

**Sociolinguistic variation and regional minority language
bilingualism: an investigation of Welsh-English bilinguals in North
Wales**

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Abstract

This thesis investigates phonetic and phonological variation in the bilingual repertoire of adolescent Welsh-English bilinguals living in North Wales. It contributes to linguistic research by, firstly, providing an account of language variation in an understudied area (N. Wales) and context (regional minority language bilingualism) and, secondly, by examining cross-linguistic variation, and the constraints on this variation, in bilingual speech. The two variables under discussion differ in how they are realised in the two languages: /l/ is thought to be heavily velarised in both languages as a result of long-term contact and *phonological convergence*. Variation in the production of /r/ and realisation of coda /r/ has hitherto been reported as language-specific, though frequent *transfer* is said to occur from Welsh to English in predominantly Welsh-speaking areas (e.g. Penhallurick 2004: 110; Wells 1982: 390).

The first aim of the study is therefore to quantify claims of phonological convergence and transfer in the speech of Welsh-English bilinguals by using a variationist sociolinguistics methodology (e.g. Labov 1966), which also considers the influence of linguistic and extra-linguistic factors on variation. Particular attention is paid to differences between a majority Welsh-speaking town and a town where English is the main language. A further distinction is made between those from Welsh-speaking homes and those from English-speaking homes who have acquired Welsh through immersion education.

The second aim is to make empirically-informed theoretical claims about the nature of phonological convergence and transfer, and conceptualise cross-linguistic interaction in the speech of Welsh-English bilinguals in light of existing frameworks.

Data (sociolinguistic interviews and wordlists) were collected in Welsh and English from 32 Welsh-English bilinguals aged 16-18. The sample was equally stratified in terms of speaker sex, home language, and area. The two towns compared in the study are Caernarfon (N.W. Wales, where c.88% of the population speak Welsh) and Mold (N.E. Wales, where c. 20% Welsh of the population speak Welsh).

The results indicate that English [ɫ] tends to be lighter than Welsh [ɫ] in word-initial onset position for females, and in word-medial intervocalic position for both males and females. The data also show linguistic influences on the realisation of [ɫ] in both languages, and differences between males and females.

The realisation of coda /r/ and production of [r] and [ɾ] in English are confined to the speech of those from Welsh-speaking homes in Caernarfon. In Welsh, use of [ɾ] is widespread and is constrained by a more complex interaction between area, home language, and sex.

On the basis of these findings, I conclude that features which have undergone phonological convergence due to long-term language contact may be subject to language-specific constraints when implemented phonetically. In terms of transfer, I argue for a ternary distinction between interference, transfer, and transfer which is constrained by linguistic and/or extra-linguistic factors (cf. Grosjean 2012). Finally, I suggest that Mufwene's (2001) notion of the 'feature pool' is the most succinct way of conceptualising Welsh-English transfer and differentiate between more focussed accents of English and a less-focussed variety of North Wales Welsh.

Declaration

I declare that no portion of the work referred to in the thesis has been submitted in support of an application for another degree or qualification of this or any other university or other institute of learning.

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The Author

Jonathan Morris was awarded a BA (Honours) in French and German Studies by The University of Manchester in 2005. During his undergraduate studies he primarily examined the relationship between language and national identity in both France and the German-speaking countries. His undergraduate dissertation investigated the roles of Swiss German dialects and Standard German in German-speaking Switzerland, and he was awarded the Swiss Embassy Book Prize for Best Dissertation. He continued to specialise in the relationship between standard and dialect in German-speaking Switzerland for his MA (Distinction) in Languages and Linguistics, again awarded by The University of Manchester, in 2009.

During his time on the MA programme, Jonathan completed modules in Language Change, Sociolinguistics, and Phonetics and Phonology. He became particularly interested in language variation and change and phonetics, and was eager to examine Welsh-English bilingualism using methods and insights from these fields. The result is the present study, which was made possible by the Johansson Scholarship awarded by The University of Manchester in September 2009.

Jonathan has continued to work part-time throughout the PhD programme, both as a Teaching Assistant at the University of Manchester and as a Lecturer in Welsh at Yale College of Wrexham, North Wales. In October 2012, he began a full-time position as a Research Assistant at the School of Welsh, Cardiff University and now works on a project which examines the acquisition of Welsh as a second language by adults. In addition to this role, he is also working with researchers at Cardiff Metropolitan University and Bangor University on a project which examines phonetic variation in the production of vowels by Welsh-English bilinguals in South Wales.

1 Introduction

This thesis is a variationist sociolinguistic investigation of phonetic and phonological variation in a context of regional minority language bilingualism. In particular, it presents a quantitative account of variation in the two languages of Welsh-English bilinguals in North Wales, and compares this variation, and the constraints which influence it, between the two languages.

Welsh and English data were elicited via sociolinguistic interviews and wordlist tasks from 32 Welsh-English bilinguals in North Wales. Participants were aged between 16 and 18 years and attended Welsh-medium schools in two different towns, which differ in the percentage of the population who are able to speak Welsh. All participants had begun to acquire Welsh by the age of five at the latest, though equal numbers of participants were sought from homes where Welsh was spoken by both parents and from homes where no parents spoke the language. This reflects the complexities of Welsh-English bilingualism which have arisen as a result of long-term language contact.

Welsh (*Cymraeg*) is a Brythonic Celtic language spoken primarily in Wales (*Cymru*), one of the four countries of the United Kingdom (Office for National Statistics 2012)¹. According to the last census, the language is spoken by approximately 19% of the population (562,000 speakers; Statistics for Wales 2012). Welsh is therefore a minority language in Wales, and all speakers (with the exception of very young children) are bilingual with English. Welsh has been in decline since records began in 1891, despite the 2001 census showing an increase in speaker numbers. This increase, from 18.7% in 1991 to 20.8% in 2001 (H.M. Jones 2012: 13–14), was attributed to

¹ There are notable diaspora communities in the English cities of London, Manchester, and Liverpool. There is also a historically Welsh ‘colony’ (*Y Wladfa*) in Patagonia (Argentina), where there remains a proportion of the population who are bilingual in Welsh and Spanish (Williams 2000).

language revitalisation measures primarily in the area of education, which has resulted in the development of a comprehensive Welsh-medium education system. Welsh-medium education acts as both heritage language education for first language speakers and immersion education for children from English-speaking homes (cf. Baker 2001).

The concentration of Welsh speakers in a given area varies throughout Wales, and in some areas Welsh is spoken by the majority of the local population. This can be attributed in large part to the Industrial Revolution, which acted as a catalyst for language contact and resulted in mass intergenerational language shift due to inward migration to eastern areas. For instance, 65.4% ($n=77,000$) of the population of the western county of Gwynedd are bilingual compared to 7.8% ($n=5284$) in the south-eastern county of Blaenau Gwent (Statistics for Wales 2012: 7). In Welsh-dominant areas the language may still be used as a community language, which increases the exposure to Welsh by children acquiring the language whereas, in areas where Welsh is spoken by a minority, exposure may be restricted to caregivers or ‘more narrowly drawn social networks’ (Coupland & Ball 1989: 10).

The establishment of Welsh-medium education has proved popular as both first language education for children from Welsh-speaking homes, and as immersion education for children with monolingual English parents. In western areas where Welsh is used as a community language, especially in North West Wales, the majority of schools teach most subjects in Welsh and only a minority of children come from monolingual homes. In eastern areas, parents may choose English-medium or Welsh-medium education for their child. Welsh-medium education in eastern areas has proven a popular choice in areas where both English- and Welsh-medium schools exist (cf. Hodges 2012). Consequently, the majority of children in Welsh-medium schools in eastern areas come from English monolingual homes. Furthermore, the majority of

Welsh speakers now come from English-speaking homes and live outside the four counties where Welsh is spoken by over half of the population (Anglesey, Gwynedd, Ceredigion, and Carmarthenshire; H.M. Jones 2012: 7).

Welsh-English minority language bilingualism is complicated by two sets of intertwined dichotomies which makes the situation inherently interesting for a study of language variation. Firstly, there is a distinction between western heartland and eastern anglicised areas. This results in a group of speakers for whom Welsh is a main community language and a group for whom Welsh is limited to certain domains or interlocutors. Secondly, there is a group of speakers who acquired Welsh in the home and a group who acquired Welsh through Welsh-medium education. Consequently, there are bilingual speakers who have different experiences of acquiring their languages. These groups are intertwined because there are increasing numbers of speakers in heartland areas who speak English at home and there has always been a proportion of the population in eastern areas who speak Welsh at home. Both home language and prevalence of Welsh in the community are two factors which have been shown to produce significant trends in previous studies of language use (e.g. H.M. Jones 2008).

1.1 Research context

1.1.1 Welsh-English bilingualism

The variation in exposure to Welsh by bilinguals has been shown to affect the acquisition of Welsh amongst children and young adults. Recent work has focussed on the acquisition of Welsh features and considered the role of home language and area. Those who come from Welsh-language homes and live in Welsh dominant areas are more likely to implement the consonant mutation system correctly (cf. Thomas & Gathercole 2005), have a greater knowledge of vocabulary (cf. Gathercole & Thomas

2009), and correct assignment of plural suffixes (cf. Thomas et al. 2012). Such studies have often been presented as part of the framework of language obsolescence (e.g. M. Jones 1998), which often entails the loss of marked features (cf. Wolfram 2004).

Variationist sociolinguistic investigations of either Welsh or Welsh English have not, however, been undertaken in any great number. Certainly, there has not been a body of research of either variety which compares to the mainstream urban sociolinguistic studies in England (e.g. Trudgill 1972; 1974; see contributions in Foulkes & Docherty 1999 and Hughes, Trudgill & Watt 2005) and to a lesser extent Scotland (e.g. Stuart-Smith et al. 2007). In Welsh, purely dialectal accounts of local areas are numerous, due in large part to the dialectological tradition of the University of Wales during the twentieth century (Ball 1988a: 12–23, e.g. Thomas 2000). In Welsh-English, the work of Inger Mees has focussed on phonological and phonetic variation in Cardiff English. Mees (1987; 1990) and Mees & Collins (1999) examined a number of features of this variety and stratified their sample of adolescent and pre-adolescent speakers according to sex and social class. Data were also elicited via sociolinguistic interview and reading passage (Mees 1990: 167).

Previous studies of Welsh-English bilingualism consider speaker home language and area, but have focussed primarily on acquisition. There are few studies of language variation in either Welsh or English, and no studies which compare variation in the Welsh and English of bilinguals. This study bridges this gap by considering how home language and area, in addition to other linguistic and extra-linguistic factors, influence variation in the two languages.

1.1.2 Bilingualism, Second Language Acquisition, & Variationist Sociolinguistics

There is a vast body of research which examines the acquisition of phonological and phonetic features amongst second language speakers. A broad distinction can be made

between those which investigate the developmental processes of second language acquirers such as the acquisition of new sounds (see Flege & Davidan 1984; Flege et al. 1999: 2973), and *phonological transfer* (Lado 1957: 11)². Transfer (examined further in §3.2.2) describes the appearance of material from one of a bilingual's languages appearing in the speech of her other language (Van Coetsem 2000: 31). Phonological transfer describes both the substitution of phonemic segments, phonotactic patterns, and prosodic features from one language in another (Simon 2010: 63). A similar distinction can be applied to studies of bilingual acquisition, which increasingly use acoustic methods in order to investigate whether bilingual speakers maintain phonetic distinctions between their languages (e.g. Simonet 2008). Most commonly, laboratory data are used for such studies and there are few studies which use naturalistic data, as is commonplace in variationist studies, to examine both languages (see, however, Khattab 1999; 2002 who used naturalistic data in studies of the acquisition of English and Arabic amongst children).

The study is informed by an increasing number of variationist sociolinguistic studies which examine non-monolingual speech communities (see §3.4). Firstly, studies of variation amongst minority ethnic groups and heritage language speakers in the U.S. and Canada have considered both the use of features from heritage languages in English (e.g. Mendoza-Denton 1997; Fought 1999; Bailey 2000; Benor 2010; Newman 2010) and, more recently, compared variation in the speech of those living in diaspora communities with 'homeland' speakers (e.g. Nagy 2011; Kang & Nagy, forth.). Secondly, studies of bilingual contexts have mainly examined variation amongst groups of second language learners or bilinguals in the second or non-dominant language and

² This has historically been interchangeable with the term *interference* (Weinrich 1953: 1), with interference being used mostly in studies of language contact (Muysken 1984: 50) and transfer being preferred by researchers working in Second Language Acquisition (Odlin 1989: 24 – 26).

compared the data to other corpora (e.g. Mougeon et al. 2004). Thirdly, and most recently, researchers have examined variation in the speech of recent migrants (e.g. Drummond 2010), sometimes comparing this data with ‘native’ speakers from the same area (e.g. Schleef et al. 2011). Such studies aim to ascertain the extent to which people acquiring a second language, for example as a result of migration, acquire variation and whether this variation matches that of local native speakers.

