Variation Study of the Received Pronunciation (RP) Vowel Phonemes /e/, /ɜ:/ and /ə/, among Ewe Speakers of English in Ghana

Inauguraldissertation

zur Erlangung des Grades eines Doktors der Philosophie

im Fachbereich Sprach- un Kulturwissenschaften

der Johann Wolfgang Goethe-Universität

zu Frankfurt am Main

vorgelegt von Awoonor-Aziaku, Lena

aus Ghana, Juapong

June, 2018

Abstract

This research investigated variation in the pronunciations of three RP vowels phonemes /e/, /ɜː/ and /ə/, among Ewe speakers of English in Ghana. It focused on variation at both individual and societal levels, investigating how social relations within these structures influenced the use of the three vowels among the speakers. In this study, social structures were seen as a system where individual members depended on one another and were linked through multiple ties. The distribution of the vowels was in respect with the social variables: age, gender and education, including dialect and social network. The study used a corpus of word-list recorded in a face-to-face interview from 96 participants selected through stratification and networking across two dialect regions: Aŋlɔ and Eʋeme. Using both aural and acoustic analyses, coupled with ANOVA and t-test, the study has shown that the three RP vowels exist in Ghana Eʋe English as independent phonemes. Each of them however has allophonic variants; /e/ has variants [e̱], [ɪ] and [ɜː]; /ɜː/ has [eː] and [ɜː], while /ə/ has [ə], [ɪ], [o] and [ʌ] as its variants. The choice of the variants of /ɜː/ and /e/ have been found to depend on speaker age, gender, and social network. But the geographical location of the speaker will largely determine how these vowels are spoken. Phonological contexts as well as speaker idiosyncrasy are also likely to condition the choice of some of these variants, however, their effects seem less important as determinant of the differences observed than those of the social factors. It is evident that age, gender and class differentiations that have been widely reported cannot be universal, they can vary from one society to another. Also though social structures as well as social relations in a speech community can play significant roles in the individual's linguistic repertoire, the attitude of the speaker and the phonological contexts of a segment can have a huge impact on the use of that variable.

Acknowledgement

I owe gratitude to the funders of this research, Deutscher Akademischer Austauschdienst (DAAD), and the Ministry of Education (MoE), Ghana, for giving me this keenly contested award. My special thanks also go to Prof. Dr. Henning Reetz and Prof. Dr. Rainer Voßen for providing me references for this award. Such awards are few in the field of linguistics, and I must say that my chances of getting one would not have been successful without your references. I am also grateful for your support and help during my three-year study at the Goethe-Universität, especially for the writing of this project. Your positive encouragement, guidance and feedback are highly appreciated. I am particularly grateful to Prof. Reetz, I really appreciate your constructive suggestions and ever readiness to discuss the work with me anytime I called on you despite your heavy schedules.

I am equally grateful to Prof. Dr. Abiola Babatunde and Dr. Aziaku for their suggestions. I deem it an honour to have you as my independent editors of this manuscript. In fact I would say that you did not only read my work, but you also shaped my thoughts. My sincere gratitude also goes to the following people for their contributions great and small in helping me to complete my study at the university successfully. Dr. Ulrike Zoch, Dr Marie Ngom and Ms. Sandra Boaman at the Institute of African Studies, for their support, advice and especially for allowing me to use the Institute of African Studies Library. And to Prof. Dr. Dora Edu-Buandoh, the Provost of the College of Humanities and Legal Studies, Prof. Dr. A. Afful, the Dean of the Faculty of Arts, University of Cape Coast, and Dr. Traore, the Head of the Department of English, University of Cape Coast. Not forgetting Prof. Dr. Owusu-Ansah and Dr. K. Koda, both at the University of Cape Coast, your contributions to the success of my academic life cannot go unmentioned.

I also say thank you to my research participants and my research assistants, Sammy and William, to my statistician, Sani, and to all my friends, especially those in the Faculty of Arts, College of Humanities and Legal Studies,

University of Cape Coast. Again, to my brothers-in-law Mr. Sepenu and his wife, and also to Prosper Yao Amesimeku, I can't thank you enough for the love and kindness you extended to me during my stay at the University.

Finally, I am grateful to my family, particularly my mother Comfort, and to my sisters Phidelia and Benedicta, and to you Vincent, my husband. Your unflinching support is highly appreciated. I cannot repay you for your contributions, both in kind and in cash towards my academic life.

Dedication

I dedicate this thesis to my husband, Vincent, and to my sons, Seyenam and Sedinam.

TABLE OF CONTENTS

TABLES **Page**

FIGURES **Page**

CHAPTER ONE

1.1. Background to the Study

Research within variationist paradigm has shown that variation in language use is normal and is key to understanding mechanisms of linguistic change. At the phonological level, for example, change appears to affect contextually defined subsets of phonological classes in a regular way, spreading through the community in waves in a manner controlled by extra-linguistic factors such as the age, sex, social status and geographical location of the speaker (Milroy & Milroy, 1985: 2). The term 'language' as generally known, is thus an idealization since no one actually speaks a 'language', but rather a 'variety' or varieties of that language, or its dialects (Kachru & Nelson, 2011). The determinants of language variation are numerous: they include gender, age, genre, migration history, socioeconomic class, status, register, style, region/location, etc. Thus if we take English, for example, based on nationality, we can identify several varieties such as American English, Australian English, Canadian English, British English, African English, and so on. Within each of these nations, several varieties can be identified according to regions; in the United Kingdom, for example, we can talk of varieties such as Scots, Northern, Central and Southern dialects. Similarly, in the US, Wolfram (1991) identifies and describes eighteen dialect areas of the Atlantic seaboard including a distinct dialect spoken in New York City.

Dialect variation appears to be largely understood as geographically based, however, several other factors have been identified as the causes of variation in language use. As mentioned earlier, there are differences in the speech of people of different classes, age groups, caste groups, ethnic groups, different genders, etc. There are differences, also, between educated and uneducated speech. In the US, for instance, one can identify a dialect such as African-American Vernacular English (AAVE) (Labov, 1998). Similarly, the Cockney dialect in the United Kingdom is believed to have a class base, and is called 'the Traditional Dialect of working class London' (Trudgill, 1990: 46). Again in South Asia, one can talk of dialect differences based on castes and religions, so that one speaks of a Brahmin dialect and a non-Brahmin dialect of, say, Tamil and of Hindu versus Muslim Bengali or Kashmiri (Shapiro & Schiffman, 1983; Ferguson & Dil, 1996; Holmes, 2008).

Linguistic diversity can also be attitudinal, exhibited mostly in socioeconomic class. According to Coupland (2007), people use speech to negotiate social meaning, group membership and for identity construction. In a job interview in Britain, for example, employing the features of the Received Pronunciation (posh) will help to create the desired identity, but among relatives on the farm in the Northwest, talking RP will be seen as creating social distance. For Coupland (2007), speech variation is a linguistic strategy speakers used to bring out linguistic differences among themselves. In sociolinguistics, language variation is seen as a way of displaying a valued distinctiveness between groups of people (Giles & Smith, 1979). Members of different groups do contrast themselves with one another using linguistic divergence, especially when one group considers another group as an undesirable one. Speakers from different social or cultural groups use speech divergence as a means to maintain their social, and or cultural identity. It can also be used as a means to indicate power or status differences, especially when speakers wish to render another speaker less powerful.

Linguistic variation therefore appears to be common, and perhaps inevitable in language use situations. It is impossible, therefore, to examine the speech of individuals in a community without encountering variations in the data. The best way one can probably accurately describe human speech behaviour is to identify a group of people who share a geographically distinct characteristic (Coupland, 2007). Within this major group, sub-groups can be identified based on different social characteristics such as age, class, gender, etc. The norm in variation study has therefore been to start a study by grouping the individuals into different social classes based on factors such as education, occupation, income; different age groups, gender, etc. After this one can find out how a given sociolinguistic variable differs among and between the different groups of speakers.

Some linguists, especially social network analysts, however argue that human behaviour can be predicted not only by their drive, attitude or demographic characteristics, but by also the web of relationship in which they are embedded (Wellman, 1988). Their belief is that human beings are not merely an aggregate mechanism, but an organic whole where the constituent elements are interconnected through a mosaic of ties based on interactions, directly or indirectly, at various domains such as social, economic, political, etc. (Berkowitz, 1982; Sarhimaa, 2009). This means

that every individual is embedded in some kind of personal social group which provides them with structures that help them cope with their everyday lives, and these structures consequently affect their behaviours including language use. It is therefore difficult to fully understand human behaviour without examining their relations within the social structure. Their web of relationship, as argued, presents opportunities and imposes constraints on their general behaviour (Wellman, 1988).

People with a closely-knit network are believed to behave differently from those that are loosely connected. Milroy's (1987) study among three class groups in Ballymacarett, Belfast, has shown that speakers with strong vernacular speech were those whose neighbourhood ties were close. Milroy believes that even if the variables of age, sex and social class of a speaker are maintained, the closer an individual's network ties are with their local community, the closer their language will approximate to localized vernacular speech (Milroy, 1980). Social analysts are strongly of the view that people's linguistic behaviours should be investigated through the 'properties of relations' between and within units, instead of the properties of the units themselves. However, 'a complete account of sociolinguistic patterns must display the effects of speakers' age, gender, ethnicity, race, social class, urban/rural status, and their position in a social network' (Labov, 2001: 84). Consequently, the present study investigates the social structures of two dialect groups; Aŋlɔ-Eʋe and Eʋeme-Eʋe in Ghana, and how the relationship among these structures influence their use of three RP vowel phonemes /e/, /ɜ:/ and /ə/.

1.2. Statement of problem

English language plays a very significant role in Ghana. Although it is not a native language of Ghana, it is learned and used extensively by most Ghanaians side by side the indigenous languages for their daily activities. Its extensive usage and being different from the indigenous languages can, therefore, cause a new variety of English language to evolve in Ghana. As argued, a language that is used in all corners of the world by people from all walks of life is bound to develop new varieties of norms which will be used by local people as symbols of their identity (Crystal, 1987). English in its native context has a norm, so it might be with the English spoken in Ghana. It is important, therefore, that we identify the norm of English in Ghana as an entity that has

its own internal variability, study and describe it independently of any other variety of English. For instance, the Eʊe speaker needs to know what English she or he speaks, be able to describe it, and explains how it works, so that at the Educational level learners can identify and use its phonological system effectively. Unfortunately, the variety of English spoken in Ghana has not received a lot of codification, coupled with this, variation studies in Ghanaian English (GhE) have received far less attention that it deserves. For example, studies on Ghanaian English, especially on phonological variables, mostly focus on few isolated individuals in a particular community, sample their speech, examine it and then generalise the results to the entire country.

The consequence of this, is that most often the results of these studies are inconsistent with one another. The inconsistency in these results may partly be due to heavy reliance on auditory analysis, which is more impressionistic and so produces results that often lend themselves to various forms of debates. The use of spectrographic analysis of the individual vowel sounds, coupled with an examination of the individual's social groupings might produce more précised and objective results, and can also help to determine the qualities of vowels produced by Ghanaian speakers with different social backgrounds. The present study hence sought to employ variation studies, coupled with instrumental method to examine the use of three RP vowel phonemes by Aŋlɔ-Eʊe and Eʊeme-Eʊe speakers of English in Ghana

1.3. Research objective

The main objective of the study was to examine realisations of the RP vowels, /e/, /ə/ and /ɜː/, among Eʊe of Ghana, taking into account dialect, age, education, gender and social network of the speakers.

1.4. Hypothesis

The three RP vowel phonemes /e/, /ɜː/ and /ə/ exist as independent phonemes in Ewe English. Their pronunciations however differ significantly according to age, gender, education, dialect and social network type.

1.5. Research questions

To achieve the said objective, the following questions were put forward: (A) how do Eʊe of Ghana realise the RP vowel phonemes /e/, /ɜː/ and /ə/?

(B) What significant effects do the following: (i) dialect, (ii) gender, (iii) education, (iv) age and (v) social network have on the realisations of the RP vowel phonemes /e/, /ɜː/ and /ə/ among the Eʊe of Ghana?

1.6. Significance of the study

The study has both theoretical and pedagogical implications. Theoretically, the variationists' approach to the present study has made it possible for us to identify the various social groups within the two Eʊe dialect communities, and how their relationships affect the use of the three RP vowel phonemes. The study, I believe, will appeal to a wide range of phoneticians, phonologists, linguists as well as sociolinguists to consider variation as the main tool when describing the speech of Ghanaians. The methods used in this study will serve as frameworks that will help address the lack of objectivity and deficiency in methodology of researches on Ghanaian English in particular, and on non-native English in general. For example, acoustic method can be adopted by language teachers as well as students working on Ghanaian English to give précised descriptions of the vowels among the Eʊe of Ghana.

1.7. Scope of the thesis

This study investigated pronunciations of three RP vowel phonemes /e/, /ə/ and /ɜː/, by both Aŋlɔ and Eʊeme dialect speakers of English in Ghana, taking into consideration, their Education background, age, gender and their social network type.

1.8. Ethics

The issue of ethics is very important in this research since it involves human subjects and is an intrusion on the individual's private lives. The participants had to reveal certain confidential information about themselves to the researcher; that is, information that may be known to their friends and associates only. It also involves spending time with the interviewer which could disrupt their regular activities in the day. One other issue that researchers do contrary to the ethics of scientific research is to publish their

work without the participants' consent. All these suggest that every research that involves human subjects runs the risk of infringing on the rights of individuals in one way or the other. Though it was not possible to guard against all these possible risks, some measures were put in place to minimise some of them and also, to protect the integrity of the participants.

Before the field work, an approval was sought from my supervisors and from my sponsors. A consent form which detailed the purpose of the study and the rights of the participants in the study, my contact details and those of my supervisors was prepared and sent to the chiefs and the elders of the various research communities for an approval. On the field, each participant was asked to give their consent by signing the forms before participating in the interview. To ensure the participants' confidentiality, only their initials were used in the research instead of their full names. Again, the recorded speech data were kept safe in a computer with a separate password; all the information received from the participants was treated with the strictest confidentiality. Care was also taken to ensure that no harm was done to the participants. That is, no participant was injured and questions that could intrude on their rights were avoided. No information that could embarrass, hurt them psychologically or endanger their life, jobs etc. were sought from them.

Many linguists, however, argue that it is not enough simply to do no harm to participants or ensure their confidentiality, but something must be given back to the research communities. Consequently, soft copies of the report will be given to any participant who requests it. Again, in case of any future publication, permission will be sought from the research communities.

1.9. Thesis organisation

The thesis has eight chapters including the introduction and the conclusion. Chapter one is made up of the background of the study, statement of the problem, research objective, research hypothesis and research questions, significance of the study, ethics and thesis organisation. Chapter two discussed briefly the historical background of the Eʊe as a people, and as a language, and also some dialectal variations in the Eʊe vowel system. This chapter also gave a brief history of the English language and some events that led to the present variations in the sound system of the English language. Chapter

three discussed some empirical studies pertinent to the work and chapter four presented the methodological issues of the work. These include the research design, the sample size, measuring the social network strength, and the field work, which includes the activities before, during and after the field work. Chapters five, six and seven discussed the results of both the experiment and the statistical analysis. Also included in this chapter is the summary of the findings of the study. Chapter eight, the final chapter, is the conclusion of the work. In this chapter, the summary of the thesis together with statement of contributions and some recommendations for further study were discussed.

Chapter Two: Historical overview of Eʋe and English

2.1. Introduction

In this chapter an attempt was made to give a brief historical overview of the Eʋe as a people and as a language. This includes their exodus from the various historical places, more importantly, the historical Notsie, where they were believed to have lived under a tyrant king called Agɔkɔli (Agɔ Akɔli), before separating finally into the different tribes and, consequently into the different dialect groups. Also in this chapter is the history of the English language. This took into consideration the English language before, during and after it was brought onto the British Isles, and some events that took place after it was transported into Britain, and more specifically how the various events have affected its vowel system.

2.2. The Eʋe people

The Eʋe or Eʋe people are a group of people that inhabits the southeastern part of the Volta Region of Ghana, southern part of the Republic of Togo and the southwestern part of the Republic of Benin, and also parts of Ogun and Lagos State or southwestern Nigeria (see map in appendix B1 and also Capo, 1991). According to the Eʋe Oral Tradition, the present-day Eʋeland is not the original home of the Eʋe. Oral Tradition traces the place of origin of the Eʋe as far back to an earlier settlement in Adzatome, a place founded by Ham, the first son of Noah, in the Bible (see Genesis 11:1 for the story of Babel). Other accounts, however, trace the exodus from various places such as Egypt, Ethiopia, Sudan, Abyssinia, Nigeria, the Republics of Benin and Togo. It is important we note that none of the accounts narrated by the different sub-clans has a scientific basis because oral tradition loses historical facts with time. Thus the narrations differ from one clan to the other. Nonetheless, they all seem to have a point of convergence; all the clans agree that the Eʋe people once lived as one group in a place called 'Ketu' in Dahomey, the present day Republic of Benin following a conquest, and thereafter settled down in a place called Ŋɔtsie/Notsie (see Dotse, 2011). Fage (1959), for example, claims that the line of migration of the Eʋe is remembered as Ketu-Tado-Ŋɔtsie. Some other historians put the line of migration as Oyo-Ketu-Ŋɔtsie, or Oyo-Ketu-Tado-Ŋɔtsie (see Dotse, 2011). At Ketu they are believed to have lived with the Yorubas, the ancestors of the present day Aja, Fon and the Ga-Dangme.

This means that the Eʋe people have once lived as one group in either Ketu, Tado or Ɲɔtsie. Although it is difficult to establish the actual period they began their migration and why they left Ketu, Kodzo-Vordoagu (1994) believes that the westward expansion of the Yoruba might have pushed the Eʋe and their king, Aja, from Ketu.

The account shows that before leaving Ketu, they split into two big divisions. One of these divisions went towards south, but later divided into two, while the other major-sub division went to found a settlement on the eastern side of River Mono and called it Tado or Tando, which became a powerful kingdom and a historical capital. This group later crossed the river and penetrated the forests along the bank of the river to settle in a town called Ɲɔtsie around 1500 BC where one group of the advanced second sub-division of migrants from Ketu had already settled (Dotse, 2011).

The sub-division of the advanced group, as was told, joined them later in Ɲɔtsie after a short settlement in the region of Adele near Dogbo-Nyigbo. This group was said to have been led by Tɔgbi Atsu Akplɔmada Ʋenya, and his nephew Srɔe or Sri, son of Amegã Ʋenya's sister Asɔngɔe who was the son of the King of Tado. It was said that Sri had fled from Tado with his father's stool following a succession dispute with his half-brothers after their father, the King of Tado's death. In Ɲɔtsie, they were known collectively as Dogboawo, and were under the leadership of King Adelã Atɔgble.
All the migrants were given a portion of Ɲɔtsie to settle on and were independent. Thus there were several settlements of the Eʋe at Ɲɔtsie, with each settlement having a leader who had a semi- autonomous power. The city of Ɲɔtsie, for example, consisted of thirty-six neighborhoods; with some of the original seven quarters being Tegbe, Tako, Ekli, Agbaladome, Anakpe, and Adime (see Dotse, 2011 & Mamattah, 1978 for details). The Dogbo quarter, e.g. had its own leader, same as the other Eʋe groups; but they were all ruled by one great King. The entire community of Ɲɔtsie thus lived within a wall called Agbogbo and was ruled by kings in succession including King Agɔ Akɔli (Agɔkɔli). In all the accounts, therefore, Ɲɔtsie was their last stop and the centre of dispersion, and is a significant point in the history of the Eʋe people, especially the Aŋlɔ people.

According to the accounts, the early kings of Ɲɔtsie ruled well and the kingdom flourished. The reign of King Agɔkɔli was however inundated with several conflicts due to his desire to impose his will on the people against their wishes. It was said that

he tyrannized them, gave them a number of impossible tasks to perform, and also punished those who did not obey him and the traditions. As his style of leadership became unbearable, the Dogboawo escaped from Ɲɔtsie through part of a collapsed wall that was believed to have been pushed down by Togbi Tegli's 'Adekpui', a magical sword. The account indicates that during their escape, the last part of the group walked backwards on the exact footsteps of the earlier parties for about two miles so that their footprints might not betray their whereabouts. The Adekpui that was used by Tegli to bore a hole into the wall that allowed the people to escape is preserved to this day as part of the stool regalia of Tɔgbui Asor, the leader of the Dogbo group which settled at Ho. The reign of Agɔkɔli thus profoundly marked the period and the deep legacy left in the memory of the Eʋe as the primary cause of the different migrations from Ɲɔtsie and the occupation of their present-day Eʋeland (Dotse, 2011).

From Ɲɔtsie, the Eʋe were believed to have settled at different places. Their first place of settlement according to the accounts was at Tsevie, in Togo, from where they split into three broad groups under different leaders, which presently inhabit the northern, central and southern areas of their new home, stretching up to the Volta River in the West (see Capo, 1991; Dotse, 2011). The accounts indicate that the Central and Northern Dogbo groups were led out of Tsevie by Akoto, Kɔdzo De, Amegã Lee, Asor and Bisiaku to settle at places like Hohoe, Matse, Peki, Awudome, Ve, Gbi, Kpando, Logba, Alavanyo, Kpalime, Agu, Kpedze, Wodze, and some other towns. Amegã Lee, however, later left the group with some followers and family members southwards to settle in a town close to 'Ge', the present day Accra. But he again moved to join the main Dogbo group which had settled at Aŋlɔga. Some members of the Central and Northern Dogbo group are believed to have later founded the settlements of Ho, Akɔvie, Takla, Kpenɔe, Hodzo, Klevi, Sɔkode, Abutia, and Adaklu, all these groups together constitute the present day Eʋeme Eʋe of Ghana.

The third group, made up of various sections of the Dogboawo, are said to have moved together southward, but are also believed to have later split into sub-divisions at Gafe. These groups which included Tɔgbi Tsatsu Batemenu (aka Adeladza), Tɔgbi Tse Tsali Akpɩɔmada and Tɔgbi Atsu Akpɩɔmada Uenya, the twin brother of Tɔgbi Tsali founded Ueta, Aŋlɔga, Klikɔ, Ave, Fenyi, Afife, Dzodze, Mafi, Agave, Avenɔ, Tavie, Tokɔe, Tanyigbe. It was said that during their migration from Tsevie, Agbana, one of

Tɔgbi Uenya's children and Tɔgbi Tsatsu Batemenu (aka Adeladza) led the advanced party. Tɔgbi Tse Tsali Akplɔmada, a mystic man, was said to be a member of a scout for the Dogbo group who was reported to have cast a sleeping spell on Agɔkɔli and his people that enabled the Eʋes to move out of Ɲɔtsie undetected. His twin brother, Tɔgbi Atsu, was said to have left Ɲɔtsie settlement earlier, went to Awukugua, performed miracles and healed people with herbs. In Awukugua, Osei Tutu, an Ashanti King to be, met him there at the court of the Awukuguahene and invited him to Kumasi to help him claim the throne as the king of the Asante. He went with him and conjured out of the sky, a golden Stool that has till this day embodied the soul of the Asante nation. He was then called 'Ɔkɔmfo from Ɲɔtsie' but corrupted into 'Kɔmfo Anɔkye' known now throughout the entire Ashanti Kingdom as 'Ɔkɔnfo Anokye'.

The present-day Aŋlɔ-Eʋe have also traveled from Tsevie as one unit, but later divided into two groups under the leadership of Tɔgbi Atsu Akplɔmada Uenya, and his nephew Tɔgbi Sri I. Tɔgbi Uenya led the main group which went south and moved along the sea shore westwards, founding settlements along the way. After many discoveries and settlements, Uenya's group reached a sandbar and called it 'ke dzi' which means 'top of sand', presently called Keta Kedzi. Going further, they came across the head of the sandbar. They then informed their leader, Tɔgbi Uenya, that 'Miéva ɖo kea ta' meaning we have reached the head of the sand; giving the present day 'Keta'. They later founded other towns including Tegbi and Woe. The group went further until they reached the present-day Aŋlɔgã. Over there, Uenya told his people, 'Nyè amèa mèŋlɔ. Afi aɖeke yiyi megale ŋunyè o, meaning 'I am exhaustively coiled, I can't go any further'. Thus the name 'Meŋlɔ', contracted to 'Aŋlɔ', became the name of the town Aŋlɔgã, the capital of the whole Aŋlɔ state, and the people of the Aŋlɔ are called 'Aŋlɔawo'.

The second group led by Kpenɔe Akplɔmada (Tɔgbi Sri I), the nephew of Tɔgbui Uenya, took the northern route of the Atlantic Coast and settled at Klikɔ. Tɔgbui Sri then continued by canoe via the Keta lagoon to settle at Fiaxɔ where he founded other Aŋlɔ communities on the northern shore of the great Keta Lagoon. He was however believed to have later moved back to join his uncle, Uenya, at Aŋlɔgã and took over his leadership role as the King of the Dogboawo now Aŋlɔawo. Some of Tɔgbui Sri I's brothers settled at various places giving rise to some differences in clan names. The

descendants of Tɔgbui Sri I's brother, Adu Lo, led by his son Adisre, and Ege Amegayibɔ, brother of Sri I, were said to have settled at Dzodze, Asuma settled at ʃenyi, Eti settled at Ave, and Kofi Akpo settled at Mafi. Some of Sri's party later founded Aʃiʃe and Kodzi, where Sri later on rejoined his uncle Uenya at Aŋlɔga. Thus the towns or settlements actually founded by Uenya and his brother Sri, their families and immediate circle of followers came to constitute one kingdom, 'Aŋlɔ' with the capital at Aŋlɔgã. The neighborhood of Aŋlɔ settlements founded by other members of the Dogbo sub-groups, who had been part of Uenya and Sri's party at one time or the other also evolved into states like Klikɔ, Fenyi, Dzodze, Ueta, Some, Blekusu, Afife and Avenɔ.

It was said that after the Keta war in 1790, two descendants of Tɔgbi Uenya, Aʊanyedɔ and Akaga with some other residents of Keta migrated to found Agbozume, which became the capital of the new state of Some. Those who could not however go with Aʊanyedɔ and Akaga were said to have left in small batches later with some fleeing to seek refuge with relatives at Uuga. These migrants could not however return to Keta as they were prevented by the Aŋlɔs with the help of Kobu Koto, the king of Kwafo, Akwamu. Blekusu therefore became the dividing line between Aŋlɔ and Some along the coast. The narration was that during and after the war, Aŋlɔgã provided a court of second instance for Aʃlao and Ueta who readily identified themselves with Aŋlɔ, and together, these states constitute Aŋlɔ-Eʊe. Towns belonging to the Aŋlɔ kingdom thus include: Kedzi, Keta, Tegbi, Woe, Aŋlɔgã, Fiaxɔ, Kodzi, Anyako, Seva, Alakple, Atiavi, Asadame, Tsiame, Aʃlao, Atito, Atiteti, Atɔkɔ, Uuti and Srɔgbui including Ave and Mafi. Mafi people were however believed to have later left the group to join a group, now known as Tɔŋu.

The accounts link the founding of Volo, Dafɔ, Batɔ, Agave, Ave and Tefle with the third group of people from Ɔtsie. This group together with the Mafi now constitutes one state called 'Tɔŋu-Eʊe'. Another Dogbo sub-group or its divisions founded the Eʊe of Be and Togo. That is, apart from the Aŋlɔ state, there are large number of other Eʊe states like Adaklu, Ho, Kpando, Have, Hohoe, Peki, Awudome, Ve, Gbi, Logba, Alavanyo, Kpalime, Kpedze, Wodze, etc., to their north of the Eʊeland; also Volo, ɐɔfɔ, Batɔ, Meʃe, Mafi, Agave, Ave, Tefle, etc. to their central, and Be, Gen, Watsi, etc., in the south of the Republic of Togo and Benin (Atakpa, 1997). The people of Aŋlɔ state

and all these other states described above, therefore, originally belonged to the Dogbo group under Uenya with the same language, Eʋe, and constituted essentially one people, as they entered their new home in what is now Eʋeland. It is essential to note that the original Eʋe, just like its speakers, might have been influenced significantly by the languages of the original inhabitants of the areas that the migrants past. That is, even though we do not know much about the original inhabitants of the areas they passed through during their exodus, it is possible that either the inhabitants fled as the Dogboawo were coming, or became assimilated into their population. For example, in what is now Aŋlɔ territory, the accounts show that there are traces of the former inhabitants at, for instance, Woe, Atsiavi and Avenɔfeme. The Eʋe language therefore has several different dialects. The section bellow discussed the Eʋe language and its dialects.

2.3. The Eʋe language

The Eʋe language or 'Eʋegbe', pronounced èβègbè [è.βè.gbè], also known as 'Gbe' (Capo, 1991), is a community language of Africa whose homeland stretches among four West African countries, namely, the Republics of Ghana, Togo and Benin (Dahomey), and to Badagry in the Federal Republic of Nigeria. According to the UNESCO grouping of languages (1985), the Eʋe language or Gbe language belongs to a member of the Kwa family of Sudanic Languages (Westermann, 1930). The Kwa languages, as indicated by Greenberg (1963a), constitute a sub-family of the Niger-Congo family of the Congo-Kordofanian language family of Africa. The language, Eʋe or Gbe, is known variously in francophone literature as 'Adja', 'Aja' and 'Adja Tado' (Bertho, 1946). Some recent names are 'Fon-Eʋe' or 'Eʋe-Fon' (Dakubu, 1977), Adja-Eʋe, or Eʋe-Adja (de Medeiros, 1984). The two names *Eve* and *Adja* had subsequently been agreed on as the specific dialect groups of the Eʋe language in general, while Tado was referred to as a specific lect spoken in the city of Stádó and its environs (Capo, 1991). A group of linguists however later decided to call it Gbe during a meeting held on the 15th of April 1980, after the main 14th West African Languages Congress held at Kútɔ̀nú (Benin). Nevertheless, many of them, especially linguists in Ghana prefer the name 'Eʋe' as a more suitable name than 'Gbe' which in itself means 'language'.

The Gbe language, henceforth Eʋe, is regarded as a cluster of dialects which include 'Aja' or Adja, 'Fon' and 'Vhe'. The cluster has subsequently been variously divided into different dialects or sections by different writers. Ellis (1890), for instance, puts the cluster into five dialects which are: (i) Mahi, spoken by the people of Mahi; (ii) Dahomi or Effon, spoken in Dahomi and Eʋemi; (iii) Anfueh, spoken in Anfueh, Krepe, Eʋe-awo, etc.; (iv) Awuna, or Aŋlɔ, spoken by the western tribes of the sea-board and (v) Whydah or Weta, spoken by the eastern tribes of the sea-board. Westermann (1930), however, divides the cluster into three main dialects: (i) western dialect whose boundary extends to north and to Atakpame; (ii) central dialect known as Gɛ̃ or Anexɔ, spoken in Lome, Grand Popo and a little beyond; (iii) Dahomey dialect, called Fɔ̃gbe, spoken in Grand Popo to Badagry (see Capo, 1991 for detail). Westermann's classification agrees with Ansre (1961). Ansre believes that the western section of the cluster consists of Inland dialects including Aŋlɔ, the central section consists of Watsi, Gɛ̃ and Adya, and the eastern section includes Gû, Fɔ̃ and Maxi dialects.

Pazzi (1979: 12), another writer, agrees that there are dialects within the Eʋe language as he says: 'From a linguistic point of view, the whole of our cultural area nowadays appears as a fabric of a single piece, but dyed with nine varieties of colours on the same number of well characterised zones'. Pazzi identifies four ancient dialects, e.g. Vhe, Aja, Ayizɔ and Xwla, which he believes come from the same source, Tado; two others, Fɔn and Gun, which emerged later out of Tado group to settle among the indigenes of other sources; and three more dialects Gɛn, Sahwe and Xweɖa, emerging out of half breeding between immigrant groups and the indigenes of Tado. He however agrees that the distinction into the nine divisions is somehow conventional since many dialects, especially Eʋe are split into multiplicity of local variants; nevertheless the nine distinct dialects, he agrees, constitute a continuum, a single fabric with unquestionable mutual intelligibility between the adjacent dialects.

Pazzi's 'Vhe' section corresponds to Wetermann's (1930) western section of the Eʋe dialect, except that Waci is part of it. The Vhe section comprises the natives of Tɔŋu, Be, Aŋlɔ, Anfɔe, Peki, Kpando, Whlin, Fodome, Ho, Vo, Avenɔ, Avedakpa, Dayin, Agu, Waci, Wance, Adamgbe, Kpesi, Mafi, etc. The 'Vhe' section or dialect is the cluster spoken by all the Eʋe groups in Ghana, plus some speakers in Togo and Benin. The term Vhe is pronounced differently by the different dialect speakers; it is

pronounced [əʊə] by Waci and Aŋlɔ groups, as [ɛʊɛ] by Peki group, as [èʊè] by Kpando and also as [èvè] by the Fon and Aja speakers respectively.

Capo (1991), on the other hand, puts the cluster into five dialects: Gɛn, Aja, Fɔn and Phlan-Pherá including the Vhe section based on certain innovations. The Vhe ([əʊə], [ɛʊɛ] or [èʊè]) section or dialect of the cluster which is the focus dialect of the present study, has, according to him innovated the consonants /ʃ/ and /ʊ/ from the labialized *χ^w and $ʁ^w$, while merging the mid-high and mid-low front vowels *e and *ɛ into a single vowel /e/ or /ɛ/ or /ə/ depending on the individual sub-dialect groups, and so, has only one traditional nominal prefix: {e-}, {ɛ-} or {ə-} apart from the prefix /a-/. The phrase [ɛdĩm] *he looked for me* in Peki dialect will, for instance, be pronounced [edĩm] by Kpando speakers, and as [ədĩm] by Aŋlɔ dialect speakers. Other examples are given in Table 1 below.

Table 2.1. The sounds: /ɛ/, /e/, and /ə/ among Peki, Kpando and Aŋlɔ

Peki	Kpando	Aŋlɔ	Meaning
ɛvavam	evavam	əvavam	S/he is coming
ɛḍiku	eḍiku	əḍiku	S/he has slimmed down
ɛfu	efu	əfu	It is white
ɛḍiḍ**ii**	eḍiḍ**ii**	əḍiḍĩm	It is ripening
ɛflĩ**m**	eflĩ**m**	əflĩ**m**	S/he cuts me into pieces

Also, the labial-velar *w and the labialized *H^w were innovated into the velar [ɣ] and [ŋ], and later merged into a single sound [w] while the two aspirated alveolar stops *t^h and *d^h developed into the unaspirated /t/ and /d/ (see Capo, 1991 for details on other dialect groups). It is obvious that there exists a large number of dialectal variations even within the Vhe section of the Eʊe cluster in, for example, pronunciation, vocabularies, tone, etc. yet there are overlapping, but with a significant mutual intelligibility. The Vhe section of the Eʊe in Ghana, henceforth 'Eʊe' has been consequently divided geographically into three sub-dialects: (i) Aŋlɔ-Eʊe, spoken

mainly along the coastal areas of the Volta Region of Ghana, particularly in Aŋlɔga, Keta, Kodzi, Woe, Kedzi, Anyako, Dzita, etc.; (ii) Tɔŋu-Eʋe, spoken in the central part of the Eʋeland in Ghana, e.g. Mafi, Batɔ, Mefe, Agave, Bakpa, Volo, Dɔfɔ, etc.; and (iii) Eʋeme-Eʋe, spoken in the northern part of Eʋeland in Ghana, e.g. Hohoe, Kpando, Peki, Ho, Kpedze, Vakpo, Alavanyo, Logba, Lolobi, Kejebi, Jasika, Wurawura, etc. (Atakpa, 1997; Gavua, 2000). Note that there exist also noticeable variations within these various subdivisions which set them apart. The dialectal variations, as in the case of all languages with dialects, cut across the three levels of language use, more specifically in the phonology, semantics which manifests in the lexemes, and in pitch/tone. In this study, however, only the phonological variations are discussed. The section below discusses the Eʋe vowel phonemes as presented by Stahlke (1971), Capo (1991), Ansre (2000), Nyomi (1976), Berry (1952) and others.

2.3.1. The Eʋe vowel inventory

There are generally 16 vowel sounds all together in the Eʋe language: eight orals [i, e, o, ɛ, ə, a, u, ɔ] and eight nasals [ĩ, ẽ, õ, ɛ̃, ə̃, ã, ũ, ɔ̃], with each of them paired oral/nasal- [i ĩ, e ẽ, o õ, ɛ ɛ̃, ə ə̃, a ã, u ũ, ɔ ɔ̃] (Capo, 1991). Apart from their oral/nasal distinction, the phonetic qualities of each of the pair is the same. However, their phonemic distinctions have not been clearly established since different authors have different views on the actual number of vowel phonemes in the Eʋe language. Most of the authors have described [i], for instance, as high-front, [u] as high-back, [e] and [ɛ] as mid-front, and [o, ɔ] as mid-back. The positions of [a] and [ə] are however controversial as different writers describe them differently. Duthie (1996) and Nyomi (1976) describe [a] and [ə] as low-central and mid-central vowels respectively. Berry (1952), however, placed [a] close to front-low position and [ə] close to mid-back. There are also two lax nasalized close vowels [ḭ̃] and [ṵ̃] (Westermann, 1930; Ansre, 1961; Berry, 1951; Stahlke, 1971a). These vowels, they believe, occur in the Eʋe dialects of Aŋlɔ, Peki and Kpando; they do not occur as underlying segments, but rather as variants of [i] and [u] before the nasal ***m***, when ***m*** is syllabic. Some examples are:

Peki	ɛtˢ**ḭ̃**m	I am fed up with it
	ɛdᶻṵ̃m	S/he insulted me
Kpando	etˢĩm	I am fed up with it

	edᶻŨm	S/he insulted me
Aŋlɔ	ətʃɪ̃m	I am fed up with it
	ədʒŨm	S/he insulted me

Interestingly the qualities of these vowels are described based on auditory impression and on Chomsky and Halle's (1968) binary feature framework. Chomsky and Halle's (1968) binary feature framework states that a vowel will have the feature [+high] when it is made with the tongue body raised above neutral position and [+low] when the tongue body is below neutral position. Using this framework, Capo (1991) indicates that [+high] implies [-low] while [+low] implies [-high], and so using the two features [±high] and [±low], one can distinguish three degrees of vowel height. Hence, though [ɛ] and [ɔ] are classified as having the feature [+low], phonetically, only [a] is a [+low] vowel in Eʋe. Again, he notes that [+front] means [-back] and [+back] means [-front]; so, [±front] and [±back] can be used to differentiate places of articulation, and anything between back and front is central; he thus identified [ə] and [a] as central vowels. As indicated by Capo, [±back] and [±rounded] can be used interchangeably for some vowels since all front vowels are unrounded and the back ones are rounded. Based on this framework, different authors have presented their versions of the vowel inventory as they occur in the various sub-dialects of the Eʋe spoken in Ghana.

According to Capo's (1991) description, none of the sub-dialect groups in Ghana has all the 16 vowels mentioned above. He, for instance, indicates that Aŋlɔ and Avenɔ dialects have all [i, ĩ, e, ɛ̃, ə ə̃, a ã, u ũ, o õ, ɔ ɔ̃], except [ɛ̃] in their vowel inventory; however, Aŋlɔ has [ɛ̃] in addition. The Peki and Kpando dialects of Eʋeme-Eʋe, on the other hand, have [i, ĩ, e, o, ɛ ɛ̃, a ã, u ũ, ɔ ɔ̃] and [i ĩ, e ɛ̃, ɛ ɛ̃, a ã, u ũ, o, ɔ ɔ̃] respectively. Ansre's (2000) vowel inventory is similar to that of Capo (1991), but he believes that [ə] and [ə̃] are allophones used in place of [ɛ] and [ɛ̃] by only the Aŋlɔ people, thus reducing Capo's inventory to 14. His observation nevertheless appears to agree with Capo (1991), who notes that *e and *ɛ have been merged into a single vowel /e/, /ɛ/ or /ə/ in Vhe depending on the sub-dialect group. Ansre notes further that the Eʋeme dialect group, particularly Peki and its neighbouring dialects use [ɔ] in place of [õ], while [ə] and [ə̃] are in free variation with [e] and [ɛ̃] among the Aŋlɔ and Avenɔ. By

this, Ansre (2000) agrees that the pairs [e ẽ] and [ɛ ɛ̃] are all in variations with [ə ə̃] among the Eʋe of southern Ghana.

Stahlke's (1971) description seems to agree with Capo and Ansre, however, he reduces the inventory entirely into seven orals: [i, e, ɛ, a, ɔ, o, u] and seven nasals [ĩ, ũ, ẽ, õ, ɛ̃, ɔ̃, ã]. That is, for him, there is nothing like the central vowel [ə ə̃] in the Ghana Eʋe. He agrees, however, that Kpando dialect uses [e] in place of [ɛ], except in certain environments where [e] and [ɛ] are alternated. He thus considered [e] and [ɛ] as variants of one underlying segment [e].

The binary feature framework proposed by Chomsky and Halle is somehow deficient in that it does not seem to make provisions for all the vowels in the world. It will be difficult, for example, to adequately describe the vowel inventory of a language that has more than three vowel heights. The vowels that fall between high and low positions can be difficult to describe by using the high-low binary description. The differences in the vowels of Tɔŋu, Aŋlɔ and some parts of Eʋeme have, therefore, been highly criticized. Mensah (1977: 6), for instance, questions the presence of the [e] identified by Capo (1991) as belonging to the vowel inventory of southern dialect. He indicates that [e] is not used by the Aŋlɔ and is used only in few cases by Kpando and Peki dialect speakers; but it is part of Capo's (1991) vowel inventory for Aŋlɔ. Capo believes that Aŋlɔ use [e] more often than Tɔŋu, but in the environments where [e] occurs in Aŋlɔ-Eʋe, the corresponding vowel in Tɔŋu-Eʋe is [ɛ]. So Tɔŋu is closer to Eʋeme than Aŋlɔ in terms of the use of [e] and [ɛ] (Gbegble, 2006). I disagree with the existence of [e] as a phoneme in Aŋlɔ dialect. However, it is difficult to tell which of the two, [ə] or [e] is actually used by Aŋlɔ speakers since there is a huge controversy among phonologists regarding the existence of [ə] in Eʋe.

The phonemic status of the Eʋe vowels therefore remains a mirage; it is difficult to draw a solid conclusion on the underlying phonemes, especially about the vowels /e/ and /ə/ in the Eʋe language. I therefore, strongly believe that the formant frequencies of /e/ and [ə], when measured, might give us some clue regarding their presence or otherwise in Eʋe. Although the data is in English, their formant frequencies as used in the English tokens might have some similarities with those of the Eʋe ones. The controversies over the phonemic status of these vowels is not peculiar to Eʋe phonologists alone. There is a great disagreement, also, over the phonemic status of

these vowels /ə/, /e/, /ɜ:/ among Ghanaian English phonologists. In the next few sections, we described briefly the history of the English before and after its introduction onto the British Isles.

2.4. Historical overview of the English language

2.4.1. Before English

The history of the English language as documented by several scholars, particularly by Venerable Bede has shown that the language 'English' is an alien language brought to Britain by three main Germanic tribes: Jutes, Angles and Saxons, together known as 'Anglo-Saxons' in around 5th century. But before this period, it is obvious that human beings were already living in this part of the world, perhaps for thousands of years: '50,000 according to more moderate estimates, 250,000 in the opinion of some' (Baugh & Cable, 2002: 38). For instance, long before the Anglo-Saxons invaded the British Island, part of it was said to have been already occupied by the Celtic tribe from other parts of Europe.

But even before the Celtic, the accounts show that there had been an era of Stone Age, a period best described as Paleolithic (Old Stone) Age and the Neolithic (New Stone) Age. But since not much can be said about the language of these group of people, many linguists even believe that the coming of the Celts to England coincided with the introduction of bronze (Neolithic Age) onto the island. Thus, the first Indo-European language known to be spoken in England, according to history, is the Celtic language; 'Celtic was probably the first Indo-European tongue to be spoken in England' (Bach & Cable, 2002: 39).

Latin was also reported to have been spoken extensively for a period of about four centuries before the coming of English, a period, according to Baugh and Cable (2002), Britain became a province of the Roman Empire. Per the reports, the Romans entered into Britain when Julius Caesar first visited England in 55 AD after conquering Gaul. The activities of the Romans on the Island was, however, said to have actually begun when Emperor Claudius conquered the British Island and succeeded in establishing himself in the central and southeastern regions in AD 43. Although England subsequently became a Roman province, they (Romans) were said to have withdrawn in 410 AD after being resisted by the Celts.

The activities of the Romans on the British Island were evidenced by the huge number of inscriptions in Latin reported to be found on the Island. For example, there are reports of occasional graffiti scratched on a tile or a piece of pottery possibly by the people who made it. Also, Latin is said to have been used by some individuals in cities and small towns, and also by the elites and the upper classes; that is, it was the language of civilization. Interestingly, Latin did not replace the Celtic language in Britain as it did in Gaul, perhaps due to its limited usage and probably because the British Celts continued to speak their own language despite the long occupation of the Romans. The use of Latin was said to have begun to drop in the early fifth century or after 410, a period the Roman legions were officially withdrawn from the island (Algeo, 2010; Baugh & Cable, 2002 for an in-depth discussion on this). This means that before English, Britain was bilingual in Latin and in Celt.

The influence of Latin on Old English was interestingly very limited and was mostly through the Celtic people who were bilinguals in Latin and Celt, and also through Christianity. Note that the Romans did not have any direct contact with the Anglo-Saxons because they (the Anglo-Saxons) came to England at the time the Roman legions had left Britain. Several Latin words, perhaps a little above 600, were said to have been adopted by the Celts, but even the relation between the Celts and the English were such bad that these words were not passed onto the English language; 'not more than a score of words in Old English can be traced with reasonable probability to a Celtic source (Baugh & Cable, 2002: 68). Thus, only few of these words were said to have been adopted by the Anglo-Saxons upon settling in England. Few of these are: *ceaster,* from the Latin word *castra* 'camp', found in several English place-names such as *Chester, Colchester, Dorchester, Manchester, Lancaster, Gloucester, Worcester, etc.*

The greatest influence of Latin on Old English was, however, during the Christianization of Britain by the Romans in 597. Thus, a great majority of words in Old English borrowed from Latin have to do with the church and its services; for example*, altar, angel, anthem, cleric, deacon, disciple, epistle, hymn, pope, priest, synod, temple, etc*. Some general ones that are not related to religion are: *cap, sock, silk, chest, lentil* (OE *lent*), *millet* (OE *mil*), *oyster* (OE *ostre*), *master, verse, meter, elephant, circle, talent, butere* 'butter', *caese* 'cheese', *piper* 'pepper', *disc* 'dish', *cycene*

‘kitchen’, *catte* ‘cattle’, *mil* ‘mile’, *munt* ‘mountain’, and many more being of Romans origin. Note that some of these words are very similar to Modern English (i.e. the spellings did not change) (see also Algeo, 2010: 250).

The British Celtic language, as said earlier, did not make a lot of linguistic impacts on Old English, although the Celtic people were able to dominate Britain, and had also established a very vibrant culture throughout the British Isles. The Celtic language was also believed to have been spoken even during the period of the Roman rule. The reason, among many others, could be because the relation between the Celts and the Anglo-Saxons was that of a submerged culture and perhaps because of the war they were not in the position to make notable contributions to Anglo-Saxon civilization. That is, the Anglo-Saxons did not have much time to adopt the Celtic modes of expression, and the Celtic influence is believed to have been the least of the early influences that have affected the English language. There are therefore only few loan words in Old English, e.g. *binn* ‘basket’, or ‘crib’ *brock* an old word for ‘badger’, *bratt* ‘cloak’, *Avon* ‘river’, *Bray* ‘hill’, *torr* ‘rock’ and some few others which are of Celtic origin. Their impact could also be seen in place and river names like Kent, York, London, Dover, Thames, Derwent, Trent, Severn, Cornwall, etc. (Hoad, 2006; Algeo, 2010).

2.4.2. Old English (OE) or Anglo-Saxon

The Old English is a descendant of Proto-Germanic or Germanic language, which in itself belongs to Indo-European family of languages. This Germanic language group, according to the *ecclesiastical history of the English people* by Venerable Bede cited in Algeo (2010: 214), began as a common language; ‘it was a relatively unified and distinctive in many of its sounds, inflections, accentual system, and word stock’. This group of language, as it is common with all languages, is believed to have split later into different distinct subgroups: East Germanic, North Germanic and West Germanic. The East Germanic branch, according to the account, was spoken by people who migrated back to southeastern Europe, a form which is no longer spoken today except Gothic which exists only in written form. The North Germanic division, according to the account, however, evolved into the modern Scandinavian languages of Swedish, Danish, Norwegian, and Icelandic, while the West Germanic branch, is the ancestor of both Old German and High German (Plattdeutsch), Dutch, Frisian, and of course the

Old English, the ancestor of the present day English (see Baugh & Cable, 2002; Hoad, 2006). Although the speakers of these languages can hardly understand one another, there are several features that prove that they have a common origin. The word 'father' in Modern English, for example, is *vader* and *vater* in modern Dutch and German respectively, but it is *fæder*, in Old English, *fatar* in Old High German, *feder* in Old Frisian, *faðir* in Old Norse, and *atta* in Gothic. Also, in Greek it is *patēr*, in Sanskrit *pitar* and *athir* in Old Irish. It is therefore evident that English was brought to Britain at the time there was no distinct English language. The English language only began as a distinct language when the Anglo-Saxons split off from their Germanic brothers around the fifth century.

The Old English period can best be described as the period between 449 and 1100 AD according to Algeo (2010), 450 to 1150 AD according to Irvine (2006), a period during which the Jutes, Saxons, Angles and the Frisians began to occupy the British Isles and when Old English was said to have actually begun. This period was pre-occupied by a lot of activities (see Algeo, 2010 for more discussion). By Bede's account cited in Algeo (2010: 82), 'in 865 the Vikings army, great and expertly organized led by the unforgettably named Ivar the Boneless and his brother Halfdan, sons of Ragnar Lothbrok (Loð brók 'Shaggy-pants'), landed in East Anglia.' They subsequently attacked Wessex, which was ruled by the first Ethelred (Æðelræd), assisted by his brother Alfred, who was to succeed him in 870. Thus, the Vikings occupied the whole of the eastern part of England after driving and looting the English wealthy monastery. Alfred however, later defeated Guthrum, the Danish king of East Anglia (i.e. the King of the Vikings), in 878 AD. A treaty, as reported, was signed later with the original Britons, therefore establishing the 'Danelaw', which split the country into two, having the Norsemen in the east, and the Anglo-Saxons in the south and west.

The Vikings spoke Old Norse, an early North Germanic language similar to the Anglo-Saxon. The similarity between OE and Old Norse is said to be so subtle that it is difficult to tell whether a word in Modern English is a native or a borrowed word. An example of this is the *sk* sound, which was palatalized to *sh* (written *sc*) in OE, except in *scr* combination, but the *sk* was retained in the Old Norse. That is, while native words such as *ship, shall, fish* have *sh* in Modern English, words borrowed from Old Norse still have their *sk,* e.g. *sky, skin, skill, scrape, scrub, bask, whisk*. Other identical

vocabularies of both languages are: *over, under, man, wife, hear, see, folk, house, thing, winter, summer, will, can, come, mother, think, ride, mine, skull, skin, leg, neck, sister, fellow, husband, wind, bull, score, seat, root, bloom, gap, knife, dirt, kid, sky, egg, cake, skirt, link, gate, bag*, etc. were said to be some of the remnants of Old Norse (Baugh & Cable, 2002: 78).

There have been several developments however in the Anglo-Saxon English that brought a huge change in its entire structure, making it completely different from the present day English. A modern English speaker cannot read and understand an Old English text without difficulty. The Old English or the Anglo-Saxon was said to have been a heavily inflected language; like German and French, it had three genders: male, female and neuter, and could be inflected for up to five cases (nominative, accusative, genitive, dative and instrumental). There were seven classes of 'strong' verbs and three of 'weak' verbs, and their endings changed for number, tense, mood and person. Adjectives were believed to have had up to eleven forms, while the definite article 'the' had three genders and four case forms as singular and plural respectively (for detailed discussion see Baugh & Cable, 2002). Some other key features that make the Old English unique are its spelling and pronunciation.

2.4.2.1. Old English monophthongs

One very important thing that distinguishes Anglo-Saxon English vowels from the present day English vowels is length. The Old English is said to have had both monophthongs and diphthongs just as it is in Modern English, and both type of vowels had short and long versions. The monophthongs were normally represented with the letters: *a, æ, e, i, o, u,* and *y,* both representing either the short or the long vowel sounds. Though the OE long vowels were said to have had the diacritic [´] written above them to avoid confusion; that is, *gód* [go:d] 'good', this was said to be inconsistent. But modern writers normally distinguish the long vowels from the short ones with a macron placed on top of them in spelling, while the short ones are left unmarked. Some examples are *fēdan* 'feed' and *fōda* 'food', where a macron is placed on *e* and on *o* to show their length. But in phonetic transcriptions a colon is used for the same purpose: thus the words *fēdan and fōda* will be transcribed [fe:dan] and [fo:da] respectively (see also Algeo, 2010: 86). The Old English short vowels would be written *a, æ, e, i, o, u,*

and y, while the long ones are written as *ā, ǣ, ē, ī, ō, ū, ȳ.* There was also an additional vowel, *ə*, said to be reduced from the second elements of the diphthongs *ēa* and *ēo* in unstressed syllables (Algeo, 2010). This vowel was said to have disappeared later somewhere in the eleventh century, and the two diphthongs, *ēa* and *ēo*, consequently became monophthongs. Examples of the vowels as they were used in Old English cited in Algeo (2010: 87) are given below:

Short vowels		Long vowels	
a as in wascan	(to wash)	*ā* as in hām	(home)
æ as in fæþm	(embrace)	*ǣ* as in dǣl	(deal)
e as in settan	(set)	*ē* as in fēdan	(feed)
i as in sittan	(sit)	*ī* as in rīdan	(ride)
o as in moðde	(moth)	*ō* as in fōda	(food)
u as in sundor	(sunder)	*ū* as in mūs	(mouse)
y as in fyllan	(fill)	*ȳ* as in mȳs	(mice)

2.4.2.2. The diphthongs

Diphthongs in Old English were made up of the OE short and long vowels and were short and long in quality. Just like the monophthongs, the long diphthongs have a macron on their first elements to indicate their length, while the second elements, the short vowels, remained unmarked. Most of the diphthongs consist of a front vowel followed by a central offglide. Examples of the diphthongs used in Old English are: *eə, æə, ēə, ǣə* (Millward & Hayes, 2012: 155).

