k] sound segment as in *ka* [kà] is produced with the main stricture occurring between the back of the tongue and the velum. During this obstruction, the glottis is opened, which allows the pulmonic airstream to flow

through without any vibration of the vocal cords. The back of the tongue then comes into contact with the velum to completely block the oral resonator for a brief period as the velum shuts off the nasal resonator. Pressure then builds up behind the blockage. The back of the tongue moves away suddenly to release the air with plosion to produce [k]. Using the VPM label, [k] is a voiceless velar plosive sound. When the voiceless velar plosive occurs before a rounded vowel like [u], as in *kɔku* [kɔ́kʷú], [k] becomes labialised. The voiceless labialised velar plosive is represented as [kʷ]. Nyomi (2017) describes [kʷ] as voiced, which is contrary to the findings in this study.

The sound [g] as in *ga* [gà] is produced with a close glottis which causes the continuous vibration of the vocal cords. The main stricture occurs between the back of the tongue and the velum. To cause the obstruction, the back of the tongue comes into contact with the velum to completely block the oral resonator for a brief period as the velum shuts off the nasal resonator. Pressure then builds up behind the blockage. The back of the tongue moves away suddenly to release the air with plosion to produce the sound [g]. Using the VPM label, [g] is a voiced velar plosive sound.

To account for /k/ and /g/ as contrastive sound segments in Aŋlɔ, Eʋeme and Tɔŋu dialects of Eʋe, the minimal pairs in Table 17 were presented to the sampled population. Their various articulations of the minimal pair are also included in the same table.

*Table 17: Respondents' Pronunciations of **ka** and **ga***

Word	Aŋlɔ	Eʋeme	Tɔŋu	Meaning
ka	[kà]	[kà]	[kà]	rope
ga	[gà]	[gà]	[gà]	money/iron

From the data in Table 17, all the 60 respondents gave the same pronunciations for both *ka* and *ga* respectively. Substituting the consonantal sounds, [k] and [g], brings about the variation in the pronunciation of the minimal pair and their meaning. All these imply that /k/ and /g are phonemes in this context. /k/ is again displayed in Table 18.

*Table 18: Respondents' Pronunciations of **kɔku** and **tɔku***

Word	Aŋlɔ	Eʋeme	Tɔŋu	Meaning
kɔku	[kɔ́kʷú][kɔ́kʷúí]	[kɔ́kʷú][kɔ́ŋkʷúí]	[kɔ́kʷú][kɔ́kʷúí]	neck lymph node
tɔku	[tɔ́kʷú]	[tɔ́kʷú]	[tɔ́kʷú]	drowning

A review of the words in Table 18 however suggests that the sound [k] occurs in a different phonetic environment, that is, before the rounded vowel [u] in the Eʋe dialects under study. This roundness causes some form of regressive assimilation in all the dialects' articulation of the minimal pair, making the sound [k] to be labialised in such an environment in all the three major dialects. [kʷ] is hence an allophone of /k/ in the three dialects.

/x/ and /h/

During the articulation of [x] as Eʋe sound segments, [x] as in *xe* [xə̀][xɛ̀][xé], requires an open glottis which makes it a voiceless sound. The raised soft palate shuts off the nasal resonating chamber. The back of the tongue then articulates in close approximation with the velum, slightly making contact. The airstream then forces through the articulators with some friction to realise [x]. From the description, [x] is a voiceless velar fricative. In the production of [h] as in ***he*** [hə̀][hɛ̀], there is a velic closure and the main stricture occurs in the glottis, just as noted on the IPA Chart. According to Catford and Esling (2006) and Cruttenden (2001), the glottis is not close but constricted beyond its neutral position by the arytenoid cartilages with the airstream causing some turbulent friction throughout the vocal tract and in the end coming out through the oral cavity with some frictional noise. Using the VPM label, [h] is a voiceless glottal fricative, a stance that contravenes the views of the previous scholars.

The respondents' articulation of the words with [x] and [h] are transcribed in Table 19.

Table 19: Respondents' Pronunciations of ***xe*** and ***he***

Word	Aŋlɔ	Eʋeme	Tɔŋu	Meaning
xe	[xə̀]	[xɛ̀][xé][xɛ́]	[xə̀]	Bird
he	[hə̀]	[hɛ̀][hé][hɛ́]	[hə̀]	pull/train

The three Eʋe dialects' pronunciations of ***xe*** and ***he*** show that if one of the initial sound segments is replaced with the other, there is a semantic change in the

word realised. /x/ and /h/ are therefore in contrastive distribution and are different phonemes in the three dialects of Eʋe. But a scrutiny of funeral tributes show that these two sound segments are sometimes used in free variation as in *hede* [hédə̀] or *xede* [xédə̀] (both meaning *fare thee*).

/ŋ/ and /ɯ/

[ŋ] as in *ŋe* [ŋə̀][ŋɛ̀] is articulated with a complete closure between the back of the tongue and the velum, making the air to flow out through the nasal cavity because there is no velic closure during the process. There is however a close glottis leading to the continuous vibration of the vocal cords, which makes [ŋ] a voiced sound segment. Using the VPM label, [ŋ] is voiced velar nasal sound. The articulation of [ɯ] also involves close glottis, hence it is a voiced sound. During its production, the back of the tongue approaches the velum in an open approximation and because there is velic closure, the air moves out freely through the oral cavity to produce [ɯ] as in *ɤe* [ɯə̀][ɯɛ̀]. Consequently, the VPM label for [ɯ] is voiced velar approximant.

Table 20: Respondents' Pronunciations of ***ŋe*** and ***ɤe***

Word	Aŋlɔ	Eʋeme	Tɔŋu	Meaning
ŋe	[ŋə̀]	[ŋɛ̀][ŋɛ́]	[ŋə̀]	Moan
ɤe	[ɯə̀]	[ɯɛ̀][ɯɛ́]	[wò][ɯə̀]	sun/dance

The transcribed data on the pronunciation of *ŋe* and *ɤe*, as displayed in Table 20, indicate the distinctive function /ŋ/ and /ɯ/ play in Aŋlɔ, Eʋeme and Tɔŋu dialects. The oppositional nature of /ŋ/ and /ɯ/ is established in their

commutation in the minimal pair, *ŋɣe* and *ɣe*. Duthie (1996) and Kpodo (2014) hold a contrary view. They argue that [ɯ] is just an allophone of /w/. Duthie and Kpodo further note that [ɯ] only occurs with unrounded vowels while [w] with rounded vowels. This is seen in the Tɔŋu pronunciations of *ɣla*, which is [wlɔ́] or [ɯlá]. Nonetheless, [ɯ] and [w] seem to occur in a similar or same environment in [wlɔ́] and [ɯlá], that is before the sound segment [l] (#—l) and not in a different environment but without causing meaning variance. Their occurrence in the same environment is further seen in the Eveme pronunciations of *ɣla*: [ɯlă] or [wlă], which make [ɯ] and [w] free variants in Eveme dialect. The Eveme pronunciations again show that both [w] and [ɯ] could occur with an unrounded vowel like [a]. All these notwithstanding, the articulations of *ŋɣe* and *ɣe*, as seen in Table 20 affirms [ɯ] as a phoneme in the dialects being analysed in Eve. The contrastive distribution of [w] and [ɯ] in Aŋlɔ and Eveme dialects is again illustrated in Aŋlɔ and Eveme respondents' pronunciation of *wòe* [wéé] (meaning *It's you*.) and ɣee [ɯéé] (meaning *It's the sun.*), where [w] contrasts with [ɯ].

In all, the meaning distinguishing consonant sounds identified in the three main dialects of Eve from the analysis of the data from the various respondents are /ɸ/, /ß/, /p/, /b/, /w/, /m/, /f/, /v/, /t/, /d/, /ʧ/, /ʤ/, /n/, /s/, /z/, /l/, /r/, /ɖ/, /j/, /ɲ/, /k/, /g/, /x/, /h/, /ŋ/, /ɯ/, /kp/ and /gb/. Those considered to be just allophones or free variants in the three main Eve dialects are [ɸ̪], [ɸ^{w}], [ß̪], [ß^{w}], [b^{j}], [b^{w}], [f^{w}], [v^{w}], [t^{w}], [d^{w}], [ts], [dz], [ts^{j}], [dz^{j}], [ʃ], [ɱ] and [k^{w}], with Aŋlɔ

adding [pʲ] and [ʒ]. Based on the data and the analysis, the study posits that there are 28 Eʋe consonant phonemes in the three major dialects under study, with some of them operating as variants in some contexts.

Vowel phonemes in the three major dialects of Eʋe

The various vowel segments articulated during the course of the interaction are presented in this section. They are presented with their descriptions based on the dimensions suggested by Akpanglo-Nartey (2002), Catford and Esling (2006), Cruttenden (2001) and Ladefoged and Johnson (2011). Table 21 contains words and their transcriptions that any pair could be considered a minimal pair in all the main dialects studied.

*Table 21: Respondents' Pronunciations of **be**, **ba**, **bu**, **bɔ**, **bi** and **bo***

Word	Aŋlɔ	Eʋeme	Tɔŋu	Meaning
be	[bə]	[bɛ][bè][bɛ́]	[bə]	hide/thatch
ba	[bà]	[bà]	[bà]	mud/cheat
bu	[bù]	[bù][bú]	[bù]	respect
bɔ	[bɔ̀]	[bɔ̀][bɔ́]	[bɔ̀]	bend
bi	[bì]	[bì][bí]	[bì]	burn
bo	[bò]	[bò]	[bò]	farm land

The [i] sound segment as in *bi* [bì][bí] is articulated with a velopharyngeal closure with the front of the tongue thrusted up towards the hard palate closely. The tip of the tongue rests behind the lower front teeth, as the rims of the tongue also touching the upper side teeth on both sides of the mouth,

as the lips are wide spread allowing the airstream to flow out through the oral resonator. Using the HBR label, [i] is close front unrounded oral vowel.

The sound [e] as in *be* [bè] is produced with the front of the tongue raised towards the hard palate in a somewhat less close state than that of the [i] tongue position. The tip of the tongue rests behind the incisors with the velum shutting off the nasal cavity. The lip is spread but a bit opened than that of the [i] sound, allowing the airstream to flow out through the lips. [e] is therefore a half-close front unrounded oral vowel just as described by previous scholars.

The [ɛ] sound segment as noted in *be* [bɛ̀][bɛ́] is articulated with the front of the tongue moving farther away from the hard palate with the mouth almost open and therefore considered half open with somewhat open spread lips. There is a velic closure thereby causing the airstream to flow out through the oral cavity. [ɛ], as noted in previous works, is half open-front unrounded oral vowel.

The Eʋe sound segment [ə] as in *be* [bə̀] seems to be the shortest of them all in terms of length, although they are all short. It is produced with the mouth at an almost neutral position with the central part of the tongue at a half-open position, but it appears to be close to the hard palate than the [a] sound. During the articulation of [ə], there is a velic closure. It is produced with spread lips which is not as open as that of [ɛ]. The air consequently flows out through the oral cavity. The HBR label for [ə] is half-open central unrounded oral vowel.

The vowel [a] as in *ba* [bà] is produced when the mouth is open widest with the bulged centre of the tongue farthest away from the hard palate and

naturally open lips. The convex mass of the tongue is thrusted at the centre and at its lowest to modify the mouth aperture with the soft palate closing the nasal resonating chamber. The air is therefore allowed to exit through the mouth to produce [a]. Based on the HBR label, [a] is an open central unrounded oral vowel segment. Nyomi's (2017) description of [a] contradicts the description in this study. In that, he considers [a] a half-open vowel and not an open vowel but describing [a] as half-open implies that it is articulated exactly as [ə], which is not plausible.

The [u] sound segment as in *bu* [bù][bú] is articulated with the convex mass at the back of the tongue raised closely towards the roof of the mouth, the lips are closely rounded and prolonged with the velum sealing off the nasal resonator causing the airstream flowing out through an elongated oral aperture. [u] can therefore be described as a close back oral vowel, which affirms the description of the previous studies.

The production of the Eʋe sound segment [o] as in *bo* [bò] involves a velic closure and the back of the tongue raised mid close to the roof of the mouth. The lips are less rounded with more opening between the lips when compared with the sound segment [u]. The airstream then flows out through the oral cavity. Using the HBR label, [o] is half-close back rounded oral vowel.

The last oral vowel [ɔ] as in *bɔ* [bɔ̀] is articulated with the back of the tongue raised further away from the roof of the mouth when compared with [o]. There is velopharyngeal closure during the articulation of [ɔ], which allows the airstream to escape through the oral cavity. There is also a medium lip rounding with more opening between the lips than [u] and [o]. Using the HBR label, the

[ɔ] sound segment as used in the three main dialects of Eʋe, is a back half-open rounded oral vowel.