The study is further informed by the comparative variationist approach to sociolinguistics research, which compares the constraints on a certain feature across different datasets (cf. Tagliamonte 2002 for an overview). This approach has been used widely in studies which examine the roots of varieties of English (e.g. Holm 1975; Rickford 1986; Bailey et al. 1989; Poplack 2000), studies which compare the distribution of features in different localities (e.g. Jones & Tagliamonte 2004), and research which traces features which have arisen as a result of language contact (e.g. Meyerhoff 2009). This study adds to the body of comparative research in variationist sociolinguistics by comparing variation in the two languages of the same bilingual speakers.

The above brief outline of bilingualism and second language acquisition, and variationist sociolinguistics (examined further in Chapter 3) shows a distinction between studies which compare a bilingual’s two languages using laboratory data, and variationist work which examines the use of non-native variants and acquisition of variation in one language. The current study is informed by both research strands and attempts to bridge the gap by using variationist methods of data elicitation and analysis and examining variation in both the bilingual speakers’ languages. The study also contributes to the field insofar as it looks at a bilingual situation, that is to say minority language bilingualism, which is understudied in variationist sociolinguistics. Indeed,

there are very few studies which examine variation in indigenous minority language contexts, all of which elicit data in the minority language only (see Stanford & Preston 2009 and chapters therein). Such situations are marked by populations which are entirely bilingual, and dominated by the majority language in everyday life. It is unclear what the effects of this are on variation, and indeed how separate speakers keep their languages under such circumstances.

1.2 Research aims and questions

Despite numerous accounts of both Welsh and Welsh English dialects, there have been few attempts to examine the role of linguistic and extra-linguistic factors on sound variation in either variety (§1.1.2). The first aim of the study is to quantify claims of phonological convergence and transfer in the speech of Welsh-English bilinguals by using a variationist sociolinguistics methodology, which also considers the influence of linguistic and extra-linguistic factors (and in particular home language and area) on variation. The second aim is to make empirically-informed theoretical claims about the nature of phonological convergence and transfer (discussed further in Chapter 3) in the context of regional minority language bilingualism, and conceptualise cross-linguistic interaction in the speech of Welsh-English bilinguals in light of existing frameworks.

In light of the above, the following questions are raised:

1. How does phonetic/phonological variation pattern in both languages?
2. To what extent is this variation constrained by linguistic factors?
3. To what extent do extra-linguistic factors influence variation? Specifically, does home language, area, speaker sex and/or the attention being paid to speech produce significant trends?

4. What is the interaction between the two languages in terms of variation, and how can this be explained theoretically?

1.3 Variables

Phonetic variation is examined through an acoustic analysis of /l/-velarisation in word-initial onset, word-medial intervocalic, and word-final coda positions. Northern varieties of both Welsh and Welsh English are reported as being heavily velarised, or dark, in all word and syllable positions. This suggests that the two languages are *phonologically converged* as phonologically both varieties are realised identically (see §3.3.1). This is commonly cited as a consequence of long-term contact between languages, as is the case for Welsh and English, whereby languages become increasingly similar to each other (Bullock & Gerfen 2004: 95).

The claim that /l/ in Northern Welsh and Northern Welsh English has undergone a process of convergence is problematic without data from earlier periods. This view is accepted in this thesis, however, based on claims made in previous work which suggest that /l/ is phonologically identical in both varieties in North Wales (e.g. Ball & Müller 1992: 88; Penhallurick 2004: 110). Furthermore, no differences have been noted between eastern and western areas, despite different histories of inward migration in these two areas (§2.1), and no differences have been found between monolinguals and Welsh-English bilinguals in English. This suggests that convergence between the two languages took place as the result of transfer from Welsh to English when Welsh monolinguals became bilingual in English, and that this transfer effect remained as a substrate feature in areas where there was a shift from Welsh-English bilingualism to English (see §2.1).

Phonological variation is examined through a primarily auditory analysis of (r) variation. This comprises the realisation and non-realisation of /r/ in coda position and phonological variation in the production of /r/ in word-initial prevocalic and word-medial intervocalic positions. The realisation of coda /r/ is described as being categorical in Welsh. In the English of the region, its realisation is noted as being a feature of areas where Welsh is strongest. Similarly, the voiced alveolar tap [ɾ] and voiced alveolar trill [r] are the main variants of /r/ in Welsh. In the English of the region, the voiced alveolar approximant [ɹ] is reported as being in variation with the Welsh variants in areas where Welsh is dominant. The appearance of a feature associated with one of a bilingual speaker's languages in the speech of the other language is generally termed as *phonological transfer* in studies of Second Language Acquisition (see §3.2.2).

The application of this term to (r) variation in Welsh-English bilingualism is again problematic given the lack of empirically-informed studies of either variety at earlier periods. Indeed, there is no quantifiable evidence to shed light on the extent to which transfer currently occurs and whether it is prevalent amongst certain groups of speakers. I argue that the realisation of coda /r/ in Caernarfon English is transfer from Welsh rather than the result of contact with a variety or varieties of English which are, or were historically, rhotic. The loss of rhoticity in English dialects began in the eighteenth century and the non-realisation of coda /r/ had become a feature of RP by 1917 (Beal 2010: 15). Currently, rhoticity remains in the Traditional Dialects (varieties spoken in primarily rural areas; cf. Trudgill 1990: 5) of South West England and parts of North West and North East England (Trudgill 1990: 27). The mass acquisition of English in North West Wales began with compulsory schooling at the end of the nineteenth century. It seems unlikely, though admittedly possible, that English was

acquired in North West Wales from only native speakers of rhotic dialects. Furthermore, rhoticity is only noted as a feature in Welsh English in communities where the majority of the population are bilingual (cf. Thomas 1985: 212), and is absent in the English of other areas where speakers would have acquired English when rhoticity in England was more widespread (King 2009: 38).

The realisation of [ɹ] and [r] in English is also restricted to predominantly Welsh-speaking areas (Wells 1982: 390), which suggests a Welsh influence rather than influence from other varieties of English. The literature on Welsh also suggests that [ɹ] is a transfer effect, as it is largely absent from earlier accounts (e.g. Parry-Williams 1923) and is only noted as being an idiosyncratic feature or restrained to a particular border area in later work (e.g. G.E. Jones 1984: 49; Ball & Williams 2001: 64). The applicability of the concept of transfer to the Welsh-English context is discussed in the current study in light of the findings from the investigation of (r) variation where, for the first time, the correlation between variation and linguistic and extra-linguistic factors are examined.

The extra-linguistic factors included for analysis are speaker home language, area, sex, and speech context. The former two independent variables are included in light of the socio-historical context of Welsh-English bilingualism which has been described briefly above. The latter two variables are common in other studies in which they have yielded interesting results. Attitudinal data, elicited via written questionnaire, was shown to correlate strongly with home language and area and, for this reason, is examined separately in the thesis.

1.4 Organisation of the Study

This introduction outlined the research aims and questions of the study in light of the socio-historical context of Welsh-English bilingualism and previous theoretical work in the area of bilingualism and second language acquisition, and language variation. The following two chapters build upon this introduction. Chapter Two provides a comprehensive account of both Welsh-English language contact and the phonologies of both varieties. Chapter Three constructs the conceptual framework for the thesis in more detail, and considers both individual and societal bilingualism in addition to language variation. Chapter Four provides an account of the methods used for participant selection and recruitment, data elicitation, and provides a rationale for the independent variables.

There are three chapters which examine the data collected for the study. Chapter Five examines the attitudinal data collected via written questionnaire. In particular, data were elicited on participants' attitudes towards the Welsh language and language policy, their own ability in Welsh, and their use of Welsh outside of the home and classroom. The questionnaire relied on Likert scales and a scoring system, which meant that the results to each of these areas were given as a numerical value. These values could have been included as independent variables in the main results chapters in order to ascertain, for example, whether the use of a certain variant is influenced by higher score for use of Welsh. The results are presented here, however, as there are strong correlations between the attitudinal data and the other independent variables which would have skewed the results of the statistical analyses. Instead, this chapter shows that both home language and area are correlated with attitudinal and usage data which suggests that home language in both areas carries social meaning.

Chapter Six presents the results for variation in the degree of /l/-velarisation. The formant values, which differ between light and dark varieties, are given for /l/ in both languages and are compared with studies of other languages to confirm that /l/ is dark in both languages. The differences between the first and second formant values, an indication of the *degree* of this velarisation, is then examined in word-initial onset, word-medial intervocalic, and word-final coda positions. Following this, there is a discussion of variation in both varieties and the way in which speakers manage their two languages.

Chapter Seven examines (r) variation and, following the introductory remarks and methodology, presents the results for coda /r/ and /r/ in prevocalic and intervocalic positions. Within each sub-section of this chapter, there is a discussion of variation in Welsh, variation in English, and a comparison of bilingual speech.

Having discussed the results in the previous chapters, Chapter Eight takes a broader view and focusses on the fourth research question. It argues that the results indicate a much more complicated situation than convergence in the case of /l/ and transfer in the case of (r) variation. It explores these notions further and looks at the extent to which constraints on variation are the same in each language. This is followed by a brief conclusion in Chapter Nine which discusses the main findings and the pathways for future research in this area.

2 Welsh and Welsh English

The present chapter provides the historical and linguistic background to Welsh-English bilingualism. This bilingualism is marked by long-term language contact, as was mentioned in Chapter 1, and this has helped to shape the current linguistic situation in North Wales. §2.1 provides a detailed survey of the background to Welsh-English bilingualism. It argues that, perhaps with the exception of border areas, contact between English and Welsh has been the result of the subjugation of Wales to England and industrialisation. The unification of England and Wales resulted in top-down Anglicisation of the upper classes. This contrasts with the more rapid westward retreat of Welsh during the Industrial Revolution.

The consequence of this is the formation of two distinct areas – East and West – which differ in language and furthermore in cultural attitudes. This context of minority language bilingualism might have been less complex, had a distinction between largely monolingual and Anglicised East Wales and Welsh-speaking West Wales continued to be clear-cut. Efforts to revitalise Welsh across Wales have, however, led to an increase in ‘new’ speakers of Welsh, who come from monolingual homes, in eastern areas. This, as is shown in §2.1, creates the more complex situation which partly provides the rationale for this study.

§2.2 outlines the linguistic features of Welsh and Welsh English. It shows that, although the two varieties have been hitherto studied separately, previous work shows the inherent influence of the languages on each other, and in particular the influence of Welsh on English. This is not surprising in light of long-term contact, where convergence between the two varieties is commonplace if not expected. This section, then, outlines the extent to which there has been a mutual influence between the two varieties and this is contextualised theoretically in Chapter 3. Together, both highlight

that although the influence of languages on each other in situations of contact is well-documented, little is known about the dynamics of this influence in bilingual speakers.

2.1 Socio-historical background

The results from the first census to measure Welsh language ability, taken in 1891, suggest that the language was spoken by 51.2% ($n=910,289$) of the total population, and that 55.8% of these were monolingual in Welsh (Welsh Language Board 2004: 81-83). Just over a century later, the 2011 census returns showed that there are 562,000 speakers, corresponding to 19% of the total population of Wales, and that all speakers were bilingual (cf. H.M. Jones 2003; §1). In addition, the percentage of speakers varies between localities with the highest proportion of Welsh-speakers being located in the Western counties of Anglesey and Gwynedd (60.1% and 69.0% respectively), and the lowest proportion being located in the more industrialised areas of the North and South East (H.M. Jones 2003). From these statistics it is apparent that, firstly, the Welsh language has been in decline and replaced by English for over 100 years. Secondly, the fact that the number of speakers varies suggest that the process of language shift has been more intense in some areas than in others. The following sections chart this shift and begin with the early development of Welsh.

2.1.1 Early developments

The development of Old Welsh from Brythonic during the sixth century (D.G. Jones 1988: 125) can be seen largely as a consequence of the expansion of Anglo-Saxon kingdoms at this time. The western advance of the Kingdom of Wessex during the late sixth century isolated the Brythonic-speaking Celts of Wales from those of south-west Britain, which led to the separate evolutions of Welsh and Cornish (Filppula et al. 2008:

8-9)³. In addition to this, the Kingdom of Mercia also made territorial gains at this time which galvanised the presence of the Anglo-Saxons to the east of Wales. Davies (1992: 62) expands on this further, and notes that:

o hirbell y bu trigolion Cymru'n ymwneud â theyrnasoedd Wessex a Northumbria, ond wrth i Mersia ymledu i dueddau afon Hafren ac afon Dyfrdwy daeth y Saeson at ororau Cymru, a ffin orllewinol Mersia a bennodd ffin Cymru.
[it was from afar that the inhabitants of Wales dealt with the kingdoms of Wessex and Northumbria, but as Mercia spread to the coasts of the Severn and Dee the Saxons came to the Welsh marches, and it was the western border of Mercia which determined the border of Wales].