2.4.3. Middle English (ME)

The Middle English period can best be described as an era of a transition between Old English and early Modern English. It was said to have begun somewhere between 1100 and 1500. According to history, this period was marked by the coming of the Normans from northern France to Britain in 1150 under William, the Duke of Normandy, who later became William I of England (Algeo, 2010; Hoad, 2006). The term 'Norman' according to Irvine (2006), was derived from the word 'Northman' a group of people who had been granted a territory in northern France in the early tenth century. The

Normans were said to have descended from the Vikings who settled in northern France; hence, they spoke Old Norse, but were said to have given up their Old Norse as early as the eleventh century. Thus, forgetting their Old Norse, they adopted a rural dialect of French, normally called Norman French believed to be completely different from the standard French of Paris which was popularly known at that time as 'Francien'.

The Norman French however developed later into Anglo-Norman, and then became the language of the kings and nobles of England used, for example, in the court, administration and culture; whilst Latin, the language of the ruling class, was used as the written language, especially by the Church and for all official records (Algeo, 2010). At the same time, English was used by the majority of the country's population, that is, the peasantry and the lower classes, continued to use English, although it was heavily stigmatised by the Normans as a low-class, vulgar tongue. The account, however, shows that there was a sign of relief after the Black Death of 1349 and 1350 which killed about a third of the English population and a number of Latin-speaking clergy. After the plague, the English-speaking labouring and merchant classes grew in economic and social importance, and within a short period, the linguistic division between the nobility and the commoners disappeared, therefore reducing the class division.

The English language, consequently became the official language of the courts and parliament, and it was used as the instructional language in schools. The Normans, according to the account, became 'Anglicized' after King John lost the French part of the Normandy to the King of France. English therefore became the lingua franca of England even though French and Latin were still spoken. The influence of the Norman French on English can be seen in several words such as: *prince, duke, count, majesty, mayor, minister, state, accuse, crime, defend, judge, justice, prison, etc.* (for details of this see Baugh & Cable, 2002). That is, in spite of all the shake-up the Normans had given English, French could not emerge as the language of England. Note that during the Middle English period, Latin continued to exert an important influence on the English vocabulary (see Algeo, 2010: 250-1). A lot of the words borrowed from the Old Norse became readily apparent in Middle English (see Algeo, 2010: 253-4), however the major new influence, and ultimately the most important, was French. Some

examples are: *attorney, chancellor, country, court, judge, jury, mayor, noble, and royal, army, captain, lieutenant, beef, mutton, pork, and veal, beef, mutton, pork*, (p254–6).

Middle English period has also witnessed a massive change in grammar, autography, phonology, and to some extent in vocabulary. Although several of the OE vowels were said to have remained unchanged in ME, quite a number of them have seen some changes. According to Algeo (2010: 123), the Old English long vowels: *ē, ī, ō,* and *ū* remained unchanged in ME though differ sometimes in spelling. Thus, the OE *fēt* was ME *fēt*, 'feet'; *rȳdan* in OE became the ME *rīden* or *rȳden* 'to ride'; while *fōda* 'food' and *hūs* 'house' in OE became *fōde* and *hous* in ME.

However, Old English ȳ [ü:] according to Algeo was unrounded to *ī* [i:] in the North and also in East Midland areas. But not until the 14th century it was ȳ [ü:] also in most part of West Midland and in the whole of Southwest, though written ⟨u⟩ or ⟨ui⟩. It was said to have changed again to *ē* [e:] in the Southeast; the OE word *hȳdan* 'to hide' was pronounced in ME in these dialects as *hīden*, *hūden* and *hēden* (p, 123). Similarly, the OE *y* was said to be unrounded to [ɪ] in the Northern and East Midland areas, just like ȳ [ü:] being unrounded to [i:] in the same areas. In the Southeast it was said to have become *e*.

The Old English vowels *æ* and *a* were said to have merged into a single central vowel *a;* hence, the word *glæd* 'glad' in Old English became *glad* 'glad' in Middle English. But words that had short *æ* in Old English were said to have been written with ⟨e⟩, in Southwest Midland and Kentish during Middle English period, e.g. *gled.* The coalesced *a* (i.e. the merged *æ* and *a,* was believed to have been fronted later to *æ* during the same period in most environments. It was however later raised to [ɛː], which was also raised to *ē* [eː] in the sixteenth and seventeenth centuries, for example *hame* [heːm] 'home', *rape* [reːp] 'rope', and *stane* [steːn] 'stone' mostly in Modern Scots, but *ā* remained central in Northern England, as in *hām* 'home,' *rāp* 'rope,' *stān* 'stone' (Wells, 1982). The raising of [ɛː] to [eː] was believed to be due to the fact that during the late Middle English, before the Great Vowel Shift, [eː] was used in some dialects, e.g. in words like 'heath', 'beast', and 'grease' instead of [ɛː]. In late Middle English, 'heath', 'beast', and 'grease' thus had two possible pronunciations [ɛː] and [eː]. The [eː] was subsequently raised to [i]. The ā became [ɔː] and was spelled ⟨o⟩ or ⟨oo⟩ exactly

like the [o:] that remained from Old English, as in fo⟨o⟩)de (Algeo, 2010, Millward & Hayes, 2012).

The reduced vowel [ə], written as ⟨e⟩ was believed to have disappeared in Northern, Midlands and Southern dialects respectively. It later disappeared also in the plural and genitive ending-es. It was said to reappear again and was used only in unstressed syllables (Millward & Hayes, 2012). All these have therefore left an asymmetric system consisting of five short vowels *a, e, i, o, u* and six long vowels *ā, ē, ī, ō, ū, ɔ:,* in the Middle English, that is, the *ā* was later restored (see Algeo, 2010 for discussion on the ME diphthongs).

2.4.4. Modern English

The Modern English era is said to have begun around 1500 century to the present day (Baugh & Cable, 2002). This period is normally divided into Early Modern (1500 to 1800) and Late Modern (1800 to date). It is a very important era in the development of the English language because it is the period that opened the way for English to become a global language. Some writers refer to it as a period of expansion of the English language in geography, in speakers and in the purposes for which English is used (Hoad, 2006). He for instance believes that the English language 'is at more than one point in its history a language which is being carried from one part of the world to another' (p20). The changes that took place during this period was felt more during the colonial era, the period the English language moved outside its native home, England, to other places such as Asia, North America, the United States and Africa. History shows that by the end of the 16th Century, the speakers of English were just around five to seven million, and almost all of them were in the British Isles. However, this number increased drastically by almost 50% with about 80% of them living outside Britain (Kachru, 1988). It has been reported that by the end of the 19th and early 20th Centuries, the reign of the British covered almost one quarter of the earth's surface (Baugh & Cable, 2002), resulting to the different varieties of English we see today.

Presently, we have varieties such as British and American English, which constitute the two major national varieties of English. There are also others like New Zealand English, Australian English, Indian English, the Irish Republic English, Canadian English, and South African English, together known as 'the Inner Circle' of English

(Algeo, 2010: 182). The English in other parts of the Americas, e.g. Trinidad and Tobago, the Falklands, Guyana, Belize, Jamaica, West Indies; in Europe, e.g. Gibraltar, Malta; in Africa, e.g. Madagascar, Cameroon, the Seychelles, Ghana, Kenya, Mauritius, Liberia, Malawi, Nigeria, Gambia, Tanzania, Sierra Leone, Uganda, Zambia and Zimbabwe; in Asia, e.g. Bangladesh, Pakistan, Nepal, Singapore, Malaysia, Hong Kong, Sri Lanka, and in Oceania, e.g. Borneo, Papua New Guinea, Fiji, Philippines, constitute a variety of English called 'Outer Circle' English (Algeo, 2010).

The Anglo-Saxon English of today has seen such a massive change in its linguistic elements that it is very difficult for one to tell who actually owns the English language; is it one's high level of competence, their use of English as a 'first language', 'second language', mother tongue, or as native language? What about a Creole speaker, a language based on English but completely incomprehensible to a native English speaker, or a Pidgin speaker? For Algeo (2010: 202), 'the question one is always tempted to ask is 'What is the English language today?' Is it the speech of London, of Boston, of New York, of Atlanta, of Melbourne, of Montreal, of Calcutta? Is it the English of the metropolitan daily newspaper, of the bureaucratic memo, of the contemporary poet, of religious ritual, of football sportscasts, of political harangues, or of loving whispers?

Recent research has shown that English is used by many people in the world, and has a wider communication than any other language. Although it is not the most widely used native language in the world, having only about 400 million native speakers from the UK and the US (Algeo, 2010), English is believed to be the most popular mother tongue in the world (Kachru, 2000). It has been reported that about two billion people can speak and understand some basic English. About 85% of Swedes, 83% of Danes, 79% of Dutch, 66% of Luxembourg and over 50% of people in countries such as Finland, Slovenia, Austria, Belgium, and Germany are believed can converse in English. English is used either as an 'official language' or spoken as first language in about 57 countries, including Ghana. In these countries, English is either the primary language or a necessary second language in the schools, in the governments, the courts, in business and administration. Countries such as Bahrain, Bangladesh, Brunei, Cyprus, Malaysia, the United Arab Emirates, Israel, Switzerland, the Netherlands, Norway and Germany are believed to use English for business and for geographical mobility. Today,

the English language is believed to be the most widely taught foreign language in schools across the globe, with many of them, e.g. China, Russia, Israel, Germany, Spain, Egypt, and Brazil, teaching it to at least a working level. For Kachru (1988: 111): 'It is a clear fact of history that English is in a position of unprecedented power: where over 650 artificial languages have failed, English has succeeded; where many other natural languages with political and economic power to back them up have failed, English has succeeded'. The English language, as he indicated, has been able to dominate the world because of its manifestation in a range of varieties. For example, English has the ability to acquire new identities, power to assimilate, ability to adapt for 'decolonization' as a language, and above all, its suitability as a flexible medium for literary and other types of creativity across languages and cultures. It will be a delusion, therefore, to have the impression that English in Ghana, for that matter among the Eʋe will be without variations.

2.4.4.1. Early Modern English vowels

The Early Modern English vowel system is also different from those of the Old English and Middle English due to several changes in its phonology. One significant thing that separates Modern English from Old and Middle English worth mentioning here is the shifting of long vowels, collaborated with 'The Great Vowel Shift', an event that brought a radical change in pronunciation during the 15th, 16th and 17th Centuries (Baugh & Cable, 2002; McMahon, 2006). The changes, though took place at different times and at different speeds in different parts of the country, their effects were said to be more noticeable in the south than in the North of England.

The account has shown that all Middle English long vowels have shifted during the Early Modern English period. The Middle English long *ī*, [iː], e.g. in *rīden* [riːden] 'to ride', has been diphthongized to [əi] and later became [aɪ]; *ū*, [uː] however became [əu]. It was said to have changed later to [aʊ] at about the same time as [əi] became [aɪ]. This vowel, according to Algeo (2010), is found in the contemporary Eastern Virginia and Canadian English. In the same way, the long [oː] was raised to [u], while [eː] was raised to [i]. The low mid front [ɛː] and back [ɔː] were also believed to have been raised to [e] and [o] respectively, but [ɔː] was however said to be laxed to [ɒ] in some few words.

The changes that occurred in the early Middle English long vowels as summarised by Algeo (2010) are as follows:

Middle English		Early Modern English		
[eː]	became	[i]		
[iː]	became	[əɪ]	became	[aɪ]
[uː]	became	[əʊ]	became	[aʊ]
[oː]	became	[u]		
[ɔː]	became	[o]		
[ɛː]	became	[e]		
[aː]	became	[æː]		

The Middle English short vowels also underwent very significant developments that are worth discussing. The Middle English short vowel /o/ as in e.g. 'pot', 'cot', 'lot', etc., observed by McMahon (2006), was lowered to /ɒ/ by the end of the seventeenth century, while /ʊ/ was split into /ʊ/ as in 'pull', 'full', 'put', and /ʌ/ as in 'luck', 'cup', 'mug', etc. Middle English short vowels in stressed syllables were, however, relatively stable, except for some few ones like the short [a] and [u] which shifted to [æ] and [ə] respectively. The short retracted [e̱] has not changed, except occasionally before [ŋ], as in 'string' and 'wing' from Middle English *streng* and *wenge*, just like the short [i]. The final schwa [ə] in *er* spellings was also said to become [ər] in General America (GenAm).

2.4.4.2. Late Modern English vowels

It is apparent that the mid central vowel [ɜː], which occurs only in stressed syllables in contemporary English is relatively new in the English language. According to Wells (1982), this vowel exists in Modern English as a result of 'NURSE Merger'; a phonological process where the Middle English vowels /i/, /ɛ/ and /u/ became centred, and then later merged into the single mid-central vowel /ə/ before the pre-consonantal /r/ (Wells, 1982: 137-138). This development as observed by Wells (1982) started in the northern and eastern dialects of English in the 15th century. But it had later spread to London in the 16th century, and to the precursor RP in the 17th century (Wells, 1982).

Its present spellings ⟨ir/yr⟩ and ⟨ur/or⟩, as he claims, came from the Middle English spellings 'er' and 'ear' respectively. The words 'virtue and 'firm' which are believed, had [ɛr] rather than [ir] were, for instance, spelt 'vertue' and 'ferm'. The merged and coalesced /ə/, is however, said to have coalesced with /r/ to yield an r-coloured vocoid, but as it was claimed, subsequently lost its r-colouring in some accents of English. So in contemporary GenAm English, words such as 'heard', 'herd', 'stirred', 'bird', and 'word' have /ɜr/ while RP has /ɜ:/. It is important to note that the changes in these vowels as stated earlier occurred differently in different dialects. Several Northern dialects share the lowering and centralization of the short /u/ and /ʊ/, and also short /i/ and /ɪ/, but do not share the split to /ʊ / and /ʌ/. For instance, Yorkshire varieties have been noted to have /ʊ/ still in e.g. 'put' and 'sun'. Again, many English accents, such as the Scottish and Irish did not undergo the Merger and so 'lack the NURSE vowel as a distinct phonological entity' (Wells, 1982: 138). Even many accents where the merger occurs, are believed, have no distinction between the merged vowel and the sequence of the STRUT plus /r/, thus the pairs of words such as 'furry-hurry' /fɜ:ri - hʌri/ in RP will be pronounced /fɛri- hɛri/ in GenAm.

As reported, several words that had short vowels in the Middle English still have their length in present day English. However, changes in the distribution of words have brought a huge difference in the vowels in different sets of words, such that, the Middle English words that had long vowels, now have different long vowels. Words such as 'kind', 'dye', 'like', etc., although had /i:/ in Middle English, are now found in words like 'green', 'serene', 'queen', while 'kind', 'dye', 'like', etc. now have the diphthong /ai/ which were earlier found in Middle English 'day', 'plain', etc. Similarly, the Middle English vowels /o:/ was found in 'boot', 'food', 'root', and /u:/ in 'loud', 'out', 'down', but these same words 'loud', 'out', 'down' now have the diphthong /au/ (see McMahon, 2006). The process of smoothing still persists in different varieties of English. For instance, some Southern American varieties of English is believed to lack the off-glide in [aɪ]; thus the phrase, 'my wife', is pronounced [ma waf]. The process as summarized in McMahon (2006: 168) is thus:

Middle English		Late Modern English
time	[ti:m]	/taɪm/

green	[gre:n]	/gri:n/
break	[bre:k]	/breɪk/
name	[na:mə]	/neɪm/
day	[dai]	/deɪ/
loud	[lu:d]	/laud/
boot	[bo:t]	/bu:t/
boat	[bɔ:t]	/boʊt/
law	[lau]	/lɔ:/

Thus altogether, there are 24 vowel phonemes; 12 monophthongs, seven short (/ɪ, e, ʌ, ə, ʊ, æ, ɒ/) and five long (/i:, ɔ:, u:, a:, ɜ:/); eight diphthongs: /ɪə, eə, ʊə, eɪ, aɪ, ɔɪ, eʊ, aʊ/ and additional five triphthongs: /eɪə, aɪə, ɔɪə, əʊə, aʊə/ in the present day English.

Obviously, there is no huge difference between modern English monophthongs and those of Eʊe. One therefore expects Eʊe speakers of English to readily speak the RP vowels /ə/ and /e/. But this is not the case. There is a great disagreement, for example, over the phonemic status of these vowels /ə/, /e/ and /ɜ:/ in Ghanaian English (GhE), in the Ewe language and even in the British Standard English. One of the earliest works, 'Ghanaian English' by Sey (1973) reported a non-existence of the RP schwa in Ghanaian English. Sackeyfio (1996) made a similar report but added that GhE lacked the RP vowel /ə/, and so was substituted with [ɛ:]. Also Aŋlɔ-Eʊe, as she observed, did not pronounce the RP /ə/ and /e/, and so substituted [eɪ] for /e/ while [a:] and [ɔ:] were used in place of /ə/. Lomotey (2010) made a similar observation about the lack of /ə/ sound in the speech of 66 participants she investigated from four ethic groups in Ghana, including Eʊe speakers. Although she agreed that the sound /ə/ existed in Eʊe, she was not sure why none of her Ewe participants could not pronounce the schwa vowel.

Koranteng (2006), on the other hand, identified 32 cases of the use of the RP [ə] out of 110 words of the RP /ə/ she examined. Adjaye's (2005) results included /ə/ and /e/ as part of the sounds used by Eʊe speakers of English contrary to Sackeyfio and others. In the Ewe language, scholars are not sure which of the three vowels /e/, /ə/ or /ɛ/, is the underlying segment. The three vowels are thus in free variation, their choice depends purely on which part of the dialect region one comes from. Interestingly, English phoneticians are also divided over the phonemic status of /ə/ and /ɜ:/. One group

believes that the vowel schwa /ə/ is an allophone of /ɜː/ in unstressed syllable; both of them are in a complementary distribution. In English /ə/ occurs only in unstressed syllables, while /ɜː/ occurs only in stressed syllables. The opposers of this view believes that /ə/ cannot be an allophone of /ɜː/ since both of them have different distributions.

For Christopherssen (1956), Africans have the tendency of substituting [a] for final [ə], so, instead of [entə], they will produce [enta]; placing equal stress on both syllables; hence there is no stress alternation. The observations made by Sey (1973), Adjaye (1987) and Bobda (2000) support the fact that Africans, particularly Ghanaians, do not speak the RP schwa vowel [ə]. According to Sey (1973), Fante (an Akan dialect) speakers of English use /ɛ/ in place of /ə/, as he said '…*in some areas, particularly Cape Coast, the RP /ə/ is very often pronounced as /*ɛ/ (p59)'. The practice of substituting the phonological features of one's first language (L1) for the features of a second language (L2) appears to be well investigated. For Yankson (1971: 22), any sounds that a Ghanaian language lacks are non-existent in Ghanaian English.

Many writers therefore argue that the difficulty in producing the English phonemes by the L2 learners is due to differences in the sound systems of the two languages. Others believe that the problem may stem from the differences in the distributions of the sounds of the two languages. But I bear to differ, this is not the case of Eʊe and English since there is a great deal of similarity between the vowel systems of the two languages. In as much as it is possible for L2 speakers to learn to perceive new L2 vowels in a native-like manner, it is also possible for adult learners to establish new non-native phonetic categories (Flege, 1995). This interesting debate made me to choose these vowels as the variables for my current investigation. Because I believe that some of the methodologies used in arriving at these results are deficient. Most of these studies depend on auditory analysis which is mainly impressionistic, and also on dialectological approach, which focuses on a small number of speakers in a community. These results are, therefore subjective, and so lend themselves to various forms of debates. A social stratification of the speakers, coupled with spectrographic analysis of the individual vowels, might produce a more objective result and offer a new perspective into understanding the phonological system of GhE.

Chapter Three: Literature Review

3.1. Introduction

This chapter discussed two major issues that specifically helped us to understand the results and consequently drew our conclusions. The chapter is divided into two sections: empirical and theoretical sections. The first part, the empirical section, involves an evaluation of studies that are related to the topic under investigation. A review of the empirical studies brings to the fore the existing knowledge on the current field of study. It also relates the current study to the larger on-going dialogue in the literature, filling in gaps in the previous studies. It is, therefore, a discussion of the findings and ideas of some other researchers, authors and professionals within variation studies including social network studies and studies in the field of phonetics and phonology. Though a review of related literature is an evaluation of other research works, this review also included a theoretical review, which forms part of section two. The theoretical review outlines the framework of the study, and how it helps us delineate the work, and its importance in understanding the results and drawing conclusions from the analysis.

3.2. The empirical review

3.2.1. Variation studies

Variation can be defined simply as the differences that exist within groups, or across groups. Variation exists in everyday life, including human languages (across and within). A given linguistic variable, for instance, may be realised in different forms, and a single individual speaker may use different linguistic forms on different occasions. Speakers make different choices in pronunciation, vocabulary, grammar, etc. depending on several different factors which we shall discuss later in this chapter.

Many scholars believe that change or variation in sociolinguistic variables, particularly in sounds is not unnatural it exists but is not without effects, it causes confusion, disconnectedness and unintelligibility and can result to a high degree of mutual unintelligibility of phonological items (see also Labov, 2001). The loss of the final ‘s’ in Spanish and Portuguese, for instance, is believed to have resulted in a huge loss of information in these languages. Labov (2001) notes that changes in phonological items remain the driving force behind a very large number of linguistic changes, perhaps the majority. Sound change is believed to be the most basic, systematic and

comprehensive mechanism of linguistic change (Labov, 2006). Studies on variation, particularly on sound change, has been the focus of research in sociolinguistics for the past few decades.

Change occurring in sounds can manifest in different ways: it could be sound shifting, merging or alternation, consonant assimilation, shift of syllabicity, or a reassignment of syllable boundaries along with several segmental changes such as: lenition and fortition, deletion and epenthesis, monophthongisation and diphthongization, development of tone and its intersection with intonation patterns, and many more (see also Labov, 2001). Sound change or phonological variation (which is the focus of this study), therefore, appears to be the necessary recipe for the vast degree of linguistic variation and change.

Several reasons have since been given for the causes of this phenomenon. Sound change, as some believe, may be caused by fashion, '… mere novelty and fashion may be added; for there is in the mind of man a strong love for slight changes in all things' (Labov, 2006: 14). The raising of the DRESS vowel /e/, in Cockney accent, for example, where the tokens 'get' /get/ and 'cemetery' /semetri/ were pronounced as [g**i**t] and [sim**i**tri] according to Wells (1982) and Cruttenden, (2001) were as a result of a mere fashion.

Some other explanations given ranged from less valuable to more valuable. For instance, there are claims that languages in cold countries tend to have fewer open vowels than those in warm countries because people in cold countries fear that opening their mouth wide when talking will allow cold air into their vocal cavities. Everett's (2013) study has shown that altitude (i.e. low pressure) correlates very well with ejectives, that is, low pressure allows for easier use of ejective consonants, and also the high level of tone languages in tropical countries have been liked with high temperature. These findings, although appear materialistic in spirit, they lack strong empirical backing. The claim that tropical countries have tone languages because of the high level of temperature is an over-generalisation because there are a huge number of tone languages in non-tropical countries as well. Other factors leading to sound change discussed in this chapter include: tempo, discontinuity in communication, phonological factors, physiological factors, imitation, physical factors, social factors and style.

3.2.1. Tempo

The term 'Tempo' is a multiple concept used to denote the rate of several different processes in speech production (Wood, 1973). Various terms such as *speech rate*, *rate of speech production*, *speed of talking*, *talking rate*, *speaking tempo, tempo, etc.* have been used to denote the tempo of speaking (Trouvain, 2001). But tempo can be defined either as 'articulation rate' or as 'speaking rate'. While speaking rate is a measure of the entire cognitive and articulatory activity involved in the production of an utterance, which includes pauses, 'articulation rate' is the amount of speech produced in the time actually taken to articulate it which excludes pauses (Wood, 1973). That is, articulation rate as a net rate refers to phases of articulation *excluding pauses*. *Speaking rate* as a gross rate refers to the entire speaking phase *including pauses*. In tempo, 'speed' is normally used not to refer to *velocity,* but to *frequency of repetition* measured as the number of units (e.g. words, morphemes, syllables, phonemes, gestures, etc.) in a period of time.

Wood examined the tempo of speakers of West Greenlandic Institute by asking the speakers to read a page from a novel in a casual speech style. He noticed that a speaker uttered 333 syllables within 74 seconds in 41 phrases as his gross talking time, and his average net articulation rate at 333 syllables in 50 seconds. Jones (1967) puts the average conversational rate of native English speakers at 300 syllables per minute and recommended this as a convenient target for foreign learners. But Gimson (1962) argues that though an absolute duration of sounds or syllables will depend on the speed of an utterance, and the average rate of delivery might range between 6 to 20 sounds per second, lower and higher speeds are frequently used without loss of intelligibility. However 'lower' and 'higher' as suggested by Gimson are relative terms since 'tempo is variable' Abercrombie (1967: 46), and everyone who starts learning a foreign language has the impression that its speakers have an exceptionally rapid tempo. It can vary according to sex, age, language, etc. In GenAm English vowel durations of women were found to be longer than those of men (Simpson, 2001). There were however no significant differences found between men and women with both syllable rate, although some differences were noted in terms of utterance length (Malécot et al., 1972).

Tempo or speech rate is regarded by many linguists as a source of interference that can distort the flow of speech (Lindblom, 1963). Sound variation is attributed to an

increase in speed of speech. Tempo is thus considered a distinctive factor in sound change which can vary independently of least effort (Labov, 2001), and can be unconscious behaviour, especially among native speakers of a language. Some linguists however associate rapid speech to intelligence and competence in speech, arguing that native speakers generally speak faster than non-native speakers of a language due to their competency in the language. Speaking rapidly, nevertheless, has several effects on speech, for example, it results to cliticisation, syncope (loss or omission of one or more sounds from the interior of a word), degemination, consonant cluster simplification and assimilation, etc. (see Dressler & Grosu, 1972; Gay, 1977). In Akan language, for example, the phrase 'Abofra yi' *this child* will be shortened to 'Afra yi' in a very rapid speech, reducing a four-syllable phrase to three 'A+fra+ yi' with the omission of the syllable 'bo'. The effect of rapid speech in Eʊe mostly results in the reduction of the prefixes 'e' and 'a', where the word e.g. 'atadi' becomes 'tadi' with the omission of the prefix 'a'.

Cruttenden (2001) observes the deletion of the weak unstressed vowel /ə/ in unaccented syllables in English, thus resulting to the shortening of some syllables, for example, the word 'police' /pʰəˈliːs/ becomes [pʰˈl̩iːs], and 'believe'/bəˈliːv/ becomes [bˈl̩iːv], while dictionary/dɪˈkʃnəri/ becomes [dɪˈkʃnri]. The schwa /ə/ is deleted in the unstressed syllables of 'po' /pʰə/, 'be' /bə/ and 'na' /nə/. Labov (2001) also reported the loss of the final /t/ of 'can't', the contracted form of 'cannot' in American English making 'can't and 'can' homophonous.

The deletion of the plosives, /t, k, d/, when occurred as the middle one of three consonants either at syllable boundary or word boundary has also been reported by Cruttenden (2000) and Roach (2000) as a common phenomenon in rapid speech. For instance, /k/ and /t/ in words such as *asks* /æs**k**s/, *Christmas* /krɪs**t**mæs/ and *scripts* /skrɪp**t**s/ are constantly omitted, thus 'ask' /æs**k**s/ is most often pronounced [æsøs], 'Christmas' /krɪs**t**mæs/ as /krɪsømæs/ and *scripts* /skrɪp**t**s/ as [skrɪpøs] and so on. The assimilation of the alveolar sounds /t, d, n/, in rapid speech in English has also been reported to have some consequences on sound change. For example, the alveolar /t/ in rapid speech readily assimilates to the place of articulation of the bilabials /p, b/ and the velars /k, g/ when it precedes them. Thus in phrases such as *that pan* /ðæt pæn/ and *that bull* /ðæt bʊl/, the final /t/ of 'that' /ðæt/ normally assimilates to the place of articulation

of /p, b/ of ‘pan’ /pæn/ and ‘bull’ /bʊl/ respectively, changing the phrases *that pan* /ðæt pæn/ to [ðæ**p** **p**æn] and *that bull* /ðæt bʊl/ to [ðæ**p** **b**ʊl] respectively (see Cruttenden, 2001; Roach, 2000 for more on assimilation and deletion).

It is also not uncommon to have the alveolar stops /t/ and /d/ coalescing into single sounds /tʃ/ and /dʒ/ when followed by the palatal approximant /j/ in a very rapid speech. So, in the phrase *what you want* /wɒt jə wɒnt/, the /t/ plus /j/ coalesce readily into [tʃ] changing the phrase /wɒt jə wɒnt/ to [wɒ**tʃ**ə wɒnt]. Speech tempo thus appears to be a universal phenomenon and can vary significantly. Although the focus of this study is not on speech tempo, it is clear that tempo can play a significant role in understanding and in explaining the current data.

3.2.1.2. Discontinuity in communication

To quote Bloomfield (1933: 476), ‘The inhabitants of a settlement, a village, or a town talk much more to each other than to the person who lives elsewhere’. Meaning that people in the same community form a kind of social group which creates opportunities for them to communicate with one another on daily basis. Speakers within this network may try to maintain certain speech norms, restricting any force from outside the group (Milroy, 1985). Any move outside this network can create a break in communication that could result to variation in the speech of the individuals. The breakaways may form new networks that may influence their speech differently from their former group. Thus, an innovative speech form that is spreading within a particular community is bound to be caused by a discontinuity or a weakness in the network of communication, and this weakness mostly occurs at, for example, boundaries of the network, between towns, villages and settlements (Bloomfield, 1933: 476). Discontinuity in network of communication can lead to a drift in neigbouring dialects. The drift may occur because the new network members may discover new things that may not be known to members of the other network. For instance, when a group of speakers from one community moves to a different community whose language is different from theirs, they are likely to shift from their language to the new language though not always. Or when a migrant minority group moves to a predominately monolingual society dominated by one majority group language in all the major institutional domains- school, TV, radio, newspaper, government administration, courts, work; language shift will be

unavoidable unless that community takes active steps to prevent it. The minority migrant group might learn the native language of the new country and passes it down to children in place of the previous country's language.

A study made by Milroy and Milroy (1978) reveals how community participation reinforces vernacular usage. Their work was based on the 'Social Network Theory', which emphasises the links between social network members; the nature and quality of how network links reinforce greater or lesser degree of integration into social groups, and how it influences a speaker's degree of resistance to linguistic innovations (L. Milroy, 1987, 2002; J. Milroy, 1992). In a similar study, Milroy and Milroy (1978, 1985) observe that within community subsections, the choice of a particular linguistic variant is associated with personal network structure.

In 1980, L. Milroy explored the relationship between local engagement and the use of vernacular speech by using the variable working-class: Ballymacarrett, Hammer and Clonard in Belfast. She analysed eight phonological variables that were indexed as Belfast urban speech in relation to the network structure of the individual speakers. From this study, she noticed that the extent at which individuals engaged or integrated into the neighbourhood network influenced their degree of vernacular use. That is, the more people are closely related to each other, the more their speech sound the same or converge. The raising of the DRESS vowel /e/, as she noted, was associated with higher class outer city women, but the low realisation was as a social network marker for inner-city males with a high level of community integration.

Similarly, the backing of the TRAP vowel, a phenomenon highly stigmatised was associated with inner-city male casual speech styles, while the backed variants were chosen by females with a higher degree of community integration, that is, 'as a marker of social network allegiance' (Milroy & Milroy, 1985: 359). Milroy concludes that '…a close-knit network has an intrinsic capacity to function as a norm-enforcement mechanism, to the extent that it operates in opposition to larger scale institutional standardizing pressures' (p359).

Several other statistical analyses have proven that the strongest dialect speakers are mainly those whose neighbourhood network ties are tight. Labov's (2001) study on the interactions between network and gender in both Belfast and Philadelphia confirms that network structure affects language patterns of men and women in both communities

differently. She believes that the effect of network ties on speech occurs because variation in speech most often happens through a face-to-face interaction in which speakers typically accommodate to one another. The notion is that accommodation involves selecting linguistic alternatives to establish solidarity with or to distance oneself from one's interlocutor (Giles & Coupland, 1991). This means that in speech, speakers purposely select linguistic features which mark or unmark a common ground with the listener.

Network structure has also been explored by Dubois and Horvath (1998) in Louisiana Cajun community. Their study highlights the interacting effect gender, age and social network have on the use of /θ/ and /ð/ among speakers from Cajun community of St Landry Parish, Louisiana. Their study reveals that even though men generally used [t] and [d] as alternative variants of /θ/ and /ð/ more than their female counterparts, the difference clearly relates to age and personal network type of the speakers. For instance, speakers from middle-age closed network group used [d] less than younger and older age speakers with strong network ties. Younger age speakers with weak network ties also used it more than the older age speakers. This implies that network plays a very significant role in sustaining group individuality in the Cajun community. The speakers from close network groups were reported to have always lived and worked in the local town while those with open network type contracted less localized ties. The communal leaving nature of the Eʊe puts them into a closely knit network structure. However, there are those whose network ties that are more open and so contract less localized ties. This behaviour, I believe, can act as a catalyst for variation in the use of the three vowel phonemes among the two dialect groups. It is therefore important to study the linguistic behaviour of those with close network ties vis-à-vis those with loose ties.

3.2.1.3. Phonological factors

According to Martinet (1955: 333), 'phonemes shift their target positions and their fields of dispersion in order to preserve their margin of security.' For martinet, phonological variation is governed by the need to maximize the distinctiveness of phonemes. The instability of the phonetic system, Martinet observes, is due to the presence of two pressures: psychological, and a preference for symmetrical and

asymmetrical constriction of the organs of articulation. He claims that there has always been the tendency to maintain a balance in the height of front and back vowels, and a tendency to have a fewer distinction in the back because there is a small physiological space to differentiate back vowels. Moulton (1962) asserts that the position of the allophones of /a:/ in Northern Switzerland is highly determined by the configuration of other low and mid long vowels in the front and back. This is consistent with Handricourt and Juilland (1949) who believes that fronting of the nucleus /u/ and /o/ in many dialects of English is to reduce the number of back vowels from four to three. There is also a fronting of the long back vowels in American English dialects prior to the merger of long vowels. Labov (2001) explains that the chain shift of vowels could be seen as a conformity to Martinet's principles of maximising margins of security in a way that maximised the efficiency of communications.

There has been a lot of scholarly works that explain Martinet's concept of phonemic maximization. It is a common knowledge that in phonetics, there is no one-to-one correspondence between a sound and its pronunciation, a phoneme is actually described by the segments that surround it. That is, how a speaker articulates a given phoneme will depend on what precedes or follows that phoneme. The two syllables /bi/ and /ba/, for example, though audibly share one phoneme /b/, the acoustic signal that corresponds to /b/ in both cases differs significantly (see Liberman, et al., 1967: 435, fig. 1). While the syllable /bi/ has an F2 that begins at a relatively higher frequency, /ba/ has an F2 that begins at a lower frequency. Hence, being followed by the high vowel /i/ instead of the low vowel /a/ influences the way /b/ is realised. Two different audible phonemes may also share the same acoustic features depending on contexts. The 'pu ka pu' experiment reveals that the acoustic signal that corresponds to /p/ is almost similar to that of /k/ in the contexts /pi/ and /ka/ (Cooper et al., 1952 for his pi ka pu experiment). So, due to coarticulation, signals lack clear *segmentations* of categorically perceived phonemes, which have been likened to beads on a string (Bloomfield, 1933).

Ladefoged (2006) examined the effects of sound environment on the articulation and production of plosives. In this experiment, he observed that the shape of the formant transitions during the stop articulation varied according to the preceding and following vowels. The stop must start at the formant frequencies of the preceding vowel or end at the formant frequencies of the following vowel. That is, during the articulation of a

vowel [æ], for example, there will be formants that correspond to the particular shape of the vocal tract, these formants will be present as the lips close for the syllable such as [pʰæ] and will have frequencies that correspond to the shape of the vocal tract as the lips come apart. So before the closure of the plosive /p/ is released, the shape of the vocal tract is already formed for the vowel and so when the closure is released the formants will move accordingly.

The acoustic features of three English stops: bilabial, alveolar and velar produced by an American English speaker examined by Ladefoged (2006) confirm that the three stops are differentiated by offset and onset of the second and third formants (F2 & F3) of vowels. When the words such as *bi* or *ba* are said, the tongue will be in the position for the vowel even as the lips are closed. So, the formant frequencies at the moment of release of the plosive will be determined by the shape of the vocal tract as a whole, and so will vary according to the vowel. Thus, in all the three places of articulation examined by Ladefoged, F1 rises from a low position as a result of the following vowels but moves from a high position when the stops are preceded by vowels. Bladon and Al-Bamerni (1976) reported a similar coarticulatory effect of the liquids /l/ on F2 and F3 frequencies of adjacent vowels. This was reiterated in Tunley's (1995), where she compared the F2 and F3 frequencies of vowels in /rV/ syllables with those of /lV/ and /hV/. She noticed a significant lowering effects of /l/ and /r/ on F2 of adjacent vowels. She, for instance, realised that both F2 and F3 were highly significantly lower in vowels after /r/ than /h/, and that /l/ only has a significant effect on F2 frequency.

A single phoneme in a language can, therefore, be realised differently in different environments, all English vowels, although orals, become nasals before the nasals /m, n, ŋ/. The vowel /ɔ:/ in 'fought' [fɔ:t] will be realised differently when before /m/ in 'form' /fɔ:m/=[fɔ̃:m], while /ʌ/ in 'love' [lʌv] is different from the one in 'sun' [sʌ̃n]. The nasalisation of /ɔ/ before /m/ is thus basically a phonological process; the articulators responsible for the articulation of the bilabial nasal /m/ in the word 'form' will be in anticipation for the nasal /m/ as the vowel /ɔ/ is being made. Hence, by the time /ɔ/ is half-way through its articulation, the velum is already down in anticipation of the articulation of /m/, allowing air through both the oral and nasal cavities simultaneously, thereby lending some nasal resonance to the oral vowel /ɔ/~[ɔ̃].

The length of a vowel also depends on whether it precedes a voiced or voiceless consonant, occurs in a stressed or unstressed syllable, or whether it occurs in an open or closed syllable. The vowel /ɒ/ in the syllable 'dog' /dɒg/ when measured will be longer than the one in 'dot' /dɒt/. Reetz and Jongman (2009) measured the length of the vowel /aɪ/ in the unstressed syllable 'sight' of the word *insight* [ˈɪnˌsaɪt], and in the stressed syllable 'cite' of *incite* [ˌɪnˈsaɪt]. They noticed that /aɪ/ with a primary stress was longer than the one without a primary stress. Vowels in open syllables also tend to be longer than those in enclosed syllables. The vowel /i/ will be longer in the open syllable of *bee* than the one in the closed syllable in *beat.* The vowels in the two syllables are better represented as [iː] and [ɪ] respectively (Reetzs & Jongman, 2009). The difference between the two RP vowels /ə/ and /ɜː/, is simply that of a difference in stress (i.e. they differ in duration, pitch and amplitude); whereas /ɜː/ occurs in stressed environment /ə/ does not. These findings are very significant in that any possible variations between /ə/ and /ɜː / in the current sample may be practically a phonological factor.

3.2.1.4. Imitation

Linguistic variation, to a large extent, is believed to be caused by imitation. As observed by Bloomfield (1933), speakers constantly adapt their speech habit to that of their interlocutors; they either give up forms they have been using and adopt new ones, or change the frequency of the forms they have without entirely abandoning old ones while accepting new ones. 'The acquisition of foreign words, for example, by fashion into another culture, their assimilation by custom, the contagion of accent, and the tyranny of usage in itself are all signs of imitation' (Labov, 2001: 312). In the view of Tarde (1873), language in itself is a phenomenon of imitation that is propagated from high to low (superior to inferior), whether it is without or within a nation. There is, for instance, transfer of features from speakers with higher socioeconomic status to those at the lower side. Linguistic variables are constantly under pressure by the society; a feature is considered either stigmatised or prestigious because of the social meaning of such a variable (s) to the society.

The direction of the imitation has however been debated among linguists; while some believe that sound imitation is initiated by people below the socioeconomic rank,

others think otherwise. For Labov (1978), a change can be initiated from above or from below. In a generational change, for instance, the upper classes have been implicated as the motivators of prestigious change from above while lower classes lead unnoticed change from below (Labov, 1990). In all cases, however, the leading social groups are followed by the others as the linguistic change diffuses through the social hierarchy.

According to Labov (1966), pressure from above is the result of overt social pressures consistent with the social hierarchy, expressed openly. These are seen from the attitudes of school teachers, and in the conscious reactions of some middle class speakers. Change from below is, however, expressed as a gradual shift in the behaviour of successive generations, which is below the level of conscious awareness of any speakers. This kind of shift begins with a particular group, usually low status group in the social structure, and is gradually internalised or accepted by other groups unconsciously (Labov, 1966). It is, therefore, not surprising to observe a speech pattern stigmatised by dominant social classes being maintained over long period of time, 'even in the face of an opposing set of values that do not readily emerge in formal situation' (Labov, 1972b: 313). A stigmatised feature used over a long period of time by dominant social groups can subsequently become the established norm. An example of this is the glottalisation of the final stop /t/ which is currently found in the speech of royals (Wells, 1962).

Giles' (1973) speech accommodation theory explains further the concept of speech imitation and change. This theory states that in speech, speakers either converge; shift their speech pattern to resemble that of their interlocutors, or diverge; shift away from the speech of other speakers to accentuate the linguistic differences between them and other interlocutors (Giles, 1973). Speech convergence occurs mostly among speakers with similar attitudes, beliefs or personalities. It is thus common to see people belonging to the same social group, e.g. age, gender, class, etc. speaking the same way. But this is not always the case because many speakers do this for a reason, for example, for favour or for appraisal, or as a politeness strategy, or to show solidarity (Giles, 1973). It is common to see a business man with high social class converging to the speech pattern of his working-class client either for price reduction or for a future transaction. In the same way, a parent may change their speech pattern to sound like that of their children. A similar phenomenon has been reported by Trudgill (1986) in Norwich,

where he observed that there were several variations in his own pronunciation of the glottal stop [ʔ] which collocated with the same amount of glottal stop used by his interviewees. Thus convergence in speech sometimes results to loss of group identity or personal integrity.

It is important to note, however that in speech speakers do not only accommodate by converging, they also sometimes divergence. This happens when members of a group want to keep their group identity, or identify themselves with another group. Speech divergence is also a powerful tool employed when a speaker wishes to distance themselves from other speakers, especially when he or she sees the other speakers as undesirable people. That is, speech divergence is either used to signal group membership, or to identify oneself with a particular social or cultural group (Giles, 1973). Labov's (1963) Martha's Vineyard is a typical example of speech divergence. In this experiment, Labov discovered that the Islanders moved away from the standard New England pronunciation, the speech of the newcomers, towards a pronunciation typical of the conservative Vineyard speakers. He stated that some of the fishermen on the island exaggerated their usage so as to identify themselves as an independent social group with superior status to the despised summer visitors. When a business man with a high social status converges to the speech pattern of his working-class client, he is in effect diverging from the speech of his upper class group. Speech divergence happens even among minority language or dialect groups. For example, Tongu dialect speakers of Eʋe in Ghana are most often heard speaking Aŋlɔ dialect when they meet an Aŋlɔ dialect speaker. In this case they are converging to the Aŋlɔ dialect, and in effect diverging from their Tongu dialect. The implication of this is that speakers do not rigidly restrict themselves to group norms, they make linguistic choices based on several factors such as their impression about the other interlocutors, or make choices to project a particular personae. It is, therefore, clear that anyone can lead sound imitation, whether from the upper side on the socioeconomic scale or from the lower side.

3.2.1.5. Social Factors

King (1975) has taken the debate on the causes of linguistic variation to another level. King's argument is in favour of a multivariate approach that takes into account the

social factors of the speakers. He argues that linguistics is a social science, so language is a social institution; hence, any change in social variables will result to a change in linguistic variables. This means that a change in the social structures of any speech community will significantly affect their speech pattern. 'The only variable element that we can resort to in accounting for linguistic change, according to Meillet (1926: 17-18) is, therefore, a social change, of which linguistic variations are only consequences, sometimes immediate and direct, more often mediated and indirect'.

There is therefore every reason to find out which social structure corresponds to a given linguistic structure, and how changes in the social structure are translated into changes in the linguistic structure. For Labov (2001), social differentiation and alignment of social groups within a single community, can result to differences in linguistic diversity among persons and individuals. For example, individuals in a community are divided into various sections or sub-groups: age, gender, class, ethnicity, etc. such that persons within a sub-group speak much more to each other than to persons outside their sub-group. Any differences in speech within a speech community are local due to this geographical and or social separation. Labov and Harris (1986), and Bailey (1993) identify divergence in the dialects spoken in a highly segregated racial groups in the North American cities as a result of social and geographical separations. The effects of class, gender, age and style on language use are discussed below.

3.2.1.5.1. Social class

Social class is one of the social variables by which speech communities are stratified. It appears to be one of the central concepts in sociolinguistic research, a variable that is extensively studied in sociolinguistic studies. For example, stratifying societies into social classes has given us huge insights into the nature of linguistic variation and change. In every society, individuals are placed into a social hierarchy based on their relation to the production and acquisition of goods and services (Labov, 1966; Michael, 1962). In variation studies, the commonest class indicators/indices normally includes a combination of any of education, occupation, wealth, income, family, intimate friends, clubs and fraternities, manners, speech and general outward behaviour, or just one of these indices (Warner, 1960).

Chambers (1995), for example, derived his class-indices, occupation, from Canadian evaluations, which have lawyers and biological scientists at the top index score while janitors and cleaners were near the bottom 28.22. Labov (1966) in his New York City study used three indicators: education, occupation and income, to distinguish ten different classes ranging from low-paid labourers with minimal education through to well-educated professionals and business people. Labov's occupational rank was determined by the following four categories (Michael, 1962: 213):

(i) Professionals, managers, and officials (salaried and self-employed;
(ii) Clerks and salesmen;
(iii) Craftsmen and foremen;
(iv) Self-employed white and blue collar workers-including small shoppers;
(v) Operatives, service workers, labourers, and permanently employed persons.

His Education rank includes:

(i) Complete some college or more;
(ii) Finished high school;
(iii) Finished some high school;
(iv) Finished grade school or less.

Labov grouped these into four strata: lower-class, working-class, lower middle-class and upper-middle class. Trudgill (1974), in his stratification of the '-ing' in words such as 'sweeping, going', 'singing', etc. in Norwich, however, used a more complex index constructed from occupation, income, education, housing type, locality and father's occupation and gender. The speakers' position on the scales was used to construct five social classes: lower-working, middle-working, upper-working, lower-middle and middle-middle class (see Labov, 1966).

Following Labov (1966), Haeri (1997) constructed a composite index in her study of gender and class variation, and change in the diglossic setting of Cairo, Arabic, using a weighted index of social factors which was then translated into a small set of social classes. She used four indicators, parent's occupation, speaker's education, neighbourhood and occupation, arranged in order of importance. She weighted parents' occupation as 0.5; speaker's education, whether the speaker attended a private language school, a private Arabic school, or a public school, with a weight of 0.25; the speaker's

neighbourhood, with a weight of 0.1. Using this indices, Haeri was able to put the speakers into four social classes ranging from lower-middle class to upper class: Lower Middle class, Middle Middle-class, Upper Middle class, and Upper Class.

Pederson's (1965) classification was, however, a more expanded one intended to have a more precise representation of the diversity in the population. He categorised his speakers into 10 and 11 class types based on both education and socioeconomic status of the speakers, using a speech sample from 136 participants across these categories. Contrarily, some variationists use occupation or education alone as an indicator of class. For example, Macaulay (1977) had his classification by employing the British Registrar General's rankings in Glasgow as occupation index. Like Macaulay (1977), Lennig (1978) also used occupation alone as a measure of social class in his study of variation and change in the vowel system of French. He also divided his sample into 3 categories:

(i) Working Class: manual workers who are not self-employed;

(ii) Lower-Middle Class: office employees, secretaries, service personnel, self-employed manual workers, artisans;

(iii) Upper Middle Class: cooperation managers, professionals and students in academic high schools.

Research in Arabic-speaking and other Middle-East countries typically uses education alone as class indicator because access to elite language codes is directly dependent upon Education level (Abdel-Jawad, 1987). A single factor or a combination of factors could, therefore, be used to construct speaker's social index. The present study uses education alone as the class index of the speakers similar to Abdel-Jawed (1987).

Classifying individuals according to class has so far provided us with a regular pattern of social stratification of variables where the use of non-standard, geographically and ethnically distinct variants correlates inversely with the social status of the speakers. Labov's 1966 stratification of the New York City English into different social classes, age, ethnicity and gender, is a confirmation of how nonstandard speech correlates inversely with social structures in a society. Labov discovered a higher incidence usage of the rhotic /r/ by speakers from lower-middle class (Macy's), in a more careful speech than speakers from both working class and upper-middle class in both styles. He believes that Macy's from lower-middle class were most likely to be

aware of the prestige forms; hence, accommodating to upper-middle class speech of their clients.

Trudgill's (1974) examination of the effects of gender on the dialect of different social classes in Norwich through the use the variable '-ing', a choice between the standard variant [ŋ] and non-standard variant [n] gives us another dimension of social stratification. In this study, Trudgill reported that women, regardless of their social characteristics used more of the standard form than their male counterparts. But interestingly, while women from middle-class group used the standard form more in formal conversation, middle-middle class women never used the non-standard variant at all, whereas lower-working class men used it almost all of the times.

Holmquist's (1985) study of Ucieda, a peasant village in the Spanish Pyrenees, also reveals a highly nuanced pattern of variation corresponding to two stages in a move towards the mainstream economy. He observes that the local dialect of Ucieda, which had post-tonic /u/, had subsequently been lowered due to accommodation to Castilian form /o/ as a result of rural-urban drift. This lowering happened as the youth from the traditional but poorest farming community moved to the industrial sector in the nearby town. Rickford (1986) questioned the universal applicability of the consensual model of class that has dominated variation studies. He made this comment during his investigation into class differentiation on a sugar plantation in Guyana. In this study, he noted a sharp division in the linguistic behaviours between the Estate Class (those who worked the sugar and lived on the plantation) and the Non-Estate Class (those who worked in the offices and lived off the plantation). The social significance attached to class in every society makes class stratification important in sociolinguistic study such as the present one. It is my hope that by stratifying the Eʊe speakers of English into different social groups, we will be able to establish the phonemic status of the three RP vowels.

3.2.1.5.2. Gender variation

Differences in the speech patterns of males and females in speech communities have caught the attention of sociolinguists in the past few decades. But the more interesting one has been how to draw distinctions between 'gender' and 'sex'. For example, while some authors use the two terms interchangeably, others think that the two constitute

two different concepts. The term ‘gender’, for instance, has been used to refer to the roles that societies assign to men and women to perform; it is socially and culturally constructed, and not biologically determined. ‘Sex’, on the other hand, marks the distinction between men and women as a result of their biological, physical and genetic differences (Epstein, 1988; WHO, 1997). Gender prescribes a set of qualities and behaviours that societies expect from a female or male (see Cheshire, 2004). Gender roles are, therefore, learned and vary within and among cultures and can be affected by factors such as education, economic, political and cultural forces. Sex is, therefore, fixed and based on nature while gender is fluid and based on culture.

Since both gender and sex appear to be natural social strata in all societies, they can be successfully relied on to evaluate language patterns. That is, as societies assign roles to males and females differently, we can examine these roles to determine how they affect language use by males and females across different societies. Among the Eʊe, for instance, women are not expected to use certain linguistic features, some words are reserved for men and are not to be used by women. Even the Bible forbids women to talk in public when both men and women are together. This means that though linguistic variables are inherently meaningless, they can derive meaning and social significance if they are associated with a particular social or cultural group. If a particular variant is used more frequently or more often by for example, women, it may become associated with the expression ‘femininity’ and be used to construct ‘a stereotypically female identity in discourse contexts where this aspect of the speaker’s identity is salient’ (Holmes, 1997: 216).

The search for biological and gender role relationship with language use has contributed significantly to our understanding of linguistic variation; which varies from one society to the other. It is common to find sex-preferential variation, where males in a community use one variety of a sociolinguistic variable more frequently than females. One of the most consistent results of sociolinguistic research in the past decades has been the use of non-standard speech by men, while women having preference for the standard form (Labov, 1966; Trudgill, 1974). In the Western world, for example, several researches have shown that women in all cases used the velar nasal [ŋ], the standard pronunciation of the morpheme ‘ing’ while men from the same social group used the nonstandard variant /n/. An experiment by Trudgill (1974) on the use of the ‘-

ing' morpheme among women of different social classes in different speaking styles in Norwich confirms this. In this study, Trudgill found that in all the classes, women used more of the standard variant [ŋ], than men who used more of the nonstandard variant [n] in all cases.