From the transcriptions in Table 21, the Aŋlɔ and Tɔŋu pronunciations show that [ə], [a], [u], [ɔ], [i] and [o] are phonemes while Eʋeme uses [ɛ] contrastively rather than [ə] as in the other two dialects, although Eʋeme dialect speakers, especially those in Kpando, use [e] as a variant of [ɛ]. This emanates from the fact that the difference in the final vowel segments did not only show the contrastive nature of these vowel sounds but also cause the semantic variations in the words as illustrated in Table 21. Ansre (1961), Anyidoho (1990) and Atakpa (1997) do not consider [ə] an Eʋe phoneme but the data in Table 21 suggest that some dialects in Eʋe, like the Aŋlɔ and Tɔŋu dialects, use [ə] contrastively. The minimal pair in Table 22 again shows the contrastive distribution between /ə/ and /a/ in Aŋlɔ and Tɔŋu.

*Table 22: Respondents' Pronunciations of **te** and **ta***

Word	Aŋlɔ	Eʋeme	Tɔŋu	Meaning
te	[tə̀]	[tɛ̀]/[tè]/[tɛ́]	[tə̀]	yam/swollen
ta	[tà]	[tà]	[tà]	wrap/swear

It must be noted that the Eʋeme dialect, from both Tables 21 and 22, rather used [ɛ] contrastively and not [ə], which makes [ɛ] a phoneme in Eʋeme and [e] as its free variant.

All the previous studies submit that the sound [e] is used in Eʋe and some clearly identify it as an Eʋe phoneme. The data in Table 23 ascertain the views of the other linguists that the phoneme /e/ exists in some dialects of Eʋe.

*Table 23: Respondents' Pronunciations of **egbe** and **agbe***

Word	Aŋlɔ	Eʋeme	Tɔŋu	Meaning
egbe	[égbɔ̀]	[égbɛ̀][égbè]	[égbɔ̀][égbíé]	today
agbe	[àgbɔ̀]	[àgbɛ̀][àgbè]	[àgbɔ̀]	Life

The Aŋlɔ and Tɔŋu pronunciations again show the contrast between /e/ and /a/ while Eʋeme again rather uses [ɛ] contrastively with [e] as a free variant. The phone [ɛ] becomes a dialectal variant of /e/ in the Tɔŋu articulation of *egbe* as in Table 23. The contrastive nature of /e/ is also illustrated in the Aŋlɔ's articulation of *yi* [jí] (meaning *cutlass*) and *ye* [jé] (meaning *he* or *she*).

*Table 24: Respondents' Pronunciations of **hɛnɔ** and **hanɔ***

Word	Aŋlɔ	Eʋeme	Tɔŋu	Meaning
hɛnɔ	[hènɔ̀]	[hɛ̀nɔ̀][hènɔ̀][hɛ́nɔ́]	[hènɔ̀][hénɔ́]	lead singer/cantor
hanɔ	[hànɔ̀]	[hànɔ̀][hànɔ̌]	[hànɔ̀][hànɔ̌]	sow/group leader

The content of Table 24, specifically the Eʋeme pronunciations of *hɛnɔ* and *hanɔ*, shows that a choice of either one of the phoneme /ɛ/ or /a/ in that phonetically identical environment leads to the realisation of a semantically different lexical item. The Eʋeme dialect again uses [ɛ] and [e] in free variation.

Here, Aŋlɔ and Tɔŋu respondents contrastively used [e] and [a] as displayed in Table 24.

Furthermore, the data from this study as exhibited in Tables 25, 26, 27, 28, 29, 30, 31 and 32 imply that all the vowel phonemes identified so far from the three main dialects, which are /i/, /e/, /ɛ/, /ə/, /a/, /u/, /o/ and /ɔ/, also functionally contrast with their respective nasal variants in some of the Eʋe dialects. However, per the data, /e/ and /ə/ are mostly contrastively employed by Aŋlɔ and Tɔŋu while /ɛ/ is mostly used by the Eʋeme and Tɔŋu respondents but not Aŋlɔ.

/i/ and /ĩ /

The sound segment [ĩ] as in *lĩ* [lĩ́] in Table 25, is produced with no velopharyngeal closure with the front of the tongue thrusted up towards the hard palate closely. The tip of the tongue rests behind the lower front teeth, as the rims of the tongue also touching the upper side teeth on both sides of the mouth, as the lips are wide spread allowing the airstream to flow out through the nasal resonator because of the absence of the velic closure. Using the HBR label, [ĩ] is a close front unrounded nasal vowel just as noted by previous studies.

*Table 25: Respondents' Pronunciations of **li** and **lĩ***

Word	Aŋlɔ	Eʋeme	Tɔŋu	Meaning
li	[lí]	[lí]	[lí]	establish firmly
lĩ	[lĩ́][lí]	[lĩ́][lĩ̌]	[lĩ́][lí]	arouse sexually

The sound segments used by the three dialects in the pronunciation of *li* and *lĩ* (cf. Table 25), especially among the Eʋeme dialects, prove that when the [i] and [ĩ] sound segments are substituted by the other in the same or similar environment, another semantically different word is realised in the three major dialects of Eʋe. Some Aŋlɔ respondents from Dzodze and some Tɔŋu respondents, according to the data, use [i] in place of the phone [ĩ], which implies that some Aŋlɔ and Tɔŋu speakers tend not to use the phone [ĩ], although majority does. The phonemes /i/ and /ĩ /, as the previous scholars suggest, could be considered phonemes in all the main dialects of Eʋe.

/e/ and /ẽ/

The sound [ẽ] as in *sẽ* [sé̃] is also articulated with the front of the tongue raised towards the hard palate in a somewhat less close state than that of the [ĩ] tongue position. The tip of the tongue rests behind the incisors with no velopharyngeal closure shutting off the nasal resonator. The lip is spread but a bit opened than that of the [ĩ] sound. The absence of the velopharyngeal closure allows the airstream to flow out mainly through the nasal resonating chamber leading to the production of the [ẽ] sound segment. [ẽ] could therefore be described as half-close front unrounded nasal vowel.

[e] and [ẽ] occur in the same environment in Aŋlɔ and Tɔŋu articulations as transcribed in Table 26.

*Table 26: Respondents' Pronunciations of **se** and **sẽ***

Word	Aŋlɔ	Eʋeme	Tɔŋu	Meaning
se	[sé]	[sɛ́][sé]	[sé][sĕ]	rule
sẽ	[sɛ́̃][sé]	[sɛ́̃][sɛ́̃]	[sɛ́̃][sé]	hard

The nasalisation of the sound [e] in Aŋlɔ and Tɔŋu dialects after the same sound segment [s] realised two different words. Consequently, [e] and [ẽ] are meaning distinguishing sounds in Aŋlɔ and Tɔŋu dialects, although some Aŋlɔ respondents in Dzodze and some Tɔŋu respondents used [e] as a free variant of [ẽ]. Agbedoxor (2014) and Amegashie (2011) do not include /ẽ/ in the Eʋe phoneme inventory but this study proves otherwise, that is [ẽ] is a phoneme in Aŋlɔ and Tɔŋu dialects. [ɛ] and [ɛ̃], from Table 26, are used contrastively by Eʋeme, although some Eʋeme respondents in Kpando use [e] and [ẽ] as free variants of [ɛ] and [ɛ̃] respectively. Based on the analysis, the phones [e] and [ẽ] are considered phonemes in Aŋlɔ and Tɔŋu dialects but not in Eʋeme dialect.

/ɛ/ and /ɛ̃/

The Eʋe sound segment [ɛ̃] is articulated with the front of the tongue moving farther away from the hard palate with the mouth almost open and therefore considered half open with somewhat open spread lips just like [ɛ]. However, there is no velopharyngeal closure during the production of the sound [ɛ̃] as in *lɛ̃* [lɛ́̃], in that, the velum is at its neutral position for the air to flow out

mostly through the nasal resonator. The HBR label for [ɛ̃], that also goes to ascertain the findings of the previous work, is half-open front unrounded nasal vowel.

Table 27: Respondents' Pronunciations of ***lɛ*** and ***lɛ̃***

Word	Aŋlɔ	Eveme	Tɔŋu	Meaning
lɛ	[lé]	[lɛ́]	[lɛ́]	thin
lɛ̃	[lé]	[lɛ́]	[lɛ́][lɛ́]	larva

The Eveme and Tɔŋu pronunciations of *lɛ* and *lɛ̃*, as shown in Table 27, illustrate the contrastive role [ɛ] and [ɛ̃] play in the two dialects. In this context, Aŋlɔ, on the other hand, used [e] and [ẽ] to bring about the semantic variation between the two words. [ẽ] being a free variant of /ɛ̃/ in some phonetic environments is seen in the Tɔŋu respondents' articulation of *lɛ̃*. In summary, [ɛ] and [ɛ̃] are meaning distinguishing sound segments in Eveme and Tɔŋu dialects but not Aŋlɔ.

/ə/ and /ə̃/

[ə̃] as in *kpə̃* [kpə̃] is articulated with the mouth at an almost neutral position with the central part of the tongue at a half-open position, but it appears to be close to the hard palate as the [ə] sound. During the articulation of [ə̃], there is no velopharyngeal closure. It is produced with spread lips which is not as open as that of the [ɛ̃] sound segment. The air consequently flows out mainly

through the nasal resonating chamber. The HBR label for [ə̃] is half-open central unrounded nasal vowel.

The pronunciations of most Aŋlɔ respondents prove that /ə/ and /ə̃/ are meaning distinguishing. Although some use the oral vowel when articulating *kpə̃,* the commonest Aŋlɔ pronunciations are [kpə̀] and [kpə̀̃] as in Table 28.

Table 28: Respondents' Pronunciations of ***kpe*** and ***kpẽ***

Word	Aŋlɔ	Eʋeme	Tɔŋu	Meaning
kpe	[kpə̀]	[kpɛ̀][kpè]	[kpə̀]	heavy
kpẽ	[kpə̀̃][kpə̀]	[kpɛ̃]	[kpə̀][kpə̀̃]	trumpet/to cake

The contrastive nature of [ə] and [ə̃] is further proven in the pronunciation of *kpə̃,* which means 'to cake', as [kpə̀̃]. In all these, Eʋeme employed [ɛ] and [ɛ̃] again contrastively and not [ə] and [ə̃]. Form the analysis, [ə] and [ə̃] are only phonemes in the Aŋlɔ and Tɔŋu dialects but not the Eʋeme dialect.

/a/ and /ã/

[ã], as in *hã* [hâ], is articulated when the mouth is open widest with the bulged centre of the tongue farthest away from the hard palate and naturally open lips. The convex mass of the tongue is thrusted at the centre and at its lowest to modify the mouth aperture with no velum closing the nasal resonating chamber. The air is therefore allowed to exit mainly through the nasal cavity to produce [ã]. Based on the HBR label, [ã] is an open central unrounded nasal vowel. Nyomi's (2017) description of [ã] however contradicts this description.

He considers [ã] a half-open vowel and not an open vowel but considering [ã] as a half-open vowel implies that it is articulated exactly as [ɜ̃], which is not the case.

Table 29: Respondents' Pronunciations of ***ha*** and ***hã***

Word	Aŋlɔ	Eʋeme	Tɔŋu	Meaning
ha	[hà]	[hà]	[hà]	pig/song/rush for something
hã	[hə̃][hà]	[hə̃]	[hə̃][hə̂]	too/also

The commutation of [a] with its nasal variant brought about the meaning variance in the minimal pair displayed in Table 29. Thus, /a/ and /ã/ are different phonemes in the three main dialects of Eʋe, although some Aŋlɔ respondents from Dzodze and some Tɔŋu speakers seem to use them in free variation. The findings indicate that /a/ and /ã/ are Eʋe phonemes in all the three main Eʋe dialects.

/u/ and /ũ/

[ũ] as in ***fũ*** [fʷŭ] is produced with the convex mass at the back of the tongue raised closely towards the roof of the mouth. The lips are closely rounded and prolonged. [ũ] is articulated without the occurrence of any velopharyngeal closure thereby allowing the pulmonic air to flow out mainly through the nasal resonator. [ũ] can therefore be described as a close back nasal vowel. All these descriptions of [ũ] go to affirm the descriptions of the previous scholars.

*Table 30: Respondents' Pronunciations of **fu** and **fũ***

Word	Aŋlɔ	Eʋeme	Tɔŋu	Meaning
fu	[fʷú]	[fʷú][fʷŭ]	[fʷŭ][fʷú]	fur/pregnancy
fũ	[fʷű]	[fʷű]	[fʷű]	a lot

The articulation of the minimal pair *fu* and *fũ* as shown in Table 30 further asserts that [u] and [ũ] are functionally contrastive sound segments in the various dialects under study. Replacing the oral [u] with the phone [ũ] just after the sound [f] results in the realisation of two different lexical items that also vary semantically. This study therefore establishes /u/ and /ũ/ as different phonemes in the three main Eʋe dialects.

/o/ and /õ/

Unlike in the production of [o] sound segment, there is no velic closure during the production of [õ] as in *lõ* [lő], which makes the air escape mainly through the nasal cavity. Its articulation involves the back of the tongue raised mid close to the roof of the mouth. The lips are less rounded with more opening between the lips when compared with the [ũ] sound segment. Simply described using the HBR label, [o] is a half-close back rounded nasal vowel, which is in line with the description of the earlier findings.