This border was fortified during the reign of King Offa of Mercia (757–796), during which a man-made boundary, Offa's Dyke, was built from Prestatyn in the North East to Shrewsbury in the English Midlands (J.G. Jones 1998: 12). With the exception of some isolated Flemish and Saxon communities in the South West (Toorians 2000), Wales was largely monolingual and contact with the Anglo-Saxons was restricted to some areas of the North East and border areas (Beverley-Smith 1997: 16).

Whilst little about the development of Welsh can be gained from the historical record at this time, the written language has been documented as early as the eighth century. Beverley-Smith (1997: 15) notes that 'cofnod ar ymyl y ddalen mewn llyfr efengylau o'r wythfed ganrif yw'r enghraifft gynharaf sydd gennym o Gymraeg cystrawennol ysgrifenedig' [a record at the edge of the sheet in a gospel book from the eighth century is the earliest example that we have of written syntactic Welsh]. A further consequence of the Anglo-Saxon influence was, in Bowen's (1986 [1964: 68]) view, a sense of unity. He states that 'under strong Anglo-Saxon pressure the inhabitants in this part of the western highlands became conscious of their unity. We see a reflection of this feeling in the very name *Cymry*, indicating 'people of the same country'. The extent to which the Welsh felt unified is questionable, but the period saw

³ Cornwall was subsequently incorporated into the jurisdiction of Wessex (Davies 1992: 59).

attempts to unify the Welsh kingdoms during the period, either through marriage or conquest (J. Jones 1998: 13). Consequently, a Welsh legal system was codified (J. Jones 1998: 14) which provides further evidence of written and official Welsh (B.P. Jones, 1988: 172) and the development of the Welsh language.

2.1.2 Top-down Anglicisation

2.1.2.1 The loss of Welsh independence

The loss of Welsh independence came in 1282, with the defeat of the last native Prince of Wales, and resulted in the kingdoms of Wales being ceded to the English crown (Carr 1999). The effect of this on the fate on the language is somewhat paradoxical. To a certain extent the position of the language was strengthened, exemplified by the manuscript evidence from the thirteenth century onwards (Sims-Williams 2010: 41). Welsh law continued to be practiced, and R.O. Jones (1993: 537) notes that ‘the domains of the language were considerably extended in spite of the fact that Wales lost its independence in 1282’. On the other hand, however, contact between the English and Welsh gentry had already led to an increase in prestige for the language of Wales’ powerful neighbour and the beginning of a gradual top-down process of Anglicisation (German 2006: 36).

The process of Anglicisation was intensified in 1536 with the *Acts of Union*. The laws decreed as part of the acts replaced the Welsh legal system with that of England and annexed some Welsh land to the English crown. With this, English became the sole language of official business and those who held any position of authority in Wales were therefore required to be bilingual (Abalain 1989: 131). R.O. Jones (1993: 539) maintains that the *Act of Union* ‘is frequently cited as the first decisive milestone in the erosion of the Welsh language. It certainly was important and its effects far-reaching,

but it would be fair to say that it accelerated rather than initiated the encroachment of English on domains which had traditionally been Welsh-medium’.

2.1.2.2 The importance of English amongst the gentry

Given that the use of English was restricted to official business, it was among the gentry that contact continued to intensify (R.O. Jones 1993: 540), as did the idea that English was a prestige variety (Beverley-Smith 1997: 36). A consequence of this was that the Welsh gentry were to become anglicised: the Welsh patronymic naming system was abandoned by the upper classes (German 2006: 39) and children were either sent to English grammar schools or to one of the few (English-medium) *Tudor grammar schools* established in Wales (Pattison 1966: 5). Following the Acts of Union, it was necessary to be bilingual in order to participate in official business at even the local level (R.O. Jones 1997: 139). This means that the Acts of Union were undeniably limiting for the majority of people in Wales who did not speak English at this time. C. H. Williams (2009: 204) claims, however, that ‘this trend towards official Anglicisation was not the linguistic genocide that some have argued, and it certainly was not forced bilingualism for the mass of the population’. Instead, the areas in which Welsh was used declined and it became increasingly seen as having a lower status to English (C.H. Williams 2009: 205).

This is also reflected in the literary history of Welsh at the time, which saw the decline of the poetic tradition (D.G. Jones 1988: 128) but the first print of the Bible in Welsh, which acted as a standard and which would form the basis of the codification of the language during the Renaissance period (D.G. Jones 1988: 129). R.B. Jones (1973: 22) states that ‘the language of the edition of 1588 and its subsequent revisions provided a vehicle of expression for prose writers and poets; it crystallised the very best in Welsh idiom and vocabulary’.

2.1.3 The Westward retreat of Welsh

2.1.3.1 Before 1760

It is clear from the above that the early history of Welsh-English contact can be viewed in light of the subjugation of Wales to England, which led to a decline in the prestige awarded to Welsh. This low prestige has remained throughout the history of the language, arguably with the exception of the late twentieth century onwards (see §2.1.4). However, low status is not the only contributory factor to the language shift experienced in Wales, nor does it explain the westward retreat of the language.

Aitchison and Carter (1994: 23) maintain that ‘the first major episode in that retreat, the one which brought English significantly beyond Offa’s Dyke, was the Anglo-Norman invasion of Wales, beginning about 1070’. Whilst the presence of English settlements at this time is not surprising in light of the territorial gains made in the West of present-day England, it is problematic that there is a lack of data from the period (see §2.1.1). What is clear, however, is that by the sixteenth century there was not only the presence of English place names in the eastern regions of Wales, but also church services had begun to be bilingual or monolingual English in many eastern locales due to the arrival of Puritanism from England (Mathias 1973: 44).

2.1.3.2 The Industrial Revolution

The Industrial Revolution came to Wales in the late eighteenth century and remained, at least initially, largely concentrated on the east. During the period 1760-1850 North East Wales witnessed an upsurge in industry concentrating on the production of coal, lead, copper, slate, wool, and iron (Dodd 1951). This shifted the focus from regional centres in the North West to the North East (Pryce 1986: 26), and resulted in internal migration to the East. As well as migration, immigration from England and other areas also

increased with the demand for skilled workers. The presence of a large community of English-speakers in the East, and the use of English as the commercial language (Mathias 1973: 51), coupled with the low prestige awarded to Welsh during the Middle Ages, meant that immigrants were not, on the whole, becoming Welsh-English bilinguals. R.O. Jones (1993: 546) expands on this, stating that ‘the English monoglots did not become bilingual, but bilingualism amongst the speakers of Welsh led to an intergenerational language switch to English in these mixed language areas’.

Consequently, the location of coal mines in the lowland areas meant a growth in population but a decline in speakers of Welsh (Bowen 1986 [1964]: 83). During the 1800s a situation therefore arose whereby the western counties remained largely monolingual (Welsh), whereas there was a division between bilingual and monolingual (English) areas in the east (Löffler 1997: 69). This division was also reflected by religious practice as, whilst Puritanism had long been established in the East, non-conformist Methodism prevailed in the West and developed internally within Welsh-speaking areas of Wales (Bowen 1986 [1964]: 82). The effect of this, unsurprisingly, was that the role of Welsh grew in the religious domain. Löffler (1997: 50) elaborates on this, stating that;

mit der Etablierung der älteren nonkonformistischen Konfessionen unter der Kymrischsprachigen Bevölkerung von Wales wuchs die Rolle des Kymrischen im religiösen Bereich weiter, da es in diesen Konfessionen auf alle Ebenen der Hierarchie Verwendung fand.
[with the establishment of the old non-conformist confessions amongst the Welsh-speaking population the role of Welsh in the religious domain grew further, as in these confessions it found use on all levels of the hierarchy].

2.1.3.3 The late nineteenth century

Whilst it cannot be denied that the industrialisation of Wales acted as a catalyst for the emergence of two distinctive areas (cf. Pryce 1986), it is not the case that western areas remained unaffected by Anglicisation, or that Welsh became completely extinct in the East. Across North Wales, communication with England intensified as the delivery of

English newspapers became more frequent (Hume 1986: 328), and tourism developed with the establishment of seaside resorts, where English prevailed, across the region (Pryce 1998: 37). Dodd (1951: 34) summarises this, stating that ‘again and again the continent was closed to tourists by the outbreak of war; and in poetry and landscape-painting alike the “picturesque” and the “horrid” were coming into vogue. So travellers turned their horses towards Wales’. By 1850 there were two main passenger railroads to link England with Ireland via Wales. D. Jones (1995: 19) studied the effects of the railroad on the Welsh language and concluded that ‘as prospective barriers of rural isolation were broken down by the railways, the idea that English was the language of commercial prosperity and of the future took hold’.

The idea of English as the language of prosperity was supported by the provision for education, from which the Welsh language was excluded. Although education in English had been instigated prior to the eighteenth century (§2.1.2.2, Griffith 1950: 21), it is not until 1870 that education in Wales became systematised, and delivered entirely through the medium of English (Williams 1973: 94)⁴. R. O. Jones (1997: 111) argues that ‘ers 1870 sefydlwyd rhwydwaith o ysgolion Saesneg-eu-cyfrwng yng Nghymru gan arwain at Seisnigeiddio’r boblogaeth yn gyflym’ [from 1870 a network of English-medium schools were established with the aim of quickly anglicising the population]. It was during this time that Welsh was actively suppressed by the education system, exemplified by the ‘Welsh Not’ (R.O. Jones 1993: 548)⁵.

⁴ Although many Welsh-speakers learned to write in Welsh through Sunday Schools (Williams 2003: 6).

⁵ The ‘Welsh Not’ refers to a system used in Welsh schools during this period in order to discourage the use of the Welsh language. A pupil who was overheard speaking the language would be forced to wear a piece of wood with the initials W.N. attached to a piece of string. When another pupil was overheard speaking Welsh the wood would be passed to them. At the end of the day, the pupil wearing the Welsh Not would be punished physically.

2.1.4 The twentieth century

2.1.4.1 The emergence of a Welsh ‘heartland’ area

From the above it is clear that the linguistic situation in Wales at the turn of the twentieth century was one of language shift. Welsh had lacked in official status since the sixteenth century, and the Industrial Revolution had led to widespread monolingualism in the eastern lowlands and emerging bilingualism in the mountainous West. This trend continued throughout the twentieth century as industrialisation increased and the World Wars created social upheaval (Aitchison & Carter 1994: 39). This pattern of decline is exemplified by the continuing pattern of language shift which has led to the current linguistic situation whereby Welsh-speakers are fully bilingual (Löffler 1997: 188).

The Industrial Revolution accentuated differences between East and West in demographic terms, which led to a distinction between the two areas by theorists. The emphasis on a division between the two areas can be viewed in light of the concept of culture-area, which began as a mapping device for tribal groups in the Americas (Harris 1968: 374). This division between the Welsh-speaking heartlands (*Y Fro Gymraeg*) and Anglo-Wales is not solely based on language, but also has ramifications for cultural norms. Firstly, the religious differences between the two areas were often cited as a further indicator of socio-cultural divisions. An example of this was the referendum on the drinking of alcohol on Sundays, according to Carter and Thomas (1969). Carter and Williams (1978: 150) note that ‘the divide between wet and dry has pushed westwards until only what has been called “fortress Wales” remains’. The difference has also manifested itself politically, with the Welsh-speaking areas being traditionally more fervent supporters of *Plaid Cymru* (The Party of Wales, Thomas & Williams 1978: 167). As will be shown, however, the twentieth century has been marked by attempts to

reverse language shift and has seen the increase of Welsh in domains such as education, law, and media.

2.1.4.2 Language planning and revitalisation

As M. Jones (1998: 17) notes, ‘the situation in Wales might have displayed a classic pattern of decline had it not been complicated by the growth of revitalisation measures, and especially by fairly large-scale immersion schooling’. In terms of education, the movement for Welsh-medium provision had already started in the late 1800s (Williams 1973: 97) with the passing of the Intermediate Education Act (Ministry of Education 1949: 3), even if its initial aim was to introduce Welsh schooling to facilitate the learning of English amongst pupils (Löffler 2000: 175). This was followed in the early part of the twentieth century by handbooks and guidelines on teaching Welsh (e.g. Owen & Berry 1926). By 1946, 40% of pupils in secondary grammar schools took Welsh as a subject which was designed for beginners, regardless of their background (Ministry of Education 1949: 8).

The introduction of Welsh schooling began in earnest with the establishment of the first Welsh-medium primary school in 1947 and a secondary school in 1956 (Aitchison & Carter 1994: 44). This marked a period of increased concern for the vitality of the language and the recognition of its importance in education. The Ministry of Education (1953: 1) state that ‘on account of the great danger in which the Welsh language finds itself, bilingualism has more than a general academic interest; it has become a matter of national concern’. Provision was further enhanced for Welsh-medium education through the creation of the *Mudiad Ysgolion Meithrin*, which caters for Early Years education (Stevens 1996: 181).