The debate on 'standardisation' and 'femininity' appears to be more complex than one can imagine. For Trudgill (1983), the association of women with standard speech is the single most consistent finding to have emerged from social dialect studies over the past twenty years. He also noticed that women tend to hypercorrect in their speech. The issue of hyper-correction has been reported by Labov (1966). He reports a hyper-correction of the postvocalic /r/ by New York City women, where female speakers from lower-middle class used more of the standard variant /r/ than those from the upper class group. Labov is certain that this behaviour of women from the lower-middle class is due to their recognition of the social meaning attached to the use /r/ in New York, and their 'insecurity' about their own speech. That is, women used the postvocalic (r) as a prestige marker of the highest social group and in their attempt to adopt the norm of this group, manifest their aspirations of upward social mobility, but they 'overshoot' the mark (see also Romaine, 1998). Hyper-correction occurs when a feature is undergoing a change in response to social pressure from above (Labov, 1966); women are 'insecure' about their own pronunciation, and so make a conscious effort towards the standard prestige variety. James (1996) agrees with this assertion, arguing that the choice of standard speech against the non-standard speech by women is as a result of their lack of respect from the society and public participation.

Several other reasons given in an attempt to explain this behaviour of women point to socio-cultural factors: association, employment and Education opportunities available to each sex. James (1996) maintains that the reason is because women have relatively limited access to power universally than men, and that the use of the standard speech allows them to sound less local and to have a voice to protest against the traditional norms that place them in an inferior social position to men. By avoiding nonstandard speech, women are trying to escape from being associated with the nonstandard social stereotype speech (Gordon, 1997). For Trudgill (1972: 113), 'women are more likely to secure and signal their social status through their use of the standard, overtly prestigious variants'. The choice of the covert non-standard speech by

men, according to Cheshire (2004), is to symbolise the roughness and toughness that is associated with working class life and with masculinity.

It is however difficult to accept some of these arguments, especially in areas where both men and women are put into the same social group, more particularly in societies where both do not have equal status either outside the home or inside it. Eckert (1989) shares the view that although in a more recent work, women are classified in terms of their own occupations, some of these methods still have some deficiencies. The methodological problems are more complicated, especially in the partriachial societies where the family is the basic unit of analysis, and the man is regarded as the head of the household, and so his occupation determines the family's social class. Among the Eʊe, men are the head of the family, they are more educated and so work the white collar jobs. The women, on the other hand, are mostly house wives, petty traders, and peasant farmers. Men are therefore more exposed to the Standard English, than the women. Nichols (1983) argues that access to the standard speech is very important; the more an individual is exposed to the standard speech, the more standard their speech will sound. This is confirmed by the high usage of Gullah Creole by older women with domestic chores he observed in the southern part of USA. Nichols noticed that overall, younger speakers used Creole less than the older speakers because the younger ones worked the white collar jobs where they often came into contact with speakers of the Standard English. In communities such as Eʊe, one would hardly expect women to lead in the use of the standard speech, but it is too early to draw any conclusion at this stage of the study.

It is also important that we recognise the overlap between men and women's speech as well as the differentiation. There are several circumstances where both men and women have been reported to have used certain linguistic features, for example, the phrase 'you know' equally (Freed & Greenwood, 1996). Sometimes too the standard functions differently for men and women in different situations; for instance, in some communities, women were reported to have used the standard speech for persuasion. This suggests that the linguistic differences between men and women may not always relate to sex or gender of the speaker, but the kind of talk which the individuals are engaged in may motivate the use of a particular feature and not the other.

3.2.1.5.3. Age variation

Human language, as argued, arises through a combination of universal shared capacities, and social interactions of individuals and communities (Chomsky, 1957). Language, like any other social behaviour, for example, dressing, music, policies, gender norms, fashion, etc. is subject to change over time (Wagner, 2012). Investigating features of a language as they are used over a period of time should obviously constitute an important part of linguistics. One of the best methods that has been used so far to examine changes that occur in language as it passes from one generation to the other has been Labov's pioneering methodology summarised, 'The use of the present to explain the past' (Labov, 1978). He states that it is possible to examine how features of a language change over time in a cross-section of a speech community by using a wide range of ages as a proxy for historical time (Labov, 1966, 2001). It is possible thus to examine a change in language by locating reference points in the past whereby a comparison can be drawn in relation to these reference points in subsequent studies. Studies of this nature are normally longitudinal, either through trend or panel studies. In trend studies, the speech pattern of a community is resampled after a period of time, while in panel studies the same individuals within the community are followed across a period of time. Trend studies enable us to confirm how language changes as it grows, and panel studies enable us to discover how individual speakers of different ages are involved in linguistic change (Sankoff, 2006). Although both studies can reveal how individual speakers of different ages, or communities are involved in a linguistic change, restudying a community, for example, or following a group of speakers across time can be very difficult task. And most often researchers find it difficult relocating the same individuals for re-examination.

A change from one linguistic feature to another can be historical or on-going (a change in progress). If a change is on-going, older speakers may change their speech towards the direction of the change as they grow. Different interpretations have been given to these changes. The change is said to be a 'communal change', when the entire community changes their use of a linguistic feature simultaneously, yielding a flat distribution across age groups (Labov, 1978; see also Sankoff, 2006). There are, however, some cases where the change may not involve everyone in the community (i.e. the change may not be simultaneous). Arnaud (1980) shows that in the 19th

century, while some individuals increased their use of the English '-ing' morpheme along with the community, others remained stable. Meaning that there are situations where individuals are linguistically stable over their lifetime, while at the same time there are some changes occurring over time in the community due to perhaps, a new generation of speakers who have adopted an innovative feature. This change is interpreted as a generational change. An example of this is the ever-increasing frequencies of /r/ in NYCE (Labov, 1966).

It is however termed 'age grading' when there is instability in the individual's usage of a feature over their lifespans against a backdrop of community stability for the same feature (Sankoff, 2006). Typical examples of variables that exhibit this characteristic are the '-ing' morpheme and the multiple negation (see e.g. Labov, 2001; Trudgill, 1974; Wolfram and Fasold, 1974). Some writers reserve the term 'age grading' to a feature that is used by the young people only and is never used by adults. Labov's Martha's Vineyard study in 1963 is a typical example of how synchronic studies can be used to trace the history of language change. This research is an introduction to his NYC study in 1966, which is a typical example of how synchronic and diachronic linguistics could be reintegrated (Weinreich, Labov & Herzog, 1968). In his Martha's Vineyard study, Labov found an age-related pattern: a rise in the height of (ay) and (aw) among the younger generation. He argued that the high nuclei among the youth might have been typical of the younger generation at that time (1961); that is, the older speakers were using them when they were young, but gradually lowered the nuclei as they grew older (a change he referred to as age grading). Or alternatively, the older speakers, as he stated, learned the language at a time when the whole community had lower values, so their speech only reflected the state of the language at that earlier time. Sankoff (2006) claims that this regular increase across the four age groups represents a generational change in progress. Labov's (1966) examination of the frequency of the use of the post-vocalic /r/ in e.g. 'floor', 'fourth', 'guard', 'car', etc. in New York City reiterated his age grading interpretation. He observed that the older New Yorkers recorded lower frequency values for the alveolar /r/ than the younger speakers. Labov interpreted the different frequency values for the /r/ usage across the different age groups as evidence for a rise in /r/ usage over time as the community moved away from the local pattern of r-lessness toward the majority American pattern of r-fulness

(Sankoff, 2006, Wagner, 2012). Results from dialect atlases and others also confirmed that NYC had earlier shown higher frequency values of r-lessness than it did in the 1960s.

Results of these studies have shown that age grading offers some explanation for language change and variation. But it is important we also realise that different people behave differently at different stages of their life since the different life stages expose them to different sociolinguistic relationships. Also, different periods of people's lives involve them differentially in their relationship to the standard language (Eckert, 1997; Sankoff, 2006). Hence, in spite of the fact that a whole community may be changing, there may be individuals who may be stable or vice versa. Even though a sociolinguistic variable may be stable, one may still observe a curvilinear pattern associated with age as well as with social class. A combination of trend studies and panel studies is highly significant in studying how particular sociolinguistic variables change over time. The present study, although uses only panel study method, I am certain that the findings would serve as a reference point by which the speech patterns of the individuals in the next 20, 30 or 50 years can be compared.

3.2.1.6. Stylistic variation

The term 'style' is used to denote a specific way in which something is done. We can talk about a specific way of cooking, building, dressing, walking, speaking, etc. In creative writing, writers have a specific way of presenting, for example, their characters or the plot of the story which makes their writings different from other writers'. So we can say that this writer's style of writing is different from the other writer's style based on the specific way in which both writers present their views. The world is full of social styles; style is characteristically part of man, and thus has a social meaning (Coupland, 2007). In speech, for example, every speaker, including children, is capable of speaking differently in different speaking situations. For Romaine (1998), style is a speaker's situational adjustments in the use of individual variables; it is the way a speaker combines variables to create distinctive ways of speaking which is key to projecting a particular identity. She believes that speaking in a specific way at a particular occasion has a social implication for the speaker.

Style in variation studies is generally regarded as a means in which individuals express their social class. Style according to Coupland (2007: 5) is 'a re-voicing of one's social class or a re-ordering of the same linguistic feature in different speaking contexts which distinguishes social groups'. The kind of social class one belongs becomes obvious when they speak carefully, that is, one's true accent determines their class and is manifested in careful speech. A particular accent can be tagged a low-class speech or uneducated speech, and usually a low-class speech is equated to casual speech.

However, all speakers consciously shift their speech patterns towards a standard or prestige variety in a more self-conscious careful style. A typical example of this is the study by Milroy and Gordon (2003) in Bradford, where many speakers, irrespective of their social class, shifted towards the standard form [ð] of the *th* variable in reading tasks (formal style), instead of their normal realisation of the nonstandard voiced stop variant /d/ in casual speech. Giles and Coupland (1991) are however of the view that, speakers do not only modify their speech in conscious situations to signal class, they do adjust their speech to express solidarity with, or distance themselves from an interlocutor; it is therefore a loss or gain situation.

Stylistic variation is, therefore, more of an intra-speaker variation (variation within a single speaker) rather than inter-speaker variation (variation across groups of speakers) (Shelling-Estes, 2002; Coupland, 2007). It is unlike class variation where the distinction is between two different classes: lower and higher classes, or between different age groups: lower, middle and upper age. Intra-speaker variation or individual speaker variation can involve several different types of variations. It can include shifts at the usage level for features associated with particular groups of speakers; dialects, or with a particular situation of use called registers (Crystal, 1991; Halliday, 1978).

A dialect-based variation may involve a higher usage level of, for instance, the r-lessness feature such as in 'farm' [fa:m], which may be associated with traditional Southern American speech (Cheshire, 2004). But a register-based variation would involve a speaker using the informal variant [e] more than the formal variant [ɜ:] of the NURSE vowel when talking with a family relation or a friend. Individual variation could also involve a shift within the same language or across different languages. Within a single language, a lawyer might switch into a legalese register to discuss a

case with his colleague lawyer, or a preacher switching into a sermon genre when on the pulpit for a sermon (Bucholtz, 1999; Cutler, 1999). It may also involve a shift from one language to another. Shifting into and out of different language varieties, as argued, may be deliberate, and may involve a conscious use of features that are known to both parties in a conversation. Cheshire (2004), however, notes that shifting into and out of different language varieties could be unconscious involving features that speakers do not even realise they are using. It is important we recognise that style shifting does not always involve single individual speakers, it can involve a whole group where a particular style becomes characteristic of a group (i.e. group style). Thus, we can have a male style or female style; youth style or adult style and so on. Again, individual variation can operate at any level of language use; from phonological level, to morphosyntatic, to lexical, to semantic, to pragmatic, and to discourse level, so that one can talk about a formal style of a particular syntactic feature, or an informal style of that feature (Tannen, 1984).

Labov's (1972a) approach to style is, however, quite different. He thinks that style can be viewed as a continuum along which speech varies; it can be rated along a scale based on the amount of attention people pay to their speech when they speak. We can talk of vernacular or free speech versus careful speech. Vernacular or free speech, according to Labov (1972a), is a speaking style in which 'minimal' attention is paid to speech, while careful speech is a type which has various degrees of formality defined in terms of self-monitoring: passage reading, reading of minimal pairs and word-list (Labov, 1972a). Labov maintains that the language variety one acquires first before any other variety is vernacular. And it is the style used when a speaker is less conscious of his or her speech. This means that everyone has a vernacular speech, but as one grows to join a particular class, one either drops it or maintains it depending on their new class. So, everybody, irrespective of their social standing speaks vernacular. For instance, when people are relaxed, tired or speaking with friends, or in informal contexts they use their everyday vernacular speech (Labov, 1966 cited in Coupland, 2007: 7). Labov associates vernacular speech to a working-class speech, though he agrees that all speakers consciously shift their speech towards a standard prestige variety when they are more self-conscious of their speech. In his social stratification of New York English, Labov observed that all speakers, regardless of their social status, consciously shifted

their pronunciation towards the standard when reading a list of words that forces a speaker to focus attention to their pronunciation.

On a scale of style shift, Labov argues that there is always a rise in the use of variables in frequency from vernacular to standard as the style of speech increases from casual to more formal. Speakers change their speech towards a standard speech in a more formal context when they are monitoring their speech (Labov, 1966). Trudgill (1974) observed a similar situation where although each class had different average scores, all the speakers shifted their style in the same direction in a more formal speech style towards the standard language. This implies that awareness of the standard overt prestige speech can make speakers shift towards it in more formal styles.

It is obvious from the discussion that in speech speakers are highly creative and careful in their use of stylistic resources; they do not shift their style merely to react to speaking situations, but do this skilfully to achieve a purpose. More importantly, intra-speaker variation is pervasive, it cuts across all languages and cultures. The most efficient and appropriate means of determining the speech patterns of speakers in a speech community is, therefore, to examine the speakers' speech along a continuum, to determine which variable is used, and in what contexts. However, the present study focuses on only formal context, where speakers pay attention and monitor their speech. Thus, any speech form observed in this study will be considered as the speakers' most formal speech only.

3.2.1.7. Physiological factors

The acoustic features of vowels of males versus females, and adults versus children have been known generally to be non-uniform. The causes of the non-uniformity in the vowel system of the different sexes and ages have been attributed to differences in the sizes of the vocal tract systems of males and females, and of children and adults. Naturally, males and females, just like children and adults, have different vocal tract lengths, for example, women have smaller and shorter vocal tracts than men, likewise children and adults. The vocal tract system of a female is generally known to be about 10 to 15 percent smaller than that of males. The formant frequency values of females are about 10 to 15 times higher than that of men (Chiba & Kajiyama, 1941; Fant, 1960; Cox, 2002). The variation in the acoustic features of both sexes occurs mostly in the

formant frequencies and pitch. This is because since vocal tract length is the basic determinant of the formant frequency location, the formant frequencies of a given vowel will vary across a variety of speakers (Reetz & Jongman, 2009).

The physiological compositions and their effects on formant frequencies have been studied extensively. Research on sex and vowel quality, for example, has shown significant differences between the quality of vowels produced by males and females of any given language. Gbegble (2006) made an acoustic description of Eʋe vowels, by focusing on the qualities of 16 Eʋe vowels among the three main dialect groups: Aŋlɔ, Eʋeme, and Tɔŋu of the Eʋe of Ghana. Using 24 males and 20 females, she discovered that though sex had no significant influence on the first formants (F1) of the front vowels and on the low vowel [a], the F2 of the back vowels (both the orals and nasals) were significantly different for the two speaker groups. Gbegble is, however, not clear in her gender/sex description. It is thus difficult to tell whether the differences in the results were due to biological differences or social differences between the two speaker groups. Again, it is not clear whether the differences in the results were not merely differences in the age of the speakers as we do not know which age groups were used. Knowing the age of the speakers can help the reader to understand the result better since speaker age can make a significant change in the formants of the speakers. Reetz and Jongman (2009) have observed a huge variation in the location of the formant frequencies even within the same group of male speakers from the same dialect area. This means that sex alone cannot reveal the true variation in the speech of males and females. To be able to draw a proper distinction between the vowels of the males and females in Eʋe, more acoustic investigation which takes into consideration other social factors of the speakers is needed.

Cox's (2002) acoustic measurement of General Australian English vowels was to find out the effects of gender on the formant frequencies and the durations of the vowels produced by both sexes. She recorded 18 vowels in the /hVd/ environment produced by 60 male and 60 female speakers of General Australian English from the fourth level of secondary school. Cox sampled the raw data at 20 kHz with 16 bit resolution. For the monophthongs, she measured the onset, target and offset of the vowels of each of the syllables (i.e. beginning and end of each nucleus). The centre frequencies of the F1, F2 and F3 of the monophthongs were measured at the segmentation points while the

duration of the onset glide (onglide), target and offset glide (offglide) were also measured. Her result reveals that whereas the overall shapes of the vowel spaces for the male and female speakers were similar, those of the male speakers shifted to the upper right, that is, the female speakers produced higher formant frequencies than those of the males. This phenomenon, Cox attributed to larger vocal tract size of males compared to that of the female speakers. She also discovered that the vowels produced by female speakers were largely longer in duration than those of the male speakers. Her results only confirm how physiological differences between males and females could contribute to non-uniformity of formant frequencies of males and females. They do not, however, say anything about how social roles of males and females contribute to the different qualities of the vowels produced by both sexes. Nevertheless, her method, when applied to the current data will contribute significantly in bringing out the physiological differences in the formant frequencies of the three RP vowel phonemes of the male and female speakers of English in Aŋlɔ and Eʋeme.

Abdul-Rahman's (2006) acoustic investigation of the vowels of Dagbani language of Northern Ghana, using 15 male and 15 female speakers was also to find out how gender affects these vowels. Surprisingly, whereas two of the three dialects of Dagbani confirmed the results of other studies on gender effects, one of the languages, Nanuni dialect, showed no significant differences for F1 as far as the height of the vowels were concerned. Mid front vowels, and [a] were however interestingly highly affected by gender. Also, her male participants were reported to have had longer durations for back 'short' vowels while the females recorded longer duration for the front short vowels. Although Abdul-Rahman was silent on the definition of the term 'gender', her results appear to confirm the general knowledge that women have larger vowel space than men as a consequence of their narrow vocal tracts.

3.3. The Theoretical Framework

3.3.1. Social network theory

Social network is defined as a social structure made up of a set of social actors, nodes, or vertices, linked by ties or edges; the ties or the edges could be one of a friendship, kinship, common interest, dislike, sexual relationship or business relationship between companies, belief, financial exchange or a combination of one or more of these factors

(Borgatti & Halgin, 2011). In mathematics, networks exist as graphs with nodes and edges, where the nodes represent individuals or groups of people, and the edges represent social interaction between the people. Social network analysts view social relationships in terms of a theory of network that consists of individual actors and relationships between the actors. Social network is, therefore, a useful 'theoretical construct' that many researchers use to determine relationships between individuals, groups, organizations, institutions, etc. and how these relationships affect the individual's social life.

In network studies, a social relation can be defined as an interaction between individuals so far as these individuals belong to a group, or an interaction between an individual and a group, or between groups. These groups could be an ethnic or a kingship group, a gender or an age group, a social institution or an organization, a social class or a nation. A social relation is, therefore, not simply identifiable with an interpersonal relation or an individual relation, but refers to a common social characteristic of a group of people.

Social network theory is, therefore, rooted in the fact that the social universe exists not as aggregate of mutually independent social actors, but as a system of interlinkages and interdependences, creating and structuring ties among themselves (Berkowitz, 1982). In this theory, individuals are considered as an organic whole where the constituent elements are connected among themselves as well as with the others through a mosaic of ties based on interactions, directly or indirectly, at various domains such as social, economic, political, etc.). According to Karl Marx:

> human beings are intrinsically, necessarily and by definition social beings who beyond being 'gregarious creatures', cannot survive and meet their needs other than through social co-operation and association. Individuals' social characteristics are, therefore, to a large extent, an objectively given fact, stamped on them from birth and affirmed by socialisation processes. Hence, as people try to produce and reproduce their material life, they must necessarily enter into relations of which are 'independent of their will (see Morrison, 2006: 112).

Relations of production, to Marx and Engels, is the sum total of social relationships that people must enter into in order to survive, produce and reproduce their means of

life. In societies, individuals create personal groups that help them in solving their day-to-day problems. Thus, we can have a network that contains people belonging to different groups: gender, age, or social groups, or generations such as family, kinship, etc. The basic network of every individual is usually that of the family they are born into, but as one grows up, they join new networks; so everyone ends up having a combination of micro-level interpersonal networks as well as macro-level involving large-scale networks (Meyerhoff, 2006 cited in Sarhimaa, 2009: 3). In life, everybody belongs to multiple social networks which sometimes overlap, though with varying degrees of strength.

Network ties can therefore vary in strength. The strength of a tie, according to Granovetter (1973: 1361), is 'probably linear combination of the amount of time, the emotional intensity, the intimacy (mutual confiding), and the reciprocal services which characterise the tie'. A network tie can be identified as strong/weak, reciprocal/non-reciprocal, directional/non-directional, etc.; each of these has a particular effect on the network structure. According to Milroy (1987), the strength of a social network depends on its density and multiplexity. A network is said to be dense if everyone has ties to everyone else within it. It is, however, multiplex when the ties within it are based on more than one relationship, similarity or activity, or if a social tie between two speakers are maintained via multiple means: work, recreation, kinship (Milroy, 1987: 50–51). A network that is 100 percent dense has every member linked to each and every other member within it. Based on these definitions, we can describe a person as being closely tied to other members within the network, or as being loosely tied or far removed from other members in the network.

One important concept dominant in network study is that dense and multiplex networks have the potential to enforce norms on members (Bott, 1957). Closely-knit tie members of a network are forced to maintain certain norms of the network, while those with loose ties or peripheral members are under no such obligations. As a result, most social analysts focus on networks with closely-knit ties. In this study, however, a focus is placed on not only closely tied members, but also on peripheral members, who although are detached from other members of the network, play very significant roles in introducing new ideas and information into the network.

The study is, therefore, anchored on Granovetter's (1973) 'The strength of weak ties' concept, which was built primarily on Stanley Milgram's small world problem' hypothesis. Milgram, a Harvard Sociology professor, advanced the theory of social network in the 1960s after the ground-breaking work of an informal group of German psychologists who specialised in 'Gestalt psychology', a concept which was said, offers a direct contrast to the classical Cartesian/Newtonian approach. Milgram's 'small world problem' was based on the idea that 'within any social group, any person could contact any other person through a small number of links' (see Milgram, 1967). This hypothesis was proved by a short experiment he made where he sent 160 letters he had addressed to one stockbroker in Boston, US, using 160 randomly chosen residents of Wichita and Omaha (see also Granovetter, 1973). The informants in this experiment were to send the letters to the stockbroker through people who were known to them. Milgram discovered later that only 42 of the letters had reached the broker by the end of the deadline; and the 42 letters took only six steps to get to him. He concluded that on average, only six links or ties are required between six actors within the network to reach the stockbroker target. This finding became known as 'Six Degrees of Separation', which many thought could apply not just to Americans but globally.

The application of Milgram's concept in other fields reveals that this concept can work perfectively in other societies and communities. The collaborative science research networks conducted by Newman (2001), and the Swedish web of human sexual contact by (Liljeros, et al., 2001) offer some good examples of Milgram's small world concept. Their findings, for example, reveal that it does not matter whether the target is a stockbroker, a physicist, or a prostitute, or whether it is an American society, Sweden, or university research communities; the small world structure can be found in all contexts. The fact that the small world networks can be found in such diverse environments means that it may be possible to find a small world network even in Eʊe communities.

This concept of 'Small World problem' has been advanced by Granovetter (1973). He came with another theory 'The strength of weak ties'. In this experiment, Granovetter wanted to know how applicants in Boston, US, got information about their new jobs, and the kind of contacts they made before getting their new job. He was, however, surprised to find that the employees got information about their new job

through their acquaintances (weak ties) rather than their friends (strong ties). He concluded that important ties in networks are not the strong ones that we may think of, but rather the weaker ties.

Granovetter's argument is that strong ties are transitive. The principle of transitivity is that if two individuals have a common close friend, then it is likely that they are all related. Strong ties are built on 'a friend of my friend is also my friend' principle and cover densely knitted networks, where a 'friend of my friend is also my friend' (Granovetter, 1973 cited in van der Leij & Goyal, 2011: 1). According to van der Leij and Goyal (2011), there can be weak ties within a strong network, but weak ties are much less transitive, and so are more likely to be 'bridges'. Weak network ties normally exist between friends, colleagues, or relatives who live in different communities whom we rarely contact. These persons are also likely to have ties with other people which are closer than ours. Hence, their weak ties with us connect us to another social group(s), but remote. Granovetter (1973) refers to these types of relationships or links, as 'bridges' that link two closely-knit networks together or connect a social group indirectly to another.

Individuals with weak ties are able to introduce new things into the network because they may have other means of receiving information which may not be available to those with close ties. They have a greater exposure to linguistic innovations through contact with speakers on the periphery of other social networks (Marsden, 2006). But closely-knit groups of strong contacts have similar information (linguistic behaviour) and are unlikely to bring anything new into the network. New ideas or any innovated speech into a strong network is bound to come via the weak links.

Milroy's (1996) exploration of the social network structure of Derby in relation to TH-fronting confirms how linguistic innovations are brought into a closely-knit network via periphery group members. She notes that:

> … the change is imported into the group through relatively weak links with other groups and diffused within the group through strong ties. While strong network ties facilitate the maintenance of linguistic features established within a network, it appears that the spread of innovative features across geographically distant cities is likely to be facilitated by contact between

> speakers with weak ties and periphery group membership, which affords them greater diversity in their social contacts (p219).

This assertion is an indication that any innovated speech in a speech community is mostly via peripheral members. An individual's linguistic behaviour can, thus be understood in relation to the roles they play in the community. Speakers in a relatively insulated community with limited geographical mobility are likely to be more influenced by the norms of that society, and are likely to maintain the dialect of that community (Scanlon, 2007). The linguistic behaviour of three working-class communities in Belfast made Milroy (1987: 179) to conclude that 'even when the variables of age, sex and social class are held constant, the closer an individual's ties are with their local community, the closer their language will approximate to localised vernacular norms'. Marsden (2006) believes that strong network members are loyal to their dialects.

The social network ties of the speakers were examined based on the assumptions that the speech patterns of the individuals with strong network ties will approximate to local variants and any non-local variants used in the Eʋe community is brought into the community through speakers with weaker ties.

Chapter Four: Methodology

4.1. Introduction

In the previous chapter, works of other researchers that are pertinent to this work were reviewed. The present chapter discusses the methodological consideration of the work. These include the research design, sample size, network type, field work (includes the activities before, during and after the field work) and also limitations of the study.

4.2. The research design

This research is a quantitative descriptive survey which aims to describe, compare and contrast the speech patterns of Aŋlɔ and Eʋeme speakers of English from different social groups and with different social relations. A survey and quantitative designs are chosen for the present study because as a survey research, it focuses on only a sample of the population instead of the entire population. The quantitative design allows me to generate numerical data to derive frequencies and, also, make a more precise quantitative description of the variables from the samples. In investigating variations in linguistic data, one can only make statistical statements about speakers' use of variables. That is, one can only say, for example, that a speaker of group A will 'probably' use more or less of a variant of a particular linguistic variable than say a speaker of group B; or group A speakers will probably use more of a variant C in situation D than in situation F.

Coupland (2007) argues that the sort of truths generated in variationist research are more often 'probabilistic truths' that express degree of relative similarity and dissimilarity within and across groups of speakers in social situations. Coupland believes that no speaker is ever consistent in their choice of linguistic variables; speakers often use a mixture of 'standard' and 'non-standard' forms of the same speech feature even within the same speaking context (p5). However, the overall frequency of use may differ across speakers, and this can only become clear when statistical averages are taken. The convention therefore is 'to produce averaged statistical values, e.g. percentages of people's use of a particular linguistic feature in a particular situation' (Coupland, 2007: 5) to represent the patterns of the linguistics variation. An accent variation between two groups of speakers, as he notes, is usually represented as the difference between one statistical value and another.

The study is about the Eʋe of Ghana, however, as a survey research, it focuses on only two main traditional areas: Aŋlɔ and Peki traditional areas representing two of the three main dialect divisions of the Eʋe dialect spoken in Ghana. From these two traditional areas, a sample was drawn from different age, education, gender and social network groups.

4.3. Sample size

Choosing a representative sample size for Aŋlɔ and Eʋeme speakers of English with different social characteristics can be quite challenging. This is because a sample size for a scientific study which draws its conclusion not on the entire population, but on a sample of the population can have a huge impact on the findings. A large sample is obviously an 'ideal' sample since the larger the sample, the better the representation. For Labov (2001: 38), a 'true representative sample of a speech community must be based on a sample that is randomly selected, in which each one of a several million speakers has an equal chance of being selected.' Unfortunately, this kind of a sample requires enumeration of all the units in the population before the random selection, a procedure, which is not always feasible, especially when the population consists of units of different characteristics that are of interest to the researcher. Also in practice, sociolinguistic analysis requires isolating and classifying dozens and sometimes hundreds of tokens from each subject (Feagin, 2002).

Thus, sample sizes for linguistic studies are generally smaller than those found with other types of survey research (Gordon, 2001). A sample of 150 participants of even a very complex speech community can be redundant, and can make data analysis difficult. In Detroit High school, for example, Shuy, Wolfram and Riley (1968) used 702 informants selected through a very good statistically representative sampling method, surprisingly, they could make a detailed analysis of only 60 participants.

The *ideal* sample in linguistic studies would therefore be the one that focuses on the nature of the population of interest, and or the nature of the data to be gathered, and not necessarily the one that is selected statistically. It is the one large enough to serve as an adequate representation of a population about which the researcher wishes to generalise his or her results, and small enough to be selected economically in terms of subject availability, time, money and complexity of data analysis (Best & Khan, 1989). In this

study, therefore, a sample of 96 participants were selected from different social network groups, different age and different genders with different Education backgrounds across the two dialect regions (see section 4.5.2.1 for the sampling procedure).

4.4. Measuring the individual's network strength

It is a common knowledge that the extent at which one integrates into their community impact their linguistic behaviour differently. Even in a very dense and multiplex network, where members have multiple ties with one another, a central or core member is likely to have an access to information more quickly than a peripheral member. Milroy (1980: 141–142), in her attempt to measure individual's network strength and how this impact their use of linguistic variables within a speech community, discovered the following variables as indicators of strong network ties:

(a) being a member of a highly dense territorially based cluster;

(b) having kinship ties with more than one household in the neighbourhood;

(c) being in the same workplace with at least two others in the neighbourhood;

(d) having the same workplace with at least two others of the same gender;

(e) taking part regularly in a territorially based activity (street gangs, football teams, etc.);

(f) Associating voluntarily with workmates after working hours.

Marsden (2006: 8) identified the strength of her participants' network ties using these indicators. Participants who showed loyalty to particular social groups, e.g. family, friends, etc., and maintained the contact via more than one capacity, she identified them as having strong ties. Those who, on the other hand, had diverse contacts throughout the local or wider geographical area, and maintained these contacts in only one capacity, she considered them as having relatively weak network ties. She consequently had two network groups: *strong* and *weak* networks.

Labov in 2001 also designed a quantitative instrument for measuring networks. In this experiment, Labov tried to find out the correlations between the social backgrounds of 112 informants, their social contexts, and a number of phonetic variables (Labov, 2001 cited in Sarhimaa, 2006: 3). His purpose was to determine linguistically innovative actors in Philadelphian neighbourhood. He developed a system that contained five communication factors. The first one, named C1, was to reveal how often

a participant interacted within the neighbourhood. The second one, named C2, had to do with the rate of interaction of the participant's potential contacts. These he investigated using questions such as (a) who is your best friend? (b) who would you invite to a party? and (c) who would you invite for a cup of coffee? The C3 and C4 were, however, to measure how often a participant integrate into the network structures outside his neighbourhood. By these Labov found that an individual with multiple neighbourhood contacts is more likely to use the most innovative variables. He also noticed that individuals with multiple relationships both inside and outside of their community serve as potential channels through which innovative variables can spread within a neighbourhood. This is similar to Granovetter's local bridge concept.

In this study, the strength of the individual's social network ties was determined by their degree of integration into the local community (i.e. their local participation), and on the degree of their geographical mobility. Thus, strong and weak network membership were identified. Strong network members are the participants who had relatively close-knit network ties with their local communities. That is, those who lived in the local community (Aŋlɔ Traditional area or Peki Traditional area) and (i) participated regularly in funerals, town meetings, festivals, communal labour, and religious activities; (ii) had very little or no geographical mobility; (iii) had very few or no contacts outside of their locality; (iv) had multiple contacts regularly with people within their local community. Weak network members, however, include those who lived outside the local communities and (i) did not regularly take part in the above mentioned activities; (ii) were geographically mobile (iii) visited and had contacts with the local community only occasionally.

4.4.1. Network structure in Aŋlɔ and Eʋeme

The network structures within the two Eʋe communities seem relatively dense and multiplex. All the members in each of the communities appear to know each other very well. They meet and communicate with one another on regular basis, for example, during activities like games, funerals, communal labour, and religious activities such as annual festivals, church services and several others. Interestingly, the structure within Eʋeme is comparatively lose and more open than that in Aŋlɔ. Many of the participants from Eʋeme revealed that they had regular contacts and visits from their family

relations both home and abroad. Meaning that the network type in Eʋeme has many more weak links or ties than that in Aŋlɔ. The people of Eʋeme are therefore more exposed to much more influences from outsiders than those in Aŋlɔ. But this is not to say that Aŋlɔ people are not under any influence from outside communities. Visitors from non-Aŋlɔ communities who visit Keta and Aŋlɔga markets weekly equally expose the indigenes to outside influences. However, the activities of these people are mostly limited to the market areas only.

Although it is difficult to define the network ties of those living outside the two communities, it is obvious that their network ties are less dense and less multiplex than those of the participants living in the two dialect communities. The participants living outside the Ewe communities are likely to contract diverse ties/contacts, have more geographical mobility and so might have relatively weaker ties than those living within the two towns. Kingsley and Beatrice, speakers of Eʋeme-Eʋe, for instance, reported living outside Ghana for a number of years, and therefore have many diverse contacts. They mentioned that they always spent their weekends and holidays with their family at Peki. There are many more examples of these types of participants in the study. Their wide contacts with people from home and abroad prove the loose nature of their social network ties. These behaviours also depict the nature of a typically loose network type where members have a wider geographical mobility; their ties are less dense and less multiplex.

4.5. Field work

4.5.1. Preliminaries

Before I embarked on the field work, I had a series of meetings with my supervisors to discuss with them the procedures for the data collection; items on the interview guide, reading lists, and the tools for the recording. Having obtained the approval from my supervisors, a consent form which detailed the purpose of the study, the rights of the participants in the study, my contact details and those of my supervisors was designed. The interview guide and the reading list were drafted and reviewed. The necessary tools were obtained from the institute while others were purchased. Preliminary visits were made to the research communities by me and my research assistants to familiarise ourselves with the research environments, the culture of the people, most of which I

was already familiar with, and to meet with the elders of the communities. A copy of the consent form was presented to the chiefs, their elders and the assembly members of each of the communities to seek their approval. During this period, we introduced ourselves to the chiefs and their elders, and then discussed our intended project with them. After seeking their consent, the assembly member informed the community about our presence and our intended project.

4.5.2. During the field work

4.5.2.1. Sampling the participants

Having completed this preliminary procedure, snowball sampling, also known as social networking, which works on the principle of 'a friend of a friend' contacts (Cheshire, 1982; Milroy, 1987; Eckert, 1988), was used to select three (3) participants each to fill each of the cells. This approach, as noted, more often involves at least a passive participation of an observer or an interviewer in a given social network, allowing an in-depth analysis of the structure of the network, and the relative degrees of individual's integration into the community.

Before this procedure, the Eʊe people of Ghana were defined. This was done by using the linguistic map of Ghana (see Appendix B) to delineate the linguistic boundaries of the three main dialect speaking communities in Ghana, which includes Aŋlɔ-Eʊe, Eʊeme-Eʊe and Tongu-Eʊe. Two communities: Aŋlɔga and Peki were chosen randomly to represent both dialect speaking groups. The network structure within each of these communities were defined using the criteria above. From this we were able to get closely-knit network (inner-city) speakers and loosely-knit network (outer-city) speakers. The social groups: gender, age and education in each of these network structures were stratified into two strata each: male/female, young/old, and basic/secondary respectively. Thus in all, 32 cells (16 in each dialect region) were obtained with equal number of three (3) speakers each for the different gender, age and the education groups based on their social relations. The age of the speakers ranged between 18 and 30 with an average of 22 and a standard deviation 4.5092 for the younger speakers, and between 50 and 90 with an average of 64 and a standard deviation of 10.4184 for the older speakers.

In selecting the sample for each stratum, a potential participant was first selected. Our first community was Peki and its environs: Tsame, Dzake, Awudome, Blengo, Avetile, Dzogbati and Afeviwofe. These areas represent the closely-knit network type of the Eʋeme-Eʋe. The first participant interviewed in Peki was the assembly member of Tsame. After participating, he recommend another participant who he knew qualified and could be willing to participate in the study. We approached the new participant as a friend of the assembly member, mentioned his name and informed him that he had been recommended to us by his friend (the assembly member) as a good candidate for the study. In this case, we approached the next participant, not as an outsider but as a friend of his friend. At times, appointments had to be made with the persons before the actual interview. Apart from the appointments, preliminary visits were made to the homes of the participants, or contacts made through phones to either confirm or remind them of the appointments. All the interviews were carried out in relatively quiet rooms in the homes of the interviewees. In these rooms artificial labs were created by covering the heads of the participants with a blanket to minimise the noise level. The procedure was carried out until the sample size for the strata within Peki; that is, the strata for the strong network including the different age, gender and Education groups were obtained.

This process was replicated in Aŋlɔga and its environs. Thus, we had the data from Aŋlɔga, Keta, Kedzikope, Dzelukope, Woe and Tegbi. The data for weak network members of the different age, gender and education for each dialect group were obtained from Accra, Madina, Sakumono Estate, Nii Boi Town, Colegono, Abeka, Lapas, Alajo, Hatso, Ashaiman, Tema, Kasoa, Amasaman and New Town. The selection of participants for the weak network (outer-city) group was comparatively different (see the discussion of this in section 4.4.2.3). All the recordings were done using Olympus and Handy4 Next audio recorders with a sampling rate of 44.1 kHz (i.e. 44,100 times per second) with a 16 bit resolution.

4.5.2.2. Data collection

The data were collected between January and March, 2016, by the researcher, and three other research assistants in a face-to-face interaction with the interviewees. The interview was in two sections and lasted for about 20 minutes. The first section was a short conversation with the interviewees which was based on an interview guide

designed to collect information on the following: participant's demographic characteristics, education, geographical location, family, occupational environment, contacts, recreational activities, participation in local activities, social group membership, and extent of travel on a local and national level. Information obtained in this section was used to classify the participants into their social network groups. The second section of the interview comprised reading of a list of words purposely designed to elicit a speech style from the participants' pronunciation of the variables in isolation in a more formal context.

4.5.2.2.1. The interview

4.5.2.2.1.1. The interview guide

4.5.2.2.1.1.1. Type of information

Personal: name, age, sex, parents' name, current residency, ethnicity, etc.

Linguistic: language(s) spoken, parents' language, etc.

Education: school(s) attended, where and levels attained, name(s) of school teacher(s), etc.

Social life: employment, friends, contacts, religion, recreational activities, social groups or clubs, social activities, place(s) visited, place(s) lived, and current residence, etc.

4.5.2.2.1.2. Section B: Reading of word list

In this section, the participants were asked to read through a list of words intermixed with distracter items, each of them twice before the main reading. The distracter items were not to be analysed, but were put in as distracters to prevent the participants from identifying which of the variables were under investigation. The participants were encouraged to read as natural and as fast as possible so as to avoid noticing the words with the target variables, and also, without pausing for too long between words. The variables were in stressed and unstressed syllable patterns. All the participants have some level of education, and so most of them were able to read the words without difficulty. None of them had hearing or speaking difficulty. All the participants were taken through some instructions detailing the rules governing the research. The total number of words read were 75; of these were 15 words each representing various spellings of the three variables in question, and 30 distracter items (words whose

spellings do not contain any of the three variables under investigation). Below is a sample of the word-list:

Table 2: Word-list /e/ /ɜː/ and /ə/

DRESS	NURSE	lettER	Distracters
Monosyllabic ate /ˈet/ head /ˈhed/ friend /ˈfrend/ get /ˈget/ ethic /ˈeθnɪk/ dress /ˈdres/ sell /ˈsel/ tent /ˈtent/ pen /ˈpen/ health /ˈhelθ/ very /ˈveri/ kept /ˈkept/ said /ˈsed/ **Disyllabic** letter /ˈletə/ **Polysyllabic** assembly /əˈsembli/	**Disyllabic** about /əˈbaʊt/ favour /ˈfeɪvə/ colour /ˈkʌlə/ creator /ˈkreɪtə/ father /ˈfaðə/ letter /ˈletə/ support /səˈpɔːt/ filler /ˈfɪlə/ doctor /ˈdɒktə/ among /əˈmʌŋ/ agree /əˈgriː/ amount /əˈmaʊnt/ dollar /ˈdɒlə/ oppress /əˈpres/ **Polysyllabic** assembly /əˈsembli/	**Monosyllabic** third /ˈθɜːd/ verse /ˈvɜːz/ earth /ˈɜːθ/ curse /ˈkɜːs/ word /ˈwɜːd/ turn /ˈtɜːn/ nurse /ˈnɜːs/ dirt /ˈdɜːt/ learn /ˈlɜːn/ birth /ˈbɜːθ/ merge /ˈmɜːdʒ/ work /ˈwɜːk/ curl /ˈkɜːl/ heard /ˈhɜːd/ first /ˈfɜːst/	**Monosyllabic** three /ˈθriː/ cord /ˈkɔːd/ thatch /ˈθætʃ/ town /ˈtaʊn/ peel /ˈpiːl/ top /ˈtɒp/ pool /ˈpʊl/ cock /ˈkɒk/ paint /ˈpeɪnt/ food /ˈfuːd/ tip /ˈtɪp/ took /ˈtʊk/ they /ˈðeɪ/ book /ˈbʊk/ park /ˈpaːk/ bathe /ˈbeɪð/ shoe /ˈʃuː/ those /ˈðʊəz/ pot /ˈpɒt/ path /ˈpæθ/ tall /ˈtɔːl/ fly /ˈflaɪ/ tool /ˈtuːl/ tithe /ˈtaɪð/ pound /ˈpaʊnd/ though /ˈðʊə/ breathe /ˈbriːð/ **Disyllabic** nothing /ˈnʌθɪŋ/ wanted /ˈwɒntɪd/ /northern /ˈnɔːðn/ southern /ˈsʌðn/ **Polysyllabic** mathematics /ˌmæθˈmætɪks/

4.5.3. Challenges

Though the field work was generally successful, it was not without a few challenges. The main problem encountered during the field work was how to get the consent of the participants. For example, many of the people contacted for the interview declined to

participate in the study. Even those that accepted to participate had to be visited or contacted several times on phone. Some of them had to be paid in order to participate. Some were also hesitant in giving information about themselves for lack of confidentiality, that is, some of them initially denied us access to their rooms for the recordings. The challenges however increased when we moved outside the two communities to Accra and its environs. In Accra, snowballing was quite difficult to apply effectively because several of the participants did not know one another compared to the local communities, and so we had to rely on religious leaders and non-governmental organisations. Also, the participants were very busy, for example, when one was identified, either he or she was not in the house or he was in the house but was not ready for the interview. We had to make a lot of visits to the homes of the interviewees, and also made multiple phone calls before getting the participants for the interview.

Literacy level of the participants also posed some challenges during the field work. Literacy was very low in the two dialect communities we visited, many of them did not know much about research; hence found it difficult to understand the project and its importance. Creating the mini lab (artificial lab) in the homes of the participants was generally difficult, although we managed to use it, especially where the level of noise was very high.

Despite the few challenges, I still consider the networking approach as a more appropriate method for the study because I can say that it has an advantage over, for example, the simple random sampling method used by Labov (1966) and Trudgill (1974). Labov's New York City sample could not give a fair representation of the informants in each stratum because even though his original sample consisted of 340 informants who were randomly selected, he could interview only 88 of them (Davis, 1982; Awoonor-Aziaku, 2013). Subsequently, his results were generalised to only a very small number of speakers. Others however argued that his random sampling method was not statistically random by definitions. Thus, though simple random sampling offers a more statistical sampling method, the researcher prefers stratified and snowball sampling as the ideal sampling methods for the present study.

4.5.4. Post Field Work

4.5.4.1. Data analysis

The greatest challenge in analysing the data for the present study has been how to convert the speech data into quantitative/measurable data. To convert a speech sample into measurable data requires careful identification, definition and categorisation of the variables in the sample. The data for the present study were therefore coded first using an acoustic analysis, which was collaborated with an auditory analysis. The purpose of the acoustic coding was to enable us identify how the vowel phonemes were spoken by the speakers. Thereafter a statistical coding was performed through the help of an SPSS (Statistical Package for the Social Sciences) *Version 10.0* (for statistical calculations and for generation of tables and diagrams) to determine statistical inferences between the speaker groups.

4.5.4.1.1. Acoustic measurement

4.5.4.1.1.1. Vowel duration

Two main things were done during the acoustic measurement: the duration (length) of the vowels and their formant frequencies including pitch and amplitude were measured. Measurement of the vowel duration, pitch and amplitude was to complement distinctions obtained from the formant frequencies. To measure the vowel duration, the starting (onset) and ending (offshoot) points of the vocalic nuclei were measured from the high-resolution gray-scale digital spectrograms. That is, the main high amplitude lump in the waveform, with their corresponding formant structures in the spectrogram was selected and measured. The measurements included release bursts of any preceding stops. Note that the onset of a release burst of a preceding stop of a vowel represents its transition point of the consonantal closure into that following vowel. Lip closure of following stops were however excluded; the points where there was a marked drop in intensity and loss of energy in the higher formants were excluded. The Figures below show the spectrograms of the vowel duration, pitch and amplitude of the words ‘get’ and ‘among’.

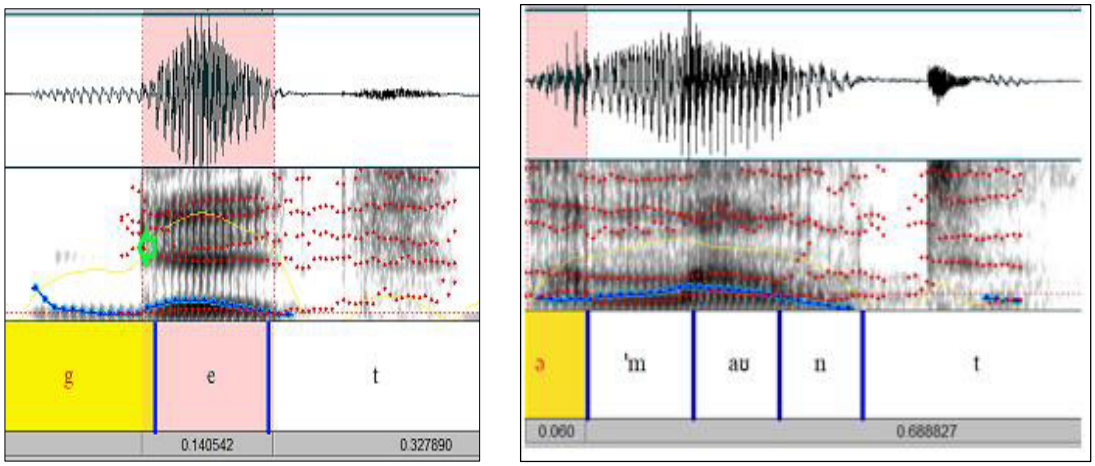


Figure 4.1: Duration, pitch and intensity of the vowel /e/ of ‘get’ and /ə/ of ‘amount’

The red horizontal lines in the spectrograms show the formants of the vowels, while their pitch and amplitude are shown with blue and yellow lines respectively. In each of the signals, the consonants were excluded from the vowels, but the release burst (marked with arrow) of the stop /g/ of ‘get’ was included, whereas the consonantal closure and release of the following stop /t/ was excluded. In the spectrograms the number immediately below the selection of /e/~[e] is the duration in milliseconds (0.140s), while that of /ə/ of ‘amount’ is about 0.060 seconds.

4.5.4.1.1.2. The vowel formants

The identity of the vowels were established mainly on their formant frequency values. That is, to distinguish the three RP vowel phonemes from one another, their first two formant (F1 and F2) frequencies were measured using PRAAT signal analysis software version 6.0.12 (Boersma, 2016), which has an inbuilt LPC (Linear Predictive Coding) and a formant tracker. The recordings were first fed into a computer installed with the speech analyser. Praat speech analyser produces a graphic display of speech signal, which is conventionally called a spectrogram. Each speaker’s recording was displayed on a wideband spectrogram with a frequency range of between 5000 and 5500 Hz depending on the sex of the speaker, and an analysis window of roughly 1.5-1.8 seconds. Meaning that the spectra peaks were overlaid on the grey-scaled LPC spectrograms. The target vowel in each syllable was segmented so as to show the visual representation of their formant frequency components on the spectrograms. For each

vowel token, a steady-state portion or its centre frequency was selected and measured manually. The estimation or the tracking of the formants was done using Praat's in-built LPC analyser, which has an expect way of estimating formant locations. Thus, the first two formants of each vowel, which represent height and backness of vowels were obtained by selecting the centre or the steady-state of the vowels. At each point, I used the 'Formant menu' to get the mean of the first formant (F1) and that of the second formant (F2) values one after the other. The number of the LPC poles was occasionally increased or decreased to separate merged formants. The formant values were sometimes obtained from the horizontal centre of the formant band when errors were noticed from the formant tracker. Taking the centre, and or the stable portion of the vowels is to limit the influence of coarticulation or transitional effects of any adjacent consonants on the vowel. The formants are shown on a spectrogram in Figure 4.2.

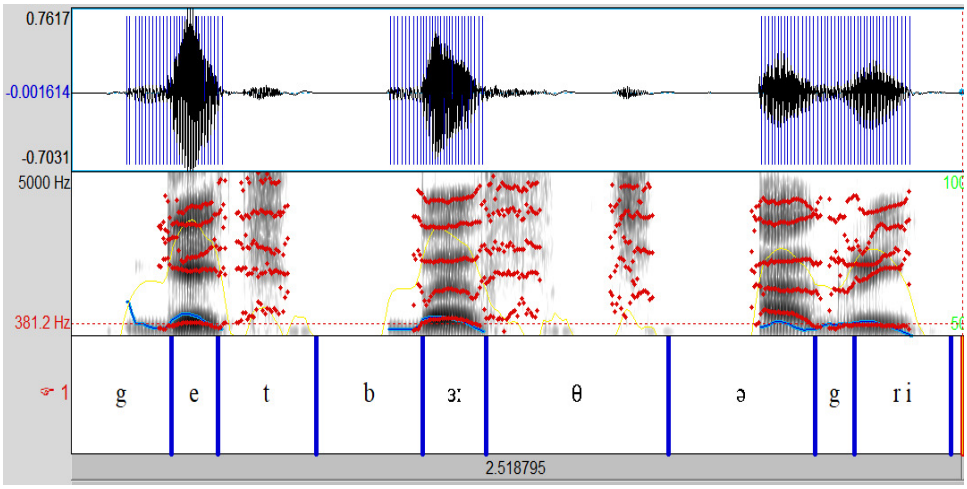


Figure 4.2: Spectrogram of the vowels of the tokens 'get', 'birth', 'agree'

In the spectrogram, the vertical striations (vertical pulses) represent vibrations of the vocal folds during the utterances. The white spaces indicate periods of silence, (both stop gaps and regular pauses between the words). The signals in the boxes have been synchronised, mapping each waveform onto its spectrographic representation. On the spectrogram, a time scale is also shown along the bottom of the picture, while the vertical scales show the frequencies in Hertz (Hz). The relative intensity of each frequency component and the pitch are shown by the darkness of the mark and blue lines respectively; the formants are shown by the red and dark horizontal bars.

4.5.4.2. Vowel normalisation

The formant frequencies of each speaker were normalised using a web-based software package (NORM) designed by Kendall and Thomas (2010). The NORM tool enabled me to process the raw formant frequencies of the vowels spoken by the speakers by using Watt and Fabricius vowel normalisation method (2002). This technique operates on formant-intrinsic, vowel-extrinsic, speaker-intrinsic procedure. This means that a range of vowels were used to normalise a single formant value of a given speaker. This method was originally designed for RP dialect speakers of English (Kendall & Thomas, 2010). But unlike the previous methods, the *grand mean* value that Watt and Fabricius used to calculate the normalised values was based on points that represent three corners of the vowel envelop. One point represented the high front corner, one the high back corner and the other the bottom corner.

In this method the mean F1 and F2 of the vowel of BEET or FLEECE /i/ was used as the lowest F1 and highest F2 values for the speaker, and this represented the high front corner of the vowel envelop. The speaker's lowest F1 value of the BEET was also used as their lowest F2 value; that is, NORM used the speaker's lowest F1 and lowest F2 values for GOOSE, which represented the high back corner. The mean F1 and F2 of BAT (labelled TRAP) comprised the point for the bottom corner of the vowel envelope, and represented the speaker's most low vowel. Meaning that NORM uses the vowel of FLEECE /i/ and TRAP /a/ to represent a speaker's most extreme high front and low vowels, and the GOOSE [u′] as a speaker's hypothetical most high back vowel. The S-procedure was therefore based on finding out three 'point vowels' that represented a speaker's most front, most low, and most back points of their vowel space (see Watt & Fabricius, 2002).