Table 31: Respondents' Pronunciations of ***lo*** and ***lõ***

Word	Aŋlɔ	Eʋeme	Tɔŋu	Meaning
lo	[ló]	[lŏ][ló]	[lŏ][ló]	crocodile
lõ	[lő][ló]	[lő]	[lŏ][lɔ̌]	take off something from fire/durable

Even though Ansre (1961) says /õ/ is not an Eʋe phoneme, data from this study suggest a counter view. The Aŋlɔ and Eʋeme dialects used [o] and [õ] in a contrastive distribution but Tɔŋu articulated [ɔ̃] in place of the sound [õ]. The Tɔŋu pronunciations in Table 31 support Ansre's view but, as illustrated in the Aŋlɔ and Eʋeme dialects, /o/ and /õ/ are separate phonemes in Aŋlɔ and Eʋeme dialects even though some Aŋlɔ respondents from Dzodze articulated the [o] as a free variant of [õ]. Tɔŋu seems not to use the sound segment [õ].

/ɔ/ and /ɔ̃/

The sound segment [ɔ̃] as used in *alɔ̃* [àlɔ̌] is produced with the back of the tongue raised further away from the roof of the mouth when compared with [õ]. There is also a medium lip rounding with more opening between the lips than [õ]. Because there is no velic closure during the articulation of [ɔ̃], the airstream is allowed to escape mainly through the nasal resonator. Using the HBR label, [ɔ̃] is a back half open rounded nasal vowel, just as the previous scholars posit.

The sampled population's pronunciations of *alɔ* and *alɔ̃*, as stated in Table 32, reiterate the stand point of the aforementioned Eʋe linguists that [ɔ] and [ɔ̃] are phonemes in the Eʋe language.

Table 32: Respondents' Pronunciations of ***alɔ*** and ***alɔ̃***

Word	Aŋlɔ	Eʋeme	Tɔŋu	Meaning
alɔ	[àlɔ̀]	[àlɔ̀][álɔ́]	[àlɔ̀]	hand
alɔ̃	[àlɔ̃̀]	[àlɔ̃̀][álɔ́]	[àlɔ̃̀][àlɔ̀]	sleep

The swapping of [ɔ] for [ɔ̃] in the minimal pair in Table 32 realises a semantically different lexeme, which qualifies the two sound segments to be considered different phonemes. [ɔ] and [ɔ̃] are therefore phonemes in all the dialects under review. Some Tɔŋu respondents seem to again use the oral form in place of the nasal form in Table 32, which is not mostly characteristic of the other two main dialects.

In summary, the analysis affirms that the Aŋlɔ dialect uses 14 vowel phonemes, Eʋeme uses 12 while Tɔŋu employs 15 vowel phonemes. The Aŋlɔ vowel phonemes include 7 oral vowels and 7 nasal vowels, which are /ə/, /a/, /u/, /o/, /ɔ/, /i/, /e/, /ə̃/, /ã/, /ũ/, /õ/, /ɔ̃/, /ĩ / and /ẽ/; the Eʋeme vowel phonemes comprise 6 oral vowels and 6 nasal vowel, which are /a/, /u/, /o/, /ɔ/, /i/, /ɛ/, /ã/, /ũ/, /õ/, /ɔ̃/, /ĩ / and /ɛ̃/ while the Tɔŋu vowel phonemes include 8 oral vowels and 7 nasal vowel, which are /ə/, /a/, /u/, /o/, /ɔ/, /i/, /e/, /ɛ/ /ə̃/, /ã/, /ũ/, /ɔ̃/, /ĩ /, /ẽ/ and /ɛ̃/. However, it can be concluded that some Aŋlɔ speakers, especially

those in Dzodze and some Tɔŋu speakers use the oral vowel sounds and their nasal variants as free-variants.

Account for the Variation in the Number of Eʋe Phonemes

This section presents some plausible bases for the differences in the number of phonemes presented by others who have done some studies on the phonology of the Eʋe language. A study of the data in relation to the findings of the previous linguists like Abadzivor and Dzamesi (2008), Agbedoxor (2014), Amegashie (2011), Ansre (1961), Anyidoho (1990), Atakpa (1985), Duthie (1996) and Kpodo (2014) brings up some issues that might have accounted for the variation in the number of phonemes identified in previous studies. Prominent among them is the significant dialectal variance in Eʋe.

The variation in the sound segments used by the various dialects in Eʋe accounts for the difference in the number of phonemes identified by some of the previous scholars. This emanates from the fact that the data collected from the 60 respondents show that some sound segments are very common and prominent in some dialects of Eʋe than the others. Ansre (1961), for instance, omits /ẽ/ and /õ/ from the Eʋe phonemes. Ansre's view is characteristic of the Tɔŋu dialect that seems to use the nasal vowels in free variation with their oral variants and in some cases using one in place of the other as in using [ɔ̃] in place of [õ] as shown in the Tɔŋu respondents' articulation of the word ***lõ*** as [lɔ̃]. In terms of using the oral and nasal vowels in free variation, they are illustrated in the respondents' pronunciation of *sẽ* as [sɛ́] or [sé]; lĩ as [lí] or [lí]

and *hã* as [hâ] or [hâ]. In these Tɔŋu pronunciations, the Eʋe phonemes /ẽ/ and /e/, /ĩ/and /i/ and /ã/ and /a/ are sometimes used in free variation respectively. Ansre could have therefore interacted with Tɔŋu or Eʋeme respondents during his data collection. The data may also be from the Eʋeme respondents because they also seem not to use the phoneme /ẽ/ during the interactions, except those at Kpando.

This is again affirmed in Ansre (1961), Anyidoho (1990) and Atakpa's (1985) omission of the phoneme /ə/ and /ə̃/ from the inventory of Eʋe phonemes. The data in this study show that /ə/ and /ə̃/ are mostly used by the Aŋlɔ and Tɔŋu speakers but not typically used by the Eʋeme dialect. The data show that the Eʋeme dialect uses /ɛ/ and /ɛ̃/ instead respectively while Tɔŋu uses a blend of Aŋlɔ and Eʋeme segmental features. Thus, this study worked on these three main dialects of Eʋe to find out how they distribute their sounds.

It is also observed that some of the studies do not indicate if they are just dealing with the sound segment inventory in Eʋe or the meaning distinguishing sounds. Abadzivor and Dzamesi (2008), Agbedoxor (2014), Amegashie (2011) and Anyidoho (1990) present the sound inventory in a language and indicate some of the words in which they could be located. Agbedoxor, for instance, went further to say that the sound segments are independent of one another, which is not specific enough. Furthermore, a somewhat inadequate proofreading, editing or inconsistency in information may also account for the variations. This is noted, for instance, in Amegashie averring that all the oral and their nasal vowel variants are produced at the same spot but he never

mentioned the sound [ẽ] in any section of his discussions although he identified [e] as one of the sound segments. All these brought about the differences.

Phonemes in borrowed words that have become an integral part of the language are in contention. The phoneme /p/, according to Duthie (1996) and Kpodo (2014), is not part of the Eʋe phonemes because it occurs in only loan words but since the loan words are always in use in Eʋe, the phonemes thereof should also be part of it. Ansre (1961) also agrees with Duthie and Kpodo that /r/ is an allophone of /l/, which is factual to an extent, but data from this study indicate that /r/ is a phoneme in all the three major dialects of Eʋe, hence Eʋe.

The accuracy of the data transcription used in the analysis of the phonemes also accounts for the variations. An instance is Atakpa (1985) transcribing *kpe* as [kpè] and *kpẽ* as [kpě] which led to him concluding that /ə/ and /ə̃/ are not part of the Eʋe phonemes. The sounds at the end of *kpe* and *kpẽ* sound shorter and lower than [e] and [ẽ]. This study therefore consulted various linguists to ascertain the data transcription accuracy.

Chapter Summary

This section provides a summary of the discussions and results by highlighting the key findings generated from the classical phonemic data analysis in relation to the three research questions governing the study. The discussions and analysis answered the questions on the number of phonemes in the three major Eʋe dialects, the descriptions of the phones identified in the

three major Eʋe dialects and the factors that may account for the differences in the previous findings on the Eʋe phonemes.

The analysis of the data indicates that all the three main Eʋe variants use 28 consonantal phonemes as in Table 33 but have some variations in the vowel phonemes they employ. Tɔŋu uses 15 vowel phonemes, Aŋlɔ uses 14 vowel phonemes while Eʋeme employs 12 vowel phonemes. In all, Tɔŋu has 43 phonemes as seen in Table 33 excluding [õ], Aŋlɔ has 42 phonemes as displayed in Table 33 excluding [ɛ] and [ɛ̃] while Eʋeme uses 40 phonemes as shown in Table 33 excluding [e] [ẽ] [ə] and [ə̃], as compared with Table 34 that contains the 49 phones/phonemes (33 consonants and 16 vowels) identified by previous scholars (The phones/phonemes identified by the individual scholars reviewed are displayed in Tables 35 to 43 in Appendix F).

Table 33: Sounds Identified as Phonemes in the Three Main Eʋe Dialects

Consonants

Place / *Manner*	**Bilabial**		**Labio dental**		**Aveolar**		**Retroflex**	**Palato-alveolar**		**palatal**	**Velar**		**Labiovelar**		**Glottal**
Plosive	b	p			d	t	ɖ				g	k	gb	kp	
Fricative	ß	ɸ	v	f	z	s						x			h
Affricate								ʤ	ʧ						
Nasal	m				n					ɲ	ŋ				
Approximant										j	ɯ		w		
Trill					r										
Lateral					l										
Voicing	Voiced	Voiceless	voiced	Voiceless	voiced	Voiceless	Voiced	Voiced	Voiceless	voiced	Voiced	Voiceless	voiced	Voiceless	

Vowels

	Front Unrounded		Central Unrounded		Back Rounded	
Close	i	ĩ			u	ũ
Half Close	e	ẽ			o	õ
Half Open	ɛ	ɛ̃	ə	ə̃	ɔ	ɔ̃
Open			a	ã		
	Oral	Nasal	Oral	Nasal	Oral	Nasal

Table 34: Summary of Ɛvɛ Phones/Phonemes Identified by Previous Scholars

Consonants															
Place *Manner*	**Bilabial**		**Labio dental**		**aveolar**		**Retroflex**	**Palato-alveolar**		**palatal**	**Velar**		**Labiovelar**		**Labialised velar**
Plosive	b	p			d	t	ɖ				g	k	gb	kp	kw
Fricative	ß	ɸ	v	f	z	s					h	x			
Affricate					dz	ts		ʤ dzy	ʧ tsy						
Nasal	m				n					ɲ	ŋ				
Approximant	w									j	ɯ				
Trill					r										
Lateral					l										
Voicing	Voiced	Voiceless	voiced	Voiceless	voiced	Voiceless	Voiced	Voiced	Voiceless	voiced	Voiced	Voiceless	voiced	Voiceless	Voiced

Vowels								
	Front Unrounded				Central Unrounded		Back Rounded	
Close	i	ĩ					u	ũ
Half Close	e	ẽ					o	õ
Half Open	ɛ	ɛ̃			ə	ə̃	ɔ	ɔ̃
Open					a	ã		
	Oral	Nasal			Oral	Nasal	Oral	Nasal

The others like [ɸ], [ɸʷ], [ß], [ßʷ], [pʲ], [bʲ], [bʷ], [fʷ], [vʷ], [tʷ], [dʷ], [ts], [dz], [tsʲ], [dzʲ], [ʃ], [ʒ] [ɱ] and [kʷ] are just variants of /ɸ/, /ß/, /p/, /b/, /f/, /v/, /t/, /d/, /ʧ/, /ʤ/, /s/, /z/, /m/ and /k/ respectively.

Finally, the probable factors that may account for the variation in the phonemes identified in previous studies include:

1. The variation in the number of phonemes used in the various Eʋe dialects
2. Unclear distinction between sound inventory and phoneme inventory
3. Information inconsistencies within some of the works
4. Issues about phonemes in the so-called borrowed words
5. Accuracy in the data transcription.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This is the concluding chapter of the thesis. It provides an overview of the purpose, research questions, methodology and a summary of the key findings of the work. It further gives some implications based on the findings of the study and some suggestions on areas related to the work that could be researched further.

Overview of Purpose, Research Questions and Methodology

The main purpose of this study was to establish the number of Eʋe phonemes used in the three main dialects of Eʋe through phonemicisation. The study is aimed at establishing the number of phonemes used in the three major Eʋe dialects and noting the palpable reasons for the variation in the number of Eʋe phonemes identified by previous studies. The two research questions that guided the work to achieve these objectives were (1) How many phonemes exist in each of the three major Eʋe dialects? (2) What factors may account for the variation in the number of phonemes identified by the previous works?