In other areas, mobilisation on the part of activists led to the Welsh Courts Act of 1942, which allowed for the use of Welsh in the court (Lewis 1973: 197). Following

the Second World War this mobilisation on the part of campaigners intensified. The foundation of *Cymdeithas yr Iaith Gymraeg* (Welsh Language Society) in 1962 is an example of such a movement, which campaigned throughout the latter half of the twentieth century for equality between Welsh and English (Davies 1973: 261). On a wider scale, this can be seen as part of wider societal changes in Western Europe. Khleif (1978: 102) describes this movement, stating that ‘groups long dormant or thought to be dead have begun to assert their cultural rights, language rights, and community rights’. Crucially, however, and as Ferguson (2006: 107) notes; ‘Welsh revitalisation [...] got underway when family transmission of the language was still not uncommon and when there was a reasonably large constituency of younger native speakers’. It is generally agreed that the campaigns undertaken by the Welsh Language Society directly led to the installation of bilingual road signs in Wales and the establishment of a Welsh language television channel (B. Jones 1997: 57). The demand for Welsh-medium television grew during the 1970s, and became a reality in 1982 with the launch of *Sianel Pedwar Cymru* (S4C; Channel Four Wales).

In terms of the legal position of the language, Coupland and Aldridge (2009: 6) note that ‘the 1993 Welsh Language Act required public sector agencies to deal with their clients in the language of their choice, and therefore effectively imposed at least a bilingual façade on public services’ In order to oversee the Act, the Welsh Language Board was established and continued to work until 2011 with the aim of promoting the language and implementing bilingual practice (HMSO 1993: 1).

The period towards the end of the twentieth century is one in which Welsh had grown in visibility and was inevitably marketed as a symbol of Welsh national identity across the nation, not just in the Welsh-speaking heartland. This appears to have been successful, as NOP (1995) found that 88% of Welsh people believed that the language

was something to be proud of, and that 75% felt the languages should have equal status. In addition to this, 72% of respondents felt that the Welsh language constitutes an integral part of Welsh identity.

Blommaert (1999: 9) notes that ‘the struggle for authoritative entextualization involves ideology brokers: categories of actors who [...] can claim authority in the field of debate’. These ideology brokers, who can be largely defined as a class of intellectuals who propagate nationalism (Smith 1991: 119), had an important place in this movement. Aitchison and Carter (2004: 15-16) state that ‘employment patterns were radically changing, and in place of the decaying smoke-stack industries new fields of work were expanding. These were in the services bureaucracy and media [...] and a new bourgeoisie which was partly Welsh-speaking was being created’. The establishment of a devolved Welsh Assembly also meant an increase in frameworks for delivering the Assembly’s oft-cited goal of a ‘truly bilingual nation’ (Welsh Assembly Government 2010). It remains to be seen, however, what the current state of the language is today and it is to this which we can now turn.

2.1.5 English and Welsh in present-day Wales

The Welsh language currently enjoys more official status than at any point in its history since the *Acts of Union* (see §2.1.4.2 above). The efforts of organisations such as *Cymdeithas yr Iaith Gymraeg* have ensured that the language is now visible across more domains than ever before. There are networks of Welsh-medium schools all over the country and it is possible for a child to go from nursery to graduate school being educated in the language. The provision of Welsh in Higher Education has recently been strengthened with the establishment of the *Coleg Cymraeg Cenedlaethol* (Welsh National College), which funds and promotes Welsh-medium Higher Education courses and facilitates the training of Welsh-medium lecturers in all subjects at Welsh

universities (Coleg Cymraeg Cenedlaethol 2012). Welsh has radio and television output, is spoken in the National Assembly and Welsh translation has been used in the European Parliament (Evans 2010).

Moreover, language planning initiatives continue to form part of government policies which aim to increase speaker numbers, speakers' confidence in their ability, and provide more opportunities for the use of Welsh (Welsh Assembly Government 2010; 2011a: 14). As part of this initiative, the Welsh Language (Wales) Measure 2011 came into force on 9th February 2012 (HMSO 2011). This piece of legislation confirms Welsh as an official language in Wales and establishes an independent Welsh Language Commissioner to increase the use of Welsh and ensure compliance with policy in the public and some parts of the private sector (Welsh Language Commissioner 2012). In addition to this, the First Minister for Wales has now assumed responsibility for the Welsh language as part of his portfolio in an attempt to ensure that the language is considered in all areas of policy (Golwg 2013).

There still remains, however, cause for concern over the vitality of the language and in particular in the use of Welsh in communities, families, and amongst young people (see Welsh Assembly Government 2013 for an overview of current policy targeting these areas). Aitchison and Carter (2004: 130) maintain that 'it is evident that [...] there still exists a core or heartland of predominantly Welsh speech [...]. It is a relic element of once much larger "*Bro Cymraeg*". As well as affecting the pockets of Welsh-speaking communities existing in the North East (M. Jones 1998), factors such as suburbanisation and tourism are also affecting the demographic in the North West (Carter & Williams 1978: 162).

Writing in 1976, Betts (1976: 17) states that 'the Welsh language has no future in [...] [A]nglicised parts of Wales'. More than thirty years later, however, it is upon

these speakers that the vitality of the Welsh language relies. H.M. Jones (2008: 550) conceptualises this polemic more precisely and claims that ‘amongst primary school children [...] second language speakers outnumbered home language speakers by at least 3 to 2. Ten years earlier the ratio was much closer to 1:1 [...]. The future [will] comprise speakers to whom Welsh is a second language’⁶. This situation is not unique in cases of minority language bilingualism: 42% of the population of Ireland have the reported ability to speak Irish, yet only 3% of the population speak the language at home or in a predominantly Irish-speaking community (Government of Ireland 2006: 10). Also, most pupils in Irish immersion education come from English-speaking families (Ó Duibhir 2011: 146).

Jones and Morris (2009) found that parents with more positive attitudes towards the language created more opportunities for children to use the language. In mixed-language households this thesis was also confirmed, although they conclude that children whose mothers spoke Welsh had significantly more exposure to the language as they were the primary caregivers (Jones and Morris 2009: 128).

Both surveys of language use and ethnographic studies highlight the fact that Welsh is a *community* language for many areas in the North West, and is used in a wide range of domains by the majority of the population. In terms of language use, a study commissioned by the Welsh Language Board found that whilst over 80% of Welsh-speakers used the language on a daily basis in the western counties of Anglesey, Gwynedd, and Conwy, this proportion ranged from around 55% to 35% in the eastern counties (Welsh Language Board 2008: 16). Family transmission of Welsh was also lower in the East: 90% of Welsh-speaking parents in the North West transmit the language to their children, compared with less than 70% in the North East (H.M. Jones

⁶ Second language here refers to those for whom Welsh-medium education is immersion education as opposed to those in English-medium schools who study Welsh Second Language.

2008: 545). R.O. Jones (1993: 565) warns that, in this area in particular, ‘there is an ever increasing danger of the Welsh language being associated in the minds of children with education and school activities and consequently being restricted to these domains only’.

In a study of school pupils from four areas of Wales, Coupland et al. (2005: 18-19) found that ‘young people in Wales see Welsh in rather more complex functional terms (use versus symbol), that they prioritise symbol over use, and that they are internally divided in the weight of their endorsement of the interactional use of Welsh’. This division is between areas in the Welsh-speaking heartland and more Anglicised areas (Coupland et al. 2005: 18) and is supported by E. Williams (2009: 88) who, in an examination of language and identity in the predominantly Welsh-speaking town of Caernarfon (also chosen for this study), concludes that ‘the data from our Welsh speakers prioritise language use over language as symbol’.

Musk (2006) uses a conversation analytic (CA) framework in order to look at attitudes towards bilingualism amongst school children. His work with a bilingual school in an area where Welsh is the dominant community language leads him to distinguish between three categories: Welsh-dominant bilinguals, ‘floaters’, and English-dominant bilinguals. The attributes of these groups, after Musk (2006: 399-410) are summarised below:

Table 2.1 Attributes of social groups in a bilingual school (after Musk 2006: 399-410).

Group	Main attributes	Links with discourse surrounding language matters
Welsh-dominant bilinguals	<ul style="list-style-type: none"> • Speak Welsh at home. • <i>May</i> be more confident speaking Welsh • Speak Welsh to other members of the group and floaters but <i>usually</i> speak English with English-dominant bilinguals. 	<ul style="list-style-type: none"> • Likely to condemn pupils who refuse to speak Welsh. • Approve of the school's attitude to Welshness. • Tend to show a commitment to maintaining Welsh.
Floaters	<ul style="list-style-type: none"> • Speak Welsh, English, or both at home. • Less likely to have a lack of confidence in either language. • Most likely to accommodate to the dominant language of the other groups. 	<ul style="list-style-type: none"> • May condemn those who refuse to speak Welsh. • Tend to criticise some teachers' methods of enforcing bilingualism. • Tend to show a commitment to maintaining Welsh.
English-dominant bilinguals	<ul style="list-style-type: none"> • Speak English at home. • <i>Tend to</i> lack confidence in Welsh. • <i>Prefer to</i> speak English with all other groups. • <i>Less</i> likely to use Welsh after school. 	<ul style="list-style-type: none"> • Tend to criticise any attempts to curb their use of English.

The results of Musk's (2006) analysis mark a shift from home language as a factor which might influence acquisition to a social factor which may influence all sorts of behavioural patterns, including language variation. Some interesting patterns emerge from this, the most important being that home language is a defining characteristic for the two 'dominant' groups (see also Eustace 1998: 202) but also that there are some from English-speaking backgrounds that are committed to using Welsh (the floaters). A further point of interest is that the distinguishing feature of the floaters from the English-dominant group is that floaters are more likely to have confidence in speaking Welsh. The problem is that this distinction is based on an area with a more equal proportion of pupils from Welsh-speaking and English-speaking backgrounds. It remains to be seen whether these groups exist in schools where 90% of the students

come from English-speaking homes and where attitudes towards the Welsh language may not be as positive as in Welsh-dominant areas (Grossman 1996: 343).

2.1.6 Summary

It can be claimed that the level of contact between Welsh and English has been both long-standing and intense, though the level of intensity has varied. The shift of Welsh-speakers to English began in the Middle Ages due to the prestige awarded to English and its position of authority in all aspects of official life. With the coming of industrial development English became much more present to speakers across the socio-economic spectrum, enforcing the idea of prestige on one level but also requiring speakers to become bilingual in order to communicate and participate in the Industrial Revolution. In the lowland North East, where the development of industry was much more intense, and where there was already a long-standing history of contact with English, the Industrial Revolution provided a catalyst for large-scale language shift and resulted in a cultural and linguistic gulf between the North West and North East.

The revitalisation attempts which began towards the end of the nineteenth century and continue until the present day have led to an increase in speakers in the more Anglicised areas. The majority of these 'new' speakers acquire the language through immersion education, which could itself have linguistic consequences, and there remain differences between those from Welsh language and English monolingual homes, and those from Welsh dominant areas and English dominant areas in terms of language usage outside of the classroom. This suggests that rather than merely being 'input factors', home language and area might correlate with social practices in terms of English and Welsh use. Any effect of home language and area on phonetic or phonological variation could not solely be attributed to lack of input but would have to acknowledge the possible role of cultural practice. This is discussed in Chapter 5 in an

examination of the attitudinal data collected for this study, while the remainder of this chapter provides a linguistic description of Welsh and Welsh English.

2.2 The phonology of Welsh and Welsh English

This section outlines the dialectal and phonological characteristics of Welsh and Welsh English, and focusses on the dialectal areas and similarities and differences between the two. The aim is to provide examples which contextualise the research questions outlined in Chapter 1. More specifically, the section shows that there are similarities between Welsh and Welsh English which are primarily attributed to the influence of Welsh. This influence may be attributed to either a historical process of transfer which resulted in convergence between Welsh and English (and which remains as a substrate in the speech of English monolinguals), or as a current transfer effect in the speech of Welsh-English bilinguals (see §1.3). It was shown in Chapter 1 that there are few quantitative studies of both varieties which use stratified sampling in order to examine both structural convergence and the appearance of features associated with Welsh in English. As most accounts of Welsh phonology have been completed before the popularity of Welsh-medium education amongst monolingual English parents, the appearance of English phonological features in Welsh speech is also understudied. Having provided an overview of the two varieties in the following sections, Chapter 3 provides a theoretical framework which accounts for these two processes.