Watt and Fabricius' (2002) method therefore works by equating a speaker's lowest F1 value with whichever mean F1 happens to be a speaker's lowest, whether it is the vowel of BEET or not. It does same also with a speaker's maximum F2 value. NORM assigns whichever vowel has the highest F1 value to be the point representing the bottom corner of the vowel envelop since the vowel of BAT is not the vowel with the highest F1 value in some other varieties of English. See Watt and Fabricius (2002) and Kendal and Thomas (2010) for the calculation and normalisation procedure. By normalizing the vowel formants, the effect of the vocal tract length (VTL), which

differs as a function of sex and age, on the vowel formants were reduced. That is, the normalisation has reduced the speaker sex-related differences in the vowel formants of the speakers. It therefore became easier to compare directly the formants of the vowels spoken by the different social groups.

The raw formant frequencies for each individual speaker were first normalised individually to get each speaker's vowel space for the three vowel phonemes. These were plotted on a scatter plot together as individual formant values of the vowels. They were subsequently plotted using their group mean values. The variables realised for each of the vowels were therefore categorised using the normalised formants with the help of the cardinal vowels as reference vowels. All the vowels that have similar formant values were subsequently pulled together; that is, NORM pulled all the related formants together as group mean formant frequencies of the vowels. For instance, all the DRESS tokens that have relatively low F1 values and high F2 values were pulled together and positioned on the top left corner of the vowel envelop, while those that have a relatively low F2 values were positioned at the centre of the vowel space, etc.

Chapter Five: Acoustic Results

5.1. Introduction

This chapter presents and discusses the results of the experiment conducted on the pronunciations of the three vowel phones: DRESS /e/, NURSE /ɜː/ and lettER /ə/, among Eʋe speakers of English in Ghana. The discussion is in relation to the research objectives and with reference to previous findings and specific responses given by the respondents. The experiment has shown that the three vowel phonemes are quite different from one another. However the scatter plot in Figure 5.1 shows a huge overlapping in the vowels, invading each other's acoustic spaces; an indication that there are variations even within each vowel category. Figure 5.1 below shows the vowel plots of the individual tokens on S-transformed scales, with F1/S(F1) on y-axis, F2-F1/S(F2-F1) on x-axis. The F1, presented on the Y-axis indicates the degree of openness (height of the vowels), while F2 on the X-axis indicates the degree of backness (Ladefoged, 1993). Note that in order to improve clarity of the display, the number of tokens for each of the vowels spoken by the 96 participants were scaled down to one-third by random selection. That is, numbers 1 to 15 were assigned to the 15 tokens of each vowel phoneme and were picked randomly. Thus the number of the recorded tokens was reduced by two-thirds, resulting in the display of the measurement of one-third of the tokens of each vowel.

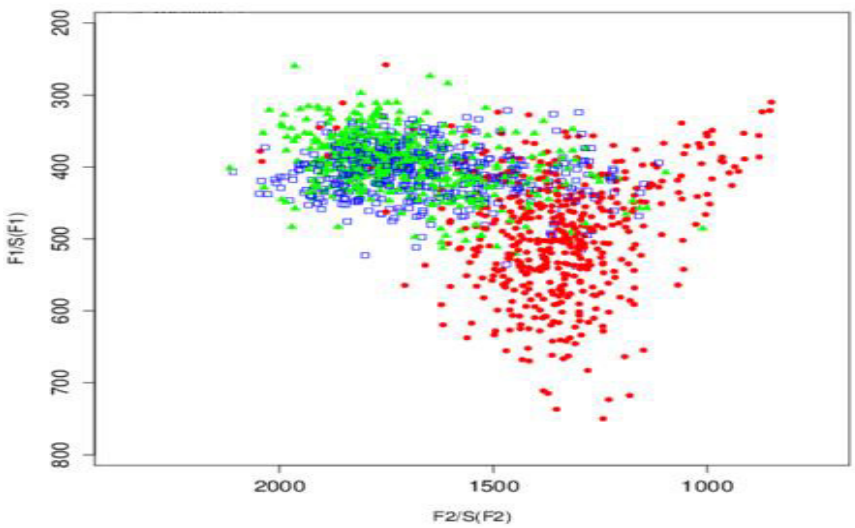


Figure 5.1: S-transformed individual F1 & F2 frequency values of the individual tokens of /e/, /ə/ and /ɜː/, plotted on S-transformed scales, F1/S (F1) on the y-axis, F2-F1/S (F2-F1) on the x-axis

Figure 5.1 shows S-transformed mean frequencies of F1 and F2 taken at the centre frequencies of the individual tokens of /e/, /ə/ and /ɜː/. The dots in different colours represent the positions of the three vowels spoken by the speakers irrespective of their social characteristics. The blue dots show the acoustic space of the NURSE, the green show that of the DRESS while the red dots show that of the lettER respectively. It is immediately clear from the figure that the three vowels are highly variable and overlap each other's acoustic spaces, covering the full range of the vowel space: from high to low and from front to back; hence giving us different phonetic variants of the three vowel phonemes. This shows that there are some level of inconsistency in their pronunciation. For the NURSE vowel, it seems like the speakers are alternating between the two vowel qualities; front /e/, and central /ɜː/, similar to for example, the alternation between the raised and lowered variants of /ɛ/ or those of /a/ reported by Milroy (1985) in Belfast. Unlike the NURSE vowel, the lettER and the DRESS vowels displayed several discrete forms, which involved more than a binary choice; a pronunciation similar to the realisation of /a/ in Belfast (see Milroy, 1985 for details).

Although discrete variables have the tendency of being distinguished easily and, so make coding relatively straight forward, the situation is quite different in the present data. In coding the data, therefore, it was decided that a coding system that distinguished the variables along a continuum be developed since the speakers have access to a broader selection and may locate their articulation at any one of the various points along the continuum. Using the cardinal vowels as reference points and textbook description of RP vowels, the variable DRESS was categorised as retracted-mid, retracted-raised and mid-central vowels, which are equivalent to the qualities of [e̞], [ɪ], and [ɜː] respectively. The lettER was categorised as retracted-raised, mid-high central, mid-high back and mid-low central vowels, also corresponding to the qualities such as [ɪ], [ə], [o] and [ʌ]. The NURSE was subsequently categorised as mid-front [e] and mid-central [ɜː]. Thus in all, seven variables were identified as the variants of the three vowel phonemes /e/, /ə/ and /ɜː/ with some overlapping. The relative positions of the variants representing the three vowel phonemes as spoken by all the respondents are clearly shown in the ellipse in Figure 5.2.

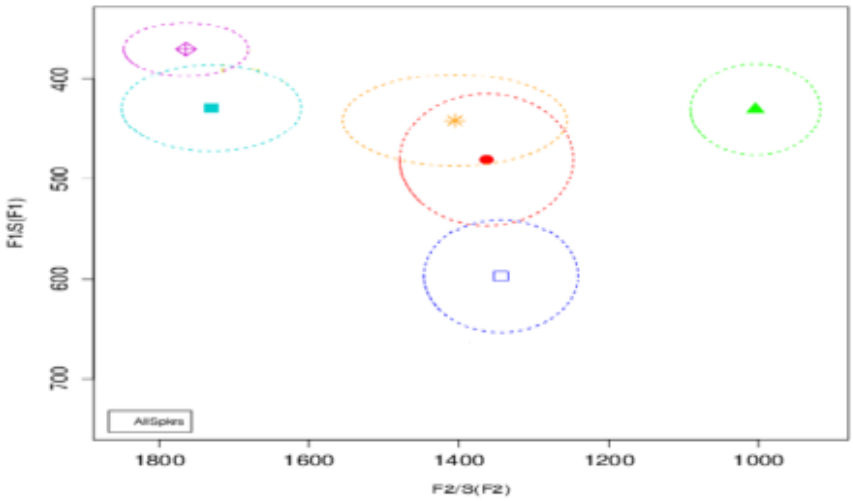


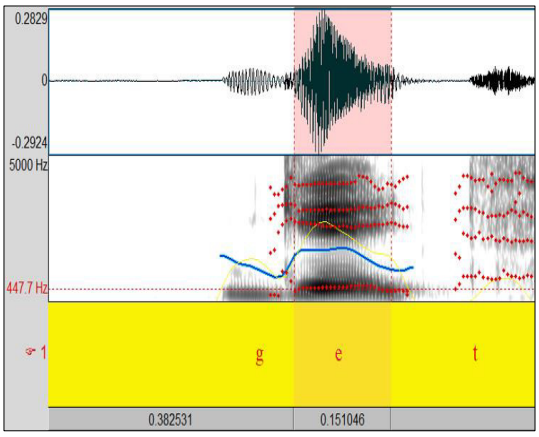
Figure 5.2: S-transformed mean F2 & F1 frequency values of the tokens representing the variants of /e/, /ə/ and /ɜ:/, plotted on S-transformed scales, F1/S (F1) on the y- axis, F2-F1/S (F2-F1) on the x-axis

Figure 5.2 shows the group average frequency values of F1 and F2 of the individual tokens representing /e/, /ə/ and /ɜ:/. From both figures, we see that the centre of the vowel quadrilateral is very crowded with different vowel qualities. Additionally, two sets of peripheral vowel qualities: relatively front high and mid vowels around the top left corner, and a relatively back quality around the top right corner. Unlike the scatter plot where the variants of each vowel could be seen easily, in the ellipse, it is difficult to see the overlapping. The sections below discussed the results of the vowel duration, pitch and intensity, and also the results of each vowel phoneme, its acoustic space and how it is used in other varieties of English.

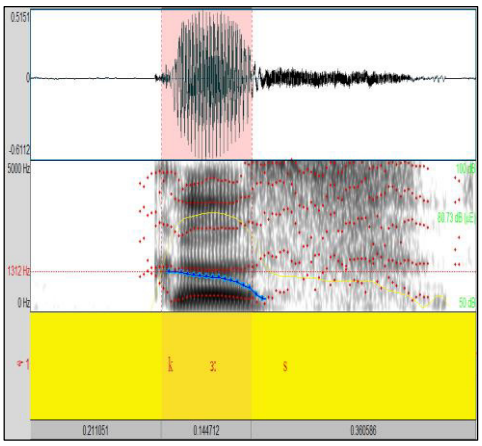
5.2: Results of the vowel duration, pitch and amplitude

The spectrograms in Figure 5.3 shows the vowel duration, amplitude and the pitch on which the vowels of the tokens ‘curse’, ’get’, ‘heard’, ‘among’, ‘agree’ and ‘oppress’ were spoken. The blue lines show the pitch on which the vowels were spoken, the yellow show the amplitude while the red show the formants of the vowels. In both sets of spectrograms, we see a slight difference especially in duration of the vowels. The vowel /ɜ:/ of ‘curse’ and ‘heard’; and /e/ of ‘get’ appear relatively longer than /ə/ of ‘among’, ‘agree’ and oppress’. In pitch and amplitude, however, there seems to be no

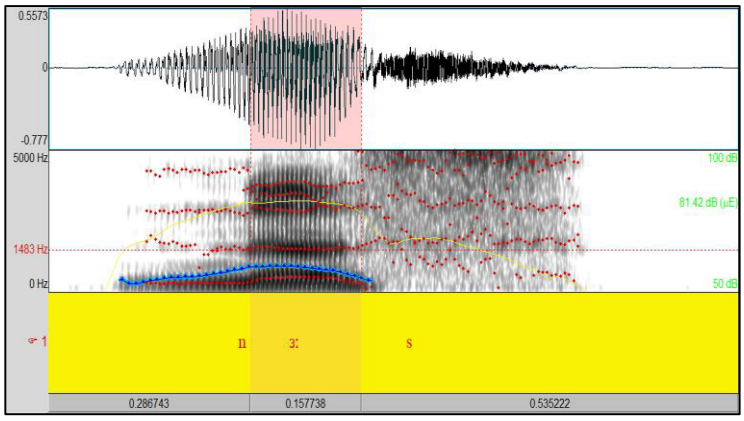
vast difference among the vowels, except for the vowel of ‘among’ which is relatively lower in pitch and in amplitude than the rest.



(a) ‘get’

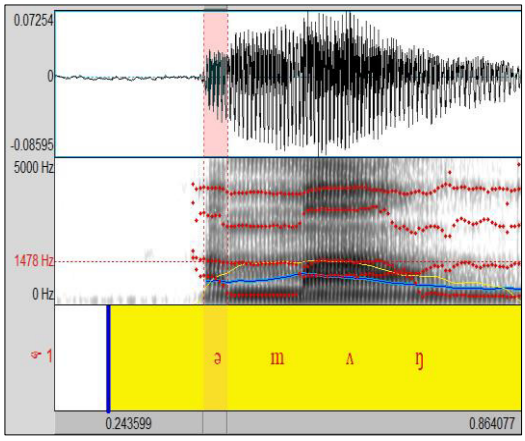


(b) ‘curse’

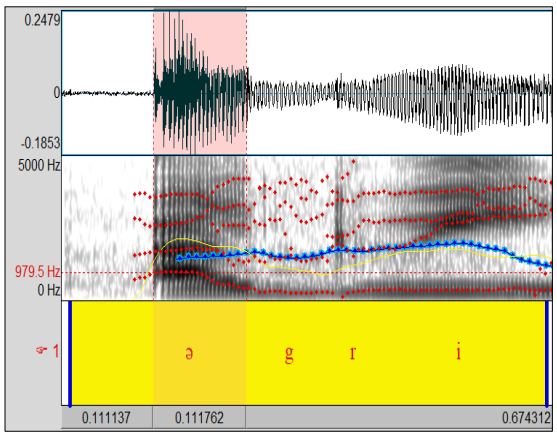


© ‘nurse’

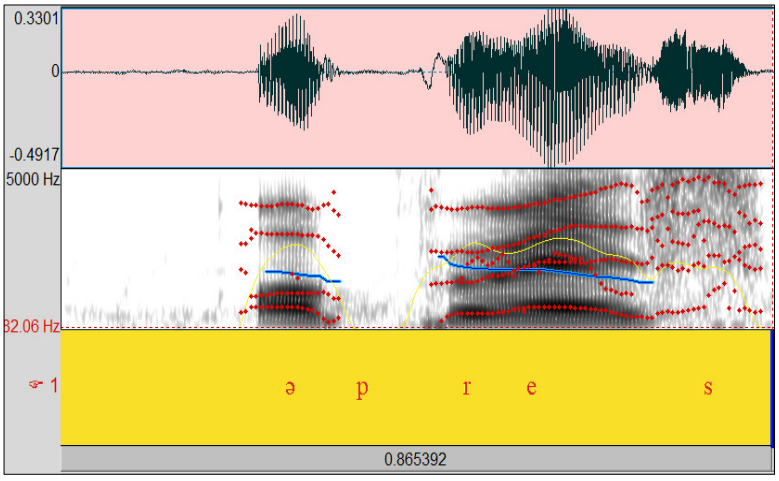
Figure 5.3: Spectrograms of the vowel /e/ of ‘get’; and /ɜː/ of ‘curse’ and ‘nurse’



(a) ‘among’



(b) ‘agree’



© ‘oppress’

Figure 5.4: Spectrograms of the vowel /ə/ of ‘among’, ‘agree’ and ‘oppress’

A careful examination of the spectrograms shows that the formant F2 of the vowel /ɜː/ in ‘curse’ is higher than that of ‘nurse’; /e/ of ‘get’ was pronounced [ɪ], while /ə/ of ‘among’, ‘agree’ and ‘oppress’ was pronounced [ə], [ʌ] and [o] respectively. The tokens of /ɜː/ seems to be the longest in duration. It appears that all the seven variables [e̱], [o], [ʌ], [ɪ], [eː] and [ɜː], identified in the sample with the exception of [ə] were recognised by most of the speakers as fully stressed vowels. It seems therefore that for most of the speakers, the distinction between [ə] and [ɜː] was mainly in pitch and in duration. Similarly, [ə] and [ʌ] were identified as different vowels not only in height but also in pitch and to some extent duration.

This is not to mean however that there were no individual as well as social variations, especially in duration of the vowels. But these distinctions as observed were largely

subtle and so were not considered as variables for analysis. For instance, in some instances the tokens of [ʌ] were longer than those of [ɜː], while [ə] in some cases overlapped with [ʌ] in duration. The only vowel variants considered as long vowels in the sample were [eː] and [ɜː] with majority of their tokens concentrated around 0.170 and 0.168 seconds with their longest token around 0.334 and 400 seconds respectively. The DRESS however seems shorter, with average duration of 0.92, 0.111 and 0.113 seconds. It is also shorter than the lettER vowel which average around 0.73, 0.117 and 0.119 seconds respectively. The possibility of phonological contexts influencing the vowel duration cannot be ruled out entirely. The vowels of the tokens 'third', 'curse', 'heard', head', 'said' and those preceded by the stops /p/ and /t/, for instance, in 'pen', 'creator' and 'letter' were realised relatively long. This is a clear proof of longer duration for vowels in syllables closed by voiced consonants and for those preceded by unvoiced stops, especially unvoiced aspirated stops.

5.3. Results of the DRESS and the NURSE vowels

Figure 5.5 illustrates the F1 & F2 frequencies of the individual tokens of the DRESS and NURSE vowels, plotted on S-transformed scales with F1/S(F1) on the y-axis and F2-F1/S(F2-F1) on the x-axis.

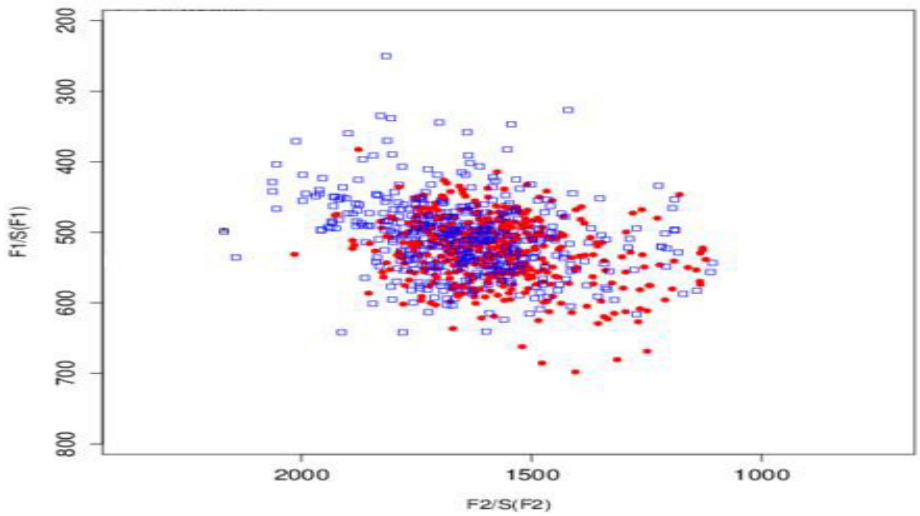
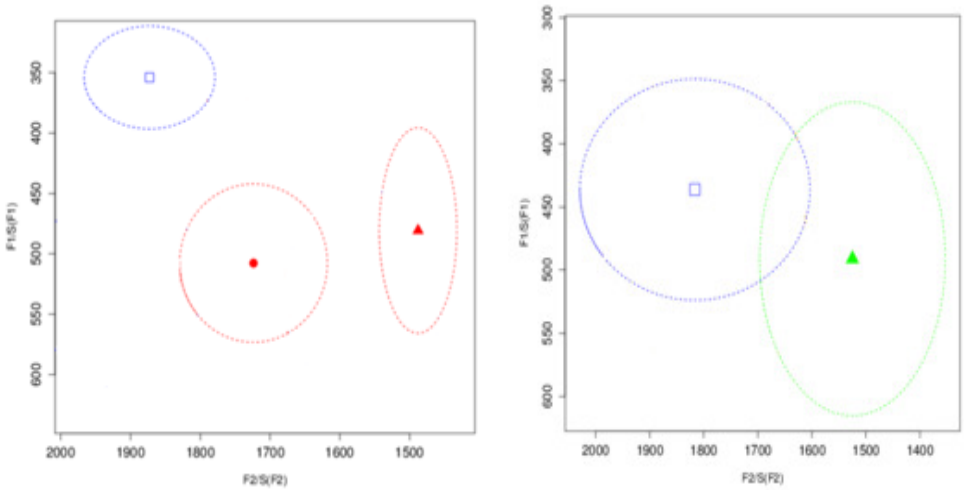


Figure 5.5: S-transformed individual F2 & F1 frequency values of the vowels /e/, and /ɜː/, plotted on S-transformed scales, F1/S (F1) on the y- axis, F2-F1/S (F2-F1) on the x-axis

The Figure above shows the distribution of the NURSE (red dots) and the DRESS (blue dots) vowels. The two vowels, as can be seen from the figure, are so close acoustically to the extent that they overlap each other's space. The vowel space of the NURSE stretches from back to front invading the space of the DRESS, while that of the DRESS stretches from front to back also invading the space of the NURSE. It is difficult therefore to distinguish between the two vowels acoustically. But the DRESS seems to differ slightly as some of its tokens are raised towards /ɪ/, therefore overlapping the space of the KIT vowel in terms of F1 and F2 dimension. The DRESS vowel can be said to have split into three with some of its tokens raised towards /ɪ/, while others are moving towards the qualities such as [e̱] and [ɜː], whilst the NURSE splits into two: front [eː] and central [ɜː] respectively. The positions of the vowels are seen clearer when plotted with their mean formant values as shown in Figures 5.6a and b.



(a) DRESS (b) NURSE

Figure 5.6: Mean F1&F2 frequency values of /e/ and /ɜː/, plotted on S-transformed scales, F1/S (F1) on the y- axis, F2-F1/S (F2-F1) on the x-axis

It is clear from both figures that the DRESS vowel in (a) has three possible allophonic variants: a retracted-raised vowel [ɪ], a retracted-mid vowel [e̱] and a central vowel [ɜː]. The NURSE in (b) has two: a fronted variant [eː] and a central vowel [ɜː]. The central variant is similar to the long central vowel found in many other nonrhotic varieties of British English, symbolised as [ɜː]. It is difficult to think of how these variables could occur in this variety of English allophonically. Nonetheless, their use is

determined by the social characteristics of the speakers, a phenomenon discussed in chapters six and seven. Meaning that for some speakers the phonetic distinction between /e/ and /ɜ:/ and that of /e/ and /ɪ/ are in one way or the other lost in Eʊe English. Figures 5.7 and 5.8 display the spectrograms of the vowels of two male speakers saying the words ‘get’, ‘kept’ and ‘said’.

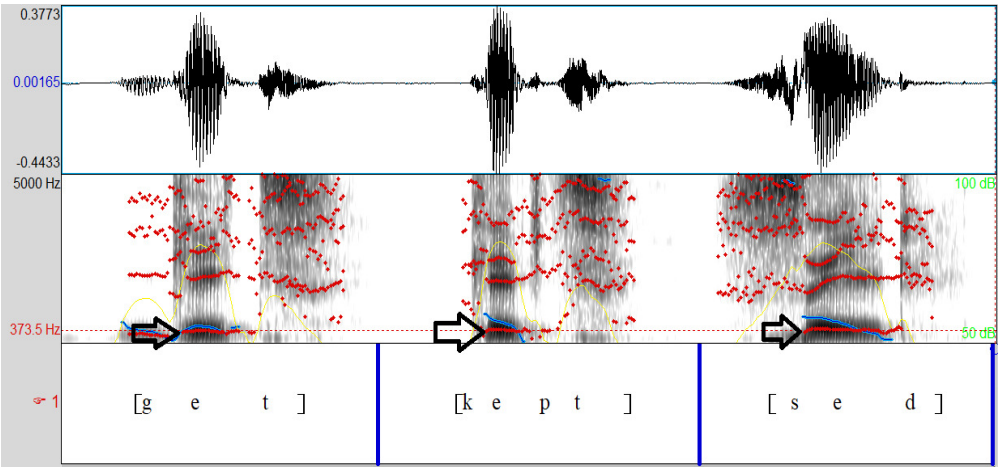


Figure 5.7: Spectrogram of CS saying ‘get’, ‘kept’, ‘said’

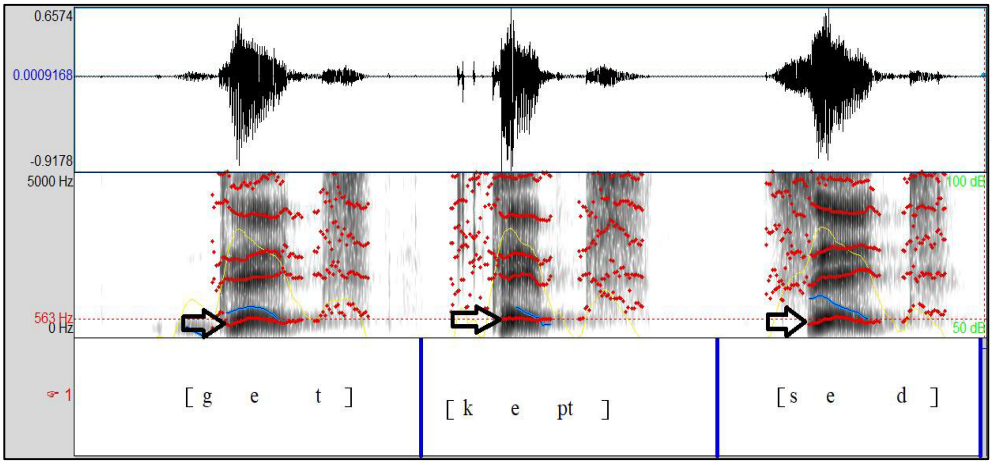
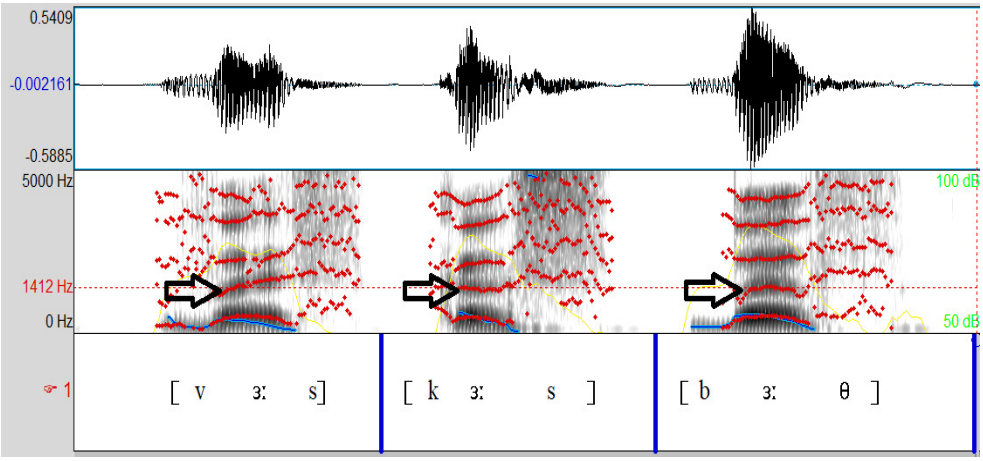


Figure 5.8: Spectrogram of DA saying ‘get’, ‘kept’, ‘said’

The spectrograms in Fig 5.7 and 5.8 show the first formants of the vowels spoken by the two speakers. As can be seen, the F1 is different for each speaker. The F1s of the three words in Figure 5.7 (the F1s of CS’s vowel), for instance, are about 370 Hz, while those in Figure 5.8 (the F1s of DA’s) are around 560 Hz, which are much higher

(a difference of about 190 Hz) than those of CS's. This is a clear indication of speaker variation. While one speaker was raising the nucleus of /e/, the other was trying to approximate to it. A similar speaker variation is illustrated in Figures 5.9 and 5.10 for the NURSE tokens 'verse, 'curse' and 'birth'.



Figures 5.9: Spectrogram of AA saying 'verse', 'curse', 'birth'

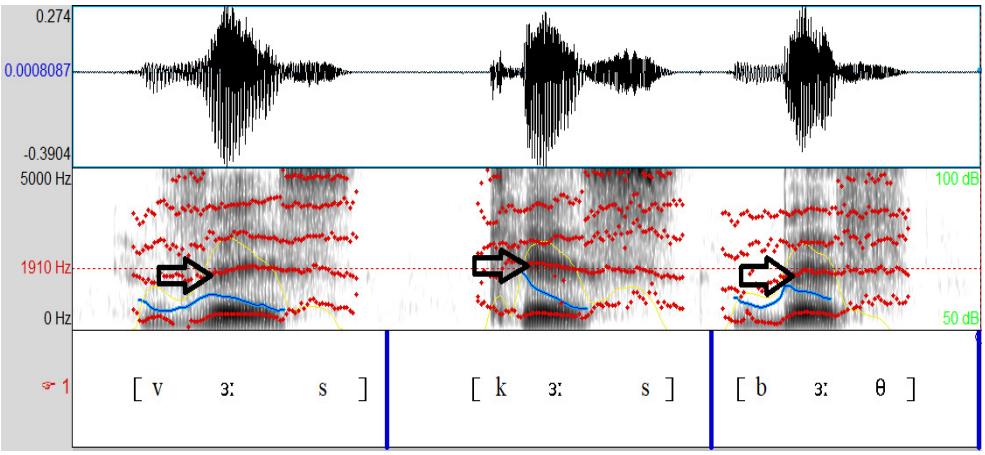


Figure 5.10. Spectrogram of EA saying 'verse', 'curse', 'birth'

The two spectrograms above show differences in the F2 of the two speakers' NURSE tokens: 'verse', 'curse' and 'birth'. AA's F2 values are much lower (1412 Hz) than those of EA's (1910 Hz) for the same tokens; while one speaker's pronunciation was moving towards the centre, e.g. to /ɜː/, the other was moving towards front, e.g. to /e/.

The results then suggest that for some speakers, the quality distinction between /e/ and /ɪ/ is lost, that is, for these speakers, the two vowels have merged into [ɪ]. Words which generally would have had /e/ in traditional RP and some London accents would

have [ɪ] instead, a phenomenon known as 'Pin-Pen merger. Pin-Pen merger is the situation where the front vowels /e/ and /i/ mostly before the nasal consonants /m, n, ŋ/ have lost their distinction so that one hears m[ɪ]mber, for GenAm m[ɛ]mber, m[ɪ]ntality, for Southern American English m[ɛ]ntality, etc. (Wells, 1982). Similarly, in the present study 'pen' /pen/, was realised as [pɪn]; 'head' /hed/ as [hɪd]; 'get' /get/ as [gɪt]; 'said' /sed/ as [sɪd] and so on, therefore giving us the homophones 'pin-pen', 'hid-head', etc. The NURSE and DRESS vowels have equally merged into /e/ for some speakers, hence homophones such as 'heard–head'; 'bird–bed'; 'learnt–lent', 'dirt–debt', etc. become obvious in the variety of English spoken by the Eʊe of Ghana.

The raised variant [ɪ] of the DRESS vowel observed in the sample is inconsistent with Sackyefio (1996) and some other earlier findings which indicate a diphthongisation of the /e/ (i.e. [eɪ]) by Aŋlɔ speakers. It nevertheless, confirms the raising and backing of /e/ observed in many other varieties of the English language across the globe. In South African English (SAE) for example, Wells (1982) notes the raising of /e/ towards a vowel quality similar to /ɪ / or /i/ so that 'yes' /jes/ and 'bread' /bred/ become [jɪs] or [jis] and [brɪd] or [brid] respectively. Maclagan and Hay (2004) reported the raising of /e/ towards a vowel quality similar to /iː/ by some speakers of New Zealand English. To them the vowel /e/, which is usually mid-high front in RP is gradually taking the same acoustic space as the FLEECE /iː/. They also noted that /e/ overlapped the space of KIT /ɪ/ for some speakers, although they found no speaker age and sex variation. But Maclagan, Gordon and Lewis (1999) are of the view that the closer variant [iː], is preferred more by younger female speakers. Wells (1982) and Cruttenden (2001) also found the raised variant of /e/ in Cockney accent, but they believed it was an old-fashioned type of RP. The evidence of this observed among older Cockney speakers can be found in the description of Matthews (1938:169) where the tokens of /e/ in 'get' /get/ and 'cemetery' [ˈsemetri] were pronounced as [g**i**t] and [ˈsim**i**tri] respectively.

Hawkins and Midgley (2005), on the other hand, identified a relatively higher F1 and lower F2 values of /e/ in their acoustic study of RP monophthongs similar to the retracted variant [ɪ], observed in the present sample. Harrington, Palethorpe and Watson (2000) similarly reported a relatively lower F2 in their acoustic study of the Queen's 1950, 1960 and 1980 speeches. In this study, they noticed that the F2 of /e/ in the

Queen's 1980 speech was much lower (i.e. more retracted) compared with the F2 of her earlier 50's and 60's speeches. This shows that the DRESS vowel is not only being raised, but is also being backed in different varieties of the English language. It appears that the DRESS vowel in many varieties of English is gradually shifting to the centre.

It is surprising to see the DRESS and NURSE vowels being merged by some of the speakers in the present study. Since the data were taken from a careful speech style (reading of word-list), one will expect that the speakers would distinguish the tokens of the NURSE from the DRESS. But this is also a strong confirmation of the variable nature of the two vowel phonemes in many varieties of English. Wells (1982), for instance, noticed the variable nature of the NURSE vowel, particularly in accents where the NURSE Merger did not occur. In Scottish and Irish accents, the NURSE vowel is completely absent, whilst in GenAm, it merges with /ʌ/ so that words such as 'ferry' /fˈɜːri/ and 'hurry' /ˈhʌri/ in native English accent, for example, in England rhymed in GenAm, thus [ˈfɜːri-hɜːri], and it is [ˈfʌri-hʌri] in typical Pennsylvania, Scottish, Ireland and West Indies (Wells, 1982:138). The realisation also differs between [ɜː] and [ɝ] depending on whether the speaker has a rhotic or non-rhotic accent. It is r-coloured [ɚː] in some eastern England and Virginia accents, but its non-r-coloured variant [əː], as observed, occurs in RP and appears to be the commonest in England, Wales and some other parts of the UK (Wells, 1982). Similarly, few r-coloured variants of the NURSE were also noticed in the present study, but they were too infrequent to report.

The fronting of /ɜː/ also corroborates Schmied (2009), where he reported a relatively high F2 frequency of /ɜː/ in South African English, thus a move towards the acoustic space of /e/. He was however of the view that the fronted realisation was a deviation from the norm, and also the variant choice depended on the geographical location of the speaker. The next two chapters discussed the influence of dialect/geography and social structures of Eʊe and the use of the three vowel phonemes.

One significant observation made about the result is that the variations in the formant frequencies, particularly in the second formants (F2) of the DRESS are, to some extent, due to coarticulatory effects of the adjacent liquids /l/ and /r/ and the stop /m/ on /e/. The second formants of the DRESS are in several cases low when adjacent to any of these consonants /r/, /l/ and /m/. The F2 of /e/ is mostly lower when preceded or followed by /r/, /l/ and /m/ in the words '**frie**nd', 'v**er**y', 'd**re**ss', 'h**eal**th', 's**ell**' and

‘ass**em**bly’ than in other environments. The central variant [ɜ:], of the DRESS vowel can therefore be said to be partly phonologically conditioned. The lowering effect of the liquid /l/ on the F2 of adjacent vowels have also been reported by Bladon and Al-Bamerni (1976). Also, Tunley’s (1999) comparison of the F2 and F3 frequencies of vowels in /rV/ syllable with those of /lV/ and the null /hV/ environments (syllables) confirms the lowering effects of /l/ and /r/ on F2 of adjacent vowels. She, for instance, noticed that both F2 and F3 frequencies were highly significantly lower in vowels after /r/ than /h/, and that /l/ only has a significant effect on the F2.

Interestingly, the low F2 values of /e/ recorded in this study occurred in two forms: in one form the lowering was deliberate, while the other form was conditioned by adjacent segments. Figures 5.11 and 5.12 show the spectrograms of FA and HB pronouncing the vowel /e/, in the words ‘dress’, ‘health’, ‘sell’ and ‘very’. Although both speakers have similar F2 values (around 1600Hz), it is clear from the audio recordings that HB’s low F2s were as a result of a coarticulatory effect of /l/ and /r/, while FA’s were as a result of his deliberate centring of /e/.

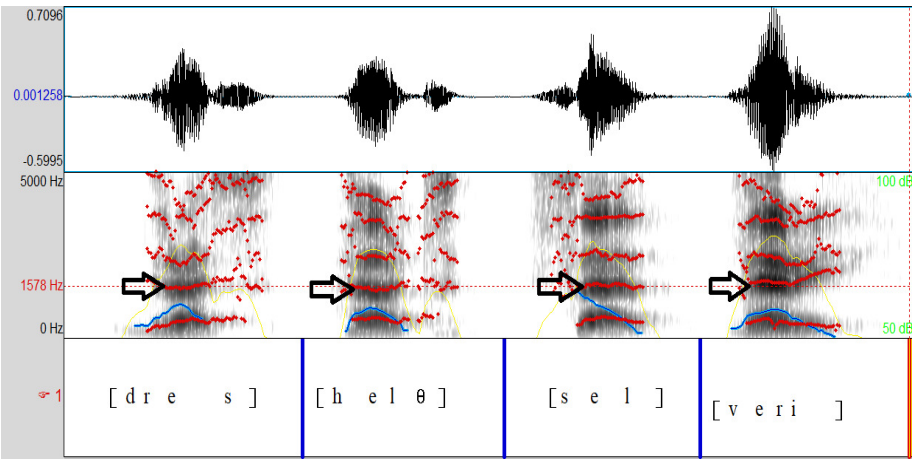


Figure 5.11: Spectrogram of FA saying ‘dress’, ‘health’, ‘sell’, ‘very’

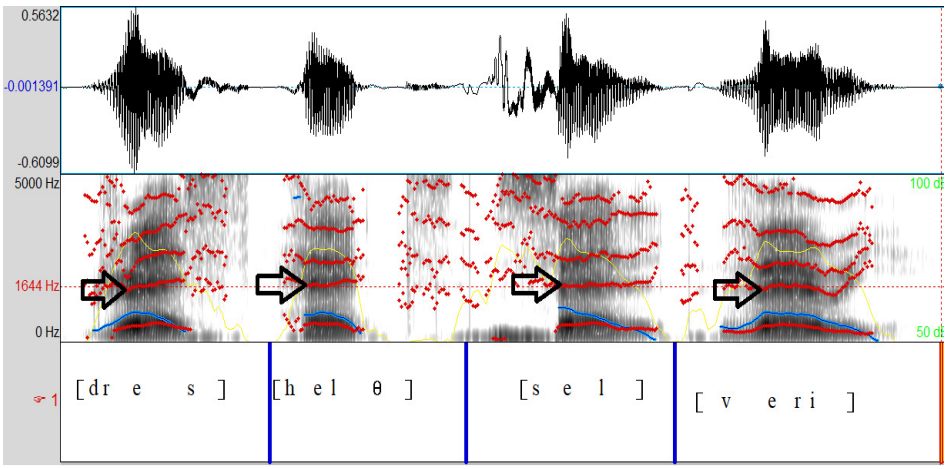


Figure 5.12: Spectrogram of HB saying ‘dress’, ‘health’, ‘sell’, ‘very’

MK and GA’s F2 values in Figures 5.13 and 5.14 are, however, relatively higher (2300/1844 Hz) for the same tokens, except for ‘health’, which is low, meaning that not everyone has low F2 frequencies for /e/ even in these same environments. What is clear from both speakers’ pronunciations is that, MK deliberately centralised the DRESS vowel in ‘health’ and ‘sell’ but fronted that of ‘dress, and ‘very’, while George fronted all, e.g. in ‘dress’ ‘health’, ‘sell’ and that in ‘very’ but fronted that of ‘dress’ and ‘sell’.

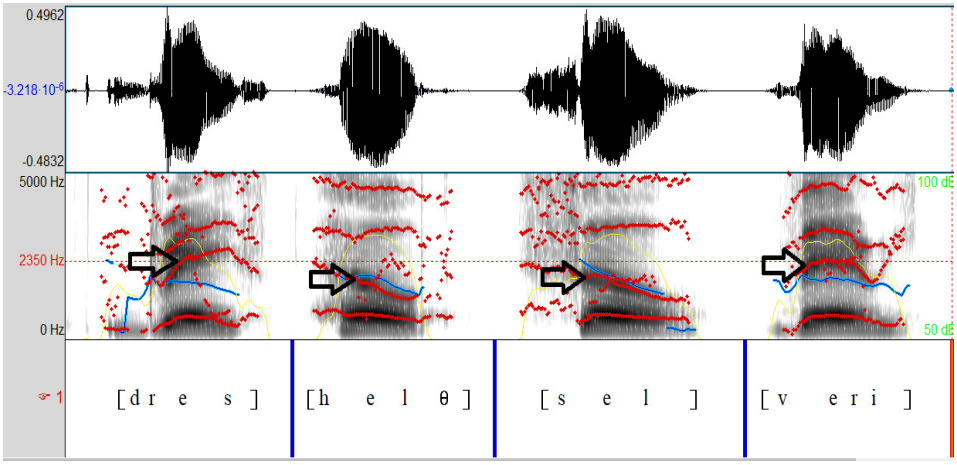


Figure 5.13: Spectrogram of MK saying ‘dress’, ‘health’, ‘sell’, ‘very’

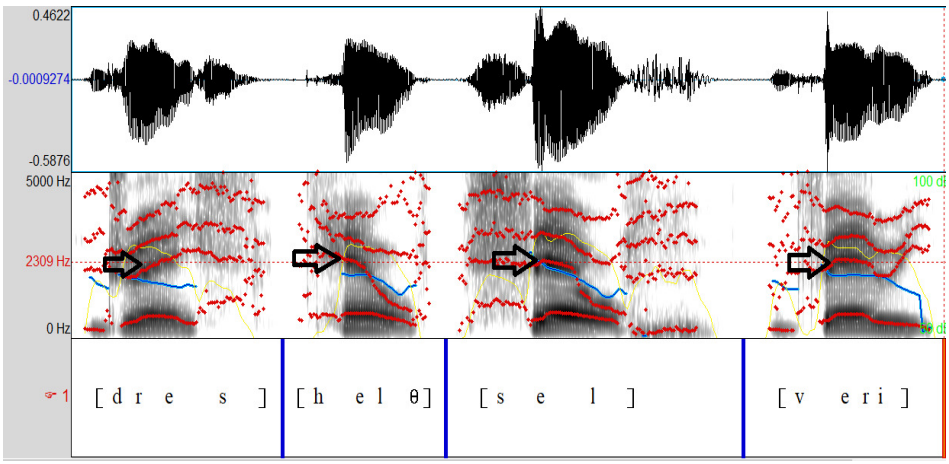


Figure 5.14: Spectrogram of GA saying ‘dress’, ‘health’, ‘sell’, ‘very’

HB’s central variant [ɜ:], of the DRESS can therefore be said to be phonologically conditioned by the environments of /r/ and /l/. The differences in the F2 frequencies of MK, FA and GA are indication of the fact that although the environments of /r/ and /l/ have lowering effects on the F2 of the DRESS, other factors such as social, dialect diversity, speaker attitude and social relations cannot be ruled out.

5.4. The lettER vowel /ə/

The lettER vowel, also known as ‘schwa’ similarly exhibits high degree of variations in height, in backness and in contexts. The variation in height and backness, indicated by F1 and F2 frequencies are illustrated in Figures 5.15a and b. In the figures, the mean F1 and F2 values of all the vowels of the individual tokens of schwa are plotted on S-transformed scales, with F1/S(F1) on y-axis, and F2-F1/S(F2-F1) on x-axis.

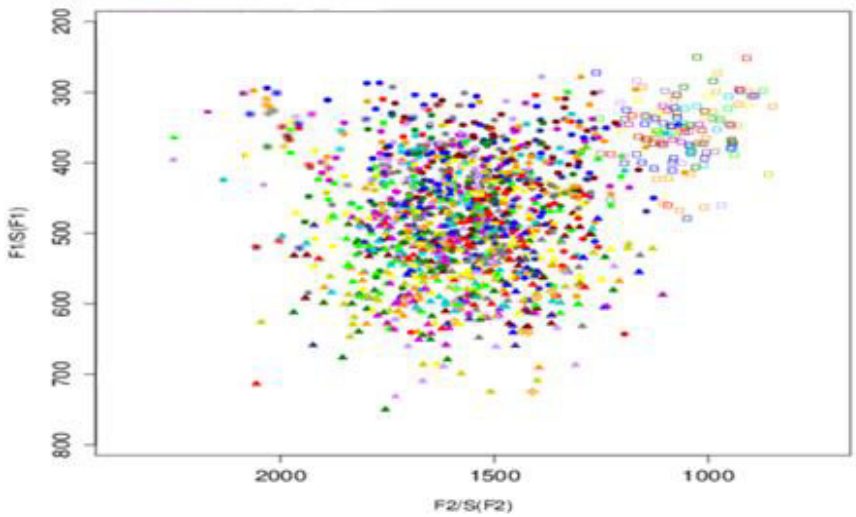


Figure 5.15: Individual F1 & F2 frequency values of /ə/, measured at a steady state, plotted on S-transformed scales, F1/S(F1) on y- axis, F2-F1/S(F2-F1) on the x-axis

It is interesting looking at Figure 5.15 the high variability in the formants of the schwa vowel, covering the full range of the acoustic vowel space, from high to low and from front to back. The schwa vowel is so variable to the extent that it overlaps the acoustic spaces of several other vowels in the English vowel system. Thus if we compare the range of variation in the schwa vowel with the text-book description of the RP vowels, different phonetic variants immediately come to mind: high and low vowels in terms of height; front, central and back vowels in terms of backness. The relative positions of the phonetic variants are seen clearer in the ellipse in Figure 5.16 in the next page.

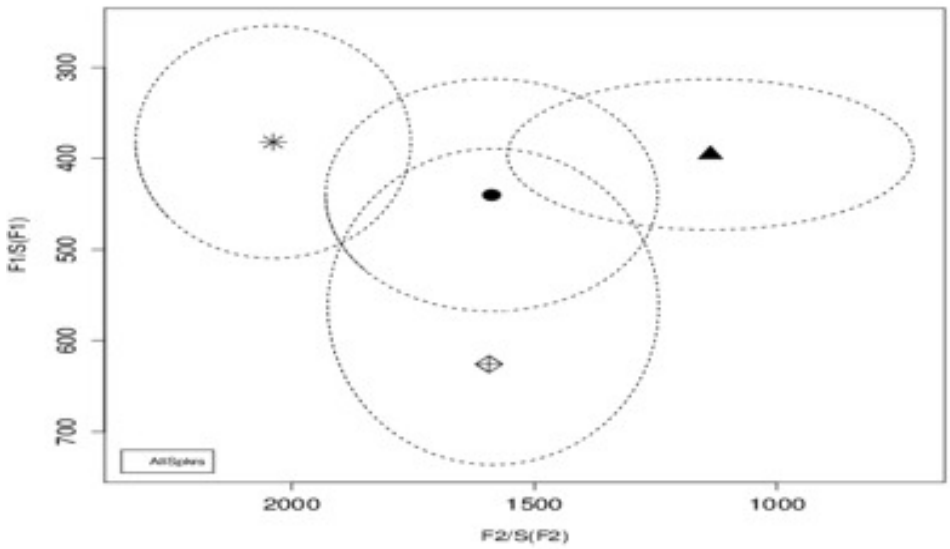


Figure 5.16: Mean F1 & F2 frequency values of /ə/, measured at a steady state, plotted on S-transformed scales, F1/S(F1) on y- axis, F2-F1/S(F2-F1) on the x-axis

The mean frequency values of the first and second formants of the vowel /ə/ in Figure 5.16 clearly show the different qualities of schwa. These, using the IPA chart and the text-book description of the RP vowels, correspond to the retracted-raised [ɪ], mid-high central [ə], mid-low central [ʌ] and mid-high back [o] vowels respectively. That is, the phonetic differences between schwa /ə/ and other English vowels, for example, the STRUT vowel /ʌ/, are lost. The loss in phonetic distinction between /ə/ and /ʌ/, confirms the general difficulty in distinguishing the two vowels phonetically. In GenAm English the acoustic difference between the two vowels is most often not very clear. Wells (1982) reported the use of the unstressed /ə/ for /ʌ/ in British English. Both vowels are most often considered allophones of the same phoneme. Some speakers even believe that /ʌ/ is nothing but a schwa /ə/ in Standard Southern British English. But the two vowels are different from each other, while /ʌ/ is a full vowel whose identity forms an integral part of an utterance, /ə/ is always unstressed and its identity does not form part of an utterance.

Variation in schwa is so common that some linguists describe it (schwa vowel) as a 'phonological beast' arising from the sound structure of words. Others attribute the variation to speakers' careless attitude towards its articulation; its articulation can vary anywhere between high to low even within the speech of a single individual. Delattre (1965), for instance, found that a larger proportion (about 90%) of unstressed vowels

in English are realised as ‘some variety’ of schwa compare to the proportion of central vowels found in French, German and Spanish. This claim is confirmed by the findings of the present study as there are four different kinds of schwa in the data. The results also agree with Lass (2006), who reported seven different types of schwa vowel in his dialect of English. Lass therefore questions the labelling of schwa vowel with a single symbol [ə] since he believes this can be misleading due to its high variability. The mid-central realisation [ə], of the schwa vowel observed in the present study, thus discredits the findings of some of the previous studies, which indicate that schwa does not exist in Ghanaian English, and in non-native varieties of English in general. The different allophonic variants of schwa discovered in the present study is, therefore, not a misnomer, and it is not peculiar to non-native English variety alone.

It is important we note, however, that the variations in height of the schwa as indicated by F1 could be due to vowel-to-consonant coarticulation; the schwa may be assimilating to its neighbouring segments. There is the general observation that schwa lacks a well-defined vowel target, or has a relatively little articulatory target, and so easily assimilates to its surrounding segments. It can vary across contexts, especially in English and Dutch (Flemming, 2007). Largely, the first formants of schwa are higher in the environments of low vowels, which in general have high F1, but are lower when adjacent to high vowels, which naturally have low F1 values (Flemming, 2004). This occurs because the tongue body and jaw height vary in relation to vowel height. High vowels with relatively small vocal cavities have low F1 values, whilst low vowels with large vocal cavities have high F1 values. The value of F1 will increase as the vocal tract opens more and more for the low vowels, and vice versa.

Again, stop constriction lowers F1, so the presence of any stop can also lower the formants of any adjacent vowel including the schwa. Thus, the situation can be more complex than we think. If the vowel (schwa) is followed by a high vowel, for example, in ‘creator’ /kreɪtə/, the body of the tongue will be relatively high during the vowel /eɪ/, but will have to lower during the stop closure /t/. What this means is that even though the schwa vowel may be adjacent to a high vowel which naturally has low F1, its F1 value may vary with reference to the consonant contexts. The schwa may assimilate to the lowered tongue body position of the stop thus reducing the F1 significantly.

The effect may also vary according to the type of consonant that precedes or follows the vowel, that is, it may respond differently to different articulators. For instance, all constrictions lower all formants, but labials have the highest lowering effects, followed by alveolars and then the velars. Assimilating to an adjacent stop will lower the F1 of schwa, for example, in '**ab**out', '**ag**ree' and 'crea**tor**', thus making the F1 of schwa in these syllables considerably lower than the F1 of schwa after /v/ in 'fa**vour**', and after /ð/ in 'fa**ther**'. As said earlier, the situation is not all that simple, the fact that there is an adjacent high or low vowel does not necessarily mean that the F1 will be low or high, the type of adjacent consonants play a very significant role in determining the extent of the effect.

Variation in backness of the schwa vowel indicated by F2 could also be contextual. In the view of Farnetani (1990), most vowel variation in English is in the front-back dimension because English has fewer vowels distributed along this horizontal plane than vowels which are distinguished by height. The F2 frequency values of schwa are usually relatively higher in the contexts of front vowels, which also have higher F2, but lower when adjacent to back vowels, stops and liquids. The body of the tongue assimilating to the preceding back vowel /a/ in 'father' or to the stop /t/ in 'doctor', or to the approximant /l/ in 'colour' may lower the F2 of the schwa considerably since both back tongue body and labial constrictions tend to lower F2.

The influence of segments, especially stops on vowels is believed to have been caused by constriction during stop closure. During continuous speech, the movements of the articulators will depend on the preceding or the following segments; the articulators will be in different positions depending on the preceding segment and will be preparing for the following segment in advance (Ladefoged 2006). As schwa in the syllable [tə] of 'doc**tor**' is being made, the alveolar closure will be ready for the stop /t/, but even before the closure is released, the tongue body must be lowered in anticipation of the schwa vowel. So before the closure is released, the shape of the vocal tract is already formed for the schwa and so when the closure is released the formants will move accordingly, thus lowering the formant (Löfqvist & Gracco, 1999). The alveolar constriction during the articulation of /ə/ might lower the F2. However, since consonants and vowels coarticulate, the positions of the articulators during the consonants will also depend on the adjacent vowel.

Flemming (2004) notes that the high susceptibility of schwa to coarticulatory effects is due to its short duration. An articulation of a segment requires a movement of articulators from a target position of a previous segment (if there is any) to the position of a following one. So as the duration of the vowel decreases, there is bound to be a target 'undershoot'; as the duration decreases, it becomes difficult to reach the vowel target, especially if the vowel target is far from the target positions of the preceding segment (Flemming, 2004; Lindblom, 1963). There is also the argument that short vowels, especially low vowels are increasingly being raised as a result of reduction in their durations.

It is important we recognise that although there is enough evidence to prove that vowel and consonant contexts affect formant frequencies of schwa vowel, the claims made in the present study remain as an assumption. Though there are tendencies among the speaker groups to prefer certain contexts as opposed to others for [ə] or for [o], this situation is inconsistent in the sample. In the same environment, for instance, we see the F2 of /ə/ high for one speaker group, but low for another group. Also there has not been any direct experiment to test the effect of vowel and consonant contexts on the schwa vowel in the present study. Thus, to be very certain of this claim, we would need a specific experiment to compare (to test) the schwa vowel in different phonetic environments, including 'null' environment.