In order to answer these questions, this study employed the phonemic theoretical framework. The classical phonemic theory provided the context for the phonemicisation of the sound segments in the three main Eʋe dialects, which is mainly based on segment constrastivity, complementarity and phonetic similarity. All these operated mainly within the qualitative research principles,

specifically, the phenomenological approach. The non-probability quota and purposive sampling techniques were used for the data collection, which mainly involved minimal and near-minimal pairs. The data was then analysed using the phonemic and inductive approaches, with the articulatory features crucial in the description of the sound segments. The analysis and results were then presented using tables and descriptions.

Summary of Key Findings

This study has come out with some key findings which are presented based on the two research questions that guided the study. The first and foremost research question seeks to establish the number of phonemes that exist in the three major dialects in Eʋe. It has been established that Tɔŋu employs 43 phonemes which are made up of 28 consonants and 15 vowels, Aŋlɔ uses 42 phonemes comprising 28 consonants and 14 vowels while Eʋeme has 40 phonemes that consist of 28 consonants and 12 vowels. All the three major Eʋe dialects contrastively distribute the following consonants: /b/, /p/, /ʁ/, /ɸ/, /m/, /v/, /f/, /d/, /t/, /z/, /s/, /ʤ/, /ʧ/, /n/, /r/, /l/, /ɖ/, /ɲ/, /j/, /g/, /k/, /x/, /ŋ/, /ɯ/, /w/, /h/, /gb/ and /kp/. They however use [ɸ], [ɸʷ], [ʁ], [ʁʷ], [bʲ], [bʷ], [fʷ], [vʷ], [tʷ], [dʷ], [ts], [dz], [tsʲ], [dzʲ], [ɱ] and [kʷ] as allophones or free variants. Tɔŋu and Aŋlɔ again use [ʃ] while only Aŋlɔ employs [pʲ] and [ʒ] as an allophone or a free variant, per the analysis.

The 15 Tɔŋu vowel phonemes are made up of 8 oral vowels (/i/, /e/, /ɛ/, /ə/, /a/, /u/, /o/, /ɔ/) and 7 nasal vowels (/ĩ/, /ẽ/, /ɛ̃/, /ə̃/, /ã/, /ũ/, /ɔ̃/); the 14 Aŋlɔ

vowel phonemes have 7 oral vowels (/i/, /e/, /ə/, /a/, /u/, /o/, /ɔ/) and 7 nasal vowels (/ĩ/, /ẽ/, /ə̃/, /ã/, /ũ/,/õ/, /ɔ̃/) while the 12 vowel phonemes in Eveme include 6 oral vowels (/i/, /ɛ/, /a/, /u/, /o/, /ɔ/) and 6 nasal vowels (/ĩ/, /ɛ̃/, /ã/, /ũ/, /õ/, /ɔ̃/). The Eveme dialect, especially those in Kpando for instance, uses [e] as a free variant of /ɛ/ while Tɔŋu speakers sometimes use [ɛ] as a free variant of /e/. Aŋlɔ speakers however seem not to either use the [ɛ] sound segment or its nasal variant, just as there is no [ə] or its nasal form in the Eveme sounds produced per the data analysis. From the three main Eve dialects, it could be generally concluded that the main Eve dialects cumulatively employ 44 phonemes made up of 28 consonants and 16 vowels (8 oral vowels and 8 nasal vowels). This emanates from the 43 phonemes used by Tɔŋu with the half close back rounded nasal vowel [õ] which is only used by the Aŋlɔ and Eveme speakers.

These findings cleared some of the controversies around sounds like [b], [p], [w], [r], [ɖ], [j], [ɯ], [dʒ], [ʧ], [ə], [ẽ], [ə̃], [õ], [ʒ], [ʃ], [ɱ], [k^{w}], [dz^{j}] and [ts^{j}] in terms of use and the sort of distribution they exhibit when employed by the various speakers of the Eve language. Descriptively, the consonant [k^{w}] is a voiceless sound; [t], [d], [ts] and [dz] are alveolar sounds in all the dialects and not dental sounds; [ɖ] is a retroflex; [ɯ] and [l] are approximant; [r] is a trill while the vowels [a] and [ã] are open vowels, per the analysis in all the main dialects under review. The three label description of all the sound segments identified in this study are next:

1. [b] is voiced bilabial plosive.
2. [b^j] is voiced palatalised bilabial plosive.
3. [b^w] is voiced labialised bilabial plosive.
4. [p] is voiceless bilabial plosive.
5. [p^j] is voiceless palatalised bilabial plosive.
6. [ß] is voiced bilabial fricative.
7. [ß̰] is voiced nasalised bilabial fricative.
8. [$ß^w$] is voiced labialised bilabial fricative.
9. [ɸ] is voiceless bilabial fricative.
10. [ɸ̰] is voiceless nasalised bilabial fricative.
11. [$ɸ^w$] is voiceless labialised bilabial fricative.
12. [m] is voiced bilabial nasal.
13. [v] is voiced labio-dental fricative.
14. [v^w] is voiced labialised labio-dental fricative.
15. [f] is voiceless labio-dental fricative.
16. [f^w] is voiceless labialised labio-dental fricative.
17. [ɱ] is voiced labio-dental nasal.
18. [d] is voiced alveolar plosive.
19. [d^w] is voiced labialised alveolar plosive.
20. [t] is voiceless alveolar plosive.
21. [t^w] is voiceless labialised alveolar plosive.
22. [z] is voiced alveolar fricative.
23. [s] is voiceless alveolar fricative.
24. [dz] is voiced alveolar affricate.

25. [dzʲ] is voiced palatalised alveolar affricate.

26. [ts] is voiceless alveolar affricate.

27. [tsʲ] is voiceless palatalised alveolar affricate.

28. [n] is voiced alveolar nasal.

29. [r] is voiced alveolar trill.

30. [l] is voiced alveolar lateral.

31. [ɖ] is voiced retroflex plosive.

32. [ɲ] is voiced palatal nasal.

33. [j] is voiced palatal approximant.

34. [ʒ] is voiced palato-alveolar fricative.

35. [ʃ] is voiceless palato-alveolar fricative.

36. [ʤ] is voiced palato-alveolar affricate.

37. [ʧ] is voiceless palato-alveolar affricate.

38. [g] is voiced velar plosive.

39. [k] is voiceless velar plosive.

40. [x] is voiceless velar fricative.

41. [ŋ] is voiced velar nasal.

42. [ɰ] is voiced velar approximant.

43. [w] is voiced labio-velar approximant.

44. [h] is voiceless glottal fricative.

45. [gb] is voiced labio-velar plosive.

46. [kp] is voiceless labio-velar plosive.

47. [i] is close front unrounded oral vowel.

48. [e] is half close front unrounded oral vowel.

49. [ɛ] is half open front unrounded oral vowel.

50. [ə] is half open central unrounded oral vowel.
51. [a] is open central unrounded oral vowel.
52. [u] is close back rounded oral vowel.
53. [o] is half close back rounded oral vowel.
54. [ɔ] is half open back rounded oral vowel.
55. [ĩ] is close front unrounded nasal vowel.
56. [ẽ] is half close front unrounded nasal vowel.
57. [ɛ̃] is half open front unrounded nasal vowel.
58. [ə̃] is half open central unrounded nasal vowel.
59. [ã] is open central unrounded nasal vowel.
60. [ũ] is close back rounded nasal vowel.
61. [õ] is half close back rounded nasal vowel.
62. [ɔ̃] is half open back rounded nasal vowel.

The second research question seeks to account for the variation in the number of phonemes identified by the previous works. This is to help resolve these issues so as to avoid their effects as much as possible. This study has identified that various factors account for the variation in the number of phonemes identified in earlier studies. Some of these factors include:

1. The variation in the sound inventory used by the various dialects in Eʋe
2. Unclear distinction between phoneme inventory and sound inventory in their findings
3. Inconsistency in the information provided about some of the identified sound segments

4. The issue of whether to include phonemes from loan words or otherwise
5. The transcription of the data employed in the respective studies.

Implications of the Study

The findings of this work make some cogent contributions to eruditeness, pedagogy and theory. In terms of eruditeness, this study provides an evidence-based number of phonemes in the Aŋlɔ, Eʋeme and Tɔŋu dialects of Eʋe. It adds to the facts on the phonemes, allophones and free variants in the three main dialects of the Eʋe language. The study further identifies the family representatives of the various phonemes and pinpoints those that are just variants of the family representatives. More importantly, in terms of its implication to scholarship, it highlights the fact that the main dialects of Eʋe have specific number of phonemes. Basically, the findings would be of great value to those interested in the sound system of the Eʋe language, especially Eʋe teachers, learners and researchers.

Relatedly, the findings of this study also have implications for language pedagogy and andragogy. The knowledge of the findings will positively affect the teaching of the phonemic awareness and phonic skills to both the young and the adult from the various dialects of the Eʋe language. When imparting these skills to improve literacy among a cosmopolitan class of the various dialects of Eʋe and even the non-native speakers of the Eʋe language, the knowledge of these Eʋe sound segments would be essential (Trudell & Adger, 2014). It would also serve as the basis to better understand the Eʋe phonology at all academic levels. This is because one needs to better understand the segmental features to

better comprehend the suprasegmental features. The findings would therefore be vital to Eʋe language teachers, curriculum developers and bodies like USAID that are interested in developing programs to enhance the reading competences of the learners in the Ghanaian languages.

Lastly, from the theoretical point of view, the study seems to encourage the use of the classical phonemic theory which is one of the earliest theories of phonetics and phonology. The study further suggests that the main dialects of a language could be studied in order to identify the sound system of the main language. The findings again assert that phones employed in borrowed words should be part of the sound inventory of the language and that the accuracy of the data transcription is principal to getting the right phonemic inventory in languages.

Suggestions for Further Studies

This study has highlighted the number of phonemes, the descriptions of the established sound segments and their related issues in the three main dialects of Eʋe. Nonetheless, there is the need to acoustically find out the length and quality of the vowel sound segments employed in the main Eʋe dialects. This is to again help differentiate between the 16 vowel sounds contrastively used in the main dialects and how they are influenced by the tonal system of Eʋe dialects. This approach will provide more information on the vowel segments.

Studies could also be done on the Eʋe variety used in the Ghanaian classrooms, especially during reading. Natural classroom readings could be recorded and analyse to find out the relationship between reading the SE and

the variants of the various Eʋe dialects that are claimed to constitute the SE. This study would in the long-run confirm if reading in a formal setting uses more of a different variant other than the major variants of the Eʋe language.

Chapter Summary

This chapter gave a simple overview of the entire study. It summarised the key steps and the findings of the work. The chapter, under the key findings, has indicated that the three main Eʋe dialects use similar consonant phonemes but have some variations in the vowel phonemes they employ, which is a major reason for the variations in the number of phonemes identified in previous studies. Again, the key findings established that each of the main dialects of Eʋe has a specific number of phonemes. The chapter further showed that the findings have some implications for the teaching and learning of Eʋe. It finally suggested some areas that needed more research.

REFERENCES

Abadzivor, P. K., & Dzamesi, F. (2008). *Evegbe gbedidi ŋuti nunya na nufialawo kple nusrɔ̃lawo*. Accra: Media Graphics & Press Ltd.

Ackumey, S. K., & Folivi, S. K. (2015). *The influence of Aŋlɔ, Tɔŋu and Eveme dialects on the use of the standard Eve*. Unpublished undergraduate project work. University of Cape Coast. Cape coast.

Adams, C. & Manen, M. (2008). Phenomenology. In L. M. Given (Ed.), *The Sage Encyclopedia of Qualitative Research Methods* Vol. 1 & 2 (pp. 614-619). London, UK: Sage Publications.

Agbedoxor, O. S. T. Y. (2014). *Evegbedidiŋutinunya*. Accra: Joraph Printsolutions.

Akamatsu, T. (2010). Articulatory Phonetics. In K. Malmkjær (Ed.), *The Routledge Linguistics Encyclopedia* (3rd ed.) (pp. 22-29). New York, NY: Routledge.

Akmajian, A., Demers, R. A., Farmer, A. K., & Harnish, R. M. (2010). *Linguistics: an introduction to language and communication* (6th ed.). Cambridge, UK: The MIT Press.

Akpanglo-Nartey, J. N. (2002). *An introduction to linguistics for non-native speakers of English* (2nd ed.).Tema, Ghana: Sakumo Books.

Alphabet Phonétique Association (2020). *Symboles phonétiques des sons du Français*. Retrieved from http://w3.univ-tlse2.fr/UOH-PHONETIQUE-FLE/DOCS/DOC01.pdf.

Amegashie, S. K. (2011). *Evegbe fe gbeɖiɖiwo.* Aflao: Vitus Printing Services.

Ameka, F. K. (1991). *Ewe: its grammatical constructions and illocutionary devices*. Unpublished doctoral dissertation. Australian National University. Australia.

Ameka, F. K., & Essegbey, J. (2006). *Elements of the grammar of space in Ewe*. Retrieved from https://www.researchgate.net/publication/290158991.