2.2.1 Dialect areas

2.2.1.1 Welsh

Early accounts of Welsh phonology focussed on educated speakers and Literary Welsh (e.g. Morris-Jones 1913; S. Jones 1926; Somerfelt 1959). During the 1960s a growth of

dialectological studies, mainly postgraduate theses from the University of Wales, resulted in phonological accounts of localities (Ball 1988b: 21). The work of Alan Thomas and both his *Linguistic Geography of Wales* (1973) and *The Welsh Dialect Survey* (2000) remain the most thorough attempts at dialect mapping, and led him to distinguish between three main areas: the North, Midlands, and South (though the Midlands' accents are often described as a hybrid between North and South; Mayr & Davies 2011: 2). Differences in lexicon, grammar, and phonology mean that the three areas can be divided into east and west which results in six dialect areas for Welsh (Thomas 1973: 14).

The differences upon which dialect areas are based come from accounts of local dialects, which appear to be in decline in many eastern areas. The primary reason for this is that the new generation of Welsh speakers in the east, the vast majority of whom come from English-speaking homes (§1.3.1), are not acquiring the local features through immersion education. Instead, speakers acquire a variety of Welsh which is an intermediary form between Literary Welsh and local dialects used in both immersion education and second language teaching since the 1970s (cf. *Cymraeg Byw* [Living Welsh]; C. Davies 1988: 200). The Welsh acquired in schools is, more precisely, a 'closely linked set of standards [...] for education purposes' (Coupland & Ball 1989: 17), rather than a unified form. The main differences between these standards exist between North and South Wales, with regional lexical items being preferred where differences exist.

M. Jones (1998: 194) provides an example of the decline of local features from her study of Rhosllannerchrugog in North East Wales. In this area, the traditional plural suffix is realised as [ɛ], in contrast to the literary and northern educational standard [ai]. M. Jones (1998: 194) found a steady decrease in the use of the traditional form, and a

sharp increase in the use of both the educational standard form and the [a] suffix associated with north-western varieties. This is shown in Figure 2.1, below:

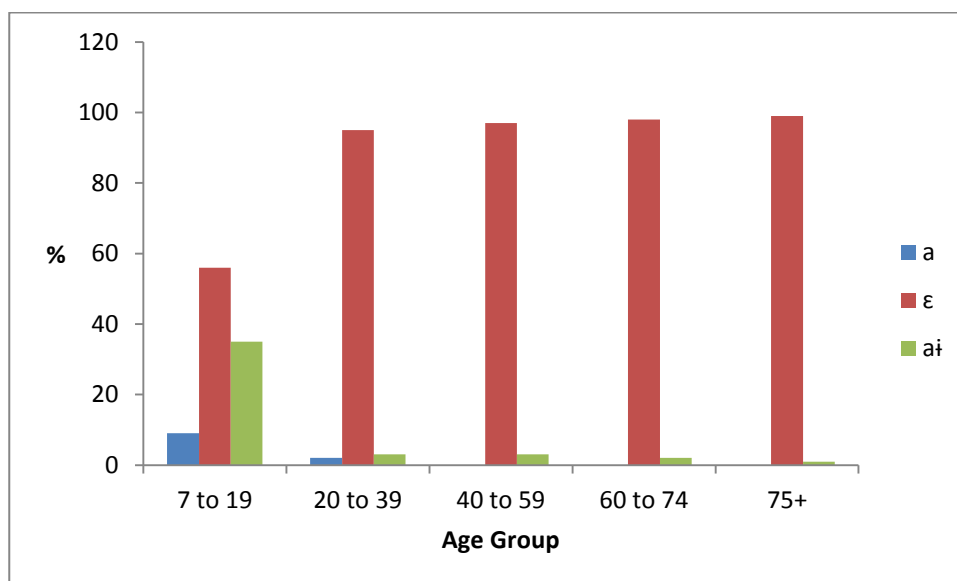


Figure 2.1: Plural suffixes in Welsh speech in Rhosllanerchrugog (North East Wales), after M. Jones (1998).

Figure 2.1 above shows a decline in traditional forms in the east and an increase in both standard and north-western forms. 99% of tokens produced by those over the age of 75 contained the local plural suffix. This declines to 56% in the youngest age group. This age group, which at the time was the first generation to attend Welsh-medium education after the establishment of a regional standard, also produced 35% of tokens as /ai/ which reflects the orthography and regional standard and 9% of tokens as /a/.

The work by M. Jones (1998), outlined above, shows that eastern forms have been declining in use. The future of traditional dialectal forms in the North East is uncertain, as the majority of speakers in these areas acquire the educational standard rather than local forms. Even in the teaching of Welsh to adults, which focusses on oral communication, features from the North West are taught across North Wales as this is where the language is most dominant (cf. Meek 2005). Despite this, however, there

seems to increasing interest in traditional forms in the east and a willingness to use them informally in education (*Ar Lafar* 25 July 2011)⁷.

2.2.1.2 Welsh English

Welsh English can be viewed as an umbrella term for the varieties of English which are spoken in Wales. Wells (1982: 377) states that ‘the main influence on the pronunciation of English in Wales is the substratum presented by the phonological system of Welsh’. Regional variation within Welsh English is largely influenced by the extent to which Welsh is, or has been, spoken in a particular region. Mees & Collins (1999: 186) differentiate between three different area types: The first area is one in which Welsh remains the dominant language in the community (most of the North West and parts of the Mid and South West). The second area remained predominantly Welsh-speaking until around the 1850s before widespread language shift to English (most of the North East and South East). Finally, the third area comprises those areas which have been English-speaking for centuries (the border areas and part of the South East).

The situation is, however, not as clear-cut as is suggested above, and the extent to which Welsh is or was spoken in an area is not the only defining characteristic of Welsh English. Whilst most accounts naturally draw upon the Welsh influence on English (e.g. Penhallurick 2004), Thomas (1994: 112) notes that ‘external dialectal influences on north-eastern Welsh dialects of English stem from the north-western counties of England, and we must expect the extraneous standard model to have the same influence on the development of those dialects too’. An example of this is the merger between STRUT and SCHWA vowels in areas of the North East, which differs

from other Welsh dialects but is identical to neighbouring areas across the border in England (see §2.2.2). Wells (1982: 390) also notes that ‘the residualism of a final [g] in *sing, hang, wrong*, etc. (thus [sɪŋg], [haŋg] etc. spills over into Clwyd [an old county of the North East] from adjacent parts of the north of England.

The few variationist studies of Welsh English have, perhaps unsurprisingly, focussed on the capital city of Cardiff in South East Wales. Mees & Collins (1999: 186) note that ‘the speech of the Barry-Cardiff-Newport [urban] area ought not to be lumped in with the rest of South Wales’. For example, /l/ is notably lighter before vowels than neighbouring rural dialects (Mees & Collins 1999: 193) and the PALM vowel tends to be produced as [æ:] as opposed to [a:] or [ɑ:] in other more rural varieties of Welsh English.

2.2.2 Vowels

2.2.2.1 Welsh

The Northern Welsh vowel system comprises 13 monophthongs and 13 diphthongs, compared with 11 monophthongs and 8 diphthongs in the southern system. Table 2.2 shows the vowel inventory for both Northern Welsh and Southern Welsh.

Table 2.2: The vowel inventory of Northern and Southern Welsh (after Mayr & Davies 2011: 18-19).

Northern Welsh			Southern Welsh	
13 monophthongs			11 monophthongs	
Short vowels		Long vowels	Short vowels	Long vowels
ɪ ɨ ʊ		i: ɨ: u:	ɪ ʊ	i: u:
ɛ ə ɔ		e: o:	ɛ ə ɔ	e: o:
a		a:	a	a:
13 diphthongs			8 diphthongs	
Front closing	Central closing	Back closing	Front closing	Back closing
aɪ ɔɪ eɪ æ ɔɛ	aɨ ʊɨ eɨ	ɪʊ ɛʊ aʊ ɔʊ ɨʊ	aɪ ɔɪ ʊɪ eɪ	ɪʊ ɛʊ aʊ ɔʊ

Both the format of Table 2.2 and notation is based on Mayr & Davies (2011: 2; 18-19), as this represents the most recent and the most in-depth acoustic analysis of

Welsh vowels. The results of the study confirm a close series and an open series with the close series being long and the open series being short. It should be noted that the description of vowels in northern varieties of Welsh has been subject to debate, as it was not clear until Mayr & Davies (2011) whether both qualitative and quantitative differences occur between vowel pairs (cf. Ball & Williams 2001: 36). Watkins (1961: 12) states that;

yng Ngogledd Cymru nid oes gwahaniaeth mewn ansawdd rhwng [i:] *cig* ac [i] *cinio* [...] er gwaethaf y ffaith mai hir yw'r llafariad yn y cyntaf o bob pâr a byr yn yr ail.
[in North Wales there is not a difference in quality between [i:] *cig* ['meat'] and [i] *cinio* ['lunch'] [...] apart from the fact that the first vowel of each pair is long and is short in the second].

G.E. Jones (1984: 57) elaborates on this, and states that 'the clear qualitative differences between long and short vowels found in SW is less marked in NW'. Based on these claims, some accounts of northern varieties (e.g. M. Jones 1998 and Ball & Williams 2001) show only a length distinction between long and short vowels.

An additional pair of vowels, /i/ and /i:/ (along with the diphthongs /ai/, /oi/, and /ei/) is present in northern varieties and some areas of the midlands. In Southern Welsh, these sounds are realised as /i/ and /i:/ respectively. Ball (1981: 201) notes that '/i/ is retreating slowly in North Wales, especially in North East Wales', though this requires an empirical study.

2.2.2.2 Welsh English

The *Survey of Anglo-Welsh Dialects* is based on data which was collected from 1968 onwards (Parry 1977, 1979; 1999; Penhallurick 1991). Although the data comes from predominantly rural areas, the study remains the most comprehensive study of Welsh English and it is therefore perhaps not surprising that it shows a lot of variation in the

phonology of Welsh-English. Table 2.3 shows the realisations of the vowels in Welsh English after Penhallurick (2004)⁸:

Table 2.3: Vowel realisations in Northern and Southern Welsh English (after Penhallurick 2004).

Lexical Set	Phoneme
KIT	ɪ
DRESS	ɛ
TRAP	ɑ
LOT	ɔ
STRUT	ʌ ~ ʊ
ONE	ʌ ~ ɔ
FOOT	ʊ
BATH	ɑ ~ ɑ:
CLOTH	ɔ
NURSE	ə: [œ:]
FLEECE	i:
FACE	e:
STAY	e: ~ ei
GOAT	o:
SNOW	o: ~ ou
PALM	ɑ:
THOUGHT	ɔ:
GOOSE	u:
PRICE	aɪ
CHOICE	ɔ
MOUTH	au
SQUARE	ɛ:
START	ɑ:
NORTH	ɔ:
FORCE	ɔ:
BOAR	ɔ: [oə]
CURE	uə
NEAR	iə
<i>happY</i>	i:
<i>lettER</i>	ə ~ ʌ
<i>commA</i>	ə ~ ʌ

Though Welsh English has fewer diphthongs than Welsh, the auditory data of previous studies shows few categorical differences amongst the monophthongs. There are influences of Welsh and regional variations to which our attention ought to be turned:

⁸ Variants restricted to one area are shown in squared brackets.

1. The vowel /ʌ/ is notably absent from accounts in Welsh, where /ə/ may appear in stressed or unstressed positions. The status of /ʌ/ is unclear in Welsh English, where it is often said to be realised /ə/. Wells (1982: 380) argues that the [ʌ] phoneme is absent due to a ‘STRUT-Schwa merger’. More recent accounts, however, claim that it is the most frequent realisation (Parry 1999: 15). Penhallurick (2004: 103) maintains that ‘the Welsh language has no /ʌ/ phoneme, but it does have /ə/, and this may be behind the both the centralising tendency in STRUT and the blurring or even erasing of distinction between /ʌ/ and /ə/. As mentioned in §2.2.1, the vowel in STRUT (and to a lesser extent in ONE) is often realised as /ʊ/ in the north-east as in many areas of northern England.
2. In terms of long vowels /ɛ:/, /œ:/ and /ɔ:/ are not present in the Welsh system, although it should be noted that [œ:] and [oə] are cited as being a fairly localised variant of the South-East, and there have been no studies which compare English realisations of /ɛ:/ and /ɔ:/ with the Welsh /e:/ and /o:/.
3. Penhallurick (2004: 301) states that ‘through most of Wales the realization of TRAP is [a] but in mid-Wales [...] a raised [æ] or even [ɛ] is recorded (Penhallurick 2004: 301). This corresponds to a major isogloss in which separates Mid Wales from northern and southern areas (this is explored further in Rees 2013).
4. Words which have the LOT vowel but have a <a> in their spelling (e.g. *wasps*). are often pronounced as [a] in predominantly Welsh-speaking areas.
5. In words which form part of the BATH lexical set, variation occurs between short and long realisations. The short forms [a ~ æ] are contrasted against the long forms [a: ~ æ: ~ ɑ:] with [a] being the most cited variable.