Variations in the vowels could also perhaps be social, dialect-specific, or idiolectal effects; hence may not be explained in terms of production or phonological patterns alone. Fronting and raising of /ə/ to [ɪ] or its back form [o] may be a mark of class, gender/sex or a mark of age differentiation. It could equally be a convention adopted by the speakers, or an approximation to vowel qualities heard in other varieties of English. In the next two chapters therefore, the results of the statistical test performed to examine the effects of social structures and their effects on the variables used are discussed.

Chapter Six: Statistical Results

6.1. Introduction

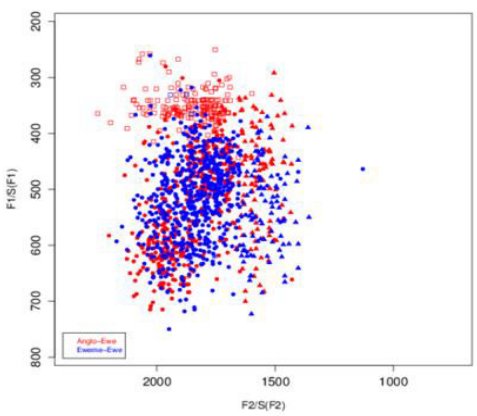
The results of the experiment in the previous chapter suggest that the three RP vowels although differ from one another, they are variable within themselves and among the speakers, suggesting some level of inconsistency in their usage. We noticed that although there seemed to be phonological contexts having some effects on the vowels, it was necessary to explore other factors. In this chapter, therefore, the variants of the DRESS /e/, NURSE /ɜː/ and the lettER /ə/ were correlated with the social variables: age, gender, education, dialect and social network. The data were subsequently coded using SPSS for the statistical comparison. Meaning that each of the [ɪ], [e̞], [ɜː], [eː], [ə], [o] and [ʌ], identified as the variants of the three vowel phonemes were assigned numerical values to transform them into measurable/quantitative data. The values/numbers assigned to the variables were imputed into the SPSS and were later pulled together with the help of Test Analytics for Surveys (TAfS), a tool for Predictive Analytic Software (PASW) Version 18. From this, tables and graphs were produced directly for each individual variant realised by each speaker. The scores for each participant were then calculated by averaging across the entire data for each variant used by each speaker; the scores were used to represent the speaker's overall usage of each variants of /e/, /ɜː/ and /ə/. The group means were later calculated and then compared with the scores across the different groups. This means that the frequencies of occurrence of each variant in the data were determined according to the individual's usage and then across groups.

Two statistical tests: an independent sample t-test and an analysis of variance (ANOVA) were used to find out statistical inferences between and among the different groups. The t-test was set to find out the differences between the two independent groups, whilst the ANOVA was used to test the statistical differences within same social groups and their social relations. Both methods made it possible to calculate the margin of differences (effect size) between the two independent groups via Eta Square statistics. A $P < 0.05$ (5% significant level) was set as the cut-off point for the P-value (i.e. as the standard level). The P-value was reported as 'significant' or 'very' significant depending on how close to zero the value was. If the P-value was very close to or less than 0 it was reported as highly significant, and was an indication that the

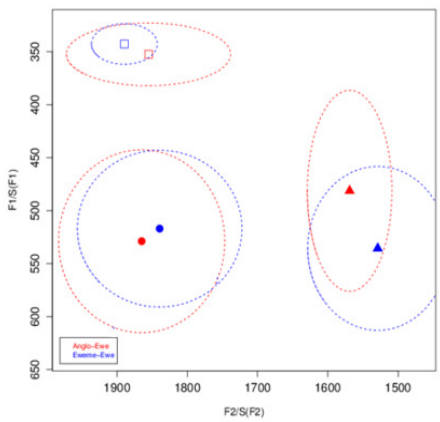
observed difference was unlikely to be due to chance. But if the value was greater than or above 0.05 (P> 0.05), it suggested an insignificant or no difference between the groups, and was an indication that the difference was likely to be due to chance. A single star attached to *P< 0.05 indicated significant and two stars **P< 0.01 indicate 'highly' or 'very' significant. The test was applied separately to each variant used with age, gender, social network and education across the two dialect regions. The next few sections discussed the results of the statistical analysis. In each of the cases, the acoustic spaces of the individual vowels of each social group were compared using F1 and F2 frequency values.

6.2. Dialectal Variation

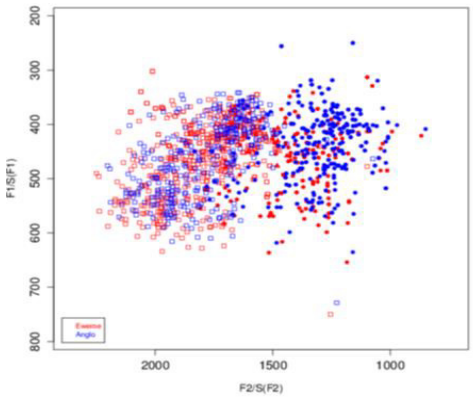
One of the aims of this study was to examine whether dialect diversities in Eʊe language had any effects on the pronunciations of the three vowel phonemes /e/, /ɜː/ and /ə/. Two dialect speaker groups: Aŋlɔ and Eʊeme were subsequently correlated with each of the phonetic variants [ɪ], [e̱], [eː], [ɜː], [ə], [ʌ] and [o]. The results presented in Figures 6.1 show some degree of variation in the formants of the two groups. From the figures, we realise that the vowel spaces for the two dialect speakers vary despite the fact that they appear to cover similar regions. The vowel space of the DRESS for Aŋlɔ speakers (red dots) is relatively wider in terms of height than that of the Eʊeme speakers (in blue). The space of the NURSE for Aŋlɔ speakers appears relatively more central (i.e. lower F2 mean), whereas that of Eʊeme is more fronted (i.e. higher F2 mean). The two group of speakers however, seem to converge in their space for the lettER vowel.



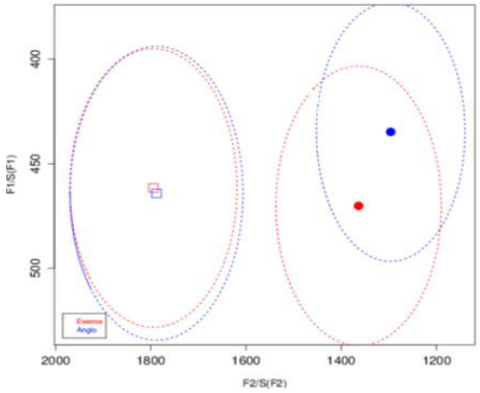
(ai) Individual formant values of /e/



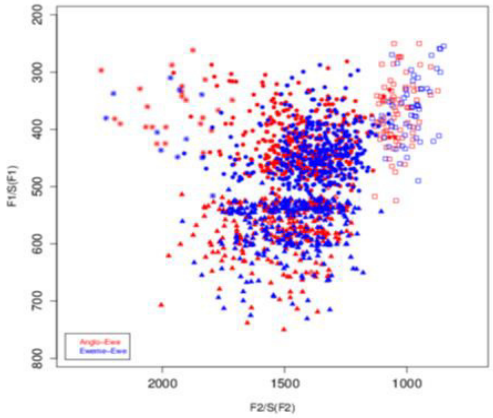
(aii) Mean formant values of /e/



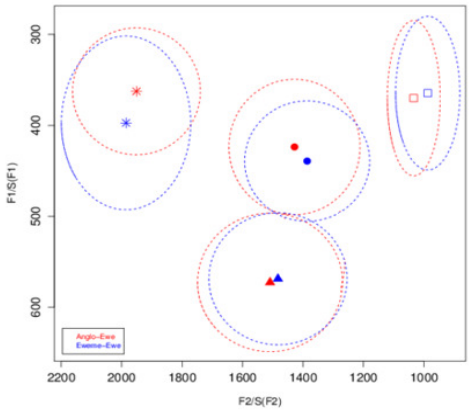
(bi) Individual formant values of /ɜː/



(bii) Mean formant values of /ɜː/



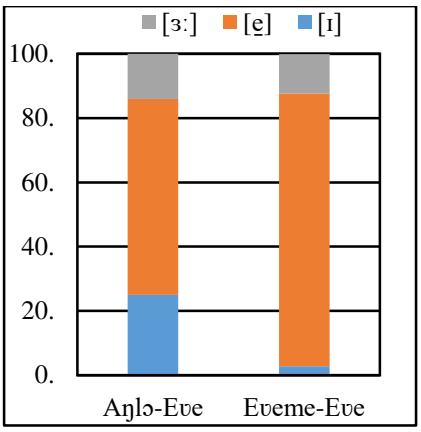
(ci) Individual formant values of /ə/



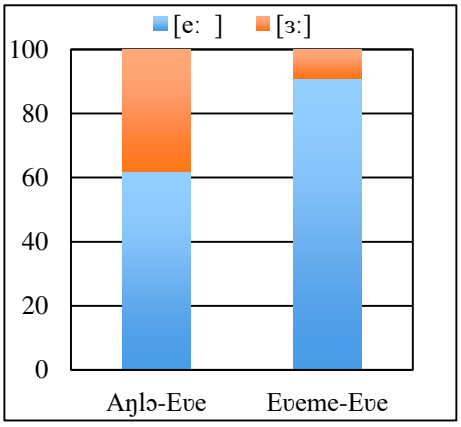
(cii) Mean formant values of /ə/

Figure 6.1: Individual and mean formant frequency values of /e/, /ɜː/ and /ə/ measured at a steady state, plotted on S-transformed scales, F1/S(F1) on y- axis, F2-F1/S(F2-F1) on the x-axis spoken by speakers across Ewe

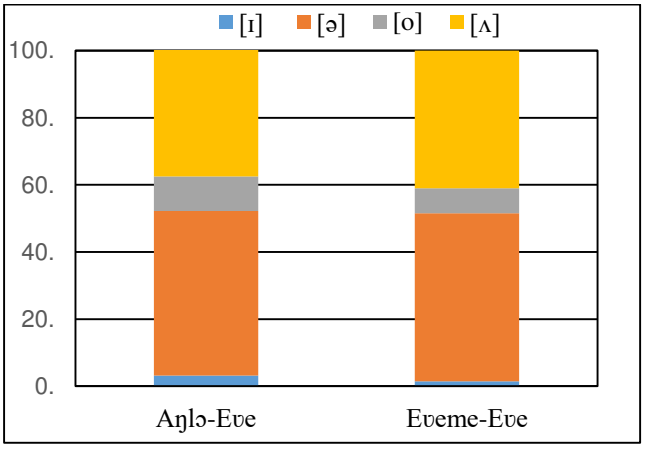
Differences in the formants within each vowel category suggest some inconsistency in the realisations of the vowels. From the vowel plots, we see a possible alternation among [e̱], [ɪ] and [ɜː]; and [ə], [ʌ], [o] and [ɪ] for the DRESS and lettER respectively, and between [eː] and [ɜː] for the NURSE. That is, the speakers either used one variant with a reasonable degree of consistency or alternated between two or more variants of the same vowel. The variants used for each vowel phoneme by each speaker group become easier to visualise with the figures converted into percentages and presented in graphic forms as in Figures 6.2a, b and c.



(a) DRESS



(b) NURSE



(c) lettER

Figure 6.2: Percentage (%) distribution of the DRESS, NURSE and the lettER vowels according to dialect region

The figures show the results of group by group distribution of the DRESS (a), NURSE (b) and lettER (c) vowels. It is obvious from the graph that Aŋlɔ speakers alternated among all the three variants [ɪ], [ɜː] and [e̱], of the DRESS, whereas Eʊeme speakers were mainly between [e̱] and [ɜː]. Meaning that for Eʊeme speakers, the retracted-raised [ɪ] was more or less absent in their speech, except for eleven tokens (1.5%) out of a total of 720. This was true also with the fronted [eː] and the central [ɜː] variants of the NURSE. Eʊeme speakers seemed to have more preference for the fronted variant [eː], while Aŋlɔ speakers alternated between both [eː] and [ɜː]. It is evident therefore, that the two dialect speakers significantly diverged in realising the DRESS and NURSE vowels, while converging virtually for the lettER vowel. A test was

performed (see Table 6.1) to examine the level of significance between the speaker groups. The observed results were highly dissimilar for some of the variants. The retracted-raised [ɪ] was found to be somehow characteristic of Aŋlɔ speakers, while the retracted-mid [e̞] was restricted largely to Eʋeme dialect speakers, notwithstanding, it may be highly favoured by some section of Aŋlɔ. This conclusion was drawn based on the high significant difference (p≤.000) observed between the two dialect speakers for both variants.

The central realisation [ɜː] of the NURSE also seemed to be typical of Aŋlɔ; that is, they showed an extremely higher preference for it than the Eʋeme speakers, whilst the fronted (the peripheral variant) [eː], appeared to be the preferred form for Eʋeme speakers. From Table 6.1, we notice that the two groups of speakers differ highly statistically significant (p≤ .000) for both [eː] and [ɜː] realisations, with Aŋlɔ speakers showing a higher preference for [ɜː] than Eʋeme speakers.

Table 6.1: Distribution of NURSE vowel by dialect region

Variables	Dialect	N	Mean	Std. Dev.	t-value	Sig.	η^2
[e]	Aŋlɔ-Eʋe	48	9.250	6.086	-4.708**	0.000	0.191
	Eʋeme-Eʋe	48	13.625	2.101			
[ɜː]	Aŋlɔ-Eʋe	48	5.740	6.000	4.700**	0.000	0.180
	Eʋeme-Eʋe	48	1.375	2.101			

Source: Field Data, 2017 **p<0.01 df = 94 (N = 96)
Where Eta Square = η^2, standard deviation = Std. Dev.

Table 6.2: Distribution of DRESS vowel by dialect region

Variables	Dialect	N	Mean	Std. Dev.	t-value	Sig.	η^2
[ɪ]	Aŋlɔ-Eʊe	48	3.833	5.669	4.512**	0.000	0.178
	Eʊeme-Eʊe	48	0.125	0.531			
[e̱]	Aŋlɔ-Eʊe	48	8.896	5.875	-.615**	0.000	0.185
	Eʊeme-Eʊe	48	12.958	1.637			
[ɜː]	Aŋlɔ-Eʊe	48	2.271	2.566	0.820	0.414	
	Eʊeme-Eʊe	48	1.917	1.541			

Source: Field Data, 2017 **p<0.01 df = 94 (N = 96)
Where Eta Square = η^2, standard deviation = Std. Dev.

The distribution of the variants of the lettER vowel in Table 6.3 is rather similar, there was no significant variation between the two groups for the choice of its variants, except for variant [o], which showed some level of significant effect (p<.014], with Aŋlɔ speakers likely to show more preference for it than Eʊeme speakers. The actual difference in the mean scores between the two groups was moderate. The effect size, calculated using eta square, was 0.063 which was small, meaning that only about 6.3 percent of the difference was due to dialectal variation.

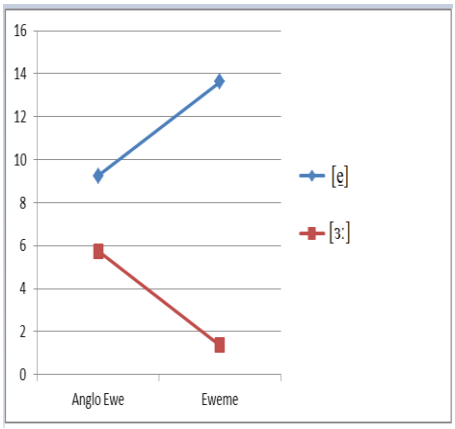
Table 6.3: Distribution of lettER vowel by dialect region

Variables	Dialect	N	Mean	Std. Dev.	t-value	Sig.	η^2
[ɪ]	Aŋlɔ-Eʊe	48	0.313	0.589	0.966	0.336	
	Eʊeme-Eʊe	48	0.208	0.459			
[ə]	Aŋlɔ-Eʊe	48	6.479	3.725	0.027	0.978	
	Eʊeme-Eʊe	48	6.458	3.809			
[o]	Aŋlɔ-Eʊe	48	1.521	0.772	2.518*	0.014	0.063
	Eʊeme-Eʊe	48	1.167	0.595			
[ʌ]	Aŋlɔ-Eʊe	48	6.687	3.327	-0.680	0.498	
	Eʊeme-Eʊe	48	7.167	3.575			

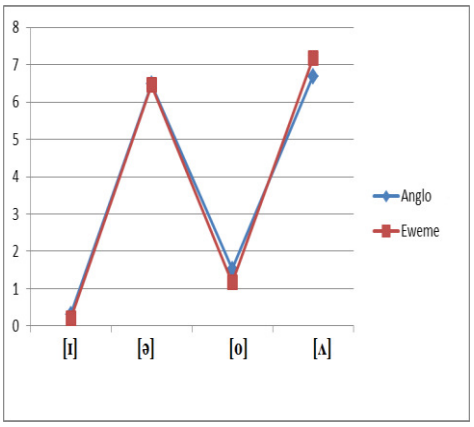
Source: Field Data, 2017 *p<0.05 df = 94 (N = 96)
Where Eta Square = η^2, standard deviation = Std. Dev.

Obviously, there is a huge linguistic difference between Aŋlɔ and Eʊeme speakers of English in Ghana, at least for the DRESS and the NURSE vowels. For instance, a margin of differences of (η^2) = 0.178, (η^2) = 0.185; and (η^2) = 0.191, (η^2) = 0.180 (that is, 18.5 percent) between the two dialect speaker groups for the choice of [ɪ] and [e̱], and those of the NURSE [eː] and [ɜː] according to Cohen's (cited in Cohen et al. 2007) guidelines for interpreting eta square is large. Meaning that on average, 18 per cent

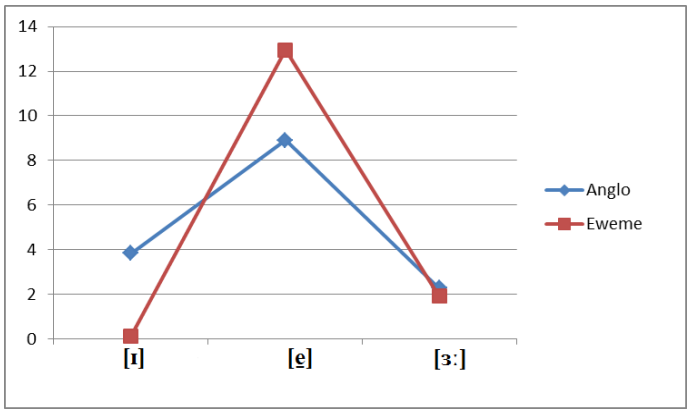
difference between the speakers can be attributed to dialect diversities in the Eʋe language, and this is large enough to accept the results as the effect of dialect difference. These differences are confirmed by the hierarchical graphs in Figures 6.3a, b and c below. In (a) and (c), we notice a huge divergence between the groups for the DRESS and NURSE vowels. The convergence in graph (b), on the other hand, shows how similar both speakers are in realising the lettER vowel, and it also confirms the insignificant effect of dialect on this vowel among Eʋe people of Ghana.



(a) NURSE



(b) lettER



(c) DRESS

Figure 6.3: Hierarchical graphs showing group mean frequencies for the tokens of the NURSE, lettER and DRESS vowels

6.2.1. Discussion

The result of the statistical test suggests that statistically, the two dialect speakers differ in their use of the DRESS and the NURSE vowels but not for the lettER vowel. However, in theory the divergence in their speech seems to be more associated with their geographical locations. It is clear from the data that the raising of the RP /e/ to the position of [ɪ] has nothing to do with the centering of the Eʊe /e/ to [ə] reported in the Aŋlɔ dialect. Also the F1 of the RP /e/ found in this study, is seemingly higher among Eʊeme speakers than the lowered form [ɛ] found in their L1 (see chapter 2, section 3.1). The location of the two dialect speakers rather appears to have a direct impact on the use of the vowel phonemes. The divisions in the Eʊe language, for example, are to a large extent attributed to the present locations of the Eʊe people after their historic split from Tsevie upon leaving Notse (see chapter 2, section 2). It is known that the Eʊe language used to belong to a definable 'speech community', who lived in one place at one time and hence, shared the same or similar linguistic norms; the speakers understood each other and, the rules and regulations of the language usage were clear and well understood. However, since their exodus from Notse, the Eʊe language has seen a massive division leading to three major dialects, although in principle they are more.

Geography is known to have a huge impact on language by indirectly constraining how humans come into contact with one another. It is a common knowledge that 'inhabitants of a settlement, a village, or a town talk much more to each other than to the person who lives elsewhere' (Bloomfield, 1933: 476). Any break in this communication can lead to a drift in their speech form. In the past, for example, communities separated by mountains and rivers were known to accumulate some peculiar speech forms over decades due to limited movement and communication, while regions with broad and flat geographical features were believed to have had successive waves of language groups replacing each other over long periods of time. Everett (2013) has shown that people who live in areas with high altitude have more ejective consonants than those in lowland areas. That is, low pressure allows for easier use of ejective consonants, although this finding is highly debatable. Social and religious barriers such as pockets of tribal/ethnic and religious conflicts that have plagued the Eʊeland have equally become geographical barriers that inhibit movements

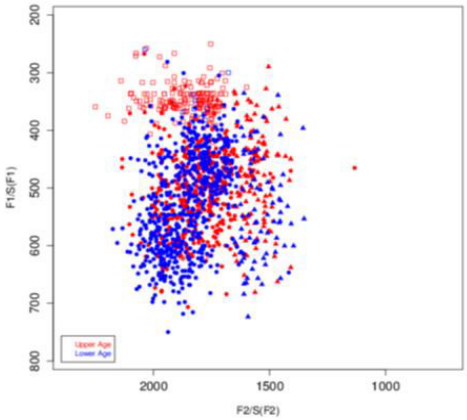
of individuals. These factors can therefore cause variation in the speech of the individuals isolated in particular part of a single town or city. The survival of the Scottish Gaelic in the western isles of Scotland only and that of Maori to the far north and east of New Zealand due to isolation (Holmes, 2008) confirms this.

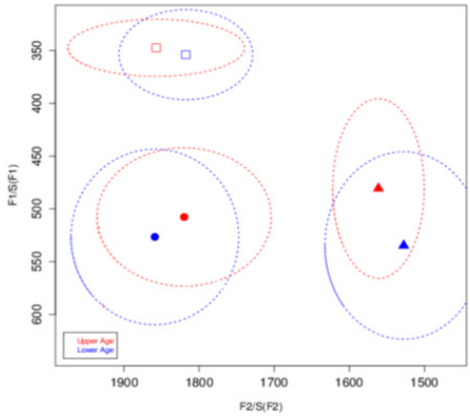
But the question now is, can one's geographical location constraint their linguistic behaviour in this econo-technical world, where mobile communication and online technologies have created complex socio-communicative environments making communication easier? Answers to such a question will certainly vary. To Wells (1982: 8), 'the word *accent* exists and may be socially distinct, whether perceived as inferior (vulgar accent), or superior (posh accent, or affected accent), however, it is most often geographically distinct. An individual's speech can therefore be directly linked with the environment in which he or she is raised and to which he or she is exposed even in this contemporary world. Again, the impact of geographical space on language, particularly English, leading to the present regional and national varieties of English cannot be a delusion.

6.3. Age variation

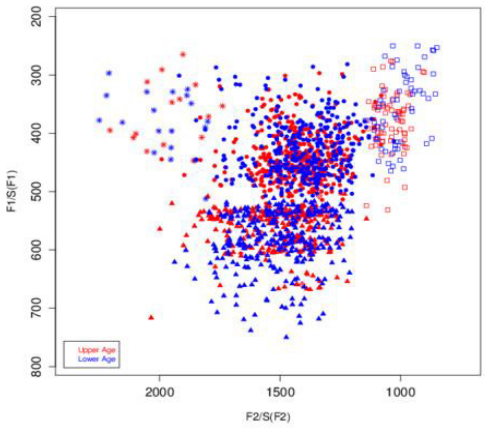
6.3.1. Age variation across Eʊe

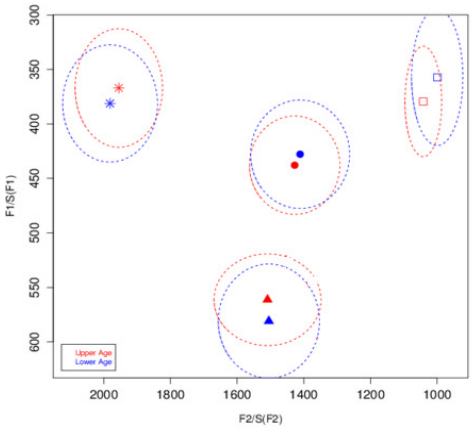
One other interesting area examined in this study was speaker age and the use of the variables /e/, /ɜː/ and /ə/. The purpose was to determine the effect of age on the use of the three vowels across the entire Eʊe. A statistical test was applied separately to the different age groups: Young age versus Old age across the two Eʊe communities. First, the vowel spaces of each speaker group were compared using group mean F1 and F2 frequency values of each vowel. Figures 6.4a, b and c show both individual formant and group mean frequency values of the individual tokens spoken by the two age groups across Eʊe.



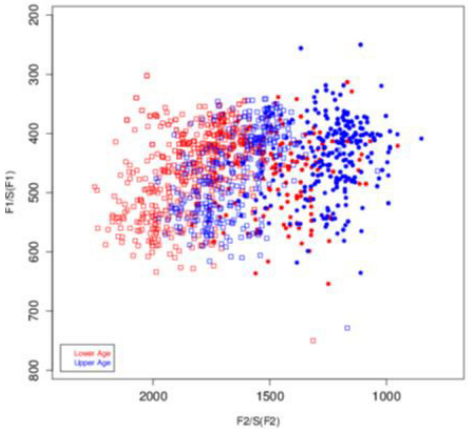


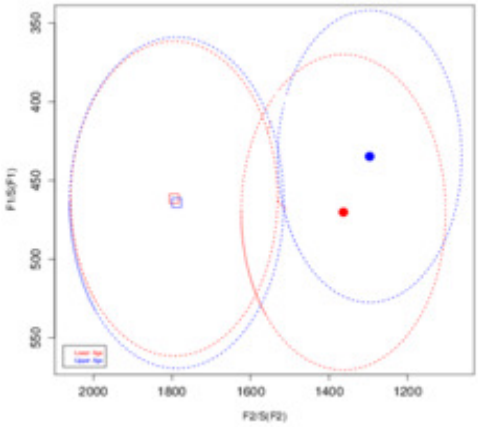
(ai) Individual formant values of /e/ (aii) Mean formant values of /e/





(bi) Individual formant values of /ə/ (bii) Mean formant values of /ə/



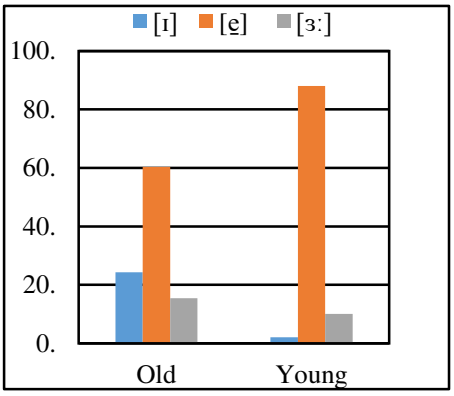


(ci) Individual formant values of /ɜː/ (cii) Mean formant values of /ɜː/

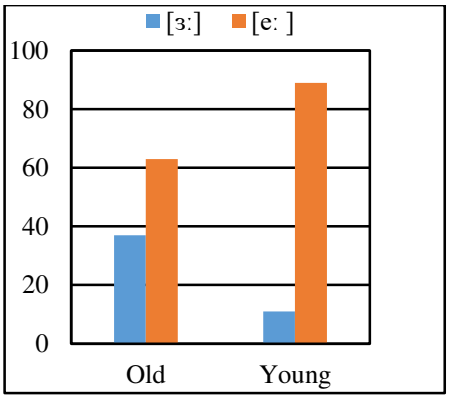
Figure 6.4: Individual and mean formant frequency values of /e/, /ɜː/ and /ə/ measured at a steady state, plotted on S-transformed scales, F1/S(F1) on y- axis, F2-F1/S(F2-F1) on the x-axis spoken by speakers across Ewe

The red dots in all the figures indicate the vowel space for older age speakers, and the blue show that of the younger age speakers. From all the figures, we see differences in the formant frequencies within each vowel category. The DRESS in (a) occupies roughly three positions for each of the speaker groups while the NURSE in (b) occupies two different positions. The lettER, however, occupies four different positions on the vowel space as shown in (c), hence confirming the earlier results indicated in chapter five. Apart from the variations in each vowel category, there are variations also in the formants of the speaker groups for each vowel. The space of the DRESS for the younger age speakers is relatively lower and more fronted (i.e. higher mean F1-F2 values). The older age speakers' is, however, relatively closer and more central (i.e. lower mean F1-F2 values). The younger speaker's space for the NURSE is surprisingly more central than that of the older speakers'. The acoustic spaces of the lettER vowel for both speaker groups, although are not uniform, appear to be different for each group.

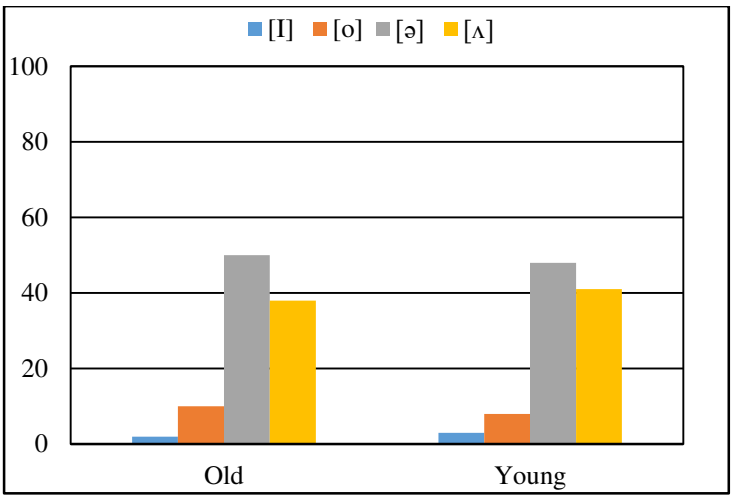
The differences in the mean frequencies within each vowel category even for each speaker group, suggest that the speakers are inconsistent in their realisation of the vowels. Figures 6.5a, b and c present the percentage of the variants used by each speaker group for each of the vowels.



(a) DRESS



(b) NURSE



(c) lettER

Figure 6.5: Percentage (%) distribution of the DRESS, NURSE and lettER vowels according to across Eʊe

It obvious from the figures that the use of [ɪ] and [ɜː] is infrequent among younger speakers, a group whose articulation of the DRESS and NURSE was mostly [e̱] and [eː]; about 633 tokens constituting 88% out of the total of 720 tokens for each. Older age speakers, on the other hand, showed a higher preference for [ɪ] and [ɜː] than the younger speakers. This is an indication that younger speakers are more likely to retract the DRESS to [e̱], while fronting the NURSE. The older speakers are however more likely to favour significantly the raised variant [ɪ] of the DRESS, but centralizing the NURSE (i.e. closer and more back realisations). The margin of difference between the two speaker groups for the variants of the lettER, however, appears relatively small compare to those of the DRESS and the NURSE. A statistical test was performed to examine whether speaker age had significant effects on the variant choice. The observed and expected results are presented in Tables 6.4 and 6.5.

Table 6.4: Age Distribution of NURSE variants across Eʊe

Variables	Age group	N	Mean	Std. Dev.	t-value	Sig.	η^2
[eː]	Lower	48	13.396	2.672	4.229**	0.000	0.150
	Upper	48	9.479	6.021			
[ɜː]	Lower	48	1.604	2.672	-4.119**	0.000	0.158
	Upper	48	5.521	6.021			

Source: Field Data, 2017 **p<0.01 df = 94 (N = 96)
Where Eta Square = η^2, standard deviation = Std. Dev.

Table 6.5: Age Distribution of DRESS variants across Eʊe

Variables	Age group	N	Mean	Std. Dev.	t-value	Sig.	η^2
[ɪ]	Lower	48	0.187	1.024	-4.329**	0.000	0.166
	Upper	48	3.771	5.642			
[e̱]	Lower	48	13.104	1.519	5.032**	0.000	0.212
	Upper	48	8.750	5.799			
[ɜː]	Lower	48	1.708	1.352	-1.808	0.075	
	Upper	48	2.479	2.625			

Source: Field Data, 2017 **p<0.01 df = 94 (N = 96)
Where Eta Square = η^2, standard deviation = Std. Dev.

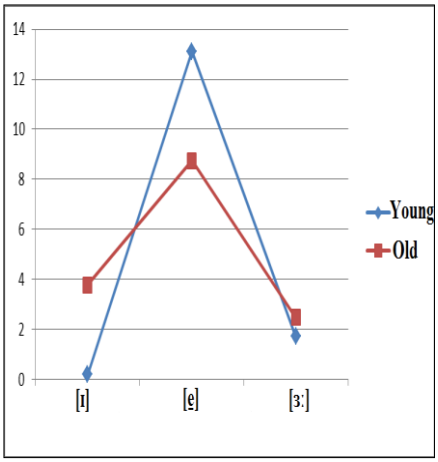
It is clear from the statistical report that the two age groups differed highly significant statistically [p≤.000] for both the raised [ɪ] and the mid [e̱] realisations of the DRESS, with younger speakers showing an extreme preference for [e̱], more than the older group. There was however no statistically significant difference between the groups for the central realisation [ɜː]. Table 6.5 equally shows that both speaker groups differed extremely significant statistically [p≤.000] for the fronted [eː] and the central realisations [ɜː] of the NURSE. That is, when the NURSE vowel and speaker age were compared, the younger speakers showed an extremely higher preference for the fronted variant than the older speakers. Interestingly, the older speakers appeared to have shown an equal preference for both variants. Age however has no significant effect for the lettER vowel as illustrated in Table 6.6.

Table 6.6: Age Distribution of the lettER variants across Eʋe

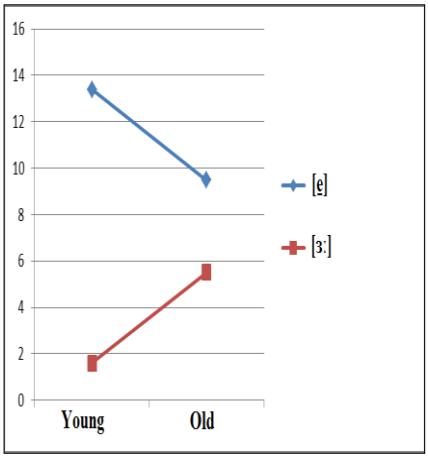
Variables	Age group	N	Mean	Std. Dev.	t-value	Sig.
[ɪ]	Lower	48	0.354	0.635	1.759	0.083
	Upper	48	0.167	0.376		
[ə]	Lower	48	6.375	3.577	-0.244	0.808
	Upper	48	6.562	3.946		
[o]	Lower	48	1.250	0.565	-1.302	0.197
	Upper	48	1.437	0.823		
[ʌ]	Lower	48	7.021	3.348	0.265	0.791
	Upper	48	6.833	3.569		

Source: Field Data, 2017 **p<0.05 df = 94 (N = 96)
Where Eta Square = η^2, standard deviation = Std. Dev.

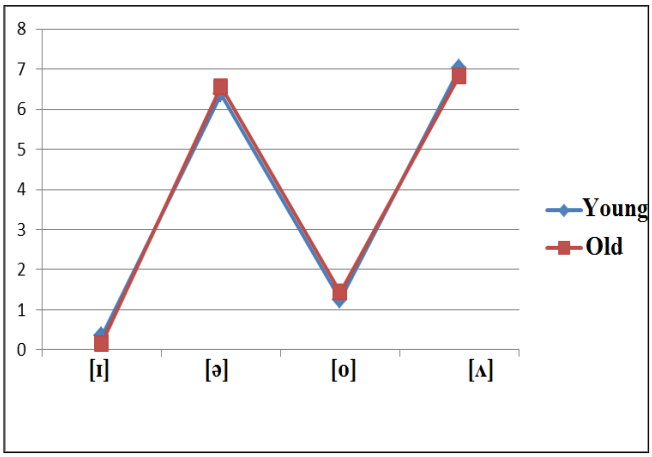
The margin of differences of ($\eta^2 = 0.166$), and ($\eta^2 = 0.212$) between the two age groups for [ɪ] and [e̱], according to Cohen's (cited in Cohen et al. 2007) guidelines of interpreting eta square are large. Meaning that the difference of about 18% between the groups are large enough to attribute the result to the age of the speakers. The margin of differences of ($\eta^2 = 0.150/158$), that is, about 15 percent each for the NURSE variants [eː] and [ɜː], is in the same way huge, and hence confirm the age effects on the DRESS and NURSE vowels among the Eʋe of Ghana. The hierarchical graphs in Figure 6.6 reiterate the convergence and divergence between the two age groups for the three vowels.



(a) DRESS



(b) NURSE



(c) lettER

Figure 6.6: Hierarchical graphs showing group mean frequencies for the tokens of the DRESS, NURSE and lettER vowels spoken by both age groups

The high mean scores for speakers below age 30 for [e̞] and [e:] in general clearly shows their preference for these variants. As seen earlier, the mean scores were very high for the younger age group for these variables, but declined for older speaker age group. The variant [ɪ] can be said to be restricted to the older age speakers since it was virtually absent from the sample of the younger speakers. It appears that the older speakers are gradually moving away from the mid retraction of /e/ while going for the raised retraction, and from /ɜ:/ fronting to its central form. For, in each of the cases, the index scores for [e̞] and [e:] decreased, but increased for [ɪ] and also for [ɜ:] for the older age speakers. The assumption then is that the younger the speaker, the more likely

they will use [e̱] and [eː], and the older the speaker, the more likely they will use [ɪ] and [ɜː]. But the two groups are identical in their use of the lettER vowel. Interestingly, the age effect on these variables seems to be strictly geography specific, that is, the age effect is different for each dialect group. To explore this further, a statistical test was applied separately to each variant and age in each dialect group: Aŋlɔ lower age versus Aŋlɔ upper age, and Eʋeme lower age versus Eʋeme upper age. That is, comparisons were made between two age groups: young and old, within each dialect region for age related variation.

6.3.2. Age variation within dialect region

A correlation of the variables with speaker age in each dialect region has revealed two patterns of change: (i) stable change and (ii) unstable change across the age spectrum.

6.3.2.1. Distribution of NURSE vowel in Aŋlɔ and Eʋeme

The distribution of the NURSE in Figures 6.7a and b show a clear stratification of the NURSE vowel in Eʋe. The graph in 6.7a shows a sharp divergence between the two age groups in Aŋlɔ, with the fronted variant [eː] (i.e. the covert prestige variant), being used more by younger speakers. In Figure 6.7a, we see a total of 83 percent usage of the fronted variant by the younger speakers as against 40 percent usage of the older speakers. The stratification is even sharper for the central variant [ɜː] (i.e. the overt prestige variant), 17 percent score by younger age speakers as against 60 percent score of the older age speakers. The age pattern in Figure 6.7b however shows a somewhat flat distribution of the NURSE in Eʋeme, the older age speakers' index scores are only slightly higher for [ɜː] and lower for [eː] than those of the younger age speakers.

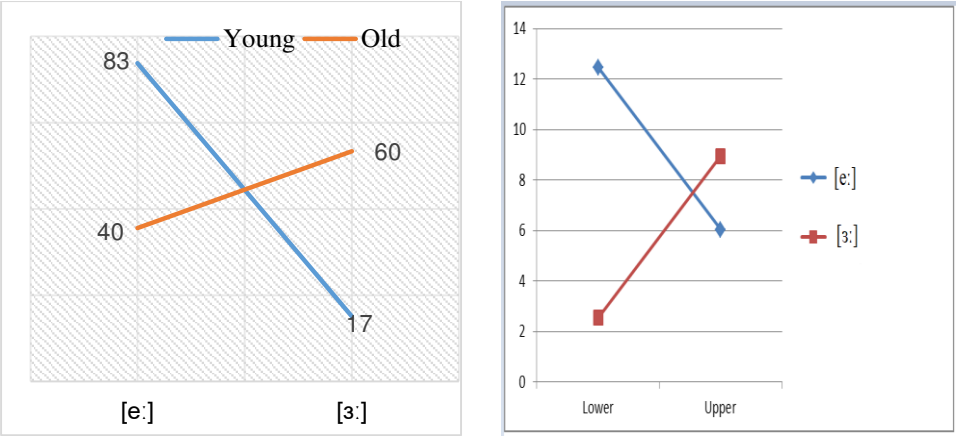


Figure 6.7a: Age distribution of the NURSE vowel in Aŋlɔ

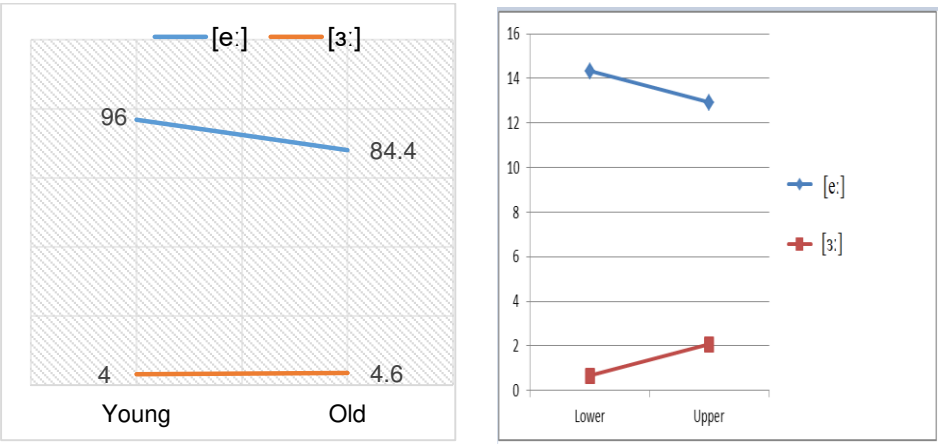


Figure 6.7b: Age distribution of the NURSE vowel in Eʋeme

The general age-related patterns observed here suggest that younger age speakers in Aŋlɔ are most likely to use the fronted variant than the older age speakers, whose articulation is most likely to be the central variant [ɜː]. In Eʋeme however, both age groups seem more likely to converge for the two variants. This conclusion is born out of the extremely significant effect [p≤ .000] of age on the variants [e] and [ɜː] observed among Aŋlɔ speakers, with their younger speakers showing an extreme preference for [eː], whereas the older speakers moving towards [ɜː]. For instance, the score for [eː] decreased but increased for [ɜː] for older speakers. The variant choice was insignificant [p< .190] in Eʋeme.

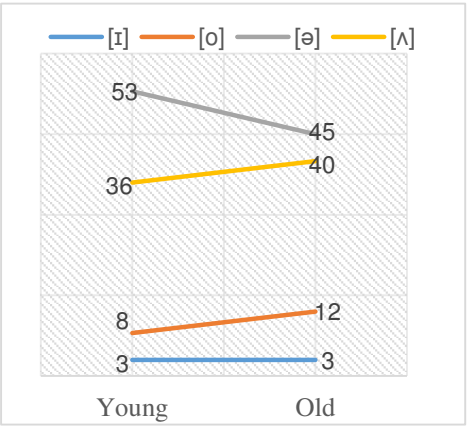
Differences in the index scores across the age groups can perhaps, be interpreted as a change in progress towards an increased use of a covert prestige variant [eː] in the Eʋe community. A linguistic variation is said to be 'a change in progress' when the variable is used more by the youth and less by the aged (Holmes, 2008). Also it is normal that a change in progress in a community will affect the aged and therefore as they grow, they may change their speech to some extent in the direction of the change (Sankoff, 2006). But to what extent does this assertion apply in this study especially since the youth are generally reported as the most users of nonstandard speech. Trudgill (1974) reported a similar case. In his case, the youth (under the age of 30) in Norwich had the highest score for the retracted variant of /e/. Other related studies have also put the youth ahead of adults in the use of nonstandard variables; they are the most users of stigmatised variables. Labov (1972a) made a similar observation in New York city, where the highest values recorded for the stigmatised variants of the sociolinguistic variables: '-ing', 'dh' and the 'negative concord', were found among the youngest (16 year old) speakers, but these scores reduced rapidly as the age of the speakers increased.

In his sample, the pattern of age distribution among adults was flat, with little or no differences between the different adult age groups. This means that older speakers did not use much of the stigmatised variants. The general inkling has been that when people are young, they are less influenced by overt norms of the mainstream society, but in their mid-years they tend to be more exposed to these pressures, which often lead to greater variability in their social relationships. But the pressure to conform to these societal norms may lessen as one grows older and retires from work (Chambers & Trudgill, 1998: 79; Downes, 1998). In Labov's samples, however, social class and gender seemed to play a very significant role, an indication that other factors interacted with age.

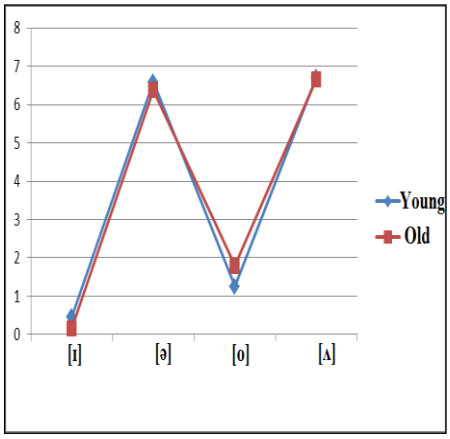
6.3.2.2. Distribution of lettER vowel in Aŋlɔ and Eʋeme

The distribution of the lettER in Figures 6.8a and b; and 6.9a and b seem to show some stability across the age spectrum in both communities. Both age groups in the two dialect regions surprisingly almost converged for all the variants of the lettER vowel. Two reasons can account for this; one, either the change in the lettER vowel is stable across the age spectrum in the entire Eʋe community, or two, all

the speakers (the entire Eʊe community); irrespective of age is changing concurrently towards the same direction. That is, the current realisations have been acquired by all the members at the same time. Labov (1994) and Payne (1976) referred to this as communal change; when the entire community changes their use of a linguistic feature simultaneously leading to a flat distribution across age groups as shown in the figures below. It could also mean that either the change is happening simultaneously, or it is complete yielding a flat distribution of the variables across the different age groups. The insignificant effect of age recorded for all the variants, except for [o] which showed some significant effect of [$p < 0.013$] in Aŋlɔ, is therefore, a confirmation of the huge similarity between the different age groups when it comes to the use the lettER vowel.

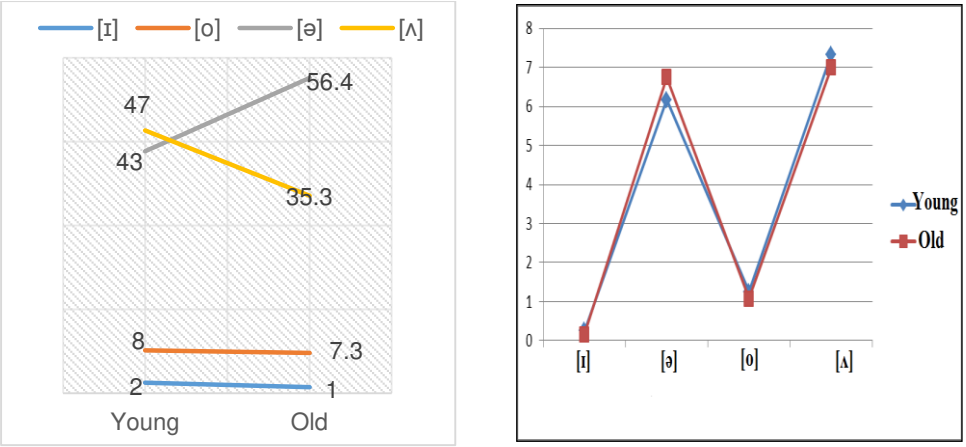


(a)



(b)

Figure 6.8: Age distribution of the lettER vowel in Aŋlɔ

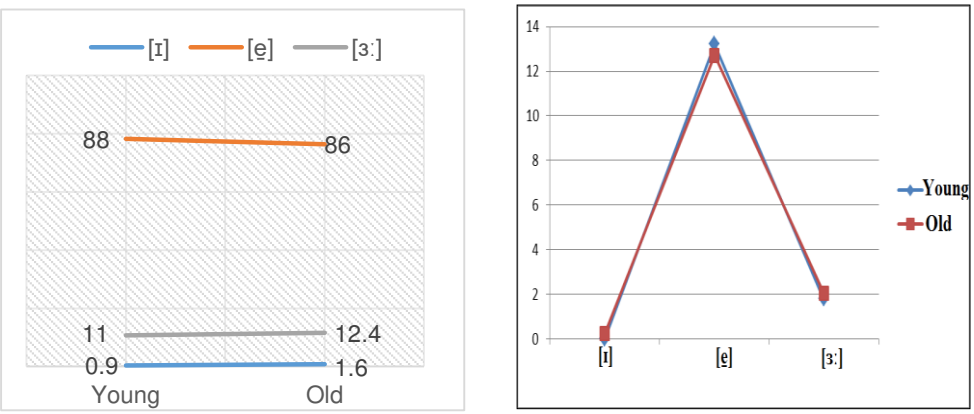


(a) (b)

Figure 6.9: Age distribution of the lettER vowel in Eʋeme

6.3.2.3. Distribution of DRESS vowel in Eʋeme

The DRESS in Figures 6.10a and b show a similar stability across the two age groups in Eʋeme; both speaker groups almost converged for all the variants. As seen in the figures, the distribution is flat indicating a possible stability across the age spectrum. This is confirmed by the result of the statistical test which showed an insignificant effect of age for all the three variants [ɪ], [ɜ:] and [e̱].



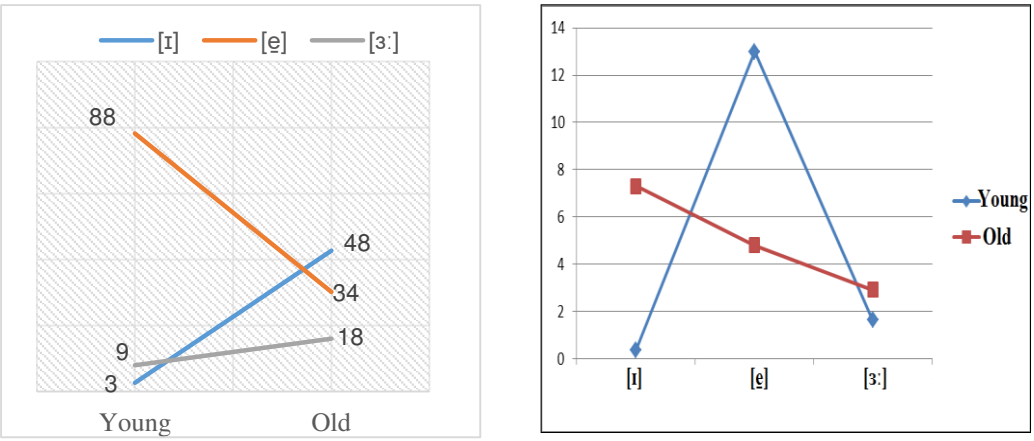
(a) (b)

Figure 6.10: Age distribution of the DRESS vowel in Eʋeme

6.3.2.4. Distribution of DRESS vowel in Aŋlɔ

The distribution of the DRESS in Figures 6.11a and b is different from what we saw earlier in Eʋeme, but strikingly similar to the distribution of the NURSE in Aŋlɔ in Figure 6.7a. The general preference among the speakers for both variants [ɪ] and [e̱] is

clear, there is a sharp divergence between the two speaker groups for both, but a convergence for variant [ɜː]. Both age groups diverged significantly for its variant choice; older age speakers scored 48% and 34% respectively for both variants [ɪ] and [e̱], against 3% and 88% of the younger age speakers. The extreme preference (88%) for the /e/-retraction by the youth contrary to what we saw for the NURSE in Figure 6.7a is surprising. In this figure, the younger speakers used the non-prestige variant [eː], in preference to the prestige form [ɜː]. Figures 6.11a and b present the percentage distribution of the DRESS spoken by both age groups in Aŋlɔ.



(a) DRESS (b) DRESS

Figure 6.11: Age distribution of the DRESS vowel in Aŋlɔ

As said earlier, we see a total divergence between the two groups for the variants [ɪ] and [e̱] similar to what we saw with the distribution of the NURSE vowel. However, the pattern here is slightly different, younger age speakers rather showed an extremely significant preference for the more overt prestige variant [e̱], while the older ones appeared to be moving towards the covert form [ɪ]. This presupposes that among Aŋlɔ, the younger one is, the more likely they will use variant [e̱], and the older the speaker, the more likely they will use [ɪ]. Both age groups are however likely to use the variant [ɜː] equally. This assumption is based on the extremely statistically significant effect [p≤ .000] of age on [ɪ] and [e̱] observed among Aŋlɔ speakers, with their younger speakers showing an extreme preference for [e̱], whereas the older speakers preferring [ɪ]. No significant effect of age was recorded for the central realisation [ɜː].

The direction of the change here is clear; in this case towards an increased use of a seemingly overt prestige variety [e̱] led by the youth. This discovery is in contrast with the earlier reports that youth always lead a change towards covert stigmatised speech; they are the heaviest users of stigmatised variables, whereas the overt speech is the prerogative of adults, especially the middle age group (Cheshire, 2006). It is very obvious that the age related pattern varies from one community to the other and from one culture to another; the pattern in Aŋlɔ is evidently different from that in Eʋeme. This is however not surprising because most often sociolinguistic variables show curvilinear patterns of age as well as class (see Labov, 1966, 1972a), and other social variables, where speakers in their mid-adult years who are more implicated in the 'linguistic market' may show a greater use of standard variables than is typical of the oldest and youngest speakers (Sankoff & Laberge, 1978 cited in Cheshire, 1982: 12).