Ansre, G. (1961). *The tonal structure of Ewe (Hartford studies in Linguistics)*. Hartford,Connecticut: Hartford Seminary Foundation Bookstore.

Anyidoho, R. K. (1990). *Ewe phono-grammar*. Accra: Godka Group Limited.

Ashby, P. (2011). *Understanding phonetics*. London, UK: Hodder Education.

Atakpa, F. K. (1985). *The phonological structure of Ewe, with reference to its dialects*. Unpublished Master's thesis. Karl Marx University. Leipzig.

Atakpa, F. K. (1997). The Ewe language. In F. Agbodeka (Ed.), *A handbook of Eweland Vol 1: the Ewes in Southeastern Ghana*. (pp. 28-46). Accra, Ghana: Woeli Publishing Service.

Awoonor-Aziaku, L. (2018). *Variation study of the Received Pronunciation (RP) vowel phonemes /e/, /ɜː/ and /ə/, among Ewe speakers of English in Ghana*. PhD Thesis. Goethe-Universität.

Bell, J. (1999). *Doing your research project: a guide for first-time researchers in education and social sciences* (3rd ed.). New York, NY: Open University Press.

Bizzocchi, A. (2017). How many phonemes does the English language have? In *International Journal on Studies in English Language and Literature (IJSELL)*. 5. 36-46.

Brown, K., & Miller, J. (2013). *The Cambridge dictionary of Linguistics*. Cambridge, UK: Cambridge University Press.

Bryman, A. (2012). *Social research methods (4th ed.)*. Oxford, New York: Oxford University Press.

Capo, H. B. C. (1991). *A comparative Phonology of Gbe*. Berlin: Foris Publications.

Carr, P. (2008). *A glossary of Phonology*. Edinburgh, UK: Edinburgh University Press Ltd.

Catford, J. C. & Esling, J. H. (2006). Phonetics, articulatory. In K. Brown (Ed.), *Encyclopedia of Language and Linguistics, Volumes 1-14* (2nd ed.) (pp. 425-442). Boston, US: Elsevier.

Celata, C., Vietti, A. & Sprafico, L. (2019). An articulatory account of rhotic variation in Tuscan Italian synchronized UTI and EPG data. In M. Gibson & J. Gil (Eds.), *Romance Phoneticsand Phonology* (pp. 91-117). Oxford, UK: Oxford University Press.

Chomsky, N., & Halley, M. (1968). *The sound pattern of English*. New York, USA: Harper & Row Publishers.

Clemente, G. (2012). *Handbook of English phonology*. Delhi: University Publications.

Creswell, J. W. (2014). *Research design: qualitative, quantitative, and mixed methods approaches (4th ed.)*. Thousand Oaks, CA: Sage.

Cruttenden, A. (2001). *Gimson's pronunciation of English* (6th ed.). London, UK: Arnold.

Crystal, D. (2008). *A dictionary of Linguistics and Phonetics (6th ed.)*. Malden, MA: Blackwell Publishing Ltd.

Darlington, Y., & Scott, D. (2002). *Qualitative research in practice: stories from the field*. Crows Nest: Allen & Unwin.

Datsa, S. C. (2012). *A comparative analysis of the use of gestures among the Aŋlɔ, Eveme and Tɔŋu Ewes of Volta Region Ghana*. Unpublished undergraduate project work. University of Cape Coast. Cape Coast.

Davenport, M. & Hannahs, S. J. (2005). *Introducing Phonetics and Phonology* (2nd ed.). London, UK: Hodder Arnold.

Dobrovolsky, M. (2016). Phonetics: the sounds of language. In W. O'Grady & J. Archibald (Eds.), *Contemporary linguistic analysis: an introduction* (pp. 14-55). Toronto, US: Pearson.

Donmoyer, R. (2008). Quantitative research. In L. M. Given (Ed.), *The Sage Encyclopedia of Qualitative Research Methods* Vol. 1 & 2 (pp. 713-718). London, UK: Sage Publications Ltd.

Dresher, B. E. (2011). The phoneme. In M. V. Oostendorp et al. (Eds.), *The Blackwell companion to Phonology* (pp. 241-266). Malden, MA: Wiley-Blackwell.

Duthie, A. S. (1996). *Introducing Ewe linguistic patterns*. Accra: Ghana Universities Press.

Eme, C. A., & Uba, E. D. (2016). A contrastive study of the phonology of Igbo and Yoruba. In *UJAH: Unizik Journal of Arts and Humanities* 17(1). 65-84. Retrieved from https://www.ajol.info/index.php/ujah/article/view/137183.

Eme, C. A. & Uwaezuoke, H. A. (2015). Teaching the standard Igbo to Ụmụolum students: issues in phoneme variation among the dialects. In *NKỌA* Vol. 3, 19-38.

Fowler, C. A. & Magnuson, J. S. (2012). Speech perception. In M. J. Spivey, K. McRae & M. F. Joanisse (Eds.), *The Cambridge Handbook of Psycholinguistics* (pp. 3-25). Cambridge, UK: Cambridge University Press.

Fromkin, V. A. (Ed.) (2000). *Linguistics: an introduction to linguistic theory*. Malden, Massachusetts: Blackwell Publishers Inc.

Fuchs, S. & Birkholz, P. (2019). *Phonetics of consonants*. Retrieved from https://www.researchgate.net/publication/335455562

GES, 2020. *Differentiated Learning (DL) facilitators guide*. Accra, Ghana: Ministry of Education/Ghana Education Service.

Gut, U. (2009). *Introduction to English Phonetics and Phonology: Volume I of textbooks in English language and linguistics*. Oxford, UK: Peter Lang.

Hickey, R. (2014). *A dictionary of varieties of English*. West Sussex, UK: Wiley Blackwell.

Isa, U. O. (2011). *A comparative phonology of Idɔma dialects: a thesis proposal for PhD Linguistics*. Department of Language and Linguistics, Nasarawa State University, Keffi.

Jansen, W. (2004). *Laryngeal contrast and phonetic voicing: a laboratory phonological approach to English, Hungarian and Dutch*. A doctoral dissertation, Behavioral and Cognitive Neurosciences (BCN) Research School, Groningen, Netherlands.

Katamba, F. (1989). *An introduction to phonology*. London, England: Longman.

Kenstowicz, M. (2006). Generative phonology. In K. Brown (Ed.), *Encyclopedia of Language and Linguistics, Volumes 1-14* (2nd ed.) (pp. 1-8). Boston, US: Elsevier.

Knight, R. (2012). *Phonetics: a coursebook*. Cambridge, UK: Cambridge University Press.

Kpodo, P. (2014). *Eve fe gbeɖiɖiwo.* Sakumono-Tema: Teamworks Graphix.

Kpodo, P. (2017). Vowel height agreement in Ewe. In *Journal of Applied Linguistics and Language Research*. 4(7). 206-216.

Kumekpor, T. K. B. (2002). *Research methods and techniques of social research*. Accra: SonLife Printing Press & Services.

Ladefoged, P. (1968). *A phonetic study of West African languages: an auditory-instrumental survey* (2nd ed.). Cambridge, UK: Cambridge University Press.

Ladefoged, P. & Johnson, K. (2011). *A course in phonetics* (6th ed.). Boston, US: Wadsworth Cengage Learning.

Lester, S. (1999). *An introduction to phenomenological research*. Taunton: Stan Lester Development.

Limberg, L. B. (2008). Phenomenography. In L. M. Given (Ed.), *The Sage Encyclopedia of Qualitative Research Methods* Vol. 1 & 2 (pp. 611-614). London, UK: Sage Publications.

Lobeck, A. & Denham, K. (2013). *Linguistics for everyone: an introduction* (2nd ed.). Boston, US: Wadsworth Cengage Learning.

Lodge, K. (2009). *A critical introduction to phonetics*. London, UK: Continuum International Publishing Group.

Lui, N. (1994). A brief critique of Chomsky's challenge to classical phonemic phonology. In *Hong Kong papers in Linguistics and language teaching*, (17), 39-43.

MacMahon, M. K. C. (1990). Language as available sound: phonetics. In N. E. Collinge (Ed.), *An Encyclopaedia of Language* (pp. 2-16). New York, NY: Routledge.

McMahon, A. (2002). *An introduction to English Phonology*. Edinburgh, UK: Edinburgh University Press Ltd.

Meyer, C. F. (2009). *Introducing English linguistics*. Cambridge, UK: Cambridge University Press.

Mompean, J. A. (2008). Phonological free variation in English: an empirical study. Paper presented at ISCA Tutorial and Research Workshop on Experimental Linguistics, Athens, Greece, 25-27 August, 2008.

Morgan, D. L. & Guevana, H. (2008). Audiorecordings. In L. M. Given (Ed.), *The Sage Encyclopedia of Qualitative Research Methods* Vol. 1 & 2 (pp. 40-41). London, UK: Sage Publications Ltd.

Mullany, L. & Stockwell, P. (2010). *Introducing English language: a resource book for students*. New York, NY: Routledge.

Newby, P. (2014). *Research methods for education (2nd ed.)*. New York, NY: Routledge.

Newman, W. L. (2014). *Social research methods: qualitative and quantitative approaches (7th ed.)*. Essex, UK: Pearson Education Limited.

Nitze, A. W., & Wilkins, E. H. (2016). *A handbook of French Phonetics*. New York, NY: Henry Holt and Company.

Nyomi, C. K. (2017). *Evegbe nyakpemenyi ŋuti nunya ŋu nusɔsrɔ̃ na gɔmedzelawo.* Accra: Yamens Press Ltd.

Okanlawon, J. (2019). *An analysis of the Yoruba language with English: Phonetics, phonology, Morphology and syntax*. Retrieved from https://www.semanticscholar.org/paper/AN-ANALYSIS-OF-THE-YORUBA-LANGUAGE-WITH-ENGLISH.

Rice, K. (2007). Markedness in Phonology. In P. Lacy (Ed.), *The Cambridge Handbook of Phonology* (pp. 79-97). Cambridge, UK: Cambridge University Press.

Roach, P. (2009). *English phonetics and phonology: a practical course* (4th ed.). Cambridge, UK: Cambridge University Press.

Rogers, H. (2000). *The sounds of language: an introduction to phonetics*. London, UK: Routledge.

Sarma, M. & Sarma, K. K. (2013). Segmentation of Assamese phonemes using hybrid soft-computational approach. *International Journal of Parallel, Emergent and Distributed Systems*, 28(4), 370-382.

Skandera, P. & Burleigh, P. (2005). *A manual of English phonetics and phonology*. Tübingen, Germany: Gunter Narr Verlag.

The International Phonetic Association (1999). *Handbook of the International Phonetic Association: a guide to the use of the International Phonetic Alphabet*. Cambridge, UK: Cambridge University Press.

Tracy, S. J. (2013). *Qualitative research methods*. West Sussex: John Wiley & Sons Ltd.

Trask, R. L. (1999). *The key concepts in language and linguistics:* New York, NY: Routledge.

Trask, R. L. & Stockwell, P. (Ed.) (2007). *Language and Linguistics: the key concepts* (2nd ed.). New York, NY: Routledge.

Trauth, G & Kazzazi, K. (Eds.). (1996). *Routledge dictionary of language and linguistics*. New York, NY: Routledge.

Trotman, D. (2006). Interpreting imaginative lifeworlds: phenomenological approaches in imagination and evaluation of educational practice. *Qualitative Research 6(2)*, 245-265.

Trudell, B. & Adger, C. T. (2014). Early reading success in Africa: the language factor. In E. C. Zsiga, O. T. Boyer & R. Kramer, *Languages in Africa: multilingualism, language policy, and education* (pp. 12-20). Washington DC: Georgetown University Press.

USAID Learning (2017). *Capacity building training resource guide*. Accra, Ghana: USAID Learning & Ghana Education Service.

Verma, S. K. & Krishnaswamy, N. (1989). *Modern linguistics: an introduction.* Oxford, NY: Oxford University Press.

Walker, D. C. (2001). *French sound structure*. Calgary, Canada: University of Calgary Press.

Westermann, D. (1930). *A study of the Ewe language*, translated by A. L. Bickford-Smith. London: Oxford University Press.

Wiese, R. (2006). Phonology: overview. In K. Brown (Ed.), *Encyclopedia of Language and Linguistics, Volumes 1-14* (2nd ed.) (pp. 562-564). Boston, US: Elsevier.

Yule, G. (2014). *The study of language* (5th ed.). Cambridge, New York: Cambridge University Press.

Zec, D. (2007). The syllable. In P. Lacy (Ed.), *The Cambridge Handbook of Phonology* (pp.161-194). Cambridge, UK: Cambridge University Press.

Zsiga, E. C. (2013). *The sounds of language: an introduction to phonetics and phonology*. Malden, MA: Wiley-Blackwell.

APPENDICES

APPENDIX A

CONVERSATIONAL INTERVIEW GUIDE/ PROTOCOL

INTERVIEWER: Seyram Kwaku Ackumey

PLACE: Tavieʃe, Dabala and Aŋlɔga

INTRODUCTION: Interviewer and interviewee introduction

Question: How do you say these pair of words in your local language?