6. Coupland & Thomas (1990: 10) suggest that bilinguals in the north tend to produce the northern Welsh [i] vowel in English stressed monosyllables such as *tip* [tip] and *bit* [bit].

The vowels inventories for both varieties show many similarities between Welsh and Welsh English, and clear influences of Welsh on Welsh English phonology. From the list above, I would argue that the lack of distinction between STRUT and SCHWA vowels (1), the raising of [a] in Mid Wales (3), the realisation of LOT vowels as [a] following the orthography (4), and the production of /i/ in stressed monosyllables are the clearest indicators of Welsh influence. In terms of vowel quality, further acoustic comparisons of the two languages will shed light on any further similarities.

2.2.3 Consonants

2.2.3.1 Welsh

An overview of the consonants of Welsh is shown in Table 2.4, below, according to manner and place of articulation.

Table 2.4: The consonants of Northern and Southern Welsh (after G.E. Jones 1984: 41).

	Plosive	Nasal	Affricate	Fricative	Liquid	Glide
Bilabial	p b	(m) m				w
Labio-dental				f v		
Dental	t d	(n) n		θ ð		
Alveolar				s (z)	(r) r	
Lateral				ɬ		l
Post-alveolar			tʃ dʒ	ʃ		
Palatal						j
Velar	k g	(ŋ) ŋ				
Uvular				χ		
Glottal				(h)		

Table 2.4 shows 29 distinct consonants in Welsh. Those phonemes in parentheses are only present as a consequence of mutation (as is the case for nasals; §2.2.3.5) or in certain dialects (§2.2.3.3).

2.2.3.2 Welsh English

Table 2.5 presents an overview of the consonants of Welsh-English:

Table 2.5: The consonants of Northern and Southern Welsh English (after Wells 1982: 387–391).

	Plosive		Nasal	Affricate	Fricative		Liquid	Glide
Bilabial	p	b	m					w
Labio-dental					f	v		
Dental	t	d	n		θ	ð		
Alveolar					s	z	ɹ	
Lateral							l	
Post-alveolar				tʃ	dʒ	ʃ		
Palatal								j
Velar	k	g	ŋ					
Uvular								
Glottal					h			

A comparison between Table 2.4 and Table 2.5 shows that Welsh, or Northern Welsh at least, has six phonemes which are not present in Welsh English. These are the voiceless nasals, the voiceless alveolar trill, and the uvular and lateral fricatives. The latter two phonemes may occur in the speech of English monolinguals, the most common instances being the pronunciation of place and personal names. These phonemes are not present, however, for many if not most non-Welsh speakers and are replaced by English phonemes such as /k/, /l/, or /r/ (Wells 1982: 389; Coupland 1985). The remainder of this section compares the Welsh and Welsh English consonants.

2.2.3.3 Plosives

As in English, Welsh has a set of six plosives (/p/, /t/, /k/, /b/, /d/, /g/) with three contrastive places of articulation (bilabial, alveolar, and velar. G.E. Jones 1984: 43). Despite being labelled as ‘voiced’ and ‘voiceless’ respectively, it is only the presence of aspiration which can be deemed the distinguishing factor between plosives articulated at the same place (Wells 1979: 344-346). In northern varieties of Welsh and Welsh English, the alveolar plosives, /t/ and /d/, are generally said to be dental in articulation, though again

this has not been examined acoustically (Penhallurick 2004: 109). In addition to this the voiceless plosives /p/, /t/, and /k/ are strongly aspirated in northern Welsh and Welsh English, which sometimes approaches affrication (Penhallurick 2007: 160).

Morris (2010) also found preaspiration, that is to say aspiration preceding the closure of a voiceless stop, in both Welsh and the Welsh English of bilinguals. Preaspiration occurred in 60.5% of the Welsh tokens with a significant difference found between males and females (Morris 2010: 4–5). This suggests that preaspiration is a non-normative feature of Welsh, though further studies in this area are needed. In English, there were significantly fewer instances of preaspiration (33.3%) although fewer English tokens were produced by participants (Morris 2010: 13).

The presence of glottal stops as a variant of /t/ in Welsh English has not been widely investigated, although Mees (1987) found that it was a distinctive feature of Cardiff English and Thomas (1994: 113) notes its presence in word-medial and word-final position in Bangor (North West Wales).

2.2.3.4 Affricates

Affricates in Welsh appear only in English loan words (G.E. Jones 1984: 44), and consist of /dʒ/ and /tʃ/. In English, there is a tendency for the voiced affricate /dʒ/ to be produced as /tʃ/ by some speakers in North Wales (Ball 1988c: 54)⁹. This results in certain homophonous pairs, such as /tʃin/ for both ‘chin’ and ‘gin’ (Coupland & Thomas 1990: 10). Wells (1982: 389) states that it is the rather marginal use of affricates in Welsh that ‘speakers from North Wales sometimes have rather [ts]-like versions of these affricates, as in [starts] for ‘starch’.

⁹ The actual distribution of the two forms has not been studied.

2.2.3.5 Fricatives

Jones and Nolan (2007: 873) state that Welsh ‘is relatively unusual in having voiceless fricatives at 6 places of articulation: /f/, /θ/, /s/, /ʃ/, /t/, /χ/’. Whilst /χ/ is a feature of Northern Welsh, it is largely realised as /x/ in the south (Ball and Müller 1992: 83). In addition to this Ball and Williams (2001: 16) note that ‘some speakers may use /z/ in certain English borrowings, but this is unusual in northern Welsh, where many speakers lack this phoneme in their accent of English’.

The presence of the glottal fricative, /h/, is a feature of northern varieties and is not present in the south (M. Jones 1998: 367). This has the effect that southern varieties do not contain the /h/-related phoneme /r/ or the voiceless nasals (Ball 1988c: 52).

2.2.3.6 Liquids

2.2.3.6.1 /l/

The lateral /l/ has a more velarised quality in Northern Welsh than in other varieties, with /l/ being dark in all positions (Ball & Müller 1992: 88). An example of this would be the realisation of ‘*lol*’ (nonsense) [lɔl] in the North compared to as [lɔl] in the South, where /l/ is light in all positions (Thomas & Thomas 1989: 34). G.E. Jones (1984: 49) states that:

In [Northern Welsh] generally, the non-fricative lateral has a marked dark quality [...], which may be due to pharyngealisation [...]. In final position, this dark quality occurs regardless of the nature of the vowel context, i.e. whether front or back [...], but it is particularly marked in the context of the central vowels.

As in northern Welsh, /l/ is cited as being velarised in all positions in Northern Welsh English. This is distinct from most areas of South Wales where, as in Welsh, clear [l] is realised in all word positions. In some south-eastern areas which had historically never been Welsh-speaking, clear [l] is expected word-initially and dark [ɫ] word-finally (as in

many other varieties of English (Penhallurick 2004: 110). As was noted in §1.3, it seems most likely that the similarities between /l/ in Welsh and Welsh English are the result of convergence rather than the influence of other varieties of English. This claim is made in light of the fact that no areal differences are noted in the literature, and is surprising considering that different varieties of English have had an influence on West and East Wales respectively (see §2.1).

2.2.3.6.2 /r/

A trilled [r] has been shown to be the most common realization of /r/ in Welsh, and has been shown to have influenced the speech of English-speaking Welsh (Walters 2001: 293). The alveolar approximant [ɹ] has been found to be a variable of /r/, especially in areas which border England in Mid Wales but this has not been noted as a major feature (Ball 1988b: 55). In addition, the voiced uvular trill [ʀ] and uvular approximant [ʁ] have been attested in the town of Bala in North Wales (G.E. Jones 1984: 50). In North West Wales, the tap [ɾ] is common in word-medial intervocalic position in both English and Welsh. The alveolar trill is cited as occurring often in Welsh English (Penhallurick 2004: 110). This is subject to variation, however, and the pronunciation of ranges from [r] and [ɾ] to [ɹ] in predominantly Welsh-speaking areas (Wells 1982: 390). In contrast to Welsh, Welsh English is largely non-rhotic. As orthographic <r> is always pronounced in Welsh, it is perhaps not surprising that, in areas where the language is strongest, /r/ is realised word-medially and word-finally. Interestingly, Wells notes that ‘the loss of a particularly “Welshy” accent [...] involves among other things the cutting out of /r/ in non-prevocalic positions’ (1982: 379).

2.2.3.7 Nasals

Amongst the nasal phonemes a distinction can be made on the basis of voicing. The voiced nasals can be considered a full part of the phonological system, with /m/ and /n/ occurring in all positions and /ŋ/ in word-medial and word-final positions. The status of the voiceless nasals, however, is more problematic as they only appear as a result of nasal mutations. The mutation system is common to all Celtic languages and involves the variation of the initial segment of a word depending on the environment (Awbery 1975: 14). As Ball & Müller (1992: 5) elaborate, Initial Consonant Mutation ‘is a process whereby word-initial consonants undergo one of three sets of phonological changes when in certain syntactic environments. The particular set of changes is determined by the syntactic environment’. Whereas other mutation processes transform initial segments into phonemes which are part of the inventory, the voiceless nasals appear only in this environment. G.E. Jones (1984: 51) notes that ‘these co-called voiceless nasals are phonetically a complex sequence consisting of a nasal and aspirated segment, hence they are more aptly termed aspirated nasals’. The nature of this aspiration can differ depending on speakers’ articulation (G.E. Jones 1984: 51). The production of /n/ is cited as being largely dental in nature in northern varieties of Welsh and Welsh English.

2.2.4 Prosody

Wells (1982: 392) claims that ‘rhythm and intonation are among the diagnostic characteristics for recognizing an accent as Welsh’. The ‘sing-song’ intonation often associated with Welsh English appears to be in the preference for the rise-fall tone (Wells 1982: 392), which is the typical pattern found in Welsh (Cruttenden 1986: 159).

Whereas lexical stress in English is not fixed, it is fixed on the penultimate syllable in Welsh (Cruttenden 1986: 17)¹⁰.

Typically, consonants in Welsh are lengthened following the stress which is not a significant factor in English (Williams 1986). There are reports of post-stress consonant lengthening in Welsh English, however (Connolly 1990; Walters 2003). Walters (2003: 218) claims that ‘one device used by speakers to help impart a strong accent is, instead of lengthening the stressed vowel, to markedly shorten it and lengthen the succeeding consonant’. There are few acoustic analyses of Welsh or Welsh English prosody, but Webb (2012) compared the durations of the stressed vowel and post-stress consonant in the English speech of five speakers of Southern Standard British English (SSBE) with both the Welsh and English speech of five bilinguals from North West Wales. She found that, despite Welsh intonation being the main influence on Welsh English intonation, the two varieties were not converged with respect to this feature as there were significant differences between all three varieties. However, she did find that bilinguals’ Welsh English was more similar to Welsh than SSBE. In SSBE, the duration of the stressed vowel accounted for 22.74% of the whole word, compared to 19.88% in Welsh English and 17.38% in Welsh. The post-stress consonant in SSBE accounted for 18.86% of the word whereas this increased to 25.77% in Welsh English and 28.92% in Welsh.

2.2.5 Summary

To summarise, both Welsh and Welsh English can be divided into six dialect areas:

North East, North West, East Midlands, West Midlands, South East, and South West.

These areas are based on Welsh traditional dialect features and predominantly rural data

¹⁰ There are a few exceptions where stress is not placed on the penultimate syllable. This is mainly to show a lexical distinction (*cf.* Williams 1999).

from the latter half of the twentieth century. Though previous studies may now be outdated, and do not take into consideration the decline of Welsh local dialect features in eastern areas nor examine processes such as dialect levelling or geolinguistic diffusion, the distinction into the six areas seems to be the most apt given the socio-historical and demographic differences between the areas.

There are two main consequences of language contact and bilingual speech which stand out from this review. The first consequence, one of long term contact, is that there are many instances where there appears to be convergence between Welsh and English. Both languages share similar vowel inventories, and most notably the merger between STRUT and SCHWA vowels is attested in both varieties. Plosives are also cited as being dental in the two languages and /l/ is reported as being heavily velarised. There are few fine-grained acoustic studies of the two languages, but both Morris (2010) on preaspiration and Webb (2012) on lexical stress suggest, however, that the two varieties may not be as converged phonetically as might be assumed.

Parallel to this, there is the influence of the dynamic appearance of features from Welsh to English in areas which are predominantly bilingual. Such features include the occurrence of [ɪ] in English stressed monosyllabic words, and realisation of coda /r/ and the voiced alveolar trill. Passing remarks made about the presence of the alveolar approximant in border areas of Mid Wales also suggest an influence from English in Welsh speech, which is the first indication of bi-directional influence between English and Welsh. The realisation of such features is not reported as being categorical in North Wales, which would suggest that they enter into variation with the phonologised variants of the language being spoken

The current review of the phonological inventories of both languages has shown clear gaps in our knowledge which are filled by the present study. Firstly, the features

which are assumed to be converged in both languages have not been subject to acoustic analysis which may show fine-grained phonetic distinctions. This would suggest that it is quite possible for features in two varieties in contact to be phonologically converged whilst being phonetically divergent. This would be an important result in the context of Welsh-English bilingualism, where /l/ is described as behaving identically in both languages and assumes that speakers do not differentiate between the two languages in their repertoire.