The results of the present study therefore suggest that this pattern of age differentiation cannot be universal, especially if social conditions of speakers are not the same. It is a common knowledge that people behave differently at different stages of their life because their different life stages expose them to different social relationships. Also, different periods of a person's life involve them differently in their exposure to standard language (Eckert, 1997; Sankoff, 2006). This implies that age alone cannot give us a comprehensive account of the pattern of speech observed in the sample, particularly since the speakers belong to different social groups. A full understanding of the relationship between age and the use of the RP vowel phonemes among the Eʋe, therefore requires that other factors be investigated along with age. In the next chapter, therefore, gender, education and social networks of the speakers were investigated together with the three vowels.

6.3.3. Discussion

The age-related patterns observed in the samples can be interpreted in two ways: as *age grading* or as *apparent time* effect. Age grading is simply a change of behaviour that repeats itself in each generation (Cheshire, 2006). In linguistic term, this will mean a speech behaviour that repeats itself in each generation. Some linguists however used the term to refer to language use by the youth only and is repeated in every generation without ever being used by adults (Hockett, 1950: 423). Going by the latter definition,

one would say that the mid retraction of /e/, for example, is characteristic of the youth only. Meaning that the older speakers used it when they were young, but gradually changed their pronunciation to the raised variant [ɪ], as they grew older. The second interpretation, apparent time, works on the assumption that old speakers do not modify their speech during their adulthood, and that they will continue to speak in much the same way they did when they were adolescents. Sankoff (2005) describes this as generational change in progress; when everyone in a community are linguistically stable over their lifetime, while at the same time there are some changes occurring over time in the community due to the addition of new generations who have adopted innovative speech style. So by this definition, variant [ɪ] would be regarded as the pattern used by everyone in the community; hence, its use by older age speakers is a reflection of the speech of the entire community, whereas [e̱] is an innovative style adopted by the youth.

The pattern of age observed for the NURSE vowel can, in the same way, be interpreted using the *age grading* and *apparent time* interpretation. That is, the fronted variant [eː], could be either the pattern used by the older generation when they were young, and as they grew older shifted the nucleus to the centre, or the central realisation [ɜː], is the norm of the entire community, whilst the [eː] is innovated by the youth. The flat distribution of the DRESS across both age groups in Eʊeme, and that of the lettER vowel in both communities could mean that the change is complete as far as the use of these variables is concerned, or it is happening simultaneously; that is, the whole community, young and old, is changing at the same rate and, therefore, shows no significant age differences.

Chapter Seven: Statistical Results Continued

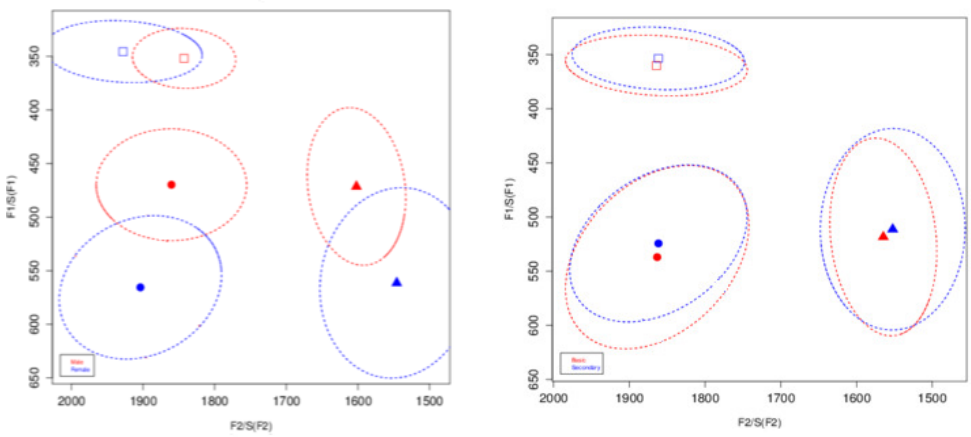
7.1. Introduction

This study also examined the use of the three vowels /e/, /ɜː/ and /ə/, in relation with gender and education of the speakers. Gender and educational levels of the speakers were subsequently compared with all the seven variables [ɪ], [e̱], [eː], [ɜː], [o], [ə] and [ʌ] identified. To examine the significant differences between the speakers, a statistical test was carried out. That is, an independent sample t-test was applied separately to each variable: (A) Gender across Eʊe: males versus females; (i) gender within each dialect region: Aŋlɔ (males versus females) and Eʊeme (males versus females); (B) education across Eʊe: basic versus secondary; (i) education within each dialect region: Aŋlɔ (basic versus secondary) and Eʊeme (basic versus secondary).

7.2. Gender, education and variants use across Eʊe

7.2.1. The DRESS vowel

Figures 7.1a and b show the vowel spaces for each gender and Education groups across Eʊe.

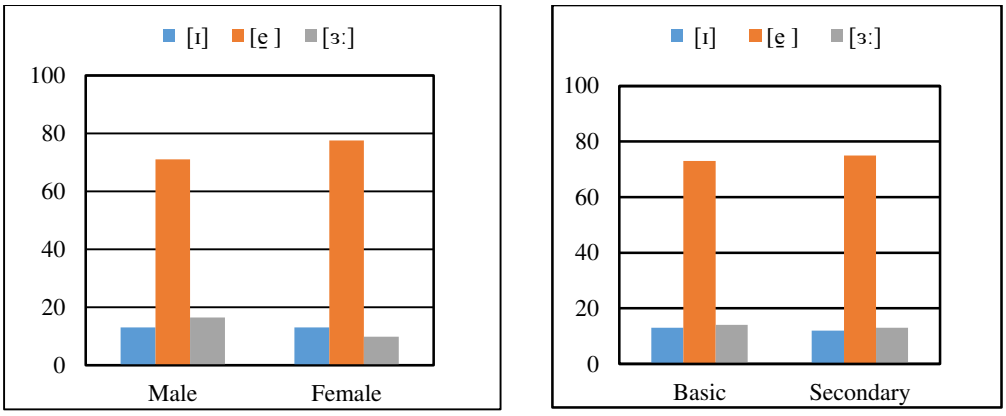


(a) Gender (b) Education

Figures 7.1: S-transformed mean F1 & F2 frequency values of /e/ of each gender and Education group across Eʊe

The figures above show the acoustic spaces of the DRESS vowel for each speaker group. The red dots in each figure indicate the spaces for the males and those with basic education, whereas the blue indicate those of the females and speakers with secondary education. In each of the figures, we see slight differences between the groups,

especially in the F1 of both genders, and also within each vowel category. This is an indication of some level of inconsistency in its realisation. The number of tokens used for each variant by each speaker group are converted into percentages and are presented in Figures 7.2a and b.

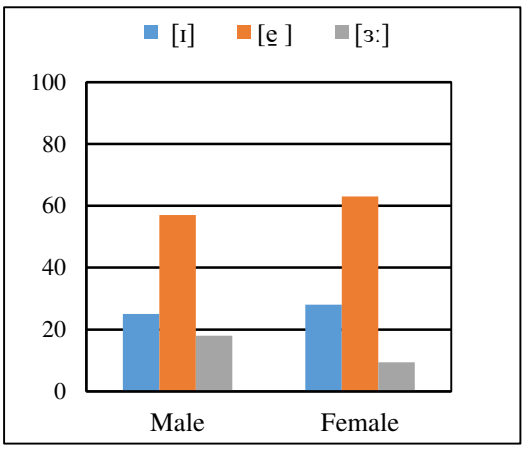


(a) Gender (b) Education

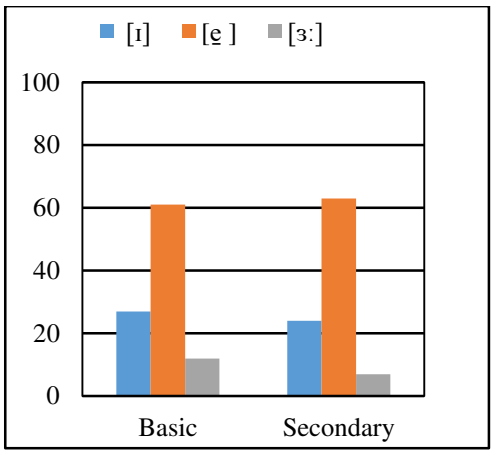
Figures 7.2: Percentage (%) distribution of the DRESS vowel according to gender and education across Eʊe

It is clear from both figures that the difference between the groups for each variant is very subtle, although the space for the women is wider than that of the men. This is an indication of a huge similarity between both groups. The linguistic similarities between the two genders and that of the two Education groups have been clarified by the results of the statistical test performed. The test indicated that gender and education have no significant effects for the use of all the variants, except variant [ɜː] which is likely to be male dominated. This generalisation is based on the significant effect ($p<.005$) of gender on the central realisation [ɜː].

Surprisingly, gender effect within each dialect region was significantly different. For instance, while the central realisation [ɜː], was gender specific (i.e was significant ($p<.048/.012$) in both communities, with the males generally dominating its use; the use of the retracted-mid [e̱], was significant ($p<.038$) only in Eʊeme. Here the females were leading but both males and females in Aŋlɔ were virtually similar. Distribution of the DRESS according gender and education within each dialect region is illustrated in Figures 7.3a and b and 7.4a and b.

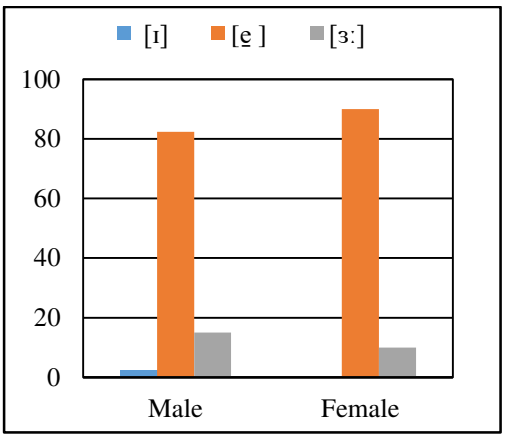


(a) Gender

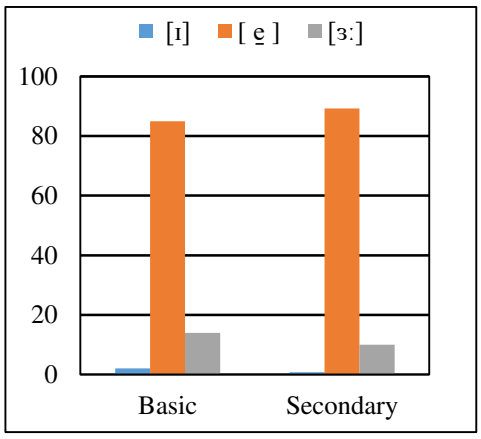


(b) Education

Figure 7.3: Percentage (%) distribution of the DRESS vowel according to gender and education in Aŋlɔ



(a) Gender

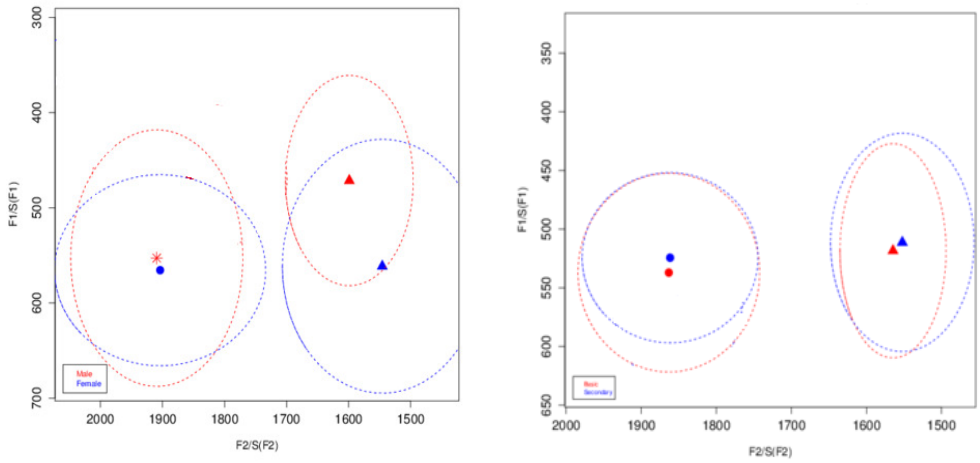


(b) Education

Figure 7.4: Percentage (%) distribution of the DRESS vowel according to gender and education in Eʊeme

7.2.2. The NURSE vowel

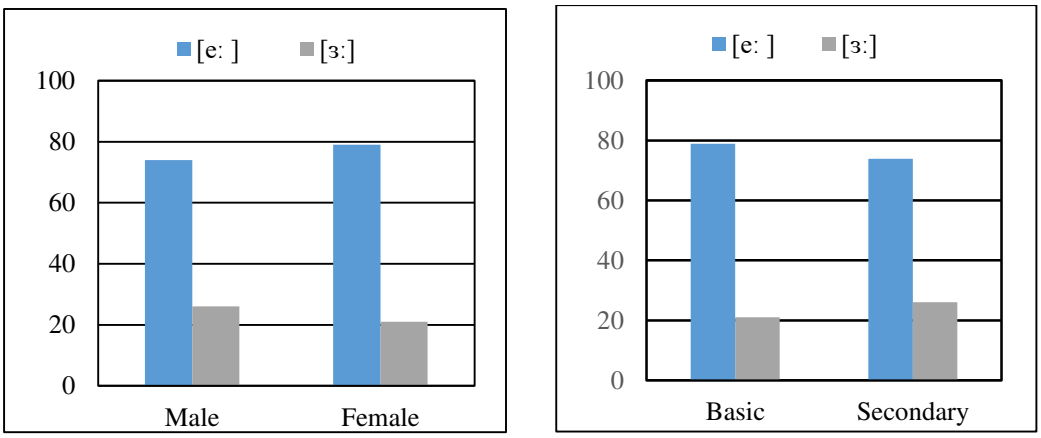
The vowel space of /ɜ:/ for each speaker group is presented in Figures 7.5a and b. In these figures, the mean F1&F2 frequencies of the vowels for each group are plotted on S-transformed scales with F1/S(F1) on y- axis, F2-F1/S(F2-F1) on x-axis. The red dots in each figure indicate the spaces for the males and those with basic education, whereas the blue indicate those of females and speakers with secondary education.



(a) Gender (b) Education

Figure 7.5: S-transformed group mean F1 and F2 frequency values of /ɜː/, for each gender and Education group in both dialect regions

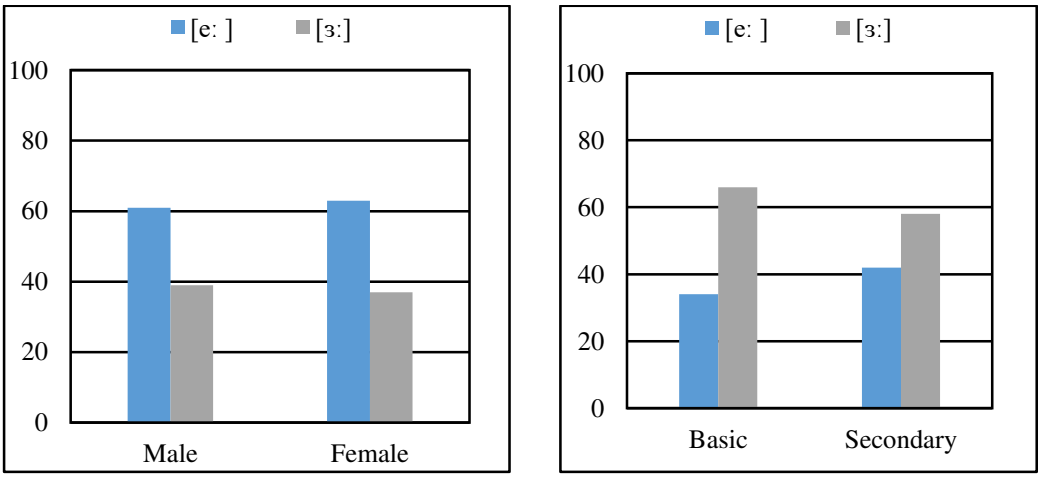
The space for each group in both figures are to some extent similar to those of the DRESS, except that the space for the females is relatively lower than that of the males. There seem to be some inconsistency also in the realisation of the NURSE vowel; for instance, while some of the tokens of the NURSE were fronted, others were centralised. The number of tokens used for each variant by each speaker group is seen more clearly with the figures converted into percentages as seen in Figures 7.6a and b.



(a) Gender (b) Education

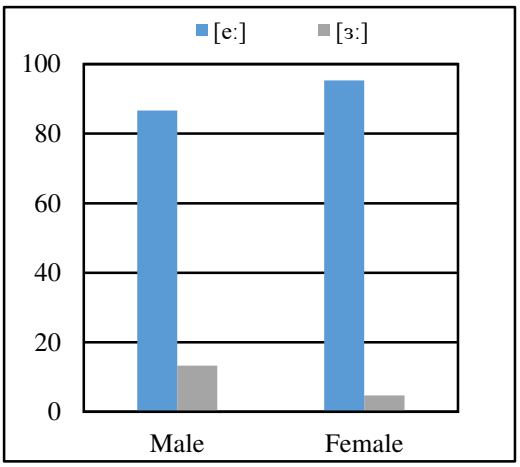
Figure 7.6: Percentage (%) distribution of the NURSE vowel according to gender and education across Eʊe

Both figures suggest that the speakers are not very different from each other; they are likely to speak the variable the same way. This assumption is confirmed by the insignificant effect of gender and education for the use of these vowels across the entire Eʊe. Surprisingly, however, the results within each dialect region were completely different. In Eʊeme for example, the choice between variants [eː] and [ɜː], was strictly gender specific; some significant effect [p< .020] and [p< .026] were recorded. The central variant [ɜː], was predominantly used by male speakers, whereas the more fronted variant [eː], was preferred by the females. In Aŋlɔ, however, gender was insignificant for the choice of each of them, similar to education. Distribution of the NURSE according gender and education in each dialect region is shown in Figures 7.7 and 7.8 below.

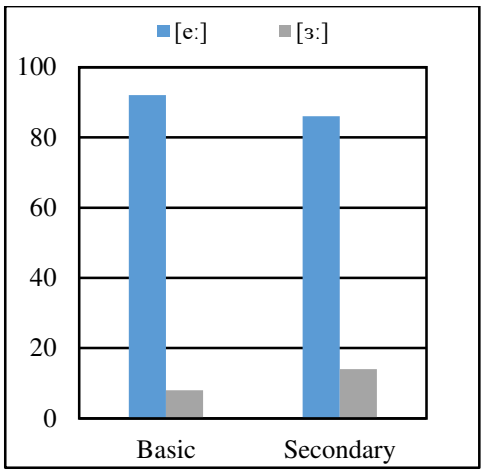


(a) Gender (b) Education

Figure 7.7: Percentage (%) distribution of the NURSE vowel according to gender and education in Aŋlɔ



(a) Gender

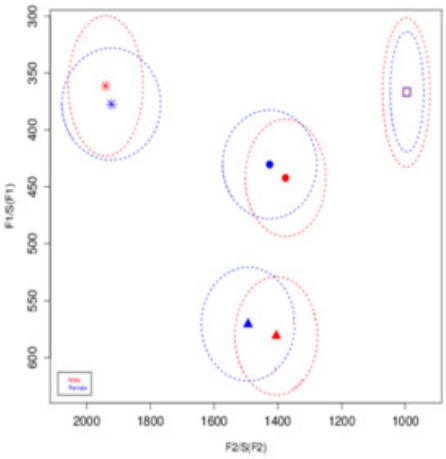


(b) Education

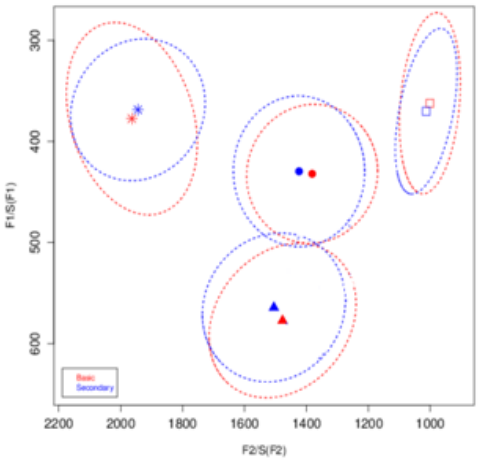
Figure 7.8: Percentage (%) distribution of the NURSE vowel according to gender and education in Eʊeme

7.2.3. The lettER vowel

The acoustic space of the lettER vowel for each speaker group is presented in Figures 7.9a and b below. In these figures, the mean F1-F2 frequencies of /ə/ for each group were drawn on S-transformed scales with F1/S(F1) on y- axis and F2-F1/S(F2-F1) on the x-axis. The red dots in each figure indicate the spaces for the males and those with basic education, whereas the blue indicate those of females and speakers with secondary education.



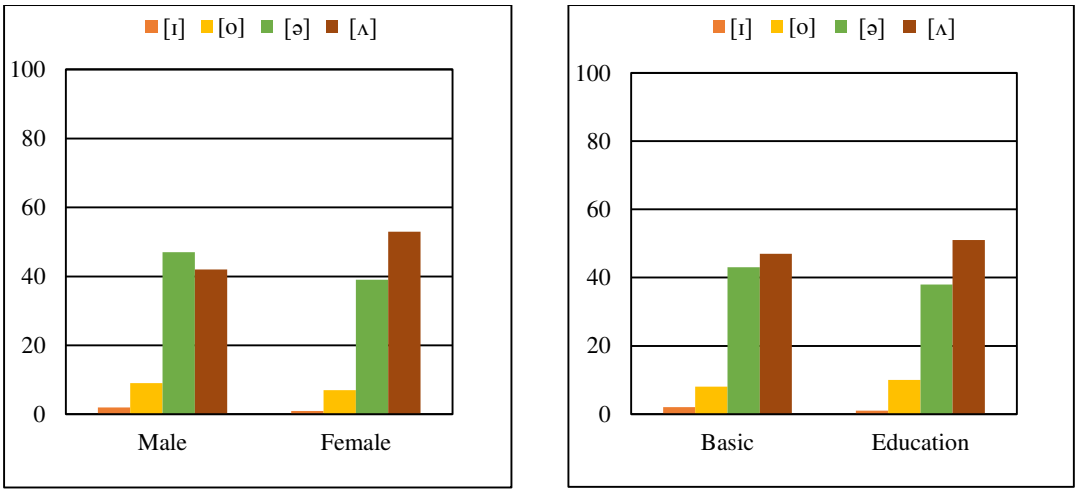
(a) Gender



(b) Education

Figures 7.9: S-transformed mean frequency values of F1 and F2 of the /ə/ vowel of each gender and Education group across Eʊe

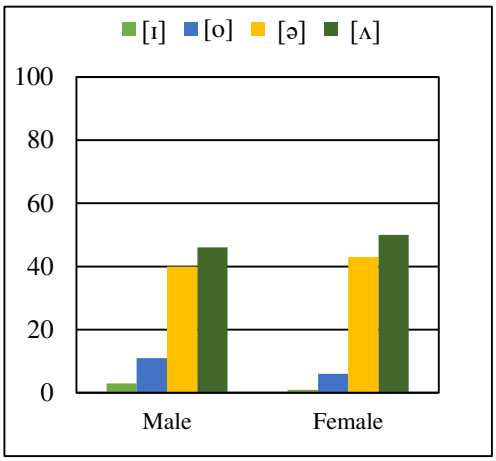
The spaces for the groups in both figures are seemingly similar; each speaker group has relatively four different positions for the lettER vowel. The number of tokens used for each variant by each group were converted into percentages and were presented in Figures 7.11a and b.



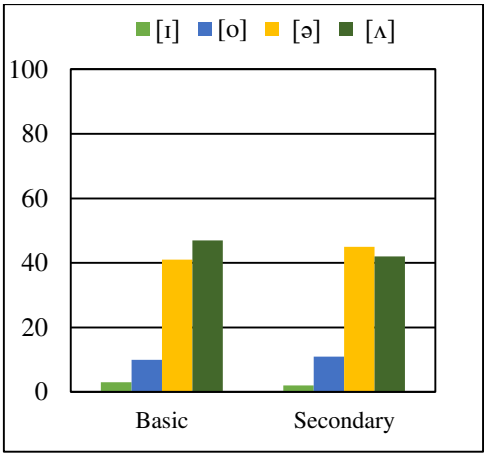
(a) Gender (b) Education

Figure 7.10: Percentage (%) distribution of the lettER vowel according to gender and education across Eʊe

It is obvious that the groups are highly similar in their realisations of the lettER vowel. An independent sample t-test was performed to examine whether gender and education were variables affecting the realisations of the lettER vowel across the entire Eʊe. The observed and expected results according to gender and education were highly similar and so were not considered significant. Meaning that when we consider the entire Eʊe as a homogeneous group, gender and education are insignificant when it comes to the realisation of the lettER vowel. However, within Eʊeme, gender has shown some significant effect ($p<.021$) and ($p<.028$) for the choice between [ə] and [ʌ]. While the male speakers showed more preference for [ə], their females seemed to have a higher preference for [ʌ] than their male counterparts. That is, the weak short mid central variant [ə], is likely to be dominated by male speakers, whereas the fully short relatively lowered variant [ʌ], is likely to be confined to female speakers. Below are figures illustrating the group by group distribution of the lettER in each dialect region.

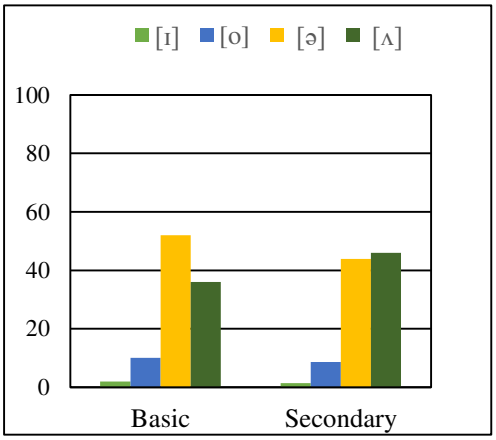


(a) Gender

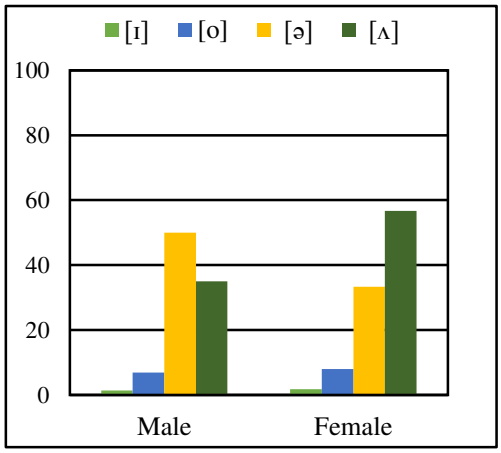


(b) Education

Figure 7.11: Percentage (%) distribution of the lettER vowel according to gender and education in Aŋlɔ



(a) Education



(b) Gender

Figure 7.12: Percentage (%) distribution of the lettER vowel according to gender and education in Eʋeme

7.2.4. Discussion

The results for both gender and Education groups across the entire Eʋe, and in each dialect region are striking. For instance, looking at the results at a glance, one is tempted to conclude that gender, just like education, plays no significant role in the choice of any of the phonetic variants of /e/, /ɜː/ and /ə/, among the Eʋe of Ghana, except the central realisation [ɜː] of the DRESS which was strictly gender specific. It can be recalled that this variant [ɜː], was regarded more or less as a male dominated variant;

that is when the entire Eʊe was considered as one group. But this impression gradually diminished when the variables were examined in each dialect region. For instance, we can remember that in Eʊeme, the central realisation [ɜː], of both the DRESS and the NURSE were strictly dominated by male speakers. Their female counterparts, however, appeared to be moving for their retracted [e̱] and the fronted [eː] forms. Interestingly, in Aŋlɔ, both genders seemed to have shown an equal preference for these variants just as it was for both Education groups in the entire Eʊe. The lettER vowel exhibited similar characteristics: while gender and education showed no significant effects for all of its variants across the entire Eʊe, the sample for Eʊeme showed some significant effect [p<.021] for [ə] and [p<.028] for [ʌ]. Thus, whereas the males were moving for the standard prestige variant [ə], their females seemed to be going for the nonstandard form [ʌ]. The results might therefore be interpreted as follows:

(i) the use of the fronted [eː] and the retracted-mid [e̱] realisations of the NURSE and of the DRESS declined for males but increased for females as a function of dialect;

(ii) the use of the central [ɜː] of the NURSE increased for males but declined for females as a function of dialect;

(iii) the use of the central [ɜː] of the DRESS increased for males but declined for females in the entire Eʊe;

(iv) the use of the central [ə] of the lettER increased for males but declined for females as a function of dialect;

(v) the use of the central [ʌ] of the lettER declined for males but increased for females as a function of dialect;

(vi) all speakers, irrespective of gender are likely to use the retracted-raised [ɪ] of the DRESS equally;

(vii) all speakers, irrespective of their levels of education are likely to use all the three RP vowels equally.

This is to say that among some of the groups, the use of [ɜː] was recessive, while for others it was the retracted [e̱] and the fronted [eː]. This was true also of the variants [ə] and [ʌ], while the females in Eʊeme appeared to be shifting away from the prestige variant [ə], their male counterparts might be said to be approximating to it.

It is interesting to find that while the men were moving away from the covert prestige realisations (i.e. [ʌ] and [eː]), their female counterparts were heading towards that

direction. Nonetheless, it signifies the direction in which the lettER and the NURSE vowels are heading towards among the Eʊe; that is, if the perception that women are innovators and leaders of linguistic change is actually true. It is also important we recognise that similar findings have emerged from studies carried out in several other varieties of English, where men reportedly used standard speech whereas women used the nonstandard form. The results of the present study are therefore partly consistent with the general sex-preferential variation reported between men and women, where women have used one variable more frequently than men. They also suggest that gender and social class differentiation may work differently for men and women in different sociocultural settings (see also Nichols, 1983).

Note that researches in the western world, for instance, have consistently put women in the lead of standard speech. In Norwich, Trudgill (1974) reported that all women, regardless of their social standing used the standard prestige variant [ŋ] of the '-ing' morpheme more than their male counterparts. Interestingly, middle-middle class women never used the nonstandard variant [n] at all; whereas lower-working class men used it almost all of the times. The social stratification of New York City English by Labov (1966), similarly put women, especially lower-middle class women (Macy's), ahead of working class and upper-middle class speakers. This behaviour as mentioned earlier, is believed by some as insecurity of women about their own pronunciation; women used standard speech to gain status they are denied (James 1996). There has also been the issue of hypercorrection of speech reported among women, a behaviour, Labov (1966) is certain, is due to women's recognition of an exterior standard of correctness and their 'insecurity' about their own speech. The Macy's from lower-middle class were most likely to be aware of the prestige forms; hence, accommodating to upper-middle class speech of their clients. Some are of the view that since women are universally granted less power than men, the use of standard speech allows them to sound less and to have a voice to protest against the traditional norms that place them in an inferior social position to men (James, 1996).

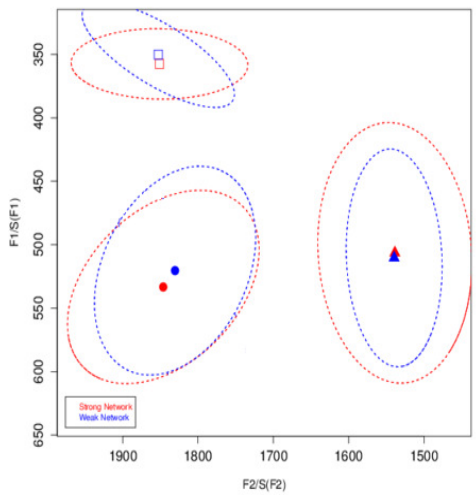
The preference for the nonstandard variants by the women contradicts some of these findings and, therefore forces one to question the general assumption that overt prestige speech is a preserve of women. The results might however agree with the fact that specific requirements of the type of talk in which speakers are engaged motivate the

use of a particular feature and not the other. Implying that the linguistic differences between males and females often reported in variation studies may not necessarily be the results of being a male or of being a female, several factors could account for this. The differences and the overlapping in the speech of both genders and speakers from the two educational groups observed in the present study are thus not peculiar to the Eʊe of Ghana alone.

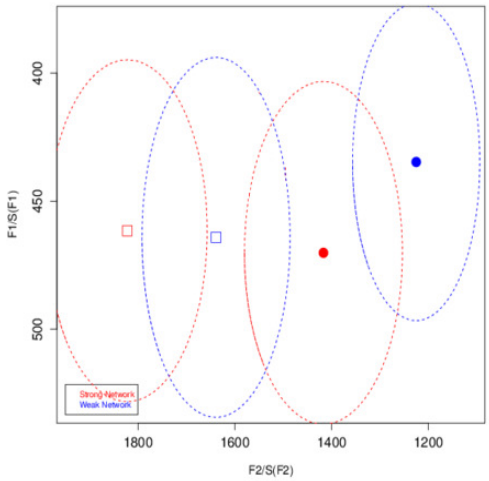
7.3. Social network variation

7.3.1. Social network across Eʊe

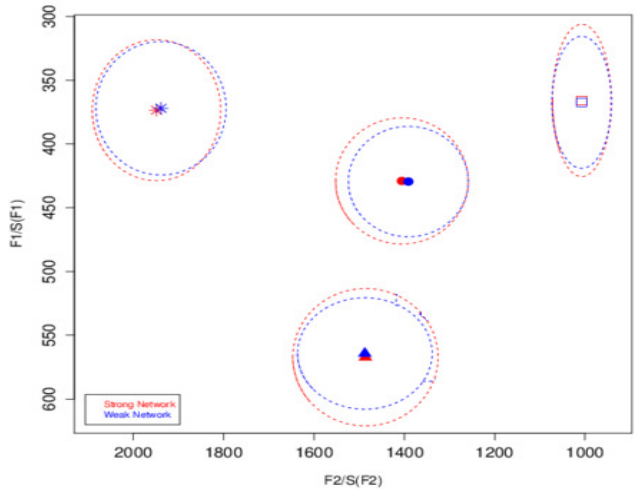
This study examined social network type and its effect on the three linguistic variables /e/, /ɜː/ and /ə/. This was premised on the notion that the speech of individuals who have contracted strong local network ties (in the case of this study the speakers with local community integration) tend to be closer to localised vernacular norm than those with weak local network ties (Milroy, 1985). The informants from the two Eʊe communities were, therefore, put into two network groups based on their network ties: those residing within the two Eʊe communities and those living outside these communities. They were subsequently correlated with all the seven allophonic variants [ɪ], [e̱], [eː], [ɜː], [ə], [o] and [ʌ] of the three RP phonemes. That is, apart from the variables of age, gender, dialect and education discussed in the preceding chapters, a further social variable associated with the 'degree' of the speaker's integration into their close-knit community appear to have some effect on the probability of the choice of the variables identified. The result has shown that all the variables correlate well with the two network groups in both communities. Figures 7.13a, b and c show the vowel plots for all the individual tokens spoken by both network groups.



(a) Mean formant values of /e/



(b) Mean formant values of /ɜ:/

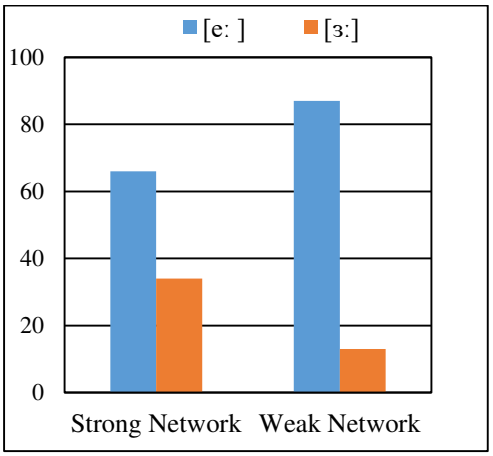


© Mean formant values of /ə/

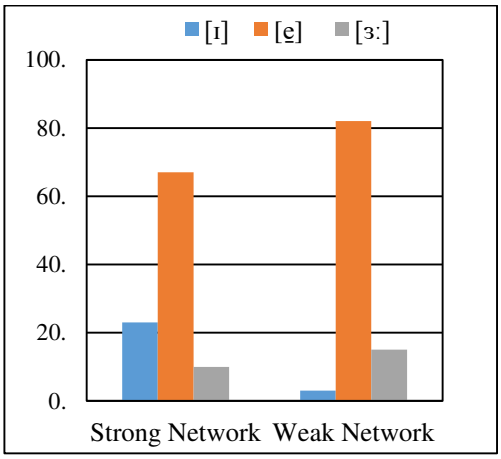
Figure 7.13: S-transformed mean frequencies of the F1 and F2 for the individual tokens of /e/, /ɜ/ and /ə/ vowels of both network groups across Eʊe

From the figures, we realised that the two speaker groups, although are quite distinct from each other, their vowel spaces appear to cover similar acoustic spaces. The DRESS vowel in (a) occupies: (i) a very close position around the upper left corner, (ii) a relatively open position around the lower left corner, and (iii) a relatively open and central position of the vowel space. The space for speakers with strong network ties (red dots) seems relatively 'lower' in terms of height than that of speakers with weak network ties (blue dots), which is relatively 'higher'. The NURSE is also variable and quite distinct for both groups. For instance, both groups have their space towards the

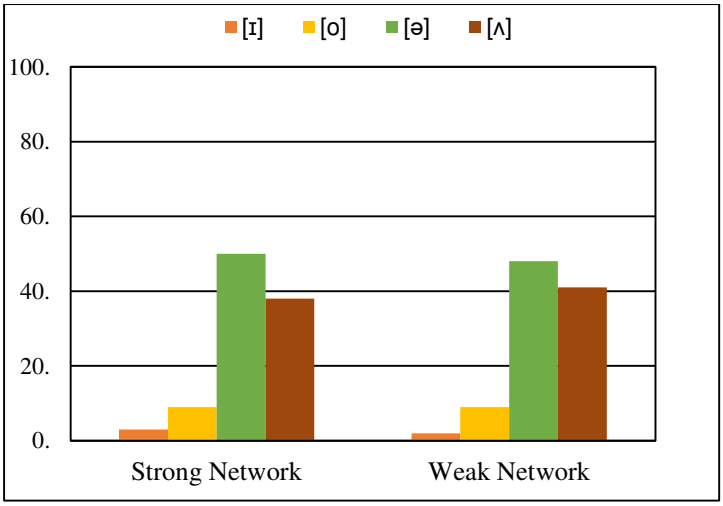
front left corner and towards the centre. The space for speakers with strong network ties appears more front (i.e. higher F2 mean), whereas that for weak network group is more central (i.e. lower F2 mean). The two groups of speakers, however, converged in their space for the lettER vowel. The variances between the two network groups are seen clearer as the figures for all the tokens were converted into percentages and presented in bar graphs as in Figure 7.14a, b and c.



(a) NURSE



(b) DRESS



© lettER

Figure 7.14: Percentage (%) distribution of the DRESS, NURSE and lettER vowels according to network across Eʊe

It is very clear from the graphs that for one speaker group, the preference was generally for the retracted-mid [e̞], while for another it was mainly between [e̞] and [ɪ]

of the DRESS. This is similar with the NURSE /ɜː/, for one group, the choice was mainly for the fronted variant [eː], whilst for the other group it is between both the fronted [eː] and the central [ɜː] realisations. Distribution of the lettER is rather similar; the figures for both speaker groups in the entire sample are virtually identical. It is evident that the DRESS and the NURSE vowels are very variable among the Eʊe of Ghana, and ranged widely from one network group to the other. An independent sample t-test was performed to examine whether social network type was a variable affecting the choice of any of these variables in Eʊe English. The results have shown that overall, speakers with the retracted-mid [e̱] and the fronted [eː] realisations have a relatively weak local network ties. Those with a relatively strong local network ties, however seem to have preferred [e̱] and [eː] less, but interestingly showed a higher preference for [ɪ] and [ɜː] than the other group. For instance, the /e/ raising was almost absent from the speech of the speakers with weak network ties, just about 22 tokens, or less than 4% of this variant was found across the entire sample of 720 tokens of the DRESS. Also, the effect was extremely significant statistically ($p < .001$) when both speaker groups were compared for variant [ɪ], but much less significant statistically ($p < .017$) for variant [e̱], with a margin of 12% and 6% respectively. This was true also ($p < .004$) for variant [eː] and ($p < .022$) for [ɜː] of the NURSE, both achieved at a significant level of 5%, with a margin of about 9%, indicating that the difference between the groups is moderate. Network effect on the central variant [ɜː] of the DRESS was insignificant similar to the effect for the lettER variants [ɪ], [ə], [o] and [ʌ].

Certainly, the network-based divergence between the speakers observed in the samples was such that while speakers with weak local network ties avoided the /e/ raising, a great deal of them appeared to be tolerated by those with strong local ties. The centring of the /ɜː/ seemed to be the form preferred predominantly by speakers with strong network ties, an effect almost as strong as that for [ɪ], whereas the more fronted variant [eː], seemed to be confined to speakers with weak local network ties. Tables 7.1 and 2 show the statistical results and the classification of the speakers according to network ties, together with the mean scores for each speaker group.

Table 7.1: Distribution of DRESS vowel according network type across Eʋe

Variables	Social network	N	Mean	Std. Dev.	t-value	Sig.	η^2
[ɪ]	Weak	48	0.458	1.148	3.576**	0.001	0.120
	Strong	48	3.500	5.779			
[e̱]	Weak	48	12.083	2.766	2.446*	0.017	0.060
	Strong	48	9.771	5.936			
[ɜː]	Weak	48	2.458	2.352	1.708	0.091	
	Strong	48	1.729	1.795			

Source: Field Data, 2016 *p<0.05; **p<0.01 df = 94 (N = 96)
Where Eta Square = η^2, standard deviation = Std. Dev.

Table 7.2: Distribution of NURSE vowel according network type across Eʊe

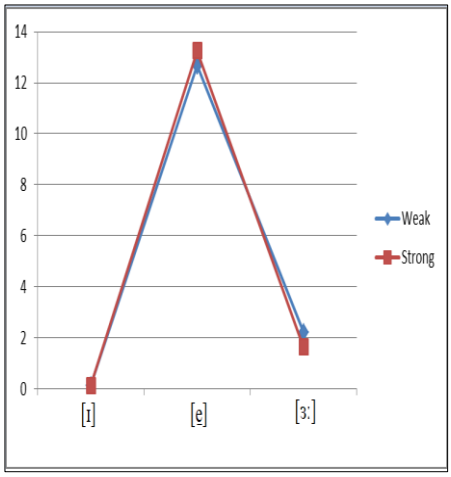
Variables	Social network	N	Mean	Std. Dev.	t-value	Sig.	η^2
[eː]	Weak	48	12.917	2.804	2.997**	0.004	0.087
	Strong	48	9.958	6.236			
[ɜː]	Weak	48	2.152	0.373	-2.871*	0.022	0.178
	Strong	48	5.042	6.236			

Source: Field Data, 2016 **p<0.01 df = 94 (N = 96)
Where Eta Square = η^2, standard deviation = Std. Dev.

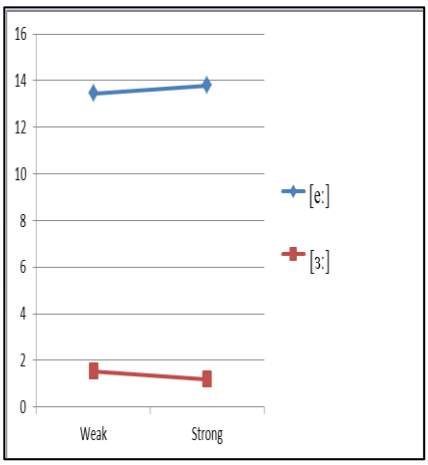
Network types in each dialect region were compared with the variables for further examination. That is, an independent sample t-test was further applied separately to each vowel with network within each dialect region: Aŋlɔ (strong network versus weak network) and Eʊeme (strong network versus weak network).

7.3.2. Network type within dialect region

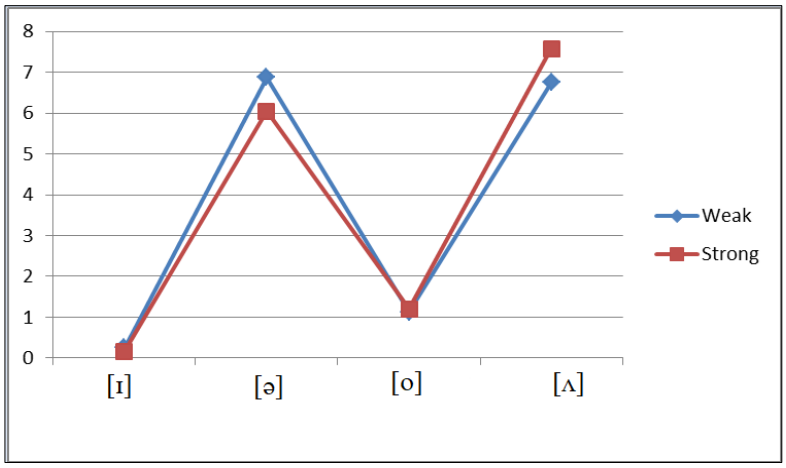
Distribution of the three vowel phonemes according to network type in each dialect region appears to differ significantly. For instance, whereas the use of the DRESS and the NURSE vowels differed significantly according to network type in Aŋlɔ, their use seems to be independent of network type in Eʊeme. In Eʊeme, the test has shown no statistically significant effect of network type for the variant choice. Similarly, in the figures below, all the speakers virtually converged for all the variants.



(a) DRESS



(b) NURSE

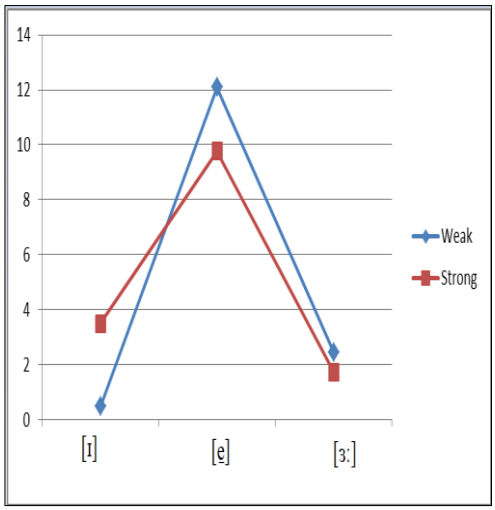


(c) lettER

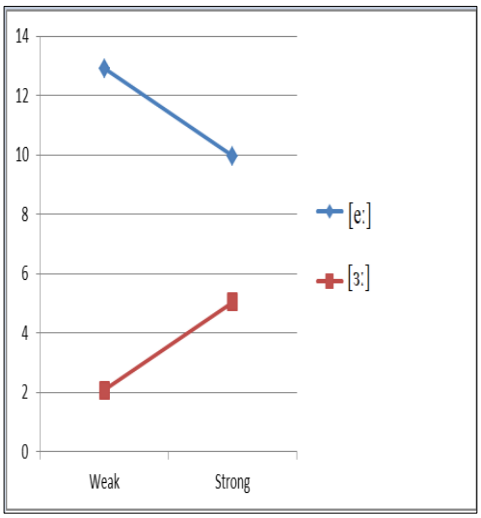
Figure 7.15: Realisations of /e/, /ə/ and /ɜ:/ by Eʊeme speakers

In Aŋlɔ however, the pattern is strikingly different; the divergence between both network groups for instance, for variants [ɪ] and [e̱] is clear, both groups diverged significantly. The /e/ retraction was significantly dominated by speakers with weak network ties: a very high statistically significant effect ($p < .002$) was recorded here; those with strong network ties appeared to be moving for [ɪ], with an extremely significant effect of ($p \leq .000$). That is, while speakers with strong local network ties used about 44% of the DRESS tokens for [ɪ], those with weak network ties recorded only about 11% of the tokens, while recording 83% for [e̱] against 34% score of speakers with strong network ties. The same was true ($p \leq .000$) and ($p \leq .000$) for the

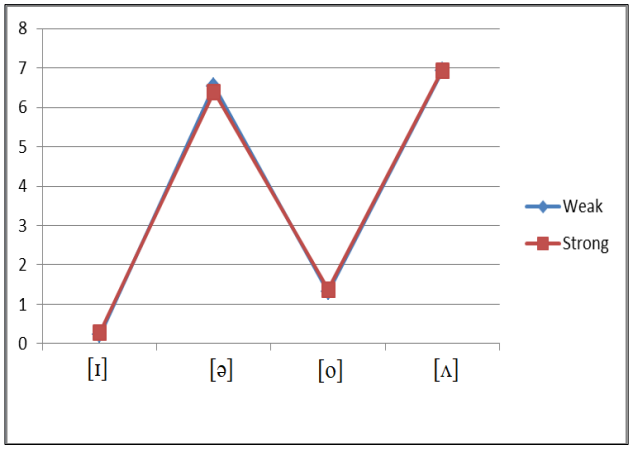
NURSE variants [ɜː] and [eː], both achieved at a significance level of 0.05. In both cases, the margin of differences are huge about 28%. There was, however, no significant variation between the two network groups for the choice of the lettER variants [ɪ], [ə], [o] and [ʌ]. The hierarchical graphs in Figures 7.16a, b and c reiterate the divergence and convergence between both network groups and, therefore confirm how significantly and or insignificantly different the two groups were in their use of the DREES, the NURSE and the lettER vowels.



(a) DRESS



(b) NURSE



© lettER

Figure 7.16: Realisations of /e/, /ə/ and /ɜː/ by Aŋlɔ speakers

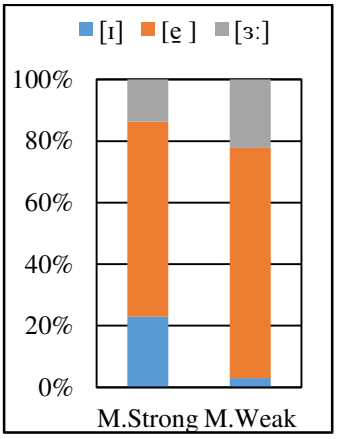
7.3.3. Network and the social variables: age, gender and education across Eʋe

The emerging results from the analysis of language/social relation in the previous sections necessitate that the variable of social network be considered in relation to the other variables: gender, age and education of the speakers. When speaker relation and variant choice were considered in the previous sections, we realised that the choice of the variants showed a correlation with personal network structure in Eʋe in general, however the correlation was quite different for each vowel and for each dialect group. Network membership correlated significantly for the population as a whole for the choice of the variants of /e/ and those of /ɜː/, but not for the variants of /ə/. Also, network was significant only in Aŋlɔ but not in Eweme. The analysis of this section is consistent with Gumperz (1982), who believes that the variable network is in general closely associated with different social factors including generation cohort and geographical location.

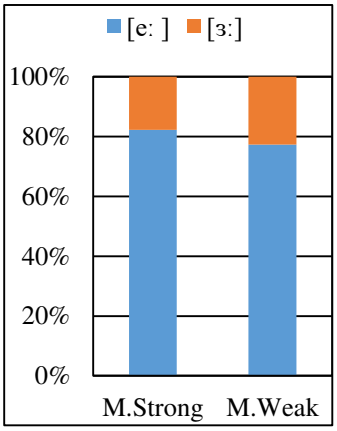
In this section, therefore, we discussed the correlation between social relations and social structures in the distributions of the variants of the three variables: /e/, /ɜː/ and /ə/, identified in the preceding chapters. We noticed that network effect was generally significant statistically for the choice of variants [ɪ] versus [e̱] for the age groups, but education and gender were not. This situation reflects similar strong effect of age for the choice of these variables observed in chapter six with older speakers reducing their choice for [e̱], while increasing that of [ɪ] as a function of age. This was true also for the fronted [eː] versus the central [ɜː] variants of the /ɜː/, for the different age cohorts, but not for any of the gender and education groups, and also not for any of the lettER variants [ɪ], [o], [ə] and [ʌ]. When each age group was considered separately with social network, however, it was clear that the network effect was much greater among the older age group than the younger age group. The /ɜː/ fronting and centring, for example, showed significant difference when the age groups were correlated separately with network, but it turned out that the difference was only significant among the older age group ($p < .006$) and ($p < .003$), and not among the younger speakers. Older speakers with strong network led in the choice of the central variant, while those with weak network led in the fronted realisation. The /e/ raising and retraction also showed only age difference across the two network groups. Some significant differences ($p \leq .000$) and ($p < .006$) were recorded here. Once again with older speakers from the closely-knit

network group leading with the raised variant, while reducing their choice for the retracted form [e̞]. That is, network membership in the younger age group has no significant effect for the choice of both variants, with both groups in the two network types converging for all the variants.

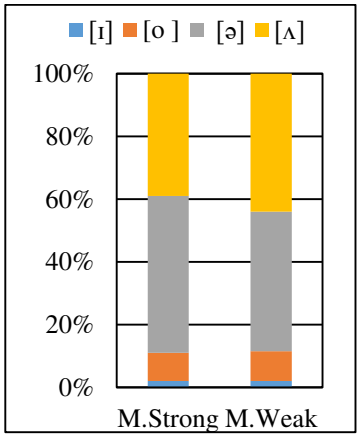
This situation was however different for both gender and education groups; they almost converged for all the variants in both network groups. Meaning that in the same gender group, social relation was insignificant for the variant choice. When the two genders were considered separately with social relation, the choice of variants was nearly the same among the males and among the females statistically. Lack of network effects held true also in each education group analysed separately. Compare Figure 7.17a with Figure 7.17b, we see that all the seven variants in the patterns are virtually identical and therefore differ insignificant statistically.