Question: Do they differ in meaning?

Question: Do you think they are Eʋe words.

THE MINIMAL AND NEAR-MINIMAL PAIRS

1. ʃè---ʋè (year/hole)
2. àpă---àbă (labour/bed)
3. àmè---àŋè (human/rubber)
4. àwù---àmù (shirt/lagoon)
5. fé---vé (tear/pain)
6. fó ---vó (run/spoil)
7. ŋʃɔ---ŋgɔ (type/front)

8. tɔ̀---dɔ̀ (water body/sickness)

9. tsé---dzé (grow/appear)

10. tà---dà (wrap/throw)

11. nyó---nó (good/breast)

12. ɖètí---dètí (thread/palm tree)

13. àsí---àzí (hand/groundnut)

14. àtsè---àdzè (scar/lie)

15. àtsyɔ́---àdzɔ́ (beauty/a fee)

16. àtsiã---àhiã̀ (skill/love)

17. àtsì---àdzì (indigestion/frog)

18. ākpā---āgbā (tilapia/plate)

19. klìklìklì---krìkrìkrì (in a hurry/noisily)

20. yì---nyì (go/nurture)

21. wɔ́---yɔ́ (flour/call)

22. kà---gà (rope/ money)

23. xè---hè (bird/pull)

24. ŋ̀gè---ɣ̀è (moan/sun)

25. glá---ɣlá (lay or support/hide)

26. kplá---gblá (put on/quick)

27. kɔ́kú…tɔ́kú (neck lymph node/drowning)

28. bèríbèrí---bélíbélí (disease/thin)

29. bè---bà (hide/cheat)

30. bù--- bɔ̀ (respect/bend)

31. bì --- bò (burn/farmland)

32. tè---tà (swell/wrap)

33. klò---klì (tortoise/stumble on)

34. àgbò---àgbì (ram/mud)

35. hɛnɔ---hanɔ (song composer/ sow)

36. égbè---àgbè (today/life)

37. yáyá---yéyĕ (spoilt/new)

38. sé---sɛ́ (God/hard)

39. kpè---kpɛ̀ (heavy/trumpet)

40. ló---lɔ́ (crocodile/to take something off the fire)

41. lí---lĩ (firm/sexually aroused)

42. hà---hȁ (song/also)

43. lɛ́---lɛ̋ (thin/a fruit or larva)

44. àlɔ̀---àlɔ̃ (hand/sleep)

45. fú---fŭ (hair/a lot)

46. lů---lă (zɔ kabakaba/animal)

47. àlé---àlɛ́ (so/sheep)

APPENDIX B

TRANSCRIPTION OF THE DATA FROM AŊLÕ RESPONDENTS ON THE PRONUNCIATION OF THE WORDS

Sn	words	Aŋlɔ 1	Aŋlɔ 2	Meaning
1	ʃe	[ɸə̀]		year
2	ʋe	[ßə̀]		hole
3	apa	[àpà]		labour
4	aba	[àbà]		bed
5	ame	[àmə̀]		human
6	aŋe	[àŋə̀]		rubber
7	awu	[àwù]		dress
8	amu	[àmù]		lagoon
9	fe	[fé]		play
10	ve	[vé]		bitter
11	fo	[fó]		peel off
12	vo	[vó]		rotten
13	ŋfɔ	[ŋ̀fɔ̀]		syllable
14	ŋgɔ	[ŋ̀gɔ̀]		front
15	tɔ	[tɔ̀]		water
16	dɔ	[dɔ̀]		sickness
17	tse	[ʧé]	[tsé]	grow
18	dze	[ʤé]	[dzé]	visible
19	ta	[tà]		wrap
20	da	[dà]		throw
21	nyo	[ɲó]		good
22	no	[nó]		breast
23	ɖeti	[ɖèʧĩ́]	[rèʧĩ́]	thread/cotton

24	deti	[dèʧǐ]		palm tree
25	asi	[àʃǐ]	[àsí]	hand
26	azi	[àʒì]	[àzì]	groundnut
27	atse	[àʧə]	[àtsə]	keloid
28	adze	[àʤə]	[àdzə]	lie
29	atsyõ	[àʧǒ]	[àʧǐõ]	beauty
30	adzɔ	[àʤɔ]	[àdzɔ́/àdzɔ]	tax/business
31	atsiã	[àʧìã]	[àtsã/ àʧã/àʧà]	style
32	ahiã	[àhìã]	[àʒìà]	sexual relationship
33	atsi	[àʧì]		indigestion
34	adzi	[àʤì]		frog/my love
35	akpa	[ākpā]		tilapia
36	agba	[āgbā]		plate
37	kliklikli	[klìklìklì]		haphazardly
38	krikrikri	[krìkrìkrì]		noisily
39	yi	[jì]		go
40	nyi	[ɲì]		nurture
41	wɔ	[wɔ́]		flour
42	yɔ	[jɔ́]		call
43	ka	[kà]		rope
44	ga	[gà]		money/iron
45	xe	[xè]		bird
46	he	[hè]		pull/train
47	ŋe	[ŋ̀]		moan
48	ɤe	[ɯ̀]		sun
49	glã	[glã́]		fortified

50	ɣla	[ɯlá]		hide
51	kpla	[kplá]		put on/train
52	gbla	[gblá]		focused
53	kɔku	[kɔ́kʷú]		neck lymph node
54	tɔku	[tɔ́kʷú]		drowning
55	beriberi	[bèríbèrí]	[bɛ̀ríbɛ̀rí]	rashes
56	belibeli	[bélíbélí]		weakly/thin
57	be	[bə̀]		hide/thatch
58	ba	[bà]		mud/cheat
59	bu	[bù]		respect
60	bɔ	[bɔ̀]		bend
61	bi	[bì]		burn
62	bo	[bò]		farm bed
63	te	[tə̀]		yam
64	ta	[tà]		wrap/swear
65	klo	[klò]		tortoise
66	kli	[klì]		stumble upon
67	agbo	[àgbò]		ram/gate
68	agbi	[àgbì]		mud
69	hɛnɔ	[hènɔ̀]		lead singer
70	hanɔ	[hànɔ̀]		sow
71	egbe	[égbə̀]		today
72	agbe	[àgbə̀]		life
73	yaya	[jájá]		spoilt
74	yeye	[jéjê]		new
75	se	[sé]		rule
76	sẽ	[sɛ́]	[sé]	hard

77	kpe	[kpə̀]		heavy
78	kpẽ	[kpə̃]	[kpə̀]	trumpet
79	lo	[ló]		crocodile
80	lõ	[lő]	[ló][lú]	take off something from fire
81	li	[lí]		establish firmly
82	lĩ	[lĭ]	[lí]	arouse sexually
83	ha	[hà]		pig
84	hã	[hȃ]	[hà]	also
85	lɛ	[lé]		thin
86	lɛ̃	[lé̋]		larva
87	alɔ	[àlɔ̀]		hand
88	alɔ̃	[àlɔ̃̀]		sleep
89	fu	[fʷú]		fur
90	fũ	[fʷŭ]		a lot
91	lũ	[lů]	[lù]	shave/hole
92	lã	[lȃ]	[là]	animal
93	ale	[àlé]		this way
94	alẽ	[àlé̋]		sheep

APPENDIX C

TRANSCRIPTION OF THE DATA FROM EUEME RESPONDENTS ON THE PRONUNCIATION OF THE WORDS

Sn	words	Eʋeme 1	Eʋeme 2	Meaning
1	ʃe	[ɸè]	[ɸè][ɸé]	year
2	ʋe	[ßè]	[ßè]	hole
3	apa	[àpă]		labour
4	aba	[àbă]		bed
5	ame	[áɱé]	[àɱè]	human
6	aŋe	[áŋé]	[àŋè]	rubber
7	awu	[áwú]		dress
8	amu	[ámú]	[àmù]	lagoon
9	fe	[fé]	[fé]	play
10	ve	[vĕ]	[vɛ́]	bitter
11	fo	[fó]		peel off
12	vo	[vó]	[vŏ]	rotten
13	ŋfɔ	[ŋ̀fɔ̀]		syllable
14	ŋgɔ	[ŋ̀gɔ̀]	[ŋ́gɔ́]	front
15	tɔ	[tɔ̀]	[tɔ́]	water
16	dɔ	[dɔ̀]	[dɔ̆]	sickness
17	tse	[ʧé]	[ʧé][tsɛ́]	grow
18	dze	[ʤé]	[ʤé][dzɛ́][ʤĕ]	visible
19	ta	[tà]		wrap
20	da	[dà]		throw
21	nyo	[ɲó]	[ɲŏ]	good

22	no	[nó]	[nŏ]	breast
23	ɖeti	[ɖɛ̀tí]	[ɖɛ̀tĭ]	thread/cotton
24	deti	[dɛ̀tí]	[dètí][dɛ̀tĭ]	palm tree
25	asi	[àsí]	[àsĭ]	hand
26	azi	[àzĭ]	[àzí]	groundnut
27	atse	[àʧɛ̀]	[àtsɛ̀]	keloid
28	adze	[àʤɛ̀]	[àdzɛ̀]	lie
29	atsyõ	[àtsʲíɔ́]	[àtsɔ́]	beauty
30	adzɔ	[àʤɔ̀]	[àdzɔ́] [àdzɔ̀]	tax/business
31	atsiã	[àtsʲìã̌]	[àʧã̌]	style
32	ahiã	[àhìã̌]		sexual relationship
33	atsi	[àʧì]		indigestion
34	adzi	[àʤì]	[àʤìkpɔ́kplɔ́] [àdĭ]	frog/my love
35	akpa	[àkpă]	[ákpá]	tilapia
36	agba	[àgbă]	[àgbà]	plate
37	kliklikli	[klìklìklì]		haphazardly
38	krikrikri	[krìkrìkrì]		noisily
39	yi	[jì]		go
40	nyi	[ɲì]		nurture
41	wɔ	[wɔ̌]	[wɔ́]	flour
42	yɔ	[jɔ̌]	[jɔ́]	call
43	ka	[kà]		rope
44	ga	[gà]		money/iron
45	xe	[xɛ̀]	[xé][xɛ́]	bird
46	he	[hɛ̀]	[hé][hɛ́]	pull/train
47	ŋe	[ŋɛ̀]	[ŋɛ́]	moan

48	ɣe	[ɯɛ̀]	[ɯɛ́]	sun
49	glā	[glǎ/glǎ]		fortified
50	ɣla	[ɯlá]	[ɯlǎ/wlǎ]	hide
51	kpla	[kplá]		put on/train
52	gbla	[gblá]	[gblǎ]	focused
53	kɔku	[kɔ́kʷú]	[kɔ́ŋ̀kʷúí]	neck lymph node
54	tɔku	[tɔ́kʷú]		drowning
55	beriberi	[bɛ̀ríbɛ̀rí]	[bèríbèrí]	rashes
56	belibeli	[bɛ́líbɛ́lí]	[bélíbélí]	weakly
57	be	[bɛ̀]	[bè][bɛ́]	hide/thatch
58	ba	[bà]		mud/cheat
59	bu	[bù]	[bú	respect
60	bɔ	[bɔ̀]	[bɔ́]	bend
61	bi	[bì]	[bí]	burn
62	bo	[bò]		farm bed
63	te	[tɛ̀]	[tè][tɛ́]	yam
64	ta	[tà]		wrap/swear
65	klo	[klò]	[kló]	tortoise
66	kli	[klì]	[klî]	stumble upon
67	agbo	[àgbò]		ram/gate
68	agbi	[àgbì]	[ágbí]	mud
69	hɛnɔ	[hɛ̀nɔ̀]	[hènɔ̀][hɛ́nɔ́]	lead singer
70	hanɔ	[hànɔ̀]	[hànǒ]	sow
71	egbe	[ɛ́gbɛ̀]	[égbè]	today
72	agbe	[àgbɛ̀]	[àgbè]	life
73	yaya	[jájá]		spoilt

74	yeye	[jéjě]		new
75	se	[sɛ́]	[sé]	rule
76	sẽ	[sɛ́̃]	[sɛ́̃]	hard
77	kpe	[kpɛ̀]	[kpè]	heavy
78	kpẽ	[kpɛ̃̀]		trumpet
79	lo	[lǒ]	[ló]	crocodile
80	lõ	[lǒ̃]		take off something from fire
81	li	[lí]		establish firmly
82	lĩ	[lĩ́]	[lĩ̌]	arouse sexually
83	ha	[hà]		pig
84	hã	[hẫ]		also
85	lɛ	[lɛ́]		thin
86	lɛ̃	[lɛ́̃]		larva
87	alɔ	[àlɔ̀]	[álɔ́]	hand
88	alɔ̃	[àlɔ̃̀]	[álɔ́̃]	sleep
89	fu	[fʷú]	[fʷŭ]	fur
90	fũ	[fʷŭ̃]		a lot
91	lũ	[lṳ̃]		shave/hole
92	lã	[lã̀]		animal
93	ale	[àlɛ́]	[álɛ́/ ɛ́lɛ́]	this way
94	alẽ	[àlɛ̃́		sheep