Secondly, what Wells (1982: 379; §2.2.3.4.2) calls a ‘particularly “Welshy” accent’ seems to be reliant on the production of variants associated with the Welsh language in English speech. This is yet to be studied quantitatively and the appearance of ‘English’ features in Welsh also requires attention, as does the possible influence of extra-linguistic factors. In other words, it is not clear whether this bi-directional influence is present in areas where Welsh is not dominant and whether it is a feature of the speech of those who have acquired Welsh through immersion education. The investigation of both languages will therefore shed light on how speakers manage variants in their bilingual repertoire, and show the extent to which variation patterns in a language-specific manner. In order to explore this further, a theoretical framework is required which takes into consideration these two consequences of Welsh-English language contact. This framework is outlined in the following chapter.

3 Towards a theoretical framework for Welsh-English bilingualism

The present study examines language variation in the understudied context of regional minority language bilingualism, and attempts to conceptualise the relationship between variation in Welsh and English within an appropriate theoretical framework. This chapter identifies the previous work which will inform this framework, and highlights the need to draw upon research in different areas of linguistics. I propose that three strands of research are relevant: individual bilingualism and Second Language Acquisition, long-term language contact, and variationist sociolinguistics.

The interaction between a bilingual's two languages is well-documented, and at the level of phonology and phonetics bilingual speakers often produce speech which differs from that of monolinguals, and also differs between bilinguals who acquired their languages differently. In addition, the process of phonological *transfer* (Lado 1957) in synchronic speech results in the production of features typically associated with one of the bilingual speaker's languages in her other language. The extent to which this process is realised in speech can depend on a number of factors, including age of acquisition, level of formal instruction, use of the two languages, social networks, the interlocutor, and the speech context (see Piske et al. 2001; Grosjean 2001).

The age at which children acquire Welsh differs, with those who acquire the language via immersion education receiving input in Welsh later than those from homes where Welsh is spoken (§2.1.4). A distinction can be made between consecutive childhood bilinguals (those from English-language homes who acquire English and Welsh consecutively) and simultaneous childhood bilinguals (those from Welsh-language homes who acquire both languages early on due to the dominance of English in the wider world). It remains to be seen what the interaction between the languages are and whether the way in which speakers acquire their languages influences variation.

There are also linguistic outcomes when languages come into contact and a situation of societal bilingualism develops. It is generally assumed that languages in contact become increasingly similar over time (Bullock and Toribio 2004: 91). Such changes may be due to convergence (the loss of structural differences) between the two languages in contact or as a result of borrowing from one language to another. This borrowing may occur in the lexicon, morphology, syntax, or phonology (Thomason & Kaufman 1988: 37).

In situations where language shift occurs, imprints from the original language may be left on the incoming language in the form of substrate features. Both convergence between Welsh and English, and a Welsh substrate has been noted in areas which had undergone language shift in North Wales, such as Mold, but such Welsh influence on English speech has been reported as being stronger in areas where the majority are bilingual, such as Caernarfon. This suggests that the demographics of the two different areas may influence variation, as the majority of speakers of Welsh in Mold are ‘new’ speakers who have acquired the language through immersion education.

Variationist sociolinguistics informs the study both methodologically and theoretically. Heller (1984: 47) states that ‘*variationist* sociolinguistics is principally interested in accounting for linguistic variation and change, at least as a product of the social distribution of language varieties’. In particular, many previous studies of variation take into consideration ‘local dynamics’ (Eckert 2005: 5), and investigate the relevance of different independent variables for the community being studied. Area and home language are *local* variables, insofar as they represent differences which have developed out of the socio-historical context of Welsh-English contact (see Chapter 2).

The chapter is structured as follows: In §3.1, I outline a typology of bilingualism and define the bilinguals in this study using this typology. §3.2 examines the phonetics

and phonology of bilinguals and shows how interactions between a bilinguals' languages have been found in a number of previous studies yet the nature of these interactions differ depending on the background of the speaker. §3.3 takes a wider view of bilingualism, and examines the possible influence of long-term language contact on variation in a regional minority language speech community. Finally, §3.4 turns to variationist sociolinguistics and focuses on previous studies of multi-ethnic and multilingual communities.

3.1 The bilingual speaker

3.1.1 Definitions

Early definitions of bilingualism centred on quantifying the ability of the speaker in her two languages. This ability can be seen as a continuum ranging from the equal mastery of two languages (e.g. Bloomfield 1933: 56) to minimal competency in another language (e.g. Diebold 1961).

The current consensus leans more towards a view of bilingualism which, similar to Weinrich (1953), places more importance on the functional ability of bilinguals and stems from the belief that language is what Matras (2010: 66) calls 'the practice of communicative interaction'. This reflects a shift from earlier definitions which emphasise the cognitive aspects of bilingualism. For example, Grosjean (1992: 51) eschews commentary of actual ability and states that bilingualism is 'the regular use of two languages and bilinguals are those people who need and use two languages in their everyday lives'. The notion of communicative competence (Romaine 1995: 14), then, is inherently linked with a speaker's ability in two languages but does not assume that this ability needs to be equal in both languages and the same as monolinguals.

The view of bilingualism taken in this thesis is based on the ability of speakers of two languages to *use* their languages. As was stated above, all of the participants in

the study were able to communicate in the sociolinguistic interviews in both English and Welsh, without needing to make sustained switches to the other language to fulfil their communicative needs. Following Grosjean (1992: 51), the fact that speakers use both languages in their everyday lives is guaranteed as they all attend Welsh-medium education. Speakers do differ, however, in the way in which they acquired Welsh and it is to a typology of bilingual speakers which we now turn.

3.1.2 Typology

Chapter 2 has outlined the different types of bilingual speakers in North Wales, and distinguishes between those who acquired Welsh at home and those who acquired Welsh via immersion education. The following typology of bilingual speakers allows us to characterise these two groups in light of previous research. Wei (2000: 6 -7) provides a glossary of different types of individual bilinguals and lists 37 entries. These will not be re-listed here, but Table 3.1 shows the relevant types of bilingualism based on age of acquisition¹¹ after Hamers & Blanc (2000: 26):

Table 3.1: Some psychological dimensions of bilingualism after Hamers & Blanc (2000: 26).

Dimension	Type of bilingualism
Age of acquisition	Childhood Simultaneous Childhood Consecutive Adolescent Adult

Applying the Welsh-English bilingual situation to Table 3.1, there is a distinction in the community in terms of the age of acquisition of Welsh and English.

Those who acquire Welsh solely through immersion education are childhood consecutive bilinguals, as they have acquired Welsh after beginning to acquire English in the home. De Houwer (1995) proposes that for a child to be

¹¹ Hamers & Blanc (2000: 1) distinguish between societal *bilingualism* and individual *bilinguality* (rather than individual bilingualism).

considered a simultaneous bilingual the child's exposure to both languages should be within one month of birth, whereas McLaughlin (1984: 10) suggests three years (see also Baker & Jones 1998: 36). The participants in this study who come from English-speaking homes all began to acquire Welsh between the ages of three and five, and are therefore outside of the threshold for simultaneous bilingualism.

The classification of those from Welsh-speaking homes is not as straightforward. Anecdotally many Welsh-speakers claim that they did not acquire English until compulsory education. Scientific accounts of Welsh-English language acquisition note, however, that the dominance of English in Wales means that Welsh-English bilinguals from Welsh-speaking homes are exposed to English simultaneously. Munro et al. (2005), for example, examined bilingual acquisition and used extensive questionnaires to examine language background (see also Ball et al. 2001a; 2001b). They found that even their youngest cohort (aged 2.6 years to 3 years), who came from Welsh-speaking homes, had acquired phonemes particular to both languages (Munro et al. 2005: 34–35). This evidence presents a strong case for the categorisation of participants from Welsh-speaking homes as simultaneous bilinguals, though all of Munro et al. (2005)'s participants came from predominantly English-speaking communities in the South East. According to Baker (2001: 87-88), the role of the languages in the community should be taken into consideration. It remains to be seen, therefore, whether those who come from Welsh-dominant areas are simultaneous bilinguals.

Although the cognitive organisation of Welsh and English is not immediately clear for those from Welsh-language homes, studies of minority language bilingualism suggest that speakers acquire the majority language to the same degree regardless of the extent to which they are exposed to it at home and in the community. Both home

language and community have been shown to affect the acquisition of Welsh, but not of English.

Thomas (1991) examined inflectional prepositions in the speech of 60 twelve year olds from different linguistic backgrounds. Welsh (in particular Standard Welsh) has a subset of prepositions which are inflectional and must agree with the sex and number of the nouns which it substitutes (see Borsley et al. 2006; chapter six). He found that all speakers produced uninflected forms and that there were differences between Welsh home-language and English home-language speaker groups (Thomas 1991: 50). These results lead Thomas (1991) to conclude that there are differences in acquisition and production between, firstly, those from Welsh-speaking and English-speaking homes and, secondly, between those from Welsh-speaking homes in English-dominant and Welsh-dominant areas (Thomas 1991: 53). Although this latter claim was based on ‘native-speaker intuition’ rather than quantitative data (Thomas 1991: 51), similar results have been found in the more recent studies outlined below.

Gathercole and Thomas (2009) administered vocabulary tests to 611 Welsh-English bilingual children across Wales, and stratified the dataset in terms of home language (Welsh, English, and both Welsh and English). The results of the English tests indicated a significantly higher score for those who spoke English in the home at the age of four, but these differences had disappeared by the age of seven (Gathercole & Thomas 2009: 228). In Welsh, however, home language remained significant for all age groups: those from Welsh-speaking homes performed better than both those from mixed-language and English-speaking homes at the age of four. Amongst older participants, both those from Welsh-speaking and mixed-language homes outperformed those from English-speaking homes (Gathercole & Thomas 2009: 233). This suggests that in cases of regional language bilingualism the majority language is acquired equally

by all speakers, but that those who speak the minority language in the home outperform their peers who acquire the language through immersion education. This has been shown in a number of other studies which have found that independent variables influence the acquisition of the minority language rather than the majority language. Such factors include the language of instruction at school education (Wright et al. 2000), and exposure to the minority language outside of the home (e.g. Allen 2006).

The differences between Welsh-dominant and English-dominant areas have also found to be significant in terms of acquisition. Building on the work of M. Jones (1998), who compared the implementation of the mutation system in two different areas (see §2.2.1), Thomas & Gathercole (2005) and Thomas et al. (2012) examined the adherence to prescriptive norms amongst children from Welsh-speaking homes in (Welsh-dominant) North West and (English-dominant) North East Wales. In both studies, it was found that those from the North West were more likely to adhere to prescriptive norms, with those from the North East simplifying both the mutation system (Thomas & Gathercole 2005) and maintaining fewer distinctions between plural suffixes (Thomas et al. 2012).

The role of exposure to language is clearly high on the research agenda for language acquisition studies (cf. Paradis 2011), and home language and community language have produced significant trends. This study applies these parameters in the study of language variation, and uses attitudinal data to examine the extent to which these input factors influence social practice and ultimately phonetic and phonological variation. The possible role of input factors on variation in bilingual speech production is examined in the following section before proceeding to consider the role that long-term language contact may play in minimising variation in situations of regional minority bilingualism.

3.2 Individual bilingualism

3.2.1 The acquisition of two languages

A number of factors have been shown to influence the acquisition of a second language, and the most emphasised of these has arguably been age of acquisition (see Flege 2007 and references therein). Previous studies have shown that there is a tendency for L2 speakers who acquired the language in childhood to perform more 'native-like' than those who acquire the language in adolescence or adulthood. The Critical Period Hypothesis (Lenneberg 1967), which states that decrease of neural plasticity decreases over time and inhibits the learning of a second language (Højen & Flege 2006: 3072), has been frequently evoked as an explanation for this phenomenon, though the actual age which marks the end of the Critical Period, has been subject to debate (cf. Scovel 2000; Flege 2007).

The Critical Period Hypothesis may be subject to debate, but studies which provide evidence against it still find that age of acquisition is significant. For instance, Flege et al. (1999) measured large groups of Italian immigrants in North America. Participants produced various sentences which were then rated for 'foreign accent' by native English monolinguals. Over 70% of productions of English /r/ by those who began acquiring the language at the age of two were perceived to be native-like. This decreased to little over 30% in the speech of those who began acquiring English aged 18 (Flege et al. 1999: 2980). Rather than support the Critical Period Hypothesis by showing two distinct groups, however, those who acquired English between the ages of 2 and 18 formed a continuum (Flege et al. 1999: 2980).