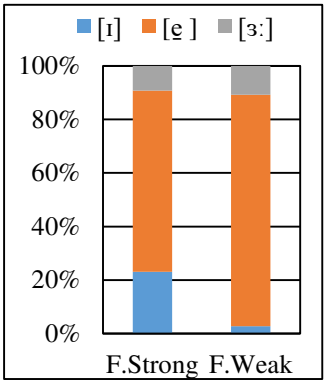
(a) DRESS



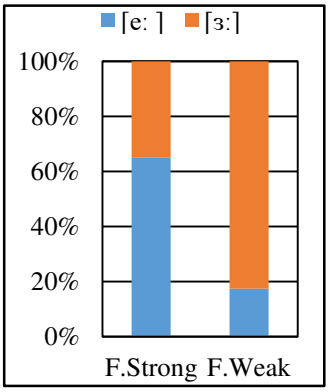
(b) NURSE



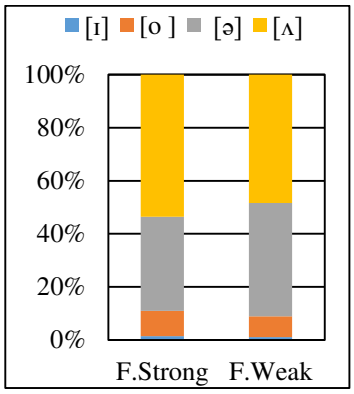
(c) lettER



(a) DRESS

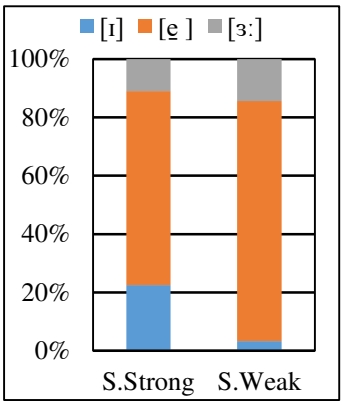


(b) NURSE

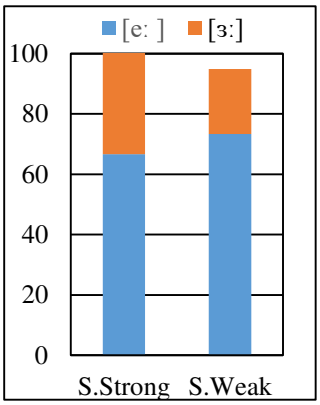


(c) lettER

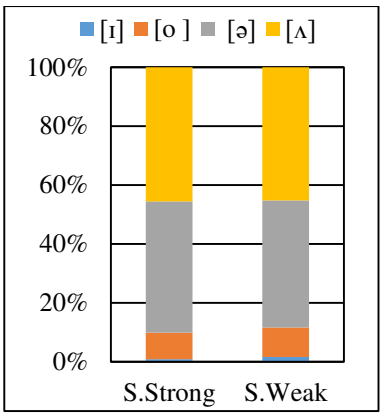
Figure 7.17a: Network distribution of DRESS, NURSE and lettER vowels within same genders across Eʊe



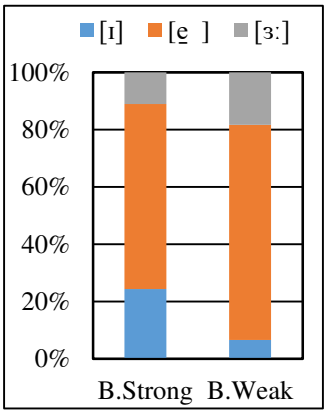
(a) DRESS



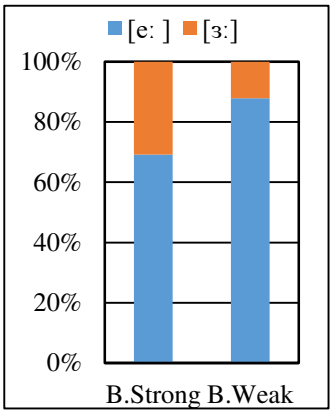
(b) NURSE



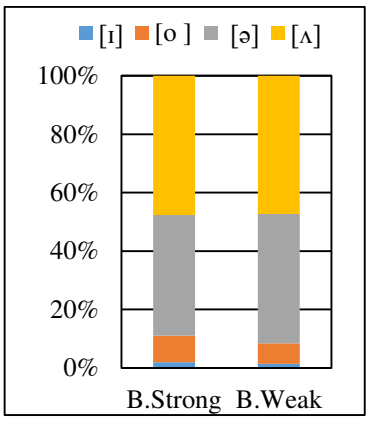
(c) lettER



(a) DRESS



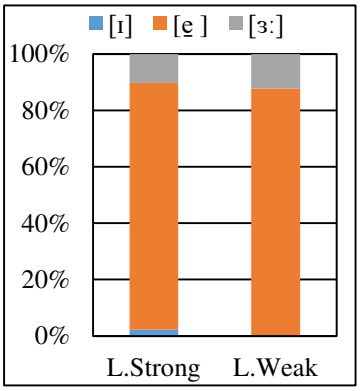
(b) NURSE



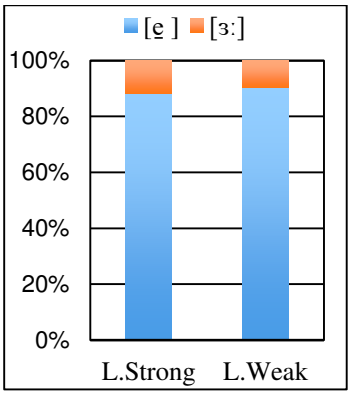
(c) lettER

Figure 7.17b: Network distribution of DRESS, NURSE and lettER vowels within same educational groups across Eʊe

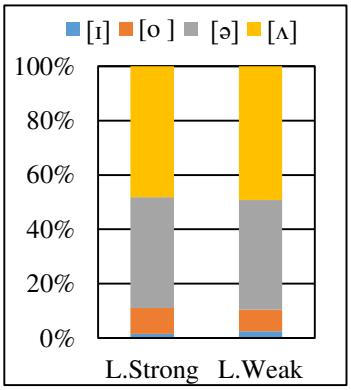
The figures in Figure 7.17c is however different; older speakers in both network types completely diverged for both [e̞] and [ɪ] except for [ɜ:], while younger speakers converged completely for all.



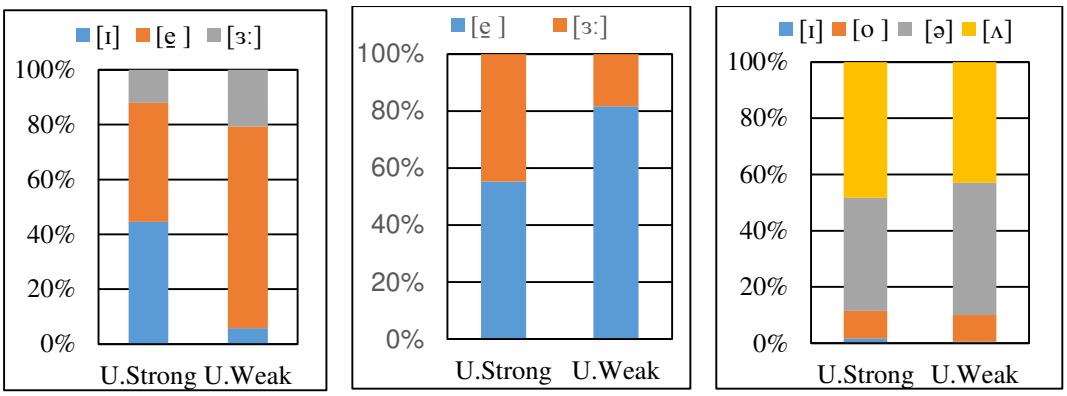
(a) DRESS



(b) NURSE



(c) lettER



(a) DRESS (b) NURSE (c) lettER

Figure 7.17c: Network distribution of DRESS, NURSE and lettER vowels within same age groups across Eʊe

The statistical results of the speaker groups for the variant choice are displayed in the figures below.

Age

		Mean	Sig.
Age	[ɛ̞]		.000
Social network			.005
Age * Social network			.006

		Mean	Sig.
Age	[ɪ]		.000
Social network			.000
Age * Social network			.000

		Mean	Sig.
Age	[ɜ:]		.063
Social network			.095
Age * Social network			.237

Gender

		Mean	Sig.
Gender	[ɛ̞]		.205
Social network			.015
Gender * Social network			.098

		Mean	Sig.
Gender	[ɪ]		.981
Social network			.000
Gender * Social network			.985

		Mean	Sig.
Gender	[ɜ:]		.006
Social network			.088
Gender * Social network			.268

Education

		Mean	Sig.
Education	[ɛ̞]		.205
Social network			.015
Edu. * Social network			.098

		Mean	Sig.
Education	[ɪ]		.856
Social network			.000
Edu. * Social network			.904

		Mean	Sig.
Education	[ɜ:]		.632
Social network			.16
Edu. * Social network			.931

(a) DRESS

Age

		Mean	Sig.
Age	[eː]		.000
Social network			.000
Age * Social network			.005

		Mean	Sig.
Age	[ɜː]		.000
Social network			.001
Age * Social network			.003

Gender

		Mean	Sig.
Gender	[eː]		.620
Social network			.002
Gender * Social network			.851

		Mean	Sig.
Gender	[ɜː]		.493
Social network			.003
Gender * Social network			1.000

Education

		Mean	Sig.
Education	[eː]		.710
Social network			.002
Edu. * Social network			.591

		Mean	Sig.
Education	[ɜː]		.575
Social network			.003
Edu. * Social network			.724

(b) NURSE

Age

		Mean	Sig.
Age	[ɪ]		.083
Social network			.661
Age * Social network			.333

		Mean	Sig.
Age	[o]		.201
Social network			.668
Age * Social network			.886

		Mean	Sig.
Age	[ə]		.809
Social network			.851
Age * Social network			.295

		Mean	Sig.
Age	[ʌ]		.972
Social network			.977
Age * Social network			.307

Gender

		Mean	Sig.
Gender	[ɪ]		.568
Social network			.570
Gender * Social network			.561

		Mean	Sig.
Gender	[o]		.669
Social network			.659
Gender * Social network			.320

		Mean	Sig.
Gender	[ə]		.109
Social network			.848
Gender * Social network			.201

		Mean	Sig.
Gender	[ʌ]		.055
Social network			.976
Gender * Social network			.271

Education

		Mean	Sig.
Education	[ɪ]		.849
Social network			.568
Edu.* Social network			.650

		Mean	Sig.
Education	[o]		.112
Social network			.663
Edu. * Social network			.115

		Mean	Sig.
Education	[ə]		.855
Social network			.851
Edu. * Social network			.688

		Mean	Sig.
Education	[ʌ]		.621
Social network			.977
Edu. * Social network			.970

(c) lettER

Figure 7.18: Network distribution of DRESS, NURSE and lettER within same age, gender and educational groups across Eʊe

As can be seen in the figures, the variant choice shows no significant association with network membership in the entire sample, except for the age groups.

7.3.4. Discussion

There is clearly a network-based pattern established in this study: speakers who have contracted strong local network ties in Eʊe in general, and in Aŋlɔ in particular, are most likely to do /e/ raising and /ɜː/ centring. However, speakers with weak local network ties and the speakers in Eʊeme in general are very much likely to front /ɜː/,

while retracting /e/ to [e̱], and avoiding its raised variant completely. Contrarily, the centring of /e/, and the choice of the lettER variants [ɪ], [ə], [o] and [ʌ] are most likely to be independent of network type in Eʋe.

The patterns of network observed in this study are, to some extent a true reflection of the network types examined in this study. As said earlier, the types of networks in both communities are relatively different from each other. For instance, the network type observed within Eʋeme community as we saw earlier has many more weak links/ties to outside communities, thus exposing the members to much more influence from outsiders, and is therefore relatively loose than that within Aŋlɔ community. The preference for the mid retraction of /e/, and the fronting of /ɜː/ by speakers with high community integration in Eʋeme; pronunciations typical of speakers with loose network ties can be linked with their frequent contacts with their socially and geographically mobile family relations. The preference by a section of Aŋlɔ speakers with strong local community ties for these same variants can seemingly be attributed to their contacts with their geographically mobile family relations, friends and business acquaintances, who visit Keta and Aŋlɔgã markets on regular basis, and during funerals and festivals. This means that these variables are diffused into both communities perhaps by those individuals with geographically diverse contacts and relatively weak local network ties who regularly visit these communities, although it is difficult to tell who the innovators are. It is however not clear how both [ɪ] and [ɜː], pronunciations typical of speakers with high community intergration diffused into both communities.

These findings are to some extent significant because they appear to provide some confirmation for network effects on sociolinguistic variables reported widely by social network analysts. These results, as we have already seen, have shed some light on the way in which a sociolinguistic variable can be transported into a speech community by weaker links, and be subsequently diffused and maintained by those with strong ties. The results are therefore consistent with the claim that people with diverse social contacts can serve as a transport system by which phonetic variants can journey from one region to the other (Milroy, 2002). For instance, Milroy (1996) reported how a change was imported into a closely-knit network group through relatively weak links, and later diffused within the group through strong ties. She emphasised that much as strong network ties could facilitate maintenance of linguistic features established within

a network, the spread of innovative features across geographically distant cities was likely to be facilitated by contact between speakers with weak ties and periphery group membership. The results have also somehow confirmed the general perception that strongest dialect speakers are mainly those whose neighbourhood network ties are tight, at least in the case of Aŋlɔ because of their general preference for [ɪ] and [ɜː] by speakers with high level of community integration (see also L. Milroy, 1987; Dubois & Horvath, 1998).

It is important to note that Aŋlɔ people are more conservative linguistically than the people of Eʋeme. Generally, the Aŋlɔ believe that their dialect is the standard prestige variety of the Eʋe language, 'Aŋlɔgbe enye the standard Eʋe', translate as 'Aŋlɔ-dialect is the standard Eʋe', reported by one of the participants. The strong preference for the variants [ɪ] and [ɜː] by a large number of speakers within the Aŋlɔ community (those with strong local ties), a pronunciation less common among those with weak network ties, clearly depict their conservative nature. Thus linguistically, the Aŋlɔ are more under pressure to enforce and maintain these pronunciations [ɪ] and [ɜː] (the linguistic norm of their community), and are highly unlikely to give-up any dialect form used by majority of speakers within the community.

7.4. Summary of findings

This section presented the summary of the findings of both the acoustic and the statistical analyses. The discussion of the findings was done in relation to the research objective, which was mainly to examine realisations of three RP vowel phonemes: /e/, /ə/ and /ɜː/, among Eʋe of Ghana from different dialect, age, gender, education, and social network groups. The findings of this study to some extent have confirmed some of the hypotheses posited in chapter one.

The study has revealed two emerging varieties of each of the vowels examined, which could be termed a local variety and nonlocal variety. The local variety here represents a type of accent independent of the native English standard (RP), and the nonlocal variety is the type very close to the native English standard (RP). This conclusion is premised by the range of pronunciations in the sample which depict the two varieties. For example, while some of the speakers fronted the phoneme /ɜː/, towards the quality of /e/, others consistently pronounced most of its tokens in the same

way [ɜː] as speakers of native Standard English. It was the same also with the DRESS vowel /e/, that is, though majority of its realisations were close to the RP standard /e/, nearly 35 percent of its tokens were realised as [ɪ] and [ɜː]. The alternation between the full vowels [ɪ], [o], [ʌ], and the reduced vowel [ə] for the lettER vowel, for example, in 'about' 'creator', 'favour', 'dollar', 'agree', 'oppress', etc. equally indicates features that can be said to be emerging varieties. The local variety observed in the sample therefore includes [ɪ] and [ɜː] of the DRESS /e/; [eː] of the NURSE /ɜː/; and [ɪ], [o] and [ʌ] of the lettER /ə/. The nonlocal variety, on the other hand, includes [e̱] of the DRESS, [ɜː] of the NURSE and [ə] of the lettER.

One very interesting thing about the result is that each dialect region seems to be developing its own speech norm covertly and overtly. Within each dialect region, there are a set of pronunciations which are far removed from the native Standard English pronunciation, and another set that approximates to it. The DRESS variants [ɪ] versus [e̱], and those of the NURSE [ɜː] and [eː] seem to be in complementary distribution in the two dialect regions, such that the variants used predominantly by one speaker group were almost avoided by the other. Interestingly, the pattern preferred by a section of Aŋlɔ speakers (e.g. [e̱]) was almost identical to that used by all speakers in Eʋeme. These pronunciations though to some extent, are phonologically conditioned, some aspects of them may also be idiosyncratic in the sense that they are highly unpredictable. However, they are equally without doubt, affected by social factors, most importantly age, with social network not exempted, but also to some extent gender. This is to say that the variations in the three vowels observed in the samples are largely related to the social characteristics of the speakers sampled.

An examination of the variables in relation to age has shown that the pronunciation of the DRESS vowel varied significantly in relation to speaker age; its usage among younger speakers was quite different from that of the older speaker group in Eʋe in general and in Aŋlɔ in particular. For instance, while older speakers used a higher proportion of the local retracted-raised variant [ɪ], particularly in Aŋlɔ, the younger speakers in general consistently showed an extremely significant preference for the nonlocal retracted-mid [e̱]. Surprisingly, in Eʋeme the local variant [ɪ] was used only infrequently by both age groups (we can recall that variant [ɪ] was almost absent in their speech). Their low index score for [ɪ] therefore reflects their extreme preference for the

retracted-mid [e̞]. It appears, therefore, that the local variant [ɪ], is very recessive among Eʊeme speakers, but predominant in Aŋlɔ. The nonlocal retracted-mid [e̞], is the most preferred variant of the youth in Eʊe in general, and of the older age speakers in Eʊeme in particular.

A similar age-related pattern was observed for the NURSE vowel; the central realisation [ɜː], was observed to be largely associated with older speakers mostly in Aŋlɔ, while the fronted variant [eː], was dominated by younger speakers in general. That is, when age and the NURSE vowel were correlated, it was clear that the youth were leading in the fronted realisation, whereas the central variant was predominant among older age speakers, mostly particularly in Aŋlɔ. A particularly interesting thing about the results is the way in which /ɜː/ and /e/ overlapped each other's acoustic space. For instance, we have a clear evidence of the fronting of /ɜː/ beyond its central target to a relatively fronted position in the region of /e/. This pattern may agree with the general claim that back vowels are gradually moving to the front as a case of overshoot. But it is also possible that the Eʊe speakers are merely approximating these vowels to vowel qualities heard from other varieties of English. Also, while both vowels appear to be changing over time, they seem to be doing so at almost the same rate within both age groups in Eʊeme, but at different rates across the age groups in Aŋlɔ. The change in the lettER vowel, on the other hand, appears to be simultaneous where everyone is changing at the same rate within the different age cohorts throughout Eʊe.

An analysis of social network type has revealed some network-based pattern for the vowel phonemes. It was noticed that speakers who used the nonlocal variant [ɜː], of the NURSE most, especially in Aŋlɔ were generally less geographically mobile and had relatively less diverse contacts. The use of the local fronted variant [eː], on the other hand, surprisingly seems to be characteristic of speakers with high geographical mobility and with diverse contacts, and also of all speakers in Eʊeme, irrespective of their network type. In the case of the DRESS, the results have shown that it is obviously centring and raising among speakers who contract strong local network ties, but without any significant raising among those with weak network ties. That is, those with weak network ties (outer city speakers) were avoiding the raised variant [ɪ], a variant which is the most likely favourite of those with strong network ties (inner city speakers), particularly in Aŋlɔ, while going for the nonlocal retracted [e̞]. Contrarily, both the local

and the nonlocal variants were favoured equally by both network groups in Eʋeme, just like the lettER vowel in the two Eʋe communities.

The results of network effects within Eʋeme might hence be interpreted more appropriately as a pattern of convergence, since the difference between both network groups in Eʋeme was generally subtle and was highly insignificant compared with the very high significant difference between both network groups in Aŋlɔ. The use of the lettER vowel was equally a matter of convergence in Eʋe in general since there was also no significant difference between both network groups in both dialect regions.

There seemed also to be a possible network effect for the choice of the variants of /ɜː/ and those of /e/ within the same social groups, however, this was true only for same age group, not for same gender and education group. The result has shown that male speakers from both networks somehow have similar pronunciations, just like the female speakers from both network groups. Network effect was insignificant also for speakers with the same educational background. For instance, the speakers who have basic education and are closely-knit together have similar pronunciations with those who are loosely-knit together. Interestingly, the network effect with age was profound only among older age speakers; younger speakers in both networks have almost converged for both sets of variants. In the older group however, speakers with strong network ties have shown a higher preference for the central variant of /ɜː/, and the raised variant of /e/ than those with weak network ties.

This finding could mean that the youth from both networks want to signal their social network identity through the use of the covert prestige form [eː] of /ɜː/, but at the same time trying to approximate to the more overt prestige form [e̱] of /e/, very surprising though. We could recall that younger speakers in both networks recorded a very low score for [ɜː], but a very high score for [eː], similar to their low score for [ɪ] and high for [e̱]. Per their already low figures observed in the previous chapter for [ɜː] and [ɪ], it is possible to conclude that both [eː] and [e̱] realisations are exclusively for the younger speakers, and would seem equally good as markers of youthfulness. Among the older speakers, however, a relatively large amount of /e/ raising is likely to be associated with high level of community integration than is the case among the youth. It is significant however we note that although older speakers are much less likely than the younger ones to select the more fronted variant of /ɜː/ and the retracted form of /e/, this lower

level of choice does not prevent individual speakers from varying their pronunciations within their social norms.

A slightly different pattern emerged for gender and education: while female speakers had the highest value for the DRESS variant [e̱], their male counterparts had the lowest value for it. Interestingly, the male speakers in both communities recorded the highest value for [ɜː] of the DRESS and of the NURSE. The trend was different for the lettER vowel; it was realised the same way by both genders in both communities, so it was with both Education groups.

Generally, the influence of social condition was stronger than that of the phonological condition. For example, there were certain tendencies among the speaker groups to favour or disfavour certain contexts when producing some of the tokens but this was not consistent in the sample. This is to say that the changes in some of the variables are diffusing through the lexicon (lexical diffusion). This diffusion can therefore be said to be promoted somewhat in certain contexts as opposed to others. Nonetheless, the contextual effect seems less important as determinant of the observed differences than those of the social factors.

Chapter Eight: Conclusion

8.1. Thesis summary

The main concern of this study has been to investigate social mechanisms of linguistic variation. Most often in variation studies, many linguists focus on linguistic variation at the individual level by examining how social structures affect language use in a speech community. In this study, however, social structures are seen not as an aggregate of independent social actors, but as a system where individual members depend on one another and are linked through multiple ties based on interactions, directly or indirectly at different domains such as social, economic, political, etc. The study therefore used a combination of methods to explore the effects of social structures and social relations on the use of the linguistic variables /e/, /ɜː/ and /ə/, among two groups of Eʋe dialect speakers of English, Aŋlɔ and Eʋeme, in Ghana.

The study began with a discussion on the background of the study, which was mainly the introduction of the study. Here the general concept of variation and it's implication on language study was discussed. It also included the statement of the problem, research hypothesis, research objective and questions, the significance of the study, ethics and thesis organisation.

Chapter two discussed briefly the historical background of the Eʋe as a people and as a language. It discussed how the Eʋe people migrated from their various historical places: Egypt, Ethiopia, Sudan, Abyssinia, Nigeria, the Republics of Benin and Togo, more importantly, the historical Notsie, where they were believed to have lived under a tyrant king called Agɔkɔli (Agɔ Akɔli), before separating finally into the different tribes and, subsequently into the different dialect groupings. The name 'Ewe' or 'Eʋe', as we learned denotes a group of people who presently inhabit southeastern part of the Volta Region in Ghana, southern part of the Republic of Togo and the southwestern part of the Republic of Benin, and also parts of Ogun and Lagos State or southwestern Nigeria. It also denotes a language spoken largely in southeastern part of the Volta region. The migration of the Eʋe and their subsequent separation have contributed immensely to the present division in the Eʋe language and, the significant variations recorded in the use of two of the RP vowel phonemes /e/ and /ɜː/. The chapter also discussed briefly the history of the English language. This took into account the English language before and after its implantation onto the British Isles. It also included some

events that took place before, during and after it was brought to Britain, more specifically how these events have affected the English vowel system. The history of the English language made us to understand that the English language is a migrant language brought onto the British Isles by three main Germanic tribes: the Jutes, Angles and Saxons in around 5th Century. The English language, just like any other living language, we have learned, has witnessed a massive change in grammar, vocabulary, autography and phonology since its arrival in Britain, leading to the different varieties we have presently.

Chapter three reviewed some empirical studies and the theoretical framework of the thesis. The chapter was divided into two parts: the first part, the empirical section, discussed some works of other authors in the field of variation. That is, this section evaluated some other studies that are related to the topic under investigation. Here the findings and ideas of other researchers, authors and professionals within variation studies including social network studies, studies in the field of phonetics and phonology, and some African linguistics in general were discussed. The second part, the theoretical section, reviewed the theory of social network, the framework of the thesis, which generally helped in the description of the social relations of the speakers and also in guiding the discussion. The theory helps in the interpretation of part of the data, and in explaining some of the issues raised in the thesis and in drawing some conclusions from the analysis.

Chapter four discussed the methodological approach to the study. This chapter included the research design, sample size, network type and the filed work, which includes pre-field work, during the field work and the post-field work. Chapter five presented and discussed the results of the experiment conducted on the use of the three vowel phonemes among the Eʋe of Ghana. This experiment was largely a spectrographic study of the vowel phonemes in question. In this experiment, the first two formants of the signals (which are inversely related to the height and backness of vowels) were measured. Also in this experiment were the measurements of vowel duration, pitch and amplitude. From this experiment, seven vowels were identified as the variants of the three RP vowels /e/, /ɜː/ and /ə/. Although they differ from one another they overlap hugely, invading each other's acoustic space, thus indicating variation even within the vowel category. Each of them therefore has its phonetic

variant; the vowel /e/, has the variants [e̱], [ɪ] and [ɜː]; the vowel /ɜː/, has [e] and [ɜː] while /ə/, has [ə], [ɪ], [o] and [ʌ] as its variants. It was noticed that these variations to some extent, were phonologically conditioned, nonetheless, some aspects of them could merely be caused by idiosyncrasy in that they were highly unpredictable.

The statistical results were discussed in chapter six and seven. In these chapters, the phonetic variants of the three vowel phonemes were correlated with the social variables: age, gender, education, dialect and social network. Two statistical tests, an independent sample t-test and an Analysis of Variance were performed for the statistical comparison; that is, to examine the statistical inferences between and among the different speaker groups. These tests were applied separately to each variant used with age, gender, social network and education across and within the two dialect regions. The results have shown that the choice of the variants of /e/ and /ɜː/ differed significantly according to the geographical location of the speakers, except the variants of the lettER vowel /ə/, which showed no significant difference in terms of the location of the speakers. Also, there were clear indications of social factors, most particularly age, with social network not exempted, but also to some extent gender. The level of education of the speakers however generally showed no statistical differences for the variants choice.

Chapter eight, the final chapter, is the conclusion of the thesis. In this chapter were the discussions of the summary of the thesis and some contributions of the study to the academic community including some deductions from the findings and some general recommendations for further investigation.

8.2. Statement of contribution

This study represents one of the contemporary investigations into social mechanisms of linguistic change and variation; it adopted a combination of approaches to investigate the social mechanism of sound variation. It thus differs from other linguistic studies (e.g. studies on GhE phonology), which focus basically on linguistic variation at the individual level by examining how social structures affect language use in speech communities, while neglecting how relationships within these structures affect their language use. The use of these approaches is therefore inconsistent with the general concept that the variables of socioeconomic class and social network are incompatible.

It agrees however with the claim, that human behaviour can be predicted not only by their drive, attitude or demographic characteristics, but also by the web of relationship in which they are embedded. By focusing on the speaker's relation of language use to their everyday practice, which constitutes their social participation and identity in the community, this study was able to establish the use of three RP vowels among Eʊe of Ghana.

This study is also significant in that it sheds more light on Granovetter's (1973) 'strength of weak ties concept' which sees peripheral members of a network as conduits through which linguistic influence and innovations are diffused, and as 'bridges' that directly link or connect different social network groups to one another. It similarly provides evidence to support Milroy's (2002) claim that individuals with diverse social contacts could serve as a transport system through which linguistic variables journey between regional varieties. In this study, for example, speakers outside Aŋlɔ and Peki communities (the speakers with weak network ties) appear to serve as channels through which the variables [eː] and [e̱] diffused into the Eweland. It also somehow agrees with the assertion that the closer an individual's network ties are to their local community, the more likely they are to approximate to vernacular norms. However, it has proven that closely-knit network members though are enforced to maintain certain linguistic norms, they are able to do this (maintain their vernacular norms) if only their links that connect them to outside networks are significantly few. We have seen from this study that a strong network with many more weak links is more susceptible to outside influence and is therefore less forced to linguistic maintenance than the type with fewer weak links.

This study is however inconsistent with the results of previous studies which indicate a total absence of /e/ among Aŋlɔ speakers of English, and the absence of [ə] and [ɜː] in nonnative varieties of English. This study has also shown that one's first language (L1) does not always interfere with second language (L2) acquisition as the theory of L1 interference appears to suggest. The age related pattern observed in this study also shows that the pattern of age differentiation can vary from one community to the other and cannot be universal, especially if social conditions (e.g. social relations and social status) of speakers are not the same. Again, the study sheds more light on the fact that

gender and social class differentiation may work differently for men and women in different sociocultural settings.

Finally, the study has established that an individual with very strong local community ties can also have strong ties to outside communities as well. The social network theory employed in this study has helped us to understand the type of social relations that exist among the two dialect communities in Eʊe, and how these influence their linguistic behaviour. This study has proven that the use of social network as well as social factors is applicable to any other society or community in Ghana, and anywhere English is learned as a second language, although the difficulty in obtaining a conclusive proof from such studies is real. This present study is therefore a wake-up call on all linguists working on nonnative English, more importantly, Ghanaian English to adopt variation method in investigating language.

8.3. Deductions from the findings

This research has shown that the three RP vowels: /e/, /ɜː/ and /ə/, exist in Ghana Eʊe English as independent phonemes. However each of them has its allophonic variants, which overlap the phonetic space of other phonemes. The DRESS /e/ for instance, has variants [e̱], [ɪ] and [ɜː]; the NURSE /ɜː/, has variants [eː] and [ɜː], while the lettER /ə/, has [ə], [ɪ], [o] and [ʌ] as its variants. These variables could be regarded as (i) emerging varieties in Eʊe English because they appear to be completely new in the Eʊe English dialect; (ii) as local and nonlocal varieties in the Eʊe English because they have elements that are completely different from the RP and elements that are very close to it.

Both the vowels /e/ and /ɜː/, although appear to be distinctive in this variety of English, they are likely to merge thereby losing their phonemic distinction. This is because there is a clear evidence of the backing of /e/; converging to similar vowel space largely among the youth, whilst /ɜː/ is being fronted; also converging to similar vowel space largely among the youth. That is, it is becoming evidently clear that the central variant of /ɜː/, is losing out possibly to [eː] as the choice of its central variant [ɜː] is becoming particularly recessive among older speakers. It is highly possible therefore that the change towards [e̱] and [eː] led by the youth will eventually diffuse into the entire Eʊe community and be adopted by all irrespective of age. /ɜː/ fronting

and /e/ backing may appear normal, and probably inevitable, and so one would expect to hear both pronunciations more frequently in the speech of Eʊe speakers of English, especially in the speech of the youth. However, if we are to go by age grading interpretation, it would mean that the two variants [e̱] and [eː] are likely to be preserved for the youth in general, whereas [ɪ] and [ɜː] will be the preferred pattern of the aged in Eʊe in general, but mostly in Aŋlɔ. That is, the younger speakers will change to the raised [ɪ] and the central [ɜː] variants as they grow old, hence the cycle repeating itself from generation to generation. The pattern for the lettER vowel may be different since its articulation seems to be similar among the speakers, an indication of no age effect. It is possible that among the Eʊe of Ghana, there is no linguistic difference between speakers with basic education and those with secondary education.

Although phonological contexts are likely to condition the choice of some of these variables; this effect seems less important as the determinant of the observed differences than those of the social factors. Factors such as gender, age as well as social network will significantly contribute to the choice of some of these variants. Nonetheless, these effects most likely will depend on the geographical location of the speaker since the two dialect groups appear to have different linguistic norms. It is also obvious that these pronunciations are to some extent idiosyncratic since they are largely unpredictable. Meaning that the speakers may be approximating some of these vowels to vowel qualities they heard from other varieties of English, or they are just conventions they have adopted.

It is significant we recognise that the local Eʊe variants much as they may be stigmatised, they could have some folk meanings to the Eʊe, and could have an equally overt prestige connotation, just like the nonlocal overt prestige forms. An English accent, for instance, that bears prestige connotation in say Northern England can be turned into a stigmatised accent in the south. In most parts of the USA, the dropping of the postvocalic 'r', a non-rhotic accent, is perceived as 'ugly'. But in England this is the norm and is the prestige variety, whereas its use (the rhotic accent) is perceived as 'rustic' or 'comic'. Thus, the local variants are likely to be widely accepted among the Eʊe of Ghana. This form of acceptance is termed 'a reallocation of variants in the koineisation process by which input variants are refunctionalised' (Britain, 1997a: 141).

Certainly, there is a gradual adoption and acceptance of an indigenous linguistic norm, an emergence of new linguistic norm, to quote Schneider (2003: 249), 'an endonormative stabilization' in each dialect community. The /ɜː/ fronting; /e/ backing, and raising, backing and lowering of /ə/, are likely to be normal among the Eʊe of Ghana, although the use of the nonlocal variants [ɜː], [ə] and [e̞] is also possible. These results are therefore a reaffirmation of the rampant chain shift in the RP vowel system.

8.4. Suggestion for further investigation

There are few other areas that for reasons of time and scope could not be examined; thus few further investigations have been suggested following the findings above. The first of these would be to explore the effects of social structures on the use of the other RP vowels. For instance, the KIT vowel whose acoustic space is being occupied by the DRESS vowel might have also been moving towards the space of the FLEECE /iː/ or has been moved to occupy the space of the DRESS, thus causing the phonemic distinction between the two vowels to be completely lost. The present study could also be replicated among the other language groups across the country to enable us establish the phonemic status of GhE vowels.

An equally important area to be investigated would be to find out whether the flat distribution of the vowels observed in Eʊeme together with that of the lettER vowel is a change in progress happening simultaneously, where everyone in the community is changing at the same time, or it is a complete change. It is also recommended that both communities be resampled so as to enable us to confirm how the English of the Eʊe is changing as it grows, perhaps after a decade, and how the individual speakers of different ages are involved in the linguistic change from time to time. Middle age speakers who are much more open to the linguistic markets in both communities should also be investigated.

One question that this study came across was 'to what extent can the Eʊe be said to be a homogeneous community', and whether the variations in these variables are features that belong to the Eʊe community alone? There is evidence that the entire Eʊe community is changing towards the retracted-mid variant [e̞] of /e/ and the fronted [eː] of /ɜː/, however, a more thorough investigation is needed to ascertain and also to clarify the social meaning of these variables to the Eʊe.

What has also not been well-established is whether some of the phonetic variants observed in the sample are merely idiosyncratic or phonologically conditioned. A further research that aims at investigating, for example, the speakers' attitude towards the use of the RP vowels, or investigating the vowels in different phonological environments could help provide answers to some of these questions. Some of these studies could also possibly examine the extent at which the individual speakers are influenced by both internal and external pressures.

Bibliography

Abdel-Jawad, H.R. (1987). Cross-dialectical variation in Arabic: Comparing Prestigious forms. *Language in Society,* 16, 59- 367.

Abdul-Rahman, F. (2006). Spectrographic analysis of Dagbani vowels. *In Papers in Applied Linguistics, University of Education,* Winneba 1:176- 248.

Abercrombie, D. (1967). *Elements of general phonetics*. UK, Edinburgh: Edinburgh University Press.

Adjaye, S.A. (1987). T*he Pronunciation of English in Ghana with specific reference to speakers of Akan, Eve and Ga.* PhD Thesis. University of London.

Adjaye, S.A. (2005). *Ghanaian English pronunciation*. UK: The Edwin Mellen Press.

Algeo, J. (2010). *Origins and Development of the English Language (6th Edition).* USA: Wadsworth.

Ansre, G. (1961). The *Tonal structure of Eve (Hartford Studies in Linguistics.* Hartford, Comm.: Hartford Seminary Foundation.

Ansre, G. (2000). *The Eve Language.* In A Handbook of Eʊeland, Vol. II. Kodzo Gavua (ed.), Accra: Woeli Publishing Services, 31.

Arnaud, R. (1980) Quelques observations quantitatives 'en temps réel' sur unchangement: L'accroissement d'emploi de la forme progressive dans la première moitié du XIX siècle, in: *Communications au XXe Congrès de la societé des Anglicistes de l'Enseignement supérieur,* Poitiers.

Atakpa, F.K. (1997). The naming system of the Eʊe. In Agbodeka, F. (ed.), *A Handbook of Eʊe.* Vol. 1: *The Eʊe of Southern Ghana.* Accra: Woeli, 177-192

Awoonor-Aziaku, L. (20013). *A socio-phonetic investigation of non-sibilant fricatives: /θ/ and /ð/ among Akan speakers of English.* Unpublished MPhil Dissertation, University of Cape Coast.

Bailey, G. (1993). A perspective on African American English. In D Preston (ed.), *American dialect research.* Amsterdam: John Benjamins, 283-318.

Baugh, A.C. and Cable, T. (2002). *The history of the English language* (5th Edn). Upper Saddle River, New Jersey: Prentice Hall Inc.

Berkowitz, S.D. (1982). *An introduction to structural analysis*. Toronto: Butterworths.

Berry, J. (1951). *The pronunciation of Eve.* Cambridge: Cambridge University Press.

Berry, J. (1952). *The pronunciation of Ewe.* Heffer, Cambridge University Press.

Bertho, J. (1946). Adja-Tado, races et langues du Bas-Dahomey et du Bas-Togo, *Grands Lacs* 61:57-59.

Best, J.W. and Khan, J.V. (1989). *Research in education,* (6th edn.). New Delhi: Prentice Hall.

Bladon, R.A.W. and Al-Bamerni, A. (1976). Coarticulation resistance in English /l/. *Journal of Phonetics* 4, 137–150.

Bloomfield, L. (1933). *Language*. New York: Henry Holt.

Bobda, A.S. (2000). The Uniqueness of Ghanaian English Pronunciation in West Africa. *In Studies in the Linguistic Sciences* Vol.30:2. 185 – 198.

Borgatti, S.P. and Halgin, D. S. (2011). On theory, *Journal of Organisation Science*, Vol. 22: 1157-1167.

Boersma, P. (2016). Praat, a system for doing phonetics by computer. *Glot International* 5, 9/10, 341-345.

Bott, E. (1957). *Family and Social Network: roles, norms and external relationships in ordinary urban families*. London: Tavistoc.

Britain, D. (1997a) Dialect contact, focusing and phonological rule complexity: the koineisation of Fenland English. *University of Pennsylvania Working Papers in Linguistics* 4(1): 141-169.

Bucholtz, M. (1999). You da man: Narrating the racial other in the production of white

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

Chambers, J.K. (1995). *Sociolinguistic theory*. UK: Blackwell.

Chambers, J. K. and Trudgill, P. (1998). *Dialectology*. (2nd edn.) Cambridge: Cambridge University Press.

Cheshire, J. (1982).*Variation in an English dialect: A sociolinguistic study*. Cambridge: Cambridge University Press.

Cheshire, J. (2004). Sex and gender in variationist study (eds.). J.K. Chambers, P. Trudgill and N. Schilling-Estes. *The Handbook of language variation and change, 423-443.*

Cheshire, J. (2006). *Age-and generation-specific use of language. Sociolinguistics: an international handbook of the science of language and society,* ed. by U.

Ammond, N. Dittmar and K. Mattheier, 1552–1563.

Chiba, T. and Kajiyama, M. (1941). *The Vowel: its nature and structure.* Tokyo: Tokyo Publishing Company.

Chomsky, N.A. (1957). *Syntactic structures*. The Hague and Paris: Mouton

Chomsky, N.A., and Halle, M. (1968). *The Sound Pattern of English.* New York: Harper and Row.

Christophersen, P. (1956). *An English Phonetics Course*. London: Longman.

Cohen, J. (1988). *Statistical power analysis for the behavioural sciences*. New Jersey: Erlbaum.

Cooper, F.S., Delattre, P. C., Libermann, A. M., Borst, J. M. and Gerstman, L. J. (1952). Some experiments on the perception of synthetic speech sounds. *Journal of Acoustic Society of America.* 24, 507-606.

Crystal, D. (1987). *English as a Global Language.* Cambridge University Press.

Crystal, D. (1991). *A dictionary of linguistics and phonetics, (*3rd edn.) Oxford: Blackwell.

Coupland, N. Garrett, P. and Williams, A. (2005). Narrative demands, cultural performance and evaluation: Teenage boys stories for their age-peers. In J. Thornbprrow & J. Coates (Ed.), *Sociolinguistics of narrative,* 45-72. Amsterdam/Philadelphia: John Benjamins.

Coupland, N. (2007). *Style, language, variation and identity*. London: Cambridge University Press.

Coupland, N., Coupland, J. and Giles, H. (1991). *Language, Society and the Elderly*, Oxford: Oxford University Press.

Cox, F. (2002). *A Description of Acoustic Characteristics of /hVd/ vowels in Australian English*. Sydney. Macquarie University.

Cruttenden, A. (2001). *Gimson's Pronunciation* of English, (6th edn.). London: Edward Arnold.

Cutler, C.A. (1999). Yorkville, crossing White teens, hip hop, and African American English. *Journal of sociolinguistics* 3, 4: 428-42.

Dakubu, M.E.K. (1977). *The Contribution of linguistics to the study of Ghanaian history.* In J.O. Hunwich (ed.), 1977, 26-43.

Davis, R. (1982). Expert systems: Where are we? And where do we go from here? *The*

AI Magazine, 3 (2)*,* 3-22.

Delattre, P. (1965). *Comparing the phonetic features of English, French, German and Spanish: An interim report*. Heidelberg: Julius Groos.

Dressler, W. and Grosu, A. (1972). Generative Phonologie und indogermanische Lautgeschichte: Eine krische Wurdigung. *Indogermanische Forschungen* 77: 19-72.

Dotse, K. (2011). The origin and brief history of the Eʊe people. Retrieved on 20/12/14 from *https://ferrusca.files.wordpress.com/.../the-origins-and-brief-histo*

Dotse, K. and Manoukian, M. (1952). The origin and brief history of the Eʊe people. Retrieved from https://ferrusca.files.wordpress.com/.../the-origins-and-brief-histo*,* on 20/12/14.

Downes, W. (1998). *Language and Society*, (2nd edn.), Cambridge: Cambridge University Press.

Dubois, S. and Horvath, B. M. (1998). Let's tink about dat: Interdental fricatives in Cajun English. *Language Variation and Change,* 10, 245-261.

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

Eckert, P. (1988). Adolescent social structure and the spread of linguistic change. *Language in Society* 17, 183-207

Eckert, P. (1989). *Jocks and burnouts*: *Social categories and identity in the high school*. New York: Teachers College Press.

Eckert, P. (1997). Age as a sociolinguistic variable. In Florian Coulmas (ed.), *the handbook of Sociolinguistics*. Oxford: Blackwell. 151-167.

Eckert, P. (2005). Variation, convention, and social meaning. *Plenary talk at the Annual Meeting of the Linguistic Society of America,* Oakland, CA.

Ellis, A.B. (1890). *The Ewe-speaking peoples of the slave Coast of West Africa: The religion, manners, customs, laws and languages*. London: Chapman and Hall.

Epstein, C.F. (1988). *Deceptive distinctions: Sex, gender and the social order.* New Haven, CT: Yale University Press and New York Russell Sage Foundation.

Everett, C. (2013). *Evidence for direct geographical influences on linguistic sounds: The case of ejectives*, PLOS ONE.

Fage, J.D. (1959). *A historical interpretation.* Madison, WI: University of Wisconsin

Press

Fant, P. (1960). *Acoustic theory of speech production*. S-Gravenhage: Mouton.

Farnetani, E. (1990). V-C-V lingual coarticulation and its spatiotemporal domain. In W. J. Hardcastle and A. Marchal (Eds). Speech Production and Speech Modelling, pp. 93-130. Kluwer Academic Publishers.

Feagin, W. (2002). Entering the community: fieldwork. In J.K. Chambers, Peter Trudgill and Nathalie Schilling-Estre (eds.). *A Handbook of Language variation and change.* USA: Blackwell, 20-39

Ferguson, C.A. and Dil, A. (1996). The sociolinguistic variable(s) in Bengali: A sound change in progress? In Sociolinguistic Perspectives: *Papers on Language in Society* 1959–1994. Charles Ferguson, (ed.), Thom Huebner. Oxford: Oxford University Press, 181–188.

Flege, J. E. (1995). Second language speech learning: theory, finding, and Problems. In *Speech Perception and Linguistic Experience: Issues in Cross-linguistic Research,* (ed.) by Winifred Strange, 229-273. Timonium, MD: York Press.

Flemming, E. (2004). Contrast and perceptual distinctiveness. Hayes, B., Kirchner, R. & Steriade, D. (eds.) *Phonetically-Based Phonology*, 232-276. Cambridge: Cambridge University Press.

Flemming, E. (2007). The phonetics of schwa vowels. Unpublished ms, MIT.

Freed, A.F. and Greenwood, A. (1996). Women, men, and type of talk: what makes the difference? *Language in Society* 25(1): 1-26.

Gay, T. (1968). Effects of speaking rates on diphthong formant movements. *Journal of the acoustical society of America* 44: 1570-73.

Gay, T. (1977). Articulatory movements in VCV sequences. *Journal of the Acoustic Society of America* 62(1), 183–193.

Gavua, K. (2000). *The handbook of Eveland,* In Agbodeka, F. (ed.). The Northern Ewes in Ghana, Vol II.

Gbegble, N. (2006). 'Spectrographic Analysis of Eʊe Vowels': *In Papers In Applied Linguistics, University of Education, Winneba* 1, 94-175.

Gimson, A. (1962). *An Introduction to the Pronunciation of English.* London: Edward Arnold.

Giles, H. (1973). Accent mobility: A model and data. *Anthropological linguistic* 1,111

225.

Giles, H. and Smith, A. (1979). Speech style and social evaluation. London: Academic Press.

Giles, H. and Coupland, N. (1991). *Language, contexts and consequences.* Milton Keynes: Open University Press.

Granovetter, M. (1973). The strength of weak ties. *American Journal of Sociology* 78, 1360-80.

Greenberg, J.H. (1963). *The languages of Africa.* Bloomington: Indiana University Press.

Gordon, E. (1997). Sex, speech and stereotypes: why women use prestige speech forms more than men. *Language in society* 26, 1-14.

Gordon, M.J. (2001). Small-Town values: Big-City vowels: A study of Northern cities shift in Michigan. *Publications of the American dialect society 84,* Durham, NC: Duke University Press.

Gumperz, J.J. (1982). *Language and social identity*. Cambridge: Cambridge University Press.

Gyasi, I.K. (1991). Aspects of English in Ghana. *English Today*, 26 (7.2), 26-31.

Haeri, N. (1997). *The sociolinguistic market of Cairo: Gender, class, and education.* London: Kegan Paul International.

Halliday, M.A.K. (1978). *Language as social semiotic*. London: Edward Arnold.

Handricourt, A.G. and Juilland, A.G. (1949). *Esai pour une histoire structural du phonetistme francais*. Paris C. Klinicksieck.

Harrington, J., Palethorpe, S. and Watson, C. (2000). Monophthongal vowel changes in Received Pronunciation: An Acoustic Analysis of the Queen's Christmas Broadcasts. *Journal of the International Phonetic Association* 30, 63-78.

Hawkins, S. and Midgley, J. (2005) Formant Frequencies of RP Monophthongs in Four Age Groups of Speakers. *Journal of the International Phonetic Association*. 35, 2, 183-199.

Hockett, C. (1950) Age-grading and linguistic continuity, in: Language 26, 449-59.

Holmes, J. (1997). Story-telling in New Zealand's women's and men's talk. In Ruth Wadack (ed.), *Gender and Discourse.* London: Sage. 245-293.

Holmes, J. (2008). *An Introduction to Sociolinguistics*. UK: Longman, Pearson.

Holmquist, J. (1985). Social correlates of a linguistic variable: A study in a Spanish village. *Language in Society,* 14, 191-203.

Irvine, S. (2006). Beginnings and Transitions: Old English. In Lynda Mugglestone, (ed.). *The Oxford History of English.* New York: Oxford University Press, 32-60

James, D. (1996). Women, men and prestige speech forms: A critical review. In Victoria L. Bergvall, Janet M. Bing, and Alice F. Freed (eds.) *Rethinking Language and Gender Research: Theory and Practice.* Harlow: Longman, 98–126.

Jenkins, J. (2003). *World Englishes*. A Resource Book for Students. London: Routledge.

Jones. D. (1967). *An outline of English phonetics.* Cambridge: W. Heffer & Sons Ltd.

Kachru, B.B. (1988). The spread of English and sacred linguistic cows. *In Language Spread and Language Policy: Issues, Implication, and Case Studies. GURT 1987.* Peter H. Lowenberg (Ed.). Washington, DC: Georgetown University Press, 207-28.

Kachru, B.B. (2000). 'Asia's Englishes and world Englishes', *English Today,* vol. 16, no. 1, 17-22.

Kachru, Y. and Nelson, C. L. (2011). World Englishes in Asian Contexts. *International Journal of Applied Linguistics* 17(1):132-137.

Kendall, T. and Thomas, E.R. (2010). Vowels: Vowel Manipulation, Normalization, and Plotting in R. R package, version 1.1 [Software Resource: http://ncslaap.lib.ncsu.edu/tools/norm/]

King, R. (1975). Integrating linguistic change. In K.H. Dahlstedt (ed.), *the Nordic Languages and Modern Linguistics*. Stockholm: Almqvist & wiksell, 47-69.

Kodzo-Vordoagu, J.G. (1994). Anglo Hogbetsotso Festival. Indiana University. Rerrieved from https://books.google.com/.../Anlo_Hogbetsotso_Festival.html?id, on, 5, 12, 14.

Koranteng, L. (2006). *Ghanaian English realizations of the central vowels.* Paper presented at the 2nd Conference on Applied Linguistics, UEW, Ghana.

Labov, W. (1963). The social motivation of a sound change. *Word,* 19, 23-309.

Labov, W. (1966). *The social stratification of English in New York City.* USA: Centre

for Applied Linguistics.

Labov, W. (1972a). *Sociolinguistic patterns*. Philadelphia: University of Pennsylvania Press.

Labov, W. (1972b). The isolation of contextual styles. In William Labov, *Sociolinguistic Patterns*. Philadelphia: University of Pennsylvania Press, 70-109.

Labov, W. (1972c). Reflection of social processes in linguistic structures. In William Labov, *Sociolinguistic Patterns.* Philadelphia: University of Pennsylvania Press, 110-121.

Labov. W. (1978). On the use of the present to explain the past. *Readings in historical phonology,* P. Baldi and R. Werth (ed.), 275–312. Pennsylvania: Pennsylvania State University Press.

Labov, W. (1984). Research methods of the project on linguistic change and variation. In J. Baugh & J. Sherzer, (eds.), *Language in use: Readings in sociolinguistics.* 28-53. Englewood Cliffs: Prentice Hall.

Labov, W. (1990). The intersection of sex and social class in the course of linguistic change. *Language Variation and Change* 2, 205–254.

Labov, W. (1994). *Principles of linguistic change*. Oxford: Blackwell.

Labov, W. (1998). Co-existent systems in African American vernacular English. In S. Mufwene, J. Rickford, G. Bailey and J. Baugh (eds.). *The structure of African American English: Structure, history, and use.* Landon and New York: Routledge, 110-53.

Labov, W. (2001). *Principles of linguistic change, Vol. 2: Social factors.* Oxford, UK: Blackwell.

Labov, W., Wendell, A. and Harris, W. A. (1986). De facto segregation of Black and White vernaculars. In David Sankoff (ed.) *Diversity and Diachrony*. Amsterdam, the Netherlands/ Philadelphia, Pennsylvania: John Benjamins.

Ladefoged, P. (1993) *A Course in Phonetics* (3rd edn.). New York: Harcourt Brace College Publishers.

Ladefoged, P. (2006). *A Course in Phonetics*. (5th edn.). USA: Thomson Wadsworth.

Lass, R. (2006). *Phonology and morphology*: In Hogg and Denison (eds.), 43-108.

Lennig, M. (1978). *Acoustic measurement of linguistic change: The modern Paris*

vowel system. PhD. Dissertation. University of Pennsylvania.

Lindblom, B. (1963). 'Spectrographic study of vowel reduction. *Journal of the Acoustical Society of America* 35, 1773-1781.

Liberman, A.M., Mattingly, I. G., and Turvey, M. T. (1967). *Language codes and memory codes, in coding processes in human memory,* (eds.) in Melton, A.W., & Martin, E., Washington: V. H. Winston.

Liljeros, F.C.R., Edling, L. A. N., Amaral, H. E. S., and Aberg, Y. (2001). The web of human sexual contacts. Nature 411 (6840), 907-908.

Löfqvist, A. and Gracco, V. (1999). Interarticulator programming in VCV sequences: Lip and tongue movements. *Journal of the Acoustical Society of America* 105, 1864-1876.

Lomotey, C.F. (2010). Ghanaians' Realization of [ə] and its implications for English teachers of University of Education, Winneba, Ghana. *Ife Studies in English Language* 8, 1-16.

Macaulay, R. (1977). *Language, social class and education: A Glasgow study*. Edinburgh: Edinburgh University Press.