APPENDIX D

TRANSCRIPTION OF THE DATA FROM TƆŋU RESPONDENTS ON THE PRONUNCIATION OF THE WORDS

Sn	words	Tɔŋu 1	Tɔŋu 2	Meaning
1	ʃe	[ɸə̀]		year
2	ʋe	[ßə̀]		hole/
3	apa	[àpă]	[àpà]	labour
4	aba	[àbă]	[àbà]	bed
5	ame	[àmə̀]		human
6	aŋe	[àŋə̀]	[àŋɛ̀]	rubber
7	awu	[àwù]		dress
8	amu	[àmù]		lagoon
9	fe	[fé]		play
10	ve	[vé]	[vě]	bitter
11	fo	[fó]		peel off
12	vo	[vó]		rotten
13	ŋfɔ	[ŋ̀fɔ̀]		syllable
14	ŋgɔ	[ŋgɔ̀]		front
15	tɔ	[tɔ̀]		water
16	dɔ	[dɔ̀]		sickness
17	tse	[ʧé]	[tsé] [tsě]	grow
18	dze	[ʤé]	[dzě]	visible
19	Ta	[tà]		wrap
20	Da	[dà]		throw
21	nyo	[ɲɔ́]	[ɲɔ̌]	good
22	no	[nɔ̌]	[nɔ́]	breast

23	ɖeti	[ɖətĭ]		cotton
24	deti	[dətĭ]	[dətí]	palm tree
25	asi	[àsĭ]		hand
26	azi	[àzĭ]		groundnut
27	atse	[àtsə̀]	[àʧə̀]	keloid
28	adze	[àdʒə̀]	[àdzə̀]	lie
29	atsyõ	[àʧɔ̃̌]	[àtsʲìõ̀]	beauty
30	adzɔ	[àdʒɔ̀]		tax/business
31	atsiã	[àtsà]	[àʧà/tsʲìà]	style
32	ahiã	[àzìə̃̀]	[àzìə̀]	sexual relationship
33	atsi	[àʃì]	[àʧì]	indigestion
34	adzi	[àdʒì]		frog
35	akpa	[ākpā]		tilapia
36	agba	[āgbā]		plate
37	kliklikli	[klìklìklì]		haphazardly
38	krikrikri	[krìkrìkrì]		noisily
39	yi	[jì]		go
40	nyi	[ɲì]	[ɲə̀]	nurture
41	wɔ	[wɔ̌]		flour
42	yɔ	[jɔ̌]	[jɔ́]	call
43	ka	[kà]		rope
44	ga	[gà]		money/iron
45	xe	[xə̀]		bird
46	he	[hə̀]		pull/train
47	ŋe	[ŋə̀]		moan
48	ɤe	[wò]	[ɯə̀]	sun
49	glã	[glɐ̃́]		fortified

50	ɣla	[wlɔ́/ɯlá]		hide
51	kpla	[kplá		put on/train
52	gbla	[gblá]		focused
53	kɔku	[kɔ́kʷú]	[kɔ́kʷúí]	neck lymph node
54	tɔku	[tɔ́kʷú]		drowning
55	beriberi	[bèríbèrí]	[bɛ̀ríbɛ̀rí]	rashes
56	belibeli	[bélíbélí]		weakly
57	be	[bə̀]		hide/thatch
58	ba	[bà]		mud/cheat
59	bu	[bù]		respect
60	bɔ	[bɔ̀]		bend
61	bi	[bì]		burn
62	bo	[bò]		farm bed
63	te	[tə̀]		yam
64	ta	[tà]		wrap/swear
65	klo	[klò]		tortoise
66	kli	[klì]		stumble upon
67	agbo	[àgbò]		ram/gate
68	agbi	[àgbì]		mud
69	hɛnɔ	[hènɔ̀]	[hénɔ́]	lead singer
70	hanɔ	[hànɔ̀]	[hànɔ̌]	sow
71	egbe	[égbə̀]	[ɛ́gbíɛ́]	today
72	agbe	[àgbə̀]		life
73	yaya	[jájá]		spoilt
74	yeye	[jéjě]		new
75	se	[sé]	[sě]	rule
76	sẽ	[sẽ́]	[sé]	hard

77	kpe	[kpə̀]		heavy
78	kpẽ	[kpə̀]	[kpə̃]	trumpet/to cake
79	lo	[lŏ]	[ló]	crocodile
80	lõ	[lŏ]	[lŏ]	take off something from fire
81	li	[lí]		establish firmly
82	lĩ	[lĭ]	[lí]	arouse sexually
83	ha	[hà]		pig
84	hã	[hə̂]	[hâ]	also
85	lɛ	[lɛ́]		thin
86	lɛ̃	[lɛ̋]	[lɛ̋]	larva
87	alɔ	[àlɔ̀]		hand
88	alɔ̃	[àlɔ̌]	[àlɔ̀]	sleep
89	fu	[fʷŭ]	[fʷú]	fur
90	fũ	[fʷŭ]		a lot
91	lũ	[lə̌]	[lù]	shave
92	lã	[lə̌]	[là]	animal
93	ale	[àlé]	[álé/àlɛ́]	this way
94	alẽ	[àlĕ]	[àlĕ]	sheep

APPENDIX E

SUMMARY OF THE DATA FROM THE RESPONDENTS

Sn	Words	Aŋlɔ 1	Aŋlɔ 2	Eʋeme 1	Eʋeme 2	Tɔŋu 1	Tɔŋu 2	Meaning
1	ʃe	[ɸà]		[ɸɛ̀]	[ɸè][ɸé]	[ɸà]		year
2	ʋe	[ßà]		[ßɛ̀]	[ßè]	[ßà]		hole
3	apa	[àpà]		[àpă]		[àpă]	[àpà]	labour
4	aba	[àbà]		[àbă]		[àbă]	[àbà]	bed
5	ame	[àmə̀]		[áméˊ]	[àmɛ̀]	[àmə̀]		human
6	aŋe	[àŋə̀]		[áŋɛ́]	[àŋɛ̀]	[àŋə̀]	[àŋɛ̀]	rubber
7	awu	[àwù]		[áwú]		[àwù]		dress
8	amu	[àmù]		[ámú]	[àmù]	[àmù]		lagoon
9	fe	[fé]		[fɛ́]	[fé]	[fé]		play

10	ve	[vé]		[vɛ̌]	[vɛ́]	[vé]	[vě]	bitter
11	fo	[fó]		[fó]		[fó]		peel off
12	vo	[vó]		[vó]	[vǒ]	[vó]		rotten
13	ŋfɔ	[ŋ̀fɔ]		[ŋ̀fɔ]		[ŋ̀fɔ]		syllable
14	ŋgɔ	[ŋ̀gɔ̀]		[ŋ̀gɔ̀]	[ŋ́gɔ́]	[ŋ̀gɔ̀]		front
15	tɔ	[tɔ̀]		[tɔ̀]	[tɔ́]	[tɔ̀]		water
16	dɔ	[dɔ̀]		[dɔ̀]	[dɔ̌]	[dɔ̀]		sickness
17	tse	[ʧé]	[tsé]	[ʧɛ́]	[ʧé][tsɛ́]	[ʧé]	[tsé] [tsě]	grow
18	dze	[ʤé]	[dzé]	[ʤɛ́]	[ʤé][dzɛ́] [ʤɛ̌]	[ʤé]	[dzě]	visible
19	ta	[tà]		[tà]		[tà]		wrap/swear
20	da	[dà]		[dà]		[dà]		throw/to pride oneself
21	nyo	[ɲó]		[ɲó]	[ɲǒ]	[ɲó]	[ɲǒ]	good

22	no	[nó]		[nó]	[nŏ]	[nŏ]	[nó]	breast
23	ɖeti	[ɖèʧĭ]	[rèʧĭ]	[ɖɛ̀tí]	[ɖɛ̀tĭ]	[ɖətĭ]		thread/cotton
24	deti	[dèʧĭ]		[dɛ̀tí]	[dètí][dɛ̀tĭ]	[dətĭ]	[dətí]	palm tree
25	asi	[àʃĭ][àsí]		[àsí]	[àsĭ]	[àsĭ]		hand
26	azi	[àʒì]		[àzĭ]	[àzí]	[àzĭ]		groundnut
27	atse	[àʧə]	[àtsə̀]	[àʧɛ̀]	[àtsɛ̀]	[àʧə]	[àtsə̀]	keloid
28	adze	[àʤə̀]	[àdzə̀]	[àʤɛ̀]	[àdzɛ̀]	[àʤə̀]	[àdzə̀]	lie
29	atsyõ	[àʧŏ]	[àʧĭõ]	[àtsʲĭõ]	[àtsõ]	[àtsŏ]	[àtsʲìõ]	beauty
30	adzɔ	[àʤɔ̀]	[àdzɔ́/àdzɔ̀]	[àʤɔ̀]	[àdzɔ́]	[àʤɔ̀]		tax/business
31	atsiã	[àʧìã]	[àtsã/àʧ̃ã] [àʧ̃à]	[àtsʲìã]	[àtsã]	[àtsà]	[àʧ̃à/tsʲìà]	style
32	ahiã	[àhìã]	[àʒìà]	[àhìã]		[àzìõ]	[àzìə̀]	sexual relationship

33	atsi	[àʧì]	[àʧì]	[àʃì]	[àʧì]		indigestion
34	adzi	[àdʒì]	[àdʒì]	[àdʒìkpɔ́kplɔ́] [àdǐ]	[àdʒì]		frog/my love
35	akpa	[ākpā]	[àkpă]	[ákpá]	[ākpā]		fish/tilapia
36	agba	[āgbā]	[àgbă]	[àgbà]	[āgbā]		plate
37	kliklikli	[klìklìklì]	[klìklìklì]		[klìklìklì]		haphazardly
38	krikrikri	[krìkrìkrì]	[krìkrìkrì]		[krìkrìkrì]		noisily
39	yi	[jì]	[jì]		[jì]		go
40	nyi	[ɲì]	[ɲì]		[ɲì]	[ɲə]	nurture
41	wɔ	[wɔ́]	[wɔ̌]	[wɔ́]	[wɔ̌]		floor
42	yɔ	[jɔ́]	[jɔ̌]	[jɔ́]	[jɔ̌]	[jɔ́]	call
43	ka	[kà]	[kà]		[kà]		rope

44	ga	[gà]		[gà]		[gà]		money/iron
45	xe	[xə̀]		[xɛ̀]	[xé][xɛ́]	[xə̀]		bird
46	he	[hə̀]		[hɛ̀]	[hé][hɛ́]	[hə̀]		pull/train
47	ŋe	[ŋə̀]		[ŋɛ̀]	[ŋɛ́]	[ŋə̀]		moan
48	ɣe	[ɯə̀]		[ɯɛ̀]	[ɯɛ́]	[wɔ̀]	[ɯə̀]	sun
49	glã	[glá]		[glã/glá]		[glá]		fortified
50	ɣla	[ɯlá]		[ɯlá]	[ɯlă/wlă]	[wlɔ́/ɯlá]		hide
51	kpla	[kplá]		[kplá]		[kplá		put on/train
52	gbla	[gblá]		[gblá]	[gblă]	[gblá]		focused
53	kɔku	[kɔ́k^{w}ú]	[kɔ́k^{w}úí]	[kɔ́k^{w}ú]	[kɔ́ŋk^{w}úí]	[kɔ́k^{w}ú]	[kɔ́k^{w}úí]	neck lymph node
54	tɔku	[tɔ́k^{w}ú]		[tɔ́k^{w}ú]		[tɔ́k^{w}ú]		drowning
55	beriberi	[bèríbèrí]	[bɛ̀ríbɛ̀rí]	[bɛ̀ríbɛ̀rí]	[bèríbèrí]	[bèríbèrí]	[bɛ̀ríbɛ̀rí]	rashes
56	belibeli	[bélíbélí]		[bɛ́líbɛ́lí]	[bélíbélí]	[bélíbélí]		weakly

57	be	[bə̀]	[bɛ̀]	bè][bɛ́]	[bə̀]	hide/thatch
58	ba	[bà]	[bà]		[bà]	mud/cheat
59	bu	[bù]	[bù]	[bú	[bù]	respect
60	bɔ	[bɔ̀]	[bɔ̀]	[bɔ́]	[bɔ̀]	bend
61	bi	[bì]	[bì]	[bí]	[bì]	burn
62	bo	[bò]	[bò]		[bò]	farm bed
63	te	[tə̀]	[tɛ̀]	[tè][tɛ́]	[tə̀]	yam/swollen
64	ta	[tà]	[tà]		[tà]	wrap/swear
65	klo	[klò]	[klò]	[kló]	[klò]	tortoise
66	kli	[klì]	[klì]	[klî]	[klì]	stumble upon
67	agbo	[àgbò]	[àgbò]		[àgbò]	ram/gate
68	agbi	[àgbì]	[àgbì]	[ágbí]	[àgbì]	mud

69	hɛnɔ	[hènɔ̀]		[hɛ̀nɔ̀]	[hènɔ̀][hɛ́nɔ́]	[hènɔ̀]	[hénɔ́]	lead singer
70	hanɔ	[hànɔ̀]		[hànɔ̀]	[hànɔ̌]	[hànɔ̀]	[hànɔ̌]	sow/group leader
71	egbe	[égbə̀]		[ɛ́gbɛ̀]	[égbè]	[égbə̀]	[ɛ́gbíɛ́]	today
72	agbe	[àgbə̀]		[àgbɛ̀]	[àgbè]	[àgbə̀]		life
73	yaya	[jájá]		[jájá]		[jájá]		spoilt
74	yeye	[jéjê]		[jéjě]		[jéjě]		new
75	se	[sé]		[sɛ́]	[sé]	[sé]	[sě]	rule
76	sẽ	[sḗ]	[sé]	[sḗ]	[sḗ]	[sḗ]	[sé]	hard
77	kpe	[kpə̀]		[kpɛ̀]	[kpè]	[kpə̀]		heavy
78	kpẽ	[kpə̃]	[kpə̀]	[kpɛ̃]		[kpə̀]	[kpə̃]	trumpet/to cake
79	lo	[ló]		[lǒ]	[ló]	[lǒ]	[ló]	crocodile

80	lõ	[ló]	[ló][lú]	[lǒ]	[lǒ]	[lǒ]	take off something from fire/durable
81	li	[lí]		[lí]	[lí]		establish firmly
82	lĩ	[lĩ]	[lí]	[lĩ́]	[lĩ̌]	[lĩ́]	[lí]	arouse sexually
83	ha	[hà]		[hà]	[hà]		pig/song/rush for something
84	hã	[hâ]	[hà]	[hâ]	[hâ]	[hâ]	too/also
85	lɛ	[lé]		[lɛ́]	[lɛ́]		thin
86	lɛ̃	[lɛ́]		[lɛ́]	[lɛ́]	[lɛ́]	larva
87	alɔ	[àlɔ̀]		[àlɔ̀]	[álɔ́]	[àlɔ̀]	hand
88	alɔ̃	[àlɔ̀]		[àlɔ̀]	[álɔ́]	[àlɔ̀]	[àlɔ̀]	sleep
89	fu	[fʷú]		[fʷú]	[fʷǔ]	[fʷǔ]	[fʷú]	fur/pregnancy
90	fũ	[fʷǔ]		[fʷǔ]		[fʷǔ]		a lot

91	lũ	[lů]	[lù]	[lů]	[lů]	[lù]	shave/hole
92	lã	[lã]	[là]	[lå]	[lå]	[là]	animal
93	ale	[àlé]	[àlɛ́]	[àlɛ́]	[álɛ́/ ɛ́lɛ́]	[àlé]	[álé/àlɛ́] this way
94	alẽ	[àlẽ́]		[àlɛ́		[àlẽ́]	[àlẽ́] Sheep

APPENDIX F

Table 35: Ɛvɛ Phones Identified by Abadzivor and Dzamesi (2008)

Consonants																
Place *Manner*	**Bilabial**		**Labio dental**		**aveolar**		**Retroflex**			**palatal**	**Velar**		**Labiovelar**		
Plosive	b	p			d	t	ɖ				g	k	gb	kp	kw
Fricative	ʋ	ʃ	v	f	z	s					h	x			
Affricate					dz	ts		dzy	tsy						
Nasal	m				n					ny	ŋ				
Approximant	w									y	ɤ				
Trill					r										
Lateral					l										
Voicing	Voiced	Voiceles	voiced	Voiceles	voiced	Voiceles	Voiced	Voiced	Voiceles	voiced	Voiced	Voiceles	voiced	Voiceles	

Vowels												
	Front Unrounded				Central Unrounded				Back Rounded			
Close	i		ĩ						u		ũ	
Half Close	e		ẽ						o		õ	
Half Open	ɛ		ɛ̃		ə		ə̃		ɔ		ɔ̃	
Open					a		ã					
	Oral		Nasal		Oral		Nasal		Oral		Nasal	

Table 36: Ɛvɛ Phones Identified by Agbedoxor (2014)

Consonants															
Place *Manner*	**Bilabial**		**Labio dental**		**aveolar**		**Retroflex**	**Palato- alveolar**		**palatal**	**Velar**		**Labiovelar**	
Plosive	b	p			d ɖ	t	ɖ				g	k	gb	kp
Fricative	ß	ɸ	v	f	z	s					h	x		
Affricate					dz dzy	ts tsy								
Nasal	m				n					ɲ	ŋ			
Approximant	w									j	ɯ			
Trill					r									
Lateral					l									
Voicing	Voiced	Voiceless	voiced	Voiceless	voiced	Voiceless	Voiced	Voiced	Voiceless	voiced	Voiced	Voiceless	voiced	Voiceless

Vowels

	Front Unrounded				Central Unrounded		Back Rounded	
Close	i		ĩ				u	ũ
Half Close	e						o	õ
Half Open	ɛ		ɛ̃		ə	ə̃	ɔ	ɔ̃
Open					a	ã		
	Oral		Nasal		Oral	Nasal	Oral	Nasal

Table 37: Ɛʋɛ Phones Identified by Amegashie (2011)

Consonants																
Place *Manner*	**Bilabial**		**Labio dental**		**aveolar**		**Retroflex**	**Palato- alveolar**		**palatal**	**Velar**		**Labiovelar**	
Plosive	b	p			d ɖ	t					g	k	gb	kp
Fricative	ß	ɸ	v	f	z	s					h	x		
Affricate					dz	ts								
Nasal	m				n					ɲ	ŋ			
Approximant	w									j	ɯ			
Trill					r									
Lateral					l									
Voicing	Voiced	Voiceless	voiced	Voiceless	voiced	Voiceless	Voiced	Voiced	Voiceless	voiced	Voiced	Voiceless	voiced	Voiceless

Vowels										
	Front Unrounded				Central Unrounded		Back Rounded			
Close	i	ĩ					u	ũ		
Half Close	e						o	õ		
Half Open	ɛ	ɛ̃			ə	ə̃	ɔ	ɔ̃		
Open					a	ã				
	Oral		Nasal		Oral	Nasal	Oral		Nasal	

Table 38: Ɛvɛ Phones Identified by Ansre (1961) as Phonemes

Consonants															
Place *Manner*	**Bilabial**		**Labio dental**		**aveolar**		**Retroflex**	**Dental**		**Alveo-palatal**	**Velar**		**Labiovelar**		
Plosive	b	p					ɖ	d	t		g	k	gb	kp	
Fricative	ʋ	ʃ	v	f	z	s					h	x			
Affricate								dz	ts						
Nasal	m				n					ny	ŋ				
Approximant	w									j	ɤ				
Trill															
Lateral					l										
Voicing	Voiced	Voiceless	voiced	Voiceless	voiced	Voiceless	Voiced	Voiced	Voiceless	voiced	Voiced	Voiceless	voiced	Voiceless	
Vowels															
	Front Unrounded				Central Unrounded					Back Rounded					
Close	i		ĩ							u		ũ			
Half Close	e									o					
Half Open	ɛ		ɛ̃							ɔ		ɔ̃			
Open					a			ã							
	Oral		Nasal		Oral			Nasal		Oral		Nasal			

Table 39: Ɛʋɛ Phones Identified by Anyidoho (1990)

Consonants															
Place *Manner*	**Bilabial**		**Labio dental**		**aveolar**		**Retroflex**	**Palato-alveolar**		**palatal**	**Velar**		**Labiovelar**		
Plosive	b	p			d	t	ɖ				g	k	gb	kp	
Fricative	ʋ	ʃ	v	f	z	s					h	x			
Affricate					dz	ts		dzy	tsy						
Nasal	m				n					ny	ŋ				
Approximant	w									j	ɤ				
Trill					r										
Lateral					l										
Voicing	Voiced	Voiceless	voiced	Voiceless	voiced	Voiceless	Voiced	Voiced	Voiceless	voiced	Voiced	Voiceless	voiced	Voiceless	

Vowels									
	Front Unrounded				Central Unrounded		Back Rounded		
Close	i		ĩ				u		ũ
Half Close	e		ẽ				o		õ
Half Open	ɛ		ɛ̃				ɔ		ɔ̃
Open					a	ã			
	Oral		Nasal		Oral	Nasal	Oral		Nasal

Table 40: Ɛvɛ Phones Identified by Atakpa (1985) as Phonemes

Consonants															
Place *Manner*	**Bilabial**		**Labio dental**		**aveolar**		**Apico-Alveolar**	**Palato-alveolar**		**palatal**	**Velar**		**Labiovelar**		**Labialised velar**
Plosive	b	p			d	t	ɖ				g	k	gb	kp	
Fricative	ʋ	ʃ	v	f	z	s					ɣ h	x			
Affricate					dz	ts									
Nasal	m				n					ny	ŋ				
Approximant	w									j					
Liquid					r										
Liquid					l										
Voicing	Voiced	Voiceless	voiced	Voiceless	voiced	Voiceless	Voiced	Voiced	Voiceless	voiced	Voiced	Voiceless	voiced	Voiceless	Voiced

Vowels									
	Front Unrounded				Central Unrounded		Back Rounded		
Close	i		ĩ				u		ũ
Half Close	e		ẽ				o		õ
Half Open	ɛ		ɛ̃				ɔ		ɔ̃
Open					a	ã			
	Oral		Nasal		Oral	Nasal	Oral		Nasal

Table 41: Ɛvɛ Phones Identified by Duthie (1996) as Phonemes

Consonants																
Place *Manner*	**Bilabial**		**Labio dental**		**aveolar**			**Laminal-dental**		**palatal**	**Velar**		**Labiovelar**		**Labialised velar**
Plosive								d	t		g	k	gb	kp	
Fricative	ʋ	ʃ	v	f	z	s					h	x			
Affricate					dz	ts									
Nasal	m				n					ny	ŋ				
Approximant					l								w		
Trill															
Lateral															
Voicing	Voiced	Voiceless	voiced	Voiceless	voiced	Voiceless		Voiced	Voiceless	voiced	Voiced	Voiceless	voiced	Voiceless	Voiced

Vowels								
	Front Unrounded			Central Unrounded		Back Rounded		
Close	i	ĩ				u	ũ	
Half Close	e	ẽ				o	õ	
Half Open	ɛ	ɛ̃		ɔ	ɔ̃	ɔ	ɔ̃	
Open				a	ã			
	Oral	Nasal		Oral	Nasal	Oral	Nasal	

Table 42: Ɛʋɛ Phones Identified by Kpodo (2014) as Phonemes

Consonants																
Place *Manner*	**Bilabial**		**Labio dental**		**aveolar**		**Retroflex**	**Palato- alveolar**		**palatal**	**Velar**		**Labiovelar**		**Labialised velar**
Plosive	b				d	t	ɖ				g	k	gb	kp	
Fricative	ß	ɸ	v	f	z	s					h	x			
Affricate					dz	ts		ʤ	ʧ						
Nasal	m				n					ɲ	ŋ				
Approximant										j					
Trill															
Lateral					l								w		
Voicing	Voiced	Voiceless	voiced	Voiceless	voiced	Voiceless	Voiced	Voiced	Voiceless	voiced	Voiced	Voiceless	voiced	Voiceless	Voiced

Vowels										
	Front Unrounded				Central Unrounded		Back Rounded			
Close	i		ĩ				u		ũ	
Half Close	e		ẽ				o		õ	
Half Open	ɛ		ɛ̃		ɔ	ɔ̃	ɔ		ɔ̃	
Open					a	ã				
	Oral		Nasal		Oral	Nasal	Oral		Nasal	

Table 43: Ɛʋɛ Phones Identified by Nyomi (2017)

Consonants																
Place *Manner*	**Bilabial**		**Labio dental**		**aveolar**		**Retroflex**	**Palato- alveolar**		**palatal**	**Velar**		**Labiovelar**		**Labialised velar**
Plosive	b	p			d	t	ɖ				g	k	gb	kp	kw
Fricative	ʋ	ʃ	v	f	z	s					h	x			
Affricate					dz	ts		dzy	tsy						
Nasal	m				n					ny	ŋ				
Approximant	w									j	ɯ				
Trill					r										
Lateral					l										
Voicing	Voiced	Voiceless	voiced	Voiceless	voiced	Voiceless	Voiced	Voiced	Voiceless	voiced	Voiced	Voiceless	voiced	Voiceless	Voiced

Vowels										
	Front Unrounded				Central Unrounded		Back Rounded			
Close	i		ĩ				u		ũ	
Half Close	e		ẽ				o		õ	
Half Open	ɛ		ɛ̃		ɔ	ə̃ a	ɔ		ɔ̃	
						ã				
Open										
	Oral		Nasal		Oral	Nasal	Oral		Nasal	