Maclagan, M, and Hay, J. (2004). The rise and rise of New Zealand English DRESS. *In the Proceedings of the Australian International Conference on Speech Science and Technology*, December 2004.

Matthew, T. (2006). Preliminaries: Before English. In Lynda Mugglestone, (ed.). *The Oxford History of English.* New York: Oxford University Press, 61-85.

Matthews, W. (1938). *Cockney past and present: A Short History of the Dialect of London*. London: George Routledge & Sons, Ltd.

McMahon, A. (2006). Restructuring renaissance English. In Lynda Mugglestone, (ed.). *The Oxford History of English.* New York: Oxford University Press, 145-177.

Maclagan, M., Gordon, E. and Lewis, G. (1999). Women and sound change: Conservative and innovation behaviour by the same speakers. *Language Variation and Change* 11, 19-41.

Malécot, A., Johnston, R. and Kizziar, P. A. (1972). Syllabic rate and utterance length in French. *Phonetica* 26, 235-251.

Mamattah, C.M.K. (1978). The Ewes of West Africa, Vol. 1: *Aŋlɔ-Ewe and their immediate neighbours.* Accra: Volta Research Publications.

Marsden, S. (2006). A socio-phonetic study of labiodental /r/ in Leeds. *Leeds Working Papers in Linguistics and Phonetics* 11, 153-172.

Martinet, A. (1955). Economie des changements phonetiques. Bern: Franck.

de Medeiros, F. (1984). *Peuples du Golfe du Benin* (Adja-Ewe). Paris Karthala. In V.A. Fromkin (ed.), 113-131.

Meillet, A. (1926). *Linguistique historique et linguistique générale*, (2nd end). Paris: Librairie Ancienne honoré Champion.

Mensah K.A. (1977). *The Phonology of the Tornu Dialect of Ewe*. Post Graduate Dip. Project. Accra: University of Ghana, Legon.

Meyerhoff, M. (2006). *Introducing sociolinguistics*, (2nd edn.) London: Routledge.

Michael, J. A. (1962). The construction of the social class index. Appendix A. Adult Survey. *Mobilization of Youth, New York, Codebook for the Mobilization of Youth,* Vol. 1.

Milgram, S. (1967). The Small-World problem. *Psychology Today* 1, 62-67.

Milroy, J. and Milroy, L. (1978). Belfast: change and variation in the urban vernacular. In P. Trudgill (ed.). *Sociolinguistic patterns in British English.* London: Edward Arnold, 19-36

Milroy, L. (1980). *Language and Social Networks*. Oxford: Blackwell.

Milroy, J. (1981). *Regional accents of English.* Belfast: Blackwell.

Milroy, J. and Milroy, L. (1985). Linguistic change, social network and speaker innovation. *Journal of Linguistics,* 21. 339–384.

Milroy, L. (1987). *Language and social networks* (2nd edn.). Oxford: Oxford University Press.

Milroy, J. (1992). *Language variation and change: On the historical sociolinguistic of English*. Oxford: Blackwell.

Milroy, J. (1996). A Current Change in British English; Variation in (*th*) in Derby. *Newcastle and Durham Working Papers in Linguistics* 4, 213-222.

Milroy, L. (2002). Social Networks. In J.K Chambers, Peter Trudgill and Natalie Schilling-Estes (eds.). *The Handbook of Language Variation and Change*. Oxford: Blackwell Publishing, 549-572.

Milroy, L. and Gordon, M. (2003). *Sociolinguistics: Method and Interpretation*. Oxford: Blackwell.

Millward, C.M. and Hayes, M. (2012). *A Biography of the English Language,* (3rd edn.). UK: Wadsworth.

Morrison, K. (2006). Marx, Durkheim, Weber. *Formations of modern social thought* (2nd edn.). London: Sage Publications.

Moulton, W.G. (1962). Dialect geography and the concept of phonological space. W*ord* 18, 23-32.

Nichols, P. (1983). Linguistic options and choices for Black women in the rural south. In Thorne, B. Kramarae, C. & N. Henley (Eds) *Language, Gender and Society,* 54–68. Rowley, MA: Newbury House.

Newman, M.E.J. (2001). The structure of scientific collaboration networks. Proceedings of the National Academy of Sciences of the United States of America, 98:404–409.

Nyomi, C.K. (1976). *Eve Phonology for Beginners*. Cape Coast: University of Cape Coast.

Payne, A. (1976). The acquisition of the phonological system of a second dialect. Philadelphia, PA: University of Pennsylvania dissertation.

Pazzi, R. (1979). *Introduction a l'histoire de l'aire culturelle Ajatado* (Etudes et Documents de Science Humaines 1, Institut National des Sciences de l'Education) Lome: Université du Benin.

Pan American Health Organisation (1997). Diabetes mortality rates Texas and El Paso. *Pan American Journal of Public Health,* 3(2): 131-133.

Pederson, D. (1965). The role of the individual and group in American English. *American Speech*, 75 (1), 3-13.

Reetz, H. and Jongman, A. (2009). *Phonetics: transcription, production, acoustics, and perception.* UK: Wiley-Blackwell.

Repp, B. and Libermann, A. (1990). *Phonetic category boundaries are flexible. In categorical perception: The groundwork of cognition*. Cambridge: Cambridge University Press.

Rickford, J.R. (1986). *Style and sociolinguistic variation.* Cambridge and New York: Cambridge University Press.

Roach, P. (2000). *English phonetics and phonology*. Cambridge: Cambridge University Press.

Romaine, S. (1998). *Why women are supposed to talk like ladies: The glamour of grammar*. Cambridge: Cambridge University Press.

Sackeyfio, N.A. (1996). *Let's teach English.* Accra: Assemblies of God Literature Centre Ltd.

Sankoff, D. and Laberge, S. (1978). *The linguistic market and the statistical explanation of variability. Linguistic variation: models and methods*, (ed.) by David Sankoff, 239–50. New York: Academic Press.

Sankoff, G. (2005). Cross-sectional and longitudinal studies in sociolinguistics. Sociolinguistics: *an international handbook of the science of language and society*, In Peter Trudgill (ed.), 1003–13. Berlin: Mouton de Gruyter.

Sankoff, G. (2006). *Age: Apparent time and real time*. Elsevier Encyclopedia of Language and Linguistics, (2nd edn), 1-16.

Sarhimaa, A. (2009). Social network theory as a framework for studying minor Finnic languages with special reference to Karelian. The *Quasquicentennial of the Finno-Ugrian Society*, 161–190.

Scanlon, M. (2007). A thesis submitted in partial fulfillment of the requirements for the degree of Master of Arts. University of Washington.

Schmied, J. (2009). *East African English (Kenya, Uganda, Tanzania).* Amsterdam: John Benjamins.

Schneider, E.W. (2003). The dynamics of New Englishes: From identity construction to dialect birth. *Language* 79, 233–81.

Sey, K.A. (1973). *Ghanaian English*: *An Exploratory Survey*. London: Macmillan.

Shapiro, M. and Schiffman, H. F. (1983) Language and Society in South Asia Dordrecht: Foris.

Shelling-Estes, N. (2002). Investigating stylistic variation. In J.K. Chambers, P. Trudgill and N. Schilling-Estre (eds.), *A Handbook of Language variation and change.* USA: Blackwell, 375-401.

Shuy, R., Wolfram, W. and Riley, W.K. (1968). *A study of social dialects in Detroit.* (Final Report, Project 6-1347).Washington, D. C.: Office of Education.

Simpson, A.P. (2001). Dynamic consequences of differences in male and female

vocal tract dimensions. *J Acoust. Soc. Am.* 109(5), 2153-2164.

Stahlke, H. (1971a). *Topics in Eve phonology.* Doctoral Dissertation, University of California, Los Angeles: Ann Arbor, Much.: University Microfilms.

Tannen, D. (1984). *Conversational Style: Analyzing Talk among Friends*. Norwood, NJ: Ablex.

Tarde, G. (1873). *Les Lois d'imitation*. English translation, New York: Henry Holt.

de Tressan, de Lavergne, (1953). *Inventaire linguistique de l'Afrique occidentale française et du Togo.* Dakar: Institut Fondamental de l'Afrique Noire.

Trudgill, P. (1972. Sex, covert prestige, and linguistic change in the urban British English of Norwich. Language in Society 1: 179-196.

Trouvain, J. (2001). Phonetic aspects of 'speech laughs'. Proc. Confer. on Orality & Gestuality (Orage), Aix-en-Provence, 634-639.

Trudgill, P. (1974). *The social differentiation of English in Norwich.* Cambridge: CUP.

Trudgill, P. (1983). *On Dialect*. Oxford: Blackwell.

Trudgill, P. (1986). *Dialects in contact*. Oxford: Blackwell.

Trudgill, P. 1990. *The dialects of England*. Malden, MA: Basil Blackwell.

Tunley, A. (1999). Coarticulatory influences of liquids on vowels in English: PhD dissertation University of Cambridge.

Van der Leij, M. J. and Goyal, S. (2011). Strong ties in a small world. Review of Network Economics, 10(2), 1.

Wagner, E.S. (2012). Language variation and change, 24 (2012), 179–202. Cambridge University Press.

Warner, W.L. (1960). *Social class in America: A manual of procedure for the measurement of social status.* New York: Harper.

Watt, D.J.L., Fabricius, A. H. (2002). Evaluation of a technique for improving the mapping of multiple speakers' vowel spaces in the F1-F2 plane. Leeds Working Papers in Linguistics and Phonetics 9, 159-173.

Weinreich, U., Labov, W. and Herzog, M. (1968). Empirical foundations for a theory of language change. In Lehmann, W. & Malkiel, Y. (eds), *Directions for historical linguistics.* Austin: University of Texas Press, 95-195

Wells, J.C. (1962). *A study of the formants of the pure vowels of British English.* MA Thesis. University College London.

Wells, J.C. (1982). *Accents of English: The British Isles* (2nd edn). Cambridge: Cambridge University Press.

Wellman, B. (1988). Thinking structurally. In B. Wellman & S. D. Berkowitz (eds.), *Social structures: A network approach*. Cambridge: Cambridge University Press, 15-19.

Westermann, D. (1930). *A study of the Eve language.* (trans. by B. Smith). Oxford: Oxford University Press.

Wolfram, W. (1991). *Dialects and American English.* Englewood Cliffs, NJ: Prentice Hall, Inc.

Wolfram, W. and Fasold, R. (1974). *The study of social dialect in American English.* Englewood Cliffs, NJ: Prentice Hall.

Wolfram, W. (1981) Varieties of American English. In Language in the USA. Edited by Charles A. Ferguson and Shirley Brice Heath. Cambridge, UK: Cambridge University Press, 44–68.

Wood, S. (1973). Speech tempo. *Working Papers Phonetics, Lund* 9, 99 147.

Yankson, K.E. (1971). *The Consonants of Fante*. Unpublished Departmental lecture, University of Cape Coast.

Appendixes

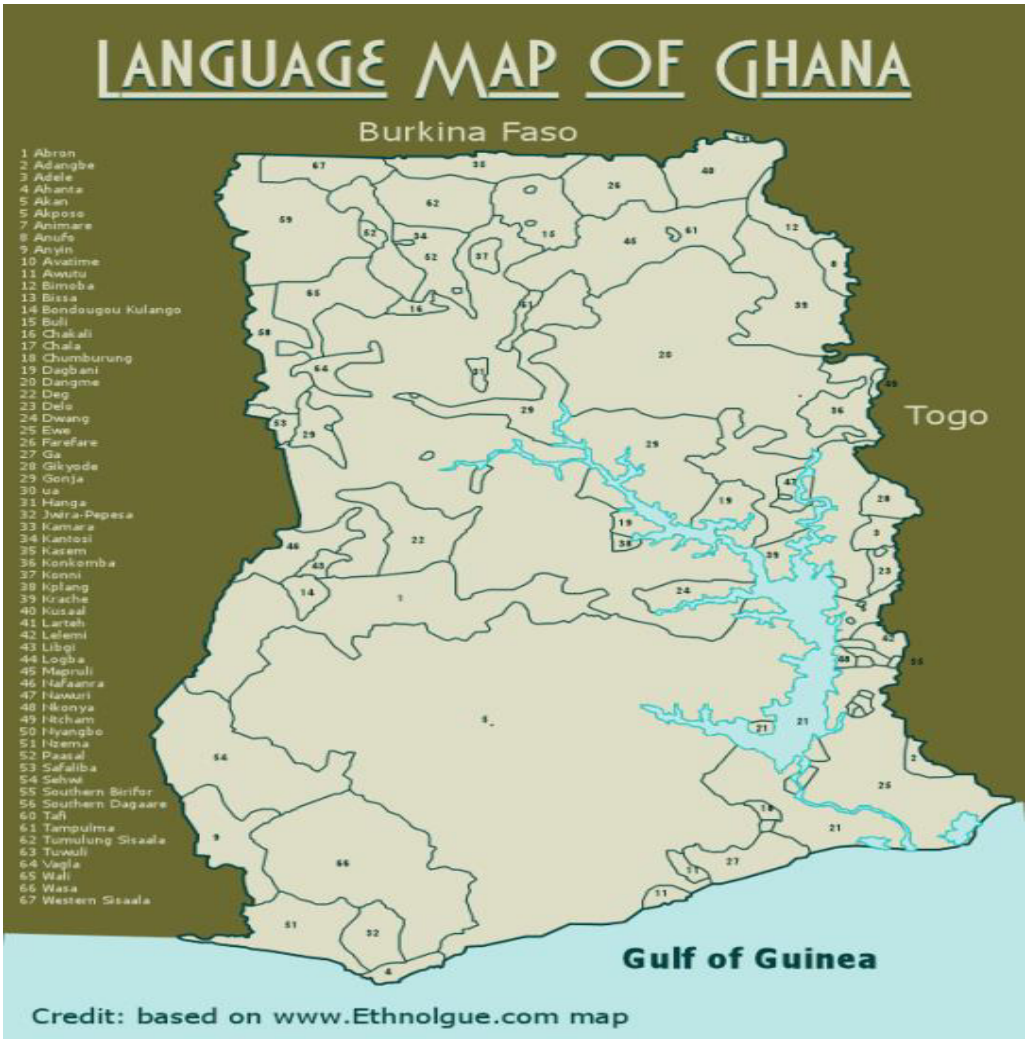
Appendix A: The Word-list /e/ /ɜː/ and /ə/

DRESS	NURSE	lettER	Distracters
Mono-Syllabic ate /ˈet/ head /ˈhed/ friend /ˈfrend/ get /ˈget/ ethic /ˈeθnɪk/ dress /ˈdres/ sell /ˈsel/ tent /ˈtent/ pen /ˈpen/ health /ˈhelθ/ very /ˈveri/ kept /ˈkept/ said /ˈsed/ **Disyllabic** letter /ˈletə/ **Polysyllabic** assembly /əˈsembli/	**Mono-Syllabic** about /əˈbaʊt/ favour /ˈfeɪvə/ colour /ˈkʌlə/ creator /ˈkreɪtə/ father /ˈfaðə/ letter /ˈletə/ support /səˈpɔːt/ filler /ˈfɪlə/ doctor /ˈdɒktə/ among /əˈmʌŋ/ agree /əˈgriː/ amount /əˈmaʊnt/ dollar /ˈdɒlə/ oppress /əˈpres/ **Polysyllabic** assembly /əˈsembli/	**Mono-Syllabic** third /ˈθɜːd/ verse /ˈvɜːz/ earth /ˈɜːθ/ curse /ˈkɜːz/ word /ˈwɜːk/ turn /ˈtɜːn/ nurse /ˈnɜːz/ dirt /ˈdɜːt/ learn /ˈlɜːn/ birth /ˈbɜːθ/ merge /ˈmɜːdʒ/ work /ˈwɜːk/ curl /ˈkɜːl/ heard /ˈhɜːd/ first /ˈfɜːst/	**Mono-Syllabic** three /ˈθri/ cord /ˈkɔːd/ thatch /ˈθætʃ/ town /ˈtaʊn/ peel /ˈpiːl/ top /ˈtɒp/ pool /ˈpʊl/ cock /ˈkɒk/ paint /ˈpeɪnt/ food /ˈfuːd/ tip /ˈtɪp/ took /ˈtʊk/ they /ˈðeɪ/ book /ˈbʊk/ park /ˈpaːk/ bathe /ˈbeɪð/ shoe /ˈʃuː/ those /ˈðʊəz/ pot /ˈpɒt/ path /ˈpæθ/ tall /ˈtɔːl/ fly /ˈflaɪ/ tool /ˈtuːl/ tithe /ˈtaɪð/ pound /ˈpaʊnd/ though /ˈðʊə/ breathe /ˈbriːð/ **Disyllabic** nothing /ˈnʌθɪŋ/ wanted /ˈwɒntɪd/ /northern /ˈnɔːðn/ southern /ˈsʌðn/ **Polysyllabic** mathematics /ˌmæθˈmætɪks

Appendix B

(1) Linguistic map of Eʋe

(2) Linguistic map of Eʋe language



Appendix C

Appendix C1. Distribution of the variable across dialect region

i. DRESS vowel /e/

Variables	Dialect	N	Mean	Std. Dev.	t-value	Sig.	η^2
Realisation of [ɪ] for DRESS	Aŋlɔ Eʋe	48	3.833	5.669	4.512**	0.000	0.178
	Eʋeme	48	0.125	0.531			
Realisation of [e] for DRESS	Aŋlɔ Eʋe	48	8.896	5.875	-4.615**	0.000	0.185
	Eʋeme	48	12.958	1.637			
Realisation of [ɜ:] for DRESS	Aŋlɔ Eʋe	48	2.271	2.566	0.820	0.414	
	Eʋeme	48	1.917	1.541			

ii. NURSE vowel /ɜ:/

Variables	Dialect	N	Mean	Std. Dev.	t-value	Sig.	η^2
Realisation of [e] for NURSE	Aŋlɔ Eʋe	48	9.250	6.086	-4.708**	0.000	0.191
	Eʋeme	48	13.625	2.101			
Realisation of [ɜ:] for NURSE	Aŋlɔ Eʋe	48	5.750	6.086	4.615**	0.000	0.180
	Eʋeme	48	1.375	2.101			

iii. lettER vowel /ə/

Variables	Dialect	N	Mean	Std. Dev.	t-value	Sig.	η^2
Realisation of [ɪ] for lettER	Aŋlɔ Eʋe	48	0.313	0.589	0.966	0.336	
	Eʋeme	48	0.208	0.459			
Realisation of [ə] for lettER	Aŋlɔ Eʋe	48	6.479	3.725	0.027	0.978	
	Eʋeme	48	6.458	3.809			
Realisation of [o] for lettER	Aŋlɔ Eʋe	48	1.521	0.772	2.518*	0.014	0.063
	Eʋeme	48	1.167	0.595			
Realisation of [ʌ] for lettER	Aŋlɔ Eʋe	48	6.687	3.327	-0.680	0.498	
	Eʋeme	48	7.167	3.575			

Appendix C2. Distribution of the variable according to age across Ewe

i. DRESS vowel /e/

Variables	Age group	N	Mean	Std. Dev.	t-value	Sig.	η^2
Realisation of [ɪ] for DRESS	Lower	48	0.187	1.024	-4.329**	0.000	0.166
	Upper	48	3.771	5.642			
Realisation of [e] for DRESS	Lower	48	13.104	1.519	5.032**	0.000	0.212
	Upper	48	8.750	5.799			
Realisation of [ɜ:] DRESS	Lower	48	1.708	1.352	-1.808	0.075	
	Upper	48	2.479	2.625			

ii. NURSE vowel /ɜ:/

Variables	Age group	N	Mean	Std. Dev.	t-value	Sig.	η^2
Realisation of [e] for NURSE	Lower	48	13.396	2.672	4.109**	0.000	0.150
	Upper	48	9.479	6.021			
Realisation of ɜ:] for NURSE	Lower	48	1.604	2.672	-4.119**	0.000	0.158
	Upper	48	5.521	6.021			

iii. lettER vowel /ə/

Variables	Age group	N	Mean	Std. Dev.	t-value	Sig.
Realisation of [ɪ] for lettER	Lower	48	0.354	0.635	1.759	0.083
	Upper	48	0.167	0.376		
Realisation of [ə] for lettER	Lower	48	6.375	3.577	-0.244	0.808
	Upper	48	6.562	3.946		
Realisation of [o] for lettER	Lower	48	1.250	0.565	-1.302	0.197
	Upper	48	1.437	0.823		
Realisation of [ʌ] for lettER	Lower	48	7.021	3.348	0.265	0.791
	Upper	48	6.833	3.569		

Appendix C3. Distribution of the variable according to age within dialect region

Aŋlɔ

i.DRESS vowel /e/

Variables	Age group	N	Mean	Std. Dev.	t-value	Sig.	η^2
Realisation of [ɪ] for DRESS	Lower	24	0.375	1.439	-5.310**	0.000	0.380
	Upper	24	7.292	6.217			
Realisation of [e] for DRESS	Lower	24	13.000	1.769	6.760**	0.000	0.498
	Upper	24	4.792	5.679			
Realisation of [ɜ:] for DRESS	Lower	24	1.625	1.468	-1.784	0.084	
	Upper	24	2.917	3.229			

ii. NURSE vowel /ɜ:/

Variables	Age group	N	Mean	Std. Dev.	t-value	Sig.	η^2
Realisation of [e] for NURSE	Lower	24	12.458	3.362	4.269**	0.000	0.280
	Upper	24	6.042	6.551			
Realisation of [ɜ:] for NURSE	Lower	24	2.542	3.362	-4.269**	0.000	0.284
	Upper	24	8.958	6.551			

iii. lettER vowel /ə/

Variables	Age group	N	Mean	Std. Dev.	t-value	Sig.	η^2
Realisation of [ɪ] for lettER	Lower	24	0.458	0.721	1.752	0.088	
	Upper	24	0.167	0.381			
Realisation of [[ə] for lettER	Lower	24	6.583	3.501	0.192	0.849	
	Upper	24	6.375	4.009			
Realisation of [o] for lettER	Lower	24	1.250	0.608	-2.573*	0.013	0.126
	Upper	24	1.792	0.833			
Realisation of [ʌ] for lettER	Lower	24	6.708	3.182	0.043	0.966	
	Upper	24	6.667	3.534			

Eʊeme

i.DRESS /e/

Variables	Age group	N	Mean	Std. Dev.	t-value	Sig.
Realisation of [ɪ] for /e/ SS	Lower	24	0.000	0.000	-1.661	0.110
	Upper	24	0.250	0.737		
Realisation of [e] for DRESS	Lower	24	13.208	1.250	1.060	0.296
	Upper	24	12.708	1.944		
Realisation of [ɜː] for DRESS	Lower	24	1.792	1.250	-0.558	0.580
	Upper	24	2.042	1.805		

ii. NURSE vowel /ɜ:/

Variables	Age group	N	Mean	Std. Dev.	t-value	Sig.	η^2
Realisation of [e] for NURSE	Lower	24	14.333	1.204	2.459*	0.019	0.116
	Upper	24	12.917	2.552			
Realisation of [ɜː] for NURSE	Lower	24	0.667	1.204	-2.459*	0.029	0.117
	Upper	24	2.083	2.552			

iii. lettER vowel /ə/

Variables	Age group	N	Mean	Std. Dev.	t-value	Sig.
Realisation of [ɪ] for lettER	Lower	24	0.250	0.532	0.624	0.535
	Upper	24	0.167	0.381		
Realisation of [ə] for lettER	Lower	24	6.167	3.714	-0.526	0.601
	Upper	24	6.750	3.959		
Realisation of [o] for lettER	Lower	24	1.250	0.532	0.969	0.338
	Upper	24	1.083	0.654		
Realisation of [ʌ] for lettER	Lower	24	7.333	3.547	0.320	0.750
	Upper	24	7.000	3.671		

Appendix C4. Distribution of the variable according to gender across Eʊe

i.DRESS vowel /e/

Variables	Gender	N	Mean	Std. Dev.	t-value	Sig.	η^2
Realisation of [ɪ] for DRESS	Male	48	2.000	4.162	.046	0.963	
	Female	48	1.958	4.704			
Realisation of [e] for DRESS	Male	48	10.313	4.745	-1.272	0.207	
	Female	48	11.542	4.726			
Realisation of [ɜː] for DRESS	Male	48	2.687	2.519	2.855**	0.005	0.081
	Female	48	1.500	1.399			

ii.NURSE vowel /ɜː/

Variables	Gender	N	Mean	Std. Dev.	t-value	Sig.
Realisation of [e] for NURSE	Male	48	11.062	5.208	-0.728	0.458
	Female	48	11.812	4.880		
Realisation of [ɜː] for NURSE	Male	48	3.937	5.208	0.718	0.468
	Female	48	3.187	4.880		

iii. lettER vowel /ə/

Variables	Gender	N	Mean	Std. Dev.	t-value	Sig.
Realisation of [ɪ] for lettER	Male	48	0.292	0.544	0.578	0.565
	Female	48	0.229	0.515		
Realisation of [ə] for lettER	Male	48	7.083	3.247	1.621	0.109
	Female	48	5.854	4.131		
Realisation of [o] for lettER	Male	48	1.375	0.733	.430	0.668
	Female	48	1.312	0.689		
Realisation of [ʌ] for lettER	Male	48	6.250	2.943	-1.955	0.054
	Female	48	7.604	3.791		

Appendix C5. Distribution of variable according to gender within dialect region

Aŋlɔ

i.DRESS vowel /e/

Variables	Gender	N	Mean	Std. Dev.	t-value	Sig.	η^2
Realisation of [ɪ] for DRESS	Male	24	3.750	5.334	-0.101	0.920	
	Female	24	3.917	6.100			
Realisation of [e] for DRESS	Male	24	8.250	5.892	-0.758	0.452	
	Female	24	9.542	5.912			
Realisation of [ɜ:] for DRESS	Male	24	3.000	3.270	2.033*	0.048	0.082
	Female	24	1.542	1.285			

ii. NURSE / ɜ:/

Variables	Gender	N	Mean	Std. Dev.	t-value	Sig.
Realisation of [e] for NURSE	Male	24	9.208	6.419	-.047	.963
	Female	24	9.292	5.872		
Realisation of [ɜ:] for NURSE	Male	24	5.792	6.419	.077	.953
	Female	24	5.708	5.872		

iii. lettER / ə/

Variables	Gender	N	Mean	Std. Dev.	t-value	Sig.
Realisation of [ɪ] for lettER	Male	24	0.375	0.576	0.731	0.468
	Female	24	0.250	0.608		
Realisation of [ə] for lettER	Male	24	6.458	3.036	-0.038	0.970
	Female	24	6.500	4.374		
Realisation of [o] for lettER	Male	24	1.708	0.751	1.718	0.092
	Female	24	1.333	0.761		
Realisation of [ʌ] for lettER	Male	24	6.458	2.797	-0.473	0.638
	Female	24	6.917	3.832		

Eʊeme

i. DRESS vowel /e/

Variables	Gender	N	Mean	Std. Dev.	t-value	Sig.	η^2
Realisation of **[ɪ]** for DRESS	Male	24	0.250	0.737	1.661	0.110	
	Female	24	0.000	0.000			
Realisation of [e] for DRESS	Male	24	12.375	1.555	-2.618*	0.012	0.129
	Female	24	13.542	1.532			
Realisation of [ɜ:] for DRESS	Male	24	2.375	1.439	2.137*	0.038	0.090
	Female	24	1.458	1.532			

ii.NURSE vowel /ɜ:/

Variables	Gender	N	Mean	Std. Dev.	t-value	Sig.	η^2
Realisation of [e] for NURSE	Male	24	12.917	2.653	-2.459*	0.020	0.116
	Female	24	14.333	0.963			
Realisation of ɜ:] for NURSE	Male	24	2.083	2.653	2.469*	0.020	0.126
	Female	24	0.667	0.963			

iii. lettER / ə/

Variables	Gender	N	Mean	Std. Dev.	t-value	Sig.	η^2
Realisation of [ɪ] for lettER	Male	24	0.208	0.509	0.000	1.000	
	Female	24	0.208	0.415			
Realisation of [ə] for lettER	Male	24	7.708	3.394	2.384*	0.021	0.110
	Female	24	5.208	3.856			
Realisation of [o] for lettER	Male	24	1.042	0.550	-1.472	0.148	
	Female	24	1.292	0.624			
Realisation of [ʌ] for lettER	Male	24	6.042	3.127	-2.275*	0.028	0.101
	Female	24	8.292	3.701			

Appendix C6. Distribution of variable according to education across Eʋe

i. DRESS /e/

Variables	Education level	N	Mean	Std. Dev.	t-value	Sig.
Realisation of [ɪ] for DRESS	Basic level	48	2.021	4.402	.092	.927
	Secondary level	48	1.937	4.478		
Realisation of [e] for DRESS	Basic level	48	10.708	4.920	-.449	.654
	Secondary level	48	11.146	4.617		
Realisation of [ɜ:] for DRESS	Basic level	48	2.271	2.541	.820	.414
	Secondary level	48	1.917	1.582		

ii. NURSE vowel /ɜ:/

Variables	Education level	N	Mean	Std. Dev.	t-value	Sig.
Realisation of [e] for NURSE	Basic level	48	11.750	5.130	0.606	0.546
	Secondary level	48	11.125	4.971		
Realisation of [ɜ:] for NURSE	Basic level	48	3.250	5.130	-0.606	0.543
	Secondary level	48	3.875	4.971		

iii.lettER vowel /ə/

Variables	Education level	N	Mean	Std. Dev.	t-value	Sig.
Realisation of [ɪ] for lettER	Basic level	48	0.271	0.574	0.192	0.848
	Secondary level	48	0.250	0.484		
Realisation of [ə] for lettER	Basic level	48	6.396	3.654	-0.190	0.850
	Secondary level	48	6.542	3.875		
Realisation of [o] for lettER	Basic level	48	1.229	0.722	-1.598	0.113
	Secondary level	48	1.458	0.683		
Realisation of [ʌ] for lettER	Basic level	48	7.104	3.385	0.502	0.617
	Secondary level	48	6.750	3.528		

Appendix C7. Distribution of the variable according to education within dialect region Aŋlɔ

i.DRESS vowel /e/

Variables	Education level	N	Mean	Std. Dev.	t-value	Sig.
Realisation of [ɪ] for DRESS	Basic level	24	3.917	5.648	0.101	0.920
	Secondary level	24	3.750	5.810		
Realisation of [e] for DRESS	Basic level	24	8.833	6.239	-0.073	0.942
	Secondary level	24	8.958	5.622		
Realisation of [ɜ:] for DRESS	Basic level	24	2.250	3.179	-0.056	0.956
	Secondary level	24	2.292	1.829		

ii.NURSE vowel /ɜ:/

Variables	Education level	N	Mean	Std. Dev.	t-value	Sig.
Realisation of [e] for NURSE	Basic level	24	9.667	6.411	0.470	0.640
	Secondary level	24	8.833	5.851		
Realisation of [ɜ:] for NURSE	Basic level	24	5.333	6.411	-0.470	0.620
	Secondary level	24	6.167	5.851		

iii. lettER vowel /ə/

Variables	Education level	N	Mean	Std. Dev.	t-value	Sig.
Realisation of [ɪ] for lettER	Basic level	24	0.375	0.711	0.731	0.468
	Secondary level	24	0.250	0.442		
Realisation of [ə] for lettER	Basic level	24	6.167	3.714	-0.577	0.567
	Secondary level	24	6.792	3.788		
Realisation of [o] for lettER	Basic level	24	1.458	0.779	-0.557	0.580
	Secondary level	24	1.583	0.775		
Realisation of [ʌ] for lettER	Basic level	24	7.000	3.451	0.647	0.521
	Secondary level	24	6.375	3.241		

Eʋeme

i.DRESS vowel /e/

Variables	Education level	N	Mean	Std. Dev.	t-value	Sig.
Realisation of [ɪ] for DRESS	Basic level	24	0.125	0.448	0.000	1.000
	Secondary level	24	0.125	0.612	0.000	1.000
Realisation of [e] for DRESS	Basic level	24	12.583	1.792	-1.614	0.113
	Secondary level	24	13.333	1.404	-1.614	0.114
Realisation of [ɜ:] for DRESS	Basic level	24	2.292	1.756	1.720	0.092
	Secondary level	24	1.542	1.215	1.720	0.093

ii. NURSE vowel /ɜ:/

Variables	Education level	N	Mean	Std. Dev.	t-value	Sig.
Realisation of [e] for NURSE	Basic level	24	13.833	1.903	0.683	0.498
	Secondary level	24	13.417	2.301		
Realisation of ɜ:] for NURSE	Basic level	24	1.167	1.903	-0.683	0.493
	Secondary level	24	1.583	2.301		

iii. lettER vowel /ə/

Variables	Education level	N	Mean	Std. Dev.	t-value	Sig.
Realisation of [ɪ] for lettER	Basic level	24	0.167	0.381	-0.624	0.535
	Secondary level	24	0.250	0.532		
Realisation of [ə] for lettER	Basic level	24	6.625	3.657	0.300	0.765
	Secondary level	24	6.292	4.027		
Realisation of [o] for lettER	Basic level	24	1.000	0.589	-2.000	0.051
	Secondary level	24	1.333	0.565		
Realisation of [ʌ] for lettER	Basic level	24	7.208	3.388	0.080	0.937
	Secondary level	24	7.125	3.826		

Appendix C8. Distribution of the variable according to network across Eʊe

i.DRESS vowel /e/

Variables	Social network	N	Mean	Std. Dev.	t-value	Sig.	η^2
Realisation of [ɪ] for DRESS	Weak	48	0.458	1.148	-3.576**	0.001	0.120
	Strong	48	3.500	5.779			
Realisation of [e] for DRESS	Weak	48	12.083	2.766	2.446*	0.017	0.060
	Strong	48	9.771	5.936			
Realisation of [ɜ:] for DRESS	Weak	48	2.458	2.352	1.708	0.091	
	Strong	48	1.729	1.795			

ii. NURSE vowel /ɜ:/

Variables	Social network	N	Mean	Std. Dev.	t-value	Sig.	η^2
Realisation of [e] for NURSE	Weak	48	12.917	2.804	2.997**	0.004	0.087
	Strong	48	9.958	6.236			
Realisation of ɜ:] for NURSE	Weak	48	2.083	2.804	-2.997**	0.006	0.089
	Strong	48	5.042	6.236			

iii. lettER vowel /ə/

Variables	Social network	N	Mean	Std. Dev.	t-value	Sig.
Realisation of [ɪ] for lettER	Weak	48	0.229	0.515	-0.578	0.565
	Strong	48	0.292	0.544		
Realisation of [ə] for lettER	Weak	48	6.542	3.930	0.190	0.850
	Strong	48	6.396	3.595		
Realisation of [o] for lettER	Weak	48	1.312	0.748	-0.430	0.668
	Strong	48	1.375	0.672		
Realisation of [ʌ] for lettER	Weak	48	6.917	3.463	-0.430	0.668
	Strong	48	6.937	3.460		

Appendix C9. Distribution of the variables according to network within dialect region Aŋlɔ

i.DRESS vowel /e/

Variables	Social network	N	Mean	Std. Dev.	t-value	Sig.	η^2
Realisation of [ɪ] for DRESS	Weak	24	0.792	1.444	-4.376**	0.000	0.294
	Strong	24	6.875	6.655			
Realisation of DRESS for DRESS	Weak	24	11.500	3.587	3.398**	0.002	0.201
	Strong	24	6.292	6.597			
Realisation of NURSE for DRESS	Weak	24	2.708	3.071	1.186	0.242	
	Strong	24	1.833	1.903			

ii. NURSE vowel /ɜ:/

Variables	Social network	N	Mean	Std. Dev.	t-value	Sig.	η^2
Realisation of [e] for NURSE	Weak	24	12.375	3.334	4.117**	0.000	0.269
	Strong	24	6.125	6.648			
Realisation of [ɜ:] for NURSE	Weak	24	2.625	3.334	-4.117**	0.000	0.259
	Strong	24	8.875	6.648			

iii. lettER vowel /ə/

Variables	Social network	N	Mean	Std. Dev.	t-value	Sig.
Realisation of [ɪ] for lettER	Weak	24	0.208	0.509	-1.232	0.225
	Strong	24	0.417	0.654		
Realisation of [ə] for lettER	Weak	24	6.208	3.538	-0.500	0.620
	Strong	24	6.750	3.959		
Realisation of [o] for lettER	Weak	24	1.500	0.834	-0.185	0.854
	Strong	24	1.542	0.721		
Realisation of [ʌ] for lettER	Weak	24	7.083	2.962	0.821	0.416
	Strong	24	6.292	3.677		

Eʋeme

i.DRESS vowel /e/

Variables	Social network	N	Mean	Std. Dev.	t-value	Sig.
Realisation of [ɪ] for DRESS	Weak	24	0.125	0.6124	0.000	1.000
	Strong	24	0.125	0.448		
Realisation of [e] for DRESS	Weak	24	12.667	1.435	-1.242	0.221
	Strong	24	13.250	1.799		
Realisation of [ɜ:] for DRESS	Weak	24	2.208	1.318	1.321	0.193
	Strong	24	1.625	1.715		

ii. NURSE vowel /ɜ:/

Variables	Social network	N	Mean	Std. Dev.	t-value	Sig.
Realisation of [e] for NURSE	Weak	24	13.458	2.085	-0.546	0.588
	Strong	24	13.792	2.146		
Realisation of ɜ:] for NURSE	Weak	24	1.542	2.085	0.546	0.587
	Strong	24	1.208	2.146		

iii. lettER vowel /ə/

Variables	Social network	N	Mean	Std. Dev.	t-value	Sig.
Realisation of [ɪ] for lettER	Weak	24	0.250	0.532	0.624	0.535
	Strong	24	0.167	0.381		
Realisation of [ə] for lettER	Weak	24	6.875	4.337	0.754	0.454
	Strong	24	6.042	3.237		
Realisation of [o] for lettER	Weak	24	1.125	0.612	-0.481	0.633
	Strong	24	1.208	0.588		
Realisation of [ʌ] for lettER	Weak	24	6.750	3.959	-0.804	0.425
	Strong	24	7.583	3.175		

Appendix C10. Network and other social variables: age, gender and education across Eve

Significant difference

i. DRESS

Age

		Mean	Sig.
Age	[e]		.000
Social network			.005
Age * Social network			.006

		Mean	Sig.
Age	[ɪ]		.000
Social network			.000
Age * Social network			.000

		Mean	Sig.
Age	[ɜː]		.063
Social network			.095
Age * Social network			.237

Gender

		Mean	Sig.
Gender	[e]		.205
Social network			.015
Gender * Social network			.098

		Mean	Sig.
Gender	[ɪ]		.981
Social network			.000
Gender * Social network			.985

		Mean	Sig.
Gender	[ɜː]		.006
Social network			.088
Gender * Social network			.268

Education

		Mean	Sig.
Education	[e]		.205
Social network			.015
Edu. * Social network			.098

		Mean	Sig.
Education	[ɪ]		.856
Social network			.000
Edu. * Social network			.904

		Mean	Sig.
Education	[ɜː]		.632
Social network			.16
Edu. * Social network			.931

ii. NURSE

Age

		Mean	Sig.
Age	[eː]		.000
Social network			.000
Age * Social network			.005

		Mean	Sig.
Age	[ɜː]		.000
Social network			.001
Age * Social network			.003

Gender

		Mean	Sig.
Gender	[eː]		.620
Social network			.002
Gender * Social network			.851

		Mean	Sig.
Gender	[ɜː]		.493
Social network			.003
Gender * Social network			1.000

Education

		Mean	Sig.
Education	[eː]		.710
Social network			.002
Edu. * Social network			.591

		Mean	Sig.
Education	[ɜː]		.575
Social network			.003
Edu. * Social network			.724

iii. lettER

Age

		Mean	Sig.
Age	[ɪ]		.083
Social network			.661
Age * Social network			.333

		Mean	Sig.
Age	[o]		.201
Social network			.668
Age * Social network			.886

		Mean	Sig.
Age	[ə]		.809
Social network			.851
Age * Social network			.295

		Mean	Sig.
Age	[ʌ]		.972
Social network			.977
Age * Social network			.307

Gender

		Mean	Sig.
Gender	[ɪ]		.568
Social network			.570
Gender * Social network			.561

		Mean	Sig.
Gender	[o]		.669
Social network			.659
Gender * Social network			.320

		Mean	Sig.
Gender	[ə]		.109
Social network			.848
Gender * Social network			.201

		Mean	Sig.
Gender	[ʌ]		.055
Social network			.976
Gender * Social network			.271

Education

		Mean	Sig.
Education	[ɪ]		.849
Social network			.568
Edu. * Social network			.650

		Mean	Sig.
Education	[o]		.112
Social network			.663
Edu. * Social network			.115

		Mean	Sig.
Education	[ə]		.855
Social network			.851
Edu. * Social network			.688

		Mean	Sig.
Education	[ʌ]		.621
Social network			.977
Edu. * Social network			.970

Appendix C11. Mean distribution

AGE: Realisation of NURSE

Dependent Variable: [ɜː]				
Respondents	Social network	Mean	Std. Dev.	N
Lower age	Weak	1.4167	2.10417	24
	Strong	1.7917	3.30979	24
	Total	1.6042	2.75016	48
Upper age	Weak	2.5417	3.28341	24
	Strong	8.2917	6.88084	24
	Total	5.4167	6.07343	48
Total	Weak	1.9792	2.78667	48
	Strong	5.0417	6.27036	48
	Total	3.5104	5.06587	96

Dependent Variable: [eː]				
Respondents	Social network	Mean	Std. Dev.	N
Lower age	Weak	13.9583	2.23566	24
	Strong	13.2083	3.30979	24
	Total	13.5833	2.81964	48
Upper age	Weak	12.4583	3.28341	24
	Strong	6.7083	6.88084	24
	Total	9.5833	6.07343	48
Total	Weak	13.2083	2.88030	48
	Strong	9.9583	6.27036	48
	Total	11.5833	5.12099	96

GENDER: Realisation of NURSE

Dependent Variable: [ɜː]				
Respondents	Social network	Mean	Std. Dev.	N
Male	Weak	2.4167	3.36112	24
	Strong	5.2917	6.42332	24
	Total	3.8542	5.27535	48
Female	Weak	1.5417	2.04257	24
	Strong	4.7917	6.24137	24
	Total	3.1667	4.87867	48
Total	Weak	1.9792	2.78667	48
	Strong	5.0417	6.27036	48
	Total	3.5104	5.06587	96

Dependent Variable: [eː]				
Respondents	Social network	Mean	Std. Dev.	N
Male	Weak	12.9583	3.55673	24
	Strong	9.7083	6.42332	24
	Total	11.3333	5.39240	48
Female	Weak	13.4583	2.04257	24
	Strong	10.2083	6.24137	24
	Total	11.8333	4.87867	48
Total	Weak	13.2083	2.88030	48
	Strong	9.9583	6.27036	48
	Total	11.5833	5.12099	96

EDUCATION: Realisation of NURSE

Dependent Variable: [ɜː]				
Respondents	Social network	Mean	Std. Dev.	N
Basic	Weak	1.8750	3.39197	24
	Strong	4.5833	6.19899	24
	Total	3.2292	5.12914	48
Secondary	Weak	2.0833	2.08341	24
	Strong	5.5000	6.44036	24
	Total	3.7917	5.04009	48
Total	Weak	1.9792	2.78667	48
	Strong	5.0417	6.27036	48
	Total	3.5104	5.06587	96

Dependent Variable: [eː]				
Respondents	Social network	Mean	Std. Dev.	N
Basic level	Weak	13.1250	3.39197	24
	Strong	10.4167	6.19899	24
	Total	11.7708	5.12914	48
Secondary level	Weak	13.2917	2.33087	24
	Strong	9.5000	6.44036	24
	Total	11.3958	5.16016	48
Total	Weak	13.2083	2.88030	48
	Strong	9.9583	6.27036	48
	Total	11.5833	5.12099	96

AGE: Realisation of lettER

Dependent Variable: [ʌ]				
Respondents	Social network	Mean	Std. Dev.	N
Lower age	Weak	7.3750	3.76266	24
	Strong	6.6667	2.91423	24
	Total	7.0208	3.34848	48
Upper age	Weak	6.4583	3.14821	24
	Strong	7.2083	3.97797	24
	Total	6.8333	3.56898	48
Total	Weak	6.9167	3.46308	48
	Strong	6.9375	3.46045	48
	Total	6.9271	3.44351	96

Dependent Variable: [ə]				
Respondents	Social network	Mean	Std. Dev.	N
Lower age	Weak	6.0417	4.14392	24
	Strong	6.7083	2.95590	24
	Total	6.3750	3.57667	48
Upper age	Weak	7.0417	3.72394	24
	Strong	6.0833	4.17983	24
	Total	6.5625	3.94594	48
Total	Weak	6.5417	3.93002	48
	Strong	6.3958	3.59515	48
	Total	6.4687	3.74715	96

Dependent Variable: [ɪ]				
Respondents	Social network	Mean	Std. Dev.	N
Lower age	Weak	.3750	.64690	24
	Strong	.3333	.63702	24
	Total	.3542	.63546	48
Upper age	Weak	.0833	.28233	24
	Strong	.2500	.44233	24
	Total	.1667	.37662	48
Total	Weak	.2292	.51528	48
	Strong	.2917	.54415	48
	Total	.2604	.52805	96

Dependent Variable: [o]				
Respondents	Social network	Mean	Std. Dev.	N
Lower age	Weak	1.2083	.50898	24
	Strong	1.2917	.62409	24
	Total	1.2500	.56493	48
Upper age	Weak	1.4167	.92861	24
	Strong	1.4583	.72106	24
	Total	1.4375	.82272	48
Total	Weak	1.3125	.74822	48
	Strong	1.3750	.67240	48
	Total	1.3437	.70827	96

GENDER: Realisation of lettER

Dependent Variable: [ʌ]				
Respondents	Social network	Mean	Std. Dev.	N
Male	Weak	6.6250	3.17343	24
	Strong	5.8750	2.70768	24
	Total	6.2500	2.94272	48
Female	Weak	7.2083	3.77612	24
	Strong	8.0000	3.84482	24
	Total	7.6042	3.79103	48
Total	Weak	6.9167	3.46308	48
	Strong	6.9375	3.46045	48
	Total	6.9271	3.44351	96

Dependent Variable: [ə]				
Respondents	Social network	Mean	Std. Dev.	N
Male	Weak	6.6667	3.74940	24
	Strong	7.5000	2.67029	24
	Total	7.0833	3.24748	48
Female	Weak	6.4167	4.17983	24
	Strong	5.2917	4.09113	24
	Total	5.8542	4.13079	48
Total	Weak	6.5417	3.93002	48
	Strong	6.3958	3.59515	48
	Total	6.4687	3.74715	96

Dependent Variable: [ɪ]				
Respondent	Social network	Mean	Std. Dev.	N
Male	Weak	.2917	.55003	24
	Strong	.2917	.55003	24
	Total	.2917	.54415	48
Female	Weak	.1667	.48154	24
	Strong	.2917	.55003	24
	Total	.2292	.51528	48
Total	Weak	.2292	.51528	48
	Strong	.2917	.54415	48
	Total	.2604	.52805	96

Dependent Variable: [o]				
Respondent	Social network	Mean	Std. Dev.	N
Male	Weak	1.4167	.77553	24
	Strong	1.3333	.70196	24
	Total	1.3750	.73296	48
Female	Weak	1.2083	.72106	24
	Strong	1.4167	.65386	24
	Total	1.3125	.68901	48
Total	Weak	1.3125	.74822	48
	Strong	1.3750	.67240	48
	Total	1.3437	.70827	96

EDUCATION: Realisation of lettER

Dependent Variable: [ʌ]				
Respondents	Social network	Mean	Std. Dev.	N
Basic	Weak	7.0833	3.77540	24
	Strong	7.1250	3.02615	24
	Total	7.1042	3.38482	48
Secondary	Weak	6.7500	3.19306	24
	Strong	6.7500	3.90373	24
	Total	6.7500	3.52800	48
Total	Weak	6.9167	3.46308	48
	Strong	6.9375	3.46045	48
	Total	6.9271	3.44351	96

Dependent Variable: [ə]				
Respondents	Social network	Mean	Std. Dev.	N
Basic level	Weak	6.6250	4.22016	24
	Strong	6.1667	3.05979	24
	Total	6.3958	3.65385	48
Secondary level	Weak	6.4583	3.70639	24
	Strong	6.6250	4.11585	24
	Total	6.5417	3.87550	48
Total	Weak	6.5417	3.93002	48
	Strong	6.3958	3.59515	48
	Total	6.4687	3.74715	96

Dependent Variable: [ɪ]				
Respondents	Social network	Mean	Std. Dev.	N
Basic	Weak	.2083	.50898	24
	Strong	.3333	.63702	24
	Total	.2708	.57388	48
Secondary	Weak	.2500	.53161	24
	Strong	.2500	.44233	24
	Total	.2500	.48378	48
Total	Weak	.2292	.51528	48
	Strong	.2917	.54415	48
	Total	.2604	.52805	96

Dependent Variable: [o]				
Respondents	Social network	Mean	Std. Dev.	N
Basic	Weak	1.0833	.65386	24
	Strong	1.3750	.76967	24
	Total	1.2292	.72169	48
Secondary	Weak	1.5417	.77903	24
	Strong	1.3750	.57578	24
	Total	1.4583	.68287	48
Total	Weak	1.3125	.74822	48
	Strong	1.3750	.67240	48
	Total	1.3437	.70827	96

AGE: Realisation of DRESS

Dependent Variable: [e]				
Respondents	Social network	Mean	Std. Dev.	N
Lower age	Weak	13.1667	1.20386	24
	Strong	13.0833	1.79169	24
	Total	13.1250	1.51060	48
Upper age	Weak	11.0417	3.44496	24
	Strong	6.4583	6.77578	24
	Total	8.7500	5.79985	48
Total	Weak	12.1042	2.76943	48
	Strong	9.7708	5.93669	48
	Total	10.9375	4.75464	96

Dependent Variable: [ɪ]				
Respondents	Social network	Mean	Std. Dev.	N
Lower age	Weak	.0417	.20412	24
	Strong	.3333	1.43456	24
	Total	.1875	1.02431	48
Upper age	Weak	.7500	1.45213	24
	Strong	6.6667	6.72870	24
	Total	3.7083	5.66797	48
Total	Weak	.3958	1.08647	48
	Strong	3.5000	5.77964	48
	Total	1.9479	4.42093	96

Dependent Variable: [ɜ:]				
Respondents	Social network	Mean	Std. Dev.	N
Lower age	Weak	1.7917	1.17877	24
	Strong	1.5833	1.50121	24
	Total	1.6875	1.33936	48
Upper age	Weak	3.0833	3.00603	24
	Strong	1.8750	2.07076	24
	Total	2.4792	2.62549	48
Total	Weak	2.4375	2.35115	48
	Strong	1.7292	1.79526	48
	Total	2.0833	2.11096	96

GENDER: Realisation of DRESS

Dependent Variable: [e]				
Respondents	Social network	Mean	Std. Dev.	N
Male	Weak	11.2500	3.27374	24
	Strong	9.4167	5.80792	24
	Total	10.3333	4.75499	48
Female	Weak	12.9583	1.85283	24
	Strong	10.1250	6.16662	24
	Total	11.5417	4.72638	48
Total	Weak	12.1042	2.76943	48
	Strong	9.7708	5.93669	48
	Total	10.9375	4.75464	96

Dependent Variable: [ɪ]				
Respondents	Social network	Mean	Std. Dev.	N
Male	Weak	.3750	.87539	24
	Strong	3.5000	5.44538	24
	Total	1.9375	4.16881	48
Female	Weak	.4167	1.28255	24
	Strong	3.5000	6.21359	24
	Total	1.9583	4.70382	48
Total	Weak	.3958	1.08647	48
	Strong	3.5000	5.77964	48
	Total	1.9479	4.42093	96

Dependent Variable: [ɜ:]				
Respondents	Social network	Mean	Std. Dev.	N
Male	Weak	3.2500	2.93776	24
	Strong	2.0833	1.90917	24
	Total	2.6667	2.52084	48
Female	Weak	1.6250	1.13492	24
	Strong	1.3750	1.63687	24
	Total	1.5000	1.39909	48
Total	Weak	2.4375	2.35115	48
	Strong	1.7292	1.79526	48
	Total	2.0833	2.11096	96

EDUCATION: Realisation of DRESS

Dependent Variable: [ɜ:]				
Respondents	Social network	Mean	Std. Dev.	N
Basic	Weak	2.7500	3.05386	24
	Strong	1.7917	1.84106	24
	Total	2.2708	2.54106	48
Secondary	Weak	2.1250	1.32902	24
	Strong	1.6667	1.78561	24
	Total	1.8958	1.57426	48
Total	Weak	2.4375	2.35115	48
	Strong	1.7292	1.79526	48
	Total	2.0833	2.11096	96

Dependent Variable: [ɪ]				
Respondents	Social network	Mean	Std. Dev.	N
Basic	Weak	.4167	1.28255	24
	Strong	3.6250	5.70897	24
	Total	2.0208	4.40256	48
Secondary	Weak	.3750	.87539	24
	Strong	3.3750	5.96958	24
	Total	1.8750	4.48461	48
Total	Weak	.3958	1.08647	48
	Strong	3.5000	5.77964	48
	Total	1.9479	4.42093	96

Dependent Variable: [e]				
Respondents	Social network	Mean	Std. Dev.	N
Basic	Weak	11.8333	3.37080	24
	Strong	9.5833	5.95575	24
	Total	10.7083	4.92047	48
Secondary	Weak	12.3750	2.03902	24
	Strong	9.9583	6.03957	24
	Total	11.1667	4.62341	48
Total	Weak	12.1042	2.76943	48
	Strong	9.7708	5.93669	48
	Total	10.9375	4.75464	96