The results from Flege et al. (1999) and various previous studies have shown that it is not only adolescent or adult learners of a second language who differ from monolinguals. Rather, those who acquire a second language at an early age, such as the

participants in this study, have been found to differ from native monolingual speakers (Flege et al. 1997; Guion et al. 2000; Piske et al. 2001; see also Flege 2007).

Attributing differences between different types of speakers (whether bilingual or second language acquirers) solely to age of acquisition does not take into consideration other factors which may influence the acquisition of a second phonology (many of which may be correlated with age of acquisition; Flege 2007: 3).

Sex does not often produce significant trends in studies of Second Language Acquisition, though in studies where it is a significant factor it is females who are rated more native-like than males (e.g. Asher & Garcia 1969; Thompson 1991). This trend does, however, appear to weaken when considered alongside other factors such as age of acquisition and sex does not appear to influence L2 acquisition independently (Piske et al. 2001: 200).

Usage of the L2 has proven significant in a number of studies, and measurement has relied primarily on speaker self-assessment of use in different domains (Suter 1976; Purcell & Suter 1980; Flege et al. 1999; Drummond 2010). Flege et al. (1999) found that, participants who acquired English earlier were more likely to be rated as native-like speakers, but also that use of Italian (the L1 of the participants) in social and work settings also correlated negatively with acquiring a native-like accent (Flege et al. 1995: 3132). Guion et al. (2000) examined the role of L1 use on both L1 and L2 pronunciation in the context of regional minority language bilingualism. They investigated the speech of thirty Quichua-Spanish bilinguals living in Ecuador, and grouped participants according to their use of Quichua (Guion et al. 2000: 31). This data came from speakers' self-assessment of their language use at home, at work, socially, and overall. Speakers produced sentences in both Quichua and Spanish, which were then rated independently by both Quichua and Spanish speakers. It was found that those who used

Quichua more often were more likely to be perceived as speaking with a foreign accent in Spanish, whereas no similar effect was found for Quichua (Guion et al. 2000: 36). All of the participants had acquired Quichua as an L1 and still used the language to varying degrees. The Quichua data was problematic, as there was little variance between the ratings between speakers (Guion et al. 2000: 34). As the authors suggest, this may have been due to a lack of experience of hearing foreign speakers of Quichua amongst the judges, though the inclusion of another group who had acquired Spanish as an L1 perhaps would have made the results of the Quichua data more insightful.

The role of factors other than age on the acquisition of L2 phonology casts doubt over the Critical Period Hypothesis, as it shows that acquisition is not wholly explained by neural plasticity at the age of acquisition (Piske et al. 2000: 28). The Speech Learning Model is proposed by Flege (e.g. 1991; 1995) as an alternative, and does not assume that learning is constrained by a critical period, nor that the capacity to learn language becomes de-activated (Flege 2007: 366). It does assume, however, that L1 and L2 share the same phonetic and phonological space and are able to influence each other. Not only does this refrain from imposing maturational constraints, but it also assumes that the direction of influence between language can be both from L1 to L2 and L2 to L1. The degree of this influence may not only vary according to age of acquisition, but allows for a number of cognitive (e.g. aptitude), input (e.g. type of instruction), and social (e.g. attitudes towards the target language group) factors to be considered (see Moyer 2004: 15 for a taxonomy of factors influencing second language acquisition).

The interaction between the two languages are conceptualised by the terms *phonetic category assimilation* and *phonetic category dissimilation*. These are briefly defined in Table 3.2 below (after Flege 1995).

Table 3.2: Processes of the Speech Learning Model (after Flege 1995).

Process	Description
Phonetic category assimilation	The speaker perceives the L2 sound as near-identical or identical to an L1 sound. The L2 sound resembles the L1 sound or if enough input in both languages co-exists, the two sounds may merge into an intermediate category.
Phonetic category dissimilation	The speaker perceives two similar sounds in both languages as different, and two separate categories are formed or maintained.

Watson (2007; see also Flege 1987 for a similar study) reports an example of phonetic category assimilation and shows how environmental factors, in this case the dominant language of the community, can influence assimilation. He examined VOT productions amongst three groups: monolingual English speakers, monolingual French speakers, French-English simultaneous bilinguals. Within the latter group he distinguished between those living in England and those living in France. He found that bilinguals made a distinction between voicing length in both languages, but that this length differed from monolinguals (Watson 2007: 1534). Those bilinguals living in France had closer VOT values to French monolinguals in their French, whereas those living in England had closer values to English monolinguals when speaking English (Watson 2007: 1535).

The SLM has been applied to a number of situations where the second language has been acquired in early childhood. As shown above, Guion et al. (2000) examined Quichua-Spanish bilinguals who began to learn Spanish at the age of five. Simonet (2010) examines alveolar lateral production amongst Catalan-Spanish early bilinguals through the SLM. He found that speakers did tend to produce different laterals in Spanish to Catalan (although this was not the case for all speakers) but that the laterals produced were not the same as L1 speakers of Catalan and Spanish. This, he asserts,

suggests that speakers create a new category for /l/ in their second language but that this category is influenced by the first language (Simonet 2010: 675). The reasons why speakers may create a new category but still produce laterals in the L2 which are influenced by the L1 are not clear, though Simonet (2010: 678) does suggest that speakers' linguistic background may carry social meaning in Catalonia which may influence speech production, though his data do not allow him to address this fully.

The interaction between bilinguals' phonetic subsystems has not only been attributed to L1 influence. Mennen (2004) examined the intonation patterns of a group of Dutch-native advanced speakers of Greek (with between 12 and 35 years of exposure). She reports a bidirectional influence between the speakers' languages (Mennen 2004: 558). In other words, the late Dutch-Greek bilinguals performed differently to native monolingual control groups in both languages as opposed to just Dutch monolinguals. Sancier and Fowler (1997) studied VOT in the speech of a Portuguese-English bilingual in her native Brazil as well as during and after a stay in the US. They show that VOT values in both languages drifted towards those of the majority language community in which they were residing. This *gestural drift*, they assert is due to the tendency for human beings to accommodate or imitate others' speech (Sancier & Fowler 1997: 422).

Phonetic studies of bilinguals and second language acquirers have shown an influence of the L1 on the L2 which appears to become stronger with age. In addition to this, however, a number of other factors such as language usage may influence bilingual phonetics and may operate independently of speaker age. Furthermore, phonetic differences have shown fine-grained distinctions between speakers in both languages. The study of /l/-velarisation can make a contribution here, as it relies on naturalistic data to find out whether extra-linguistic factors produce significant trends on a phonetically

gradient feature. It also examines individual speech in order to ascertain whether speakers maintain distinct categories. While this has been also been the subject of previous research, researchers have tended to focus on features which differ markedly between languages. It is not clear, therefore, whether such differences exist amongst features which are reported as being phonologically converged.

3.2.2 Phonological transfer

Studies in the context of SLA and bilingualism have been primarily concerned with ‘foreign accent’ in L2 speech (Flege & Darwinian 1984) and have depended on how native monolinguals rate the participants (e.g. Imai et al. 2005; Flege et al. 1995; Piske et al. 2001). Both the developmental processes outlined above (§3.2.1) and phonological transfer contribute to the perception of a foreign accent (cf. Flege & Darwinian 1984), and this section focusses on the latter.

The terms *interference* and *transfer* both refer to the influence of one of a bilingual speaker’s languages on the other during speech, though arguably both terms have come to define slightly different processes as interference is used more in descriptions of language contact, whereas transfer has been the term adopted in studies of Second Language Acquisition (Treffers-Daller & Mougeon 2005: 93; see also Major 2008 for a review). Weinrich (1953: 1) defines *interference* as ‘those instances of deviation from the norms of either language which occur in the speech of bilinguals which occur [...] as a result of language contact’. Phonological transfer, as Flege & Darwinian (1984: 325) state, ‘is what primarily accounts for the *recognizably* different accents of L2 learners differing in native language background’ (italics added).

The transfer of properties from a speaker’s L1 to the L2 is well-documented (see Odlin 1989 for an overview), though exactly which aspects of a language is transferable remains unclear (Curtin et al. 1998: 390). Phonological transfer has been shown occur

in segments, phonotactic patterns, prosody, and post-lexical phonological rules (Simon 2010: 63-64) such as devoicing (Simon 2010) and voicing and aspiration contrasts (Kehoe, Lleó & Rakow 2004). The extent to which transfer occurs has been largely attributed to markedness, where transfer is more likely to occur when the L2 contains features which are typologically rare (cf. Markedness Differential Hypothesis; Eckman 1977). The term *positive transfer* is used in SLA to describe outcomes where the linguistic system of the speaker's L1 reduce the time needed to develop the L2 (Odlin 1989: 36). This contrasts with *negative transfer* which are 'divergences from the norms in the target language' (Odlin 1989: 36). Odlin (1989:26) suggests that interference is therefore negative transfer.

The vast majority of SLA studies are, however, based on laboratory data, and only a minority of studies examine transfer in naturalistic settings (cf. Piske et al. 2001). While this is not inherently problematic, it has meant that the extent to which transfer varies in different contexts is understudied. A further issue is that in minority language bilingualism there are few studies which examine the input a child receives. Khattab (1999; 2002) examines bilingual acquisition by taking into consideration sociolinguistic notions of the variability of input. She examines the production of /l/ not only by children acquiring English and Arabic in Yorkshire (England) but also their parents and monolinguals from each language. This leads her to conclude that 'each of the bilingual's language "systems" consists of considerable sociophonetic variation that is nonetheless systematic in its distribution according to dialectal, individual, and stylistic conditions' (Khattab 2002: 351).

A number of frameworks have been proposed for phonological transfer in individual bilingual speech. Johanson (2002; 2005) proposes a framework centred on the umbrella term of code-copying, which avoids the ambiguity of transfer and

interference, and does not make any inferences about direction of influence (Johanson 2002: 287). He explains that 'the term code-copying implies no more than the insertion of elements copied from one code within the context of another code, without specifying the degree of acceptability at a given stage of development' (Johanson 2002: 288).

Grosjean (2001) suggests that the extent to which a bilingual speaker transfers material from one language to another will depend on a number of factors, which he conceptualises as the language mode. Grosjean (2001: 2) states that 'in the monolingual speech mode, the bilingual deactivates one language (but never totally) and in the bilingual mode, the bilingual speaker chooses the base language, activates the other language and calls upon it from time to time in the form of code-switches and borrowings'. The factors which influence which language mode, or more precisely where on the language mode continuum a speaker is positioned, depends on the interlocutor, their habits (e.g. proficiency, attitudes), the situation, the content of the message, and the function (Grosjean 2001: 5).

Matras (2010: 66) builds on this definition and proposes that instead of organising languages according to systems, bilinguals have an extended repertoire and learn which forms are appropriate in certain situations. The notion of the extended bilingual repertoire calls into question the presumption of previous work that the ideal state for bilinguals is complete separation of two languages (Treffers-Daller & Sakel 2012: 3). Instead, as Matras (2010: 66) states, 'some contexts allow greater flexibility of choices. These are the contexts in which bilinguals can make the most effective use of their full repertoire, exploiting nuances as well as contrasts between variants of equivalent or near-equivalent meaning'. Bullock et al. (2006: 9) add that 'such research

contends that bilinguals' language use is malleable in that they may behave differently according to which language they are producing or perceiving at a given time'.

Grosjean (2001; 2012) claims that a distinction should be made between 'static' and 'dynamic' elements. Static elements are permanent inclusions into a language as a result of language contact, whereas dynamic elements are represented by what Grosjean (2012: 13) calls 'ephemeral intrusions of the other language'. Following Paradis (1993: 134-135), he suggests that the term 'transfer' should be applied in cases where the presence of the historically non-native element is due to a permanent change whereas interference should be reserved for those cases in which the speaker makes a dynamic interference. Transferred material is both high in frequency and acceptable to bilinguals living in the community under discussion, where interferences are low in frequency and rated as unacceptable. This is problematic, which Grosjean (2002: 17) fully admits. He states that:

Unfortunately, differentiating between transfers (static interferences) and interferences (dynamic interferences) will be a long and difficult enterprise as the two contact phenomena clearly resemble one another. In addition, putting bilinguals in a strictly monolingual mode will be [...] necessary.

Phonological transfer has been widely investigated in studies of Second Language Acquisition (see Piske et al. 2001 for an overview). Such studies examine transfer as a synchronic and dynamic process in the speech of those acquiring a second language. Where languages are in contact through societal bilingualism, however, prolonged transfer can lead to language change. Societal bilingualism and the results of long-term transfer are examined in the following section.

3.3 Societal bilingualism and language contact

As stated above, the short-term dynamic processes outlined above may result in the long-term adoption of certain features when languages are in contact. Weinrich (1953:

82) states that 'in speech, interference is like sand carried by a stream; in language it is the sedimented sand deposited on the bottom of a lake'. This describes the phenomenon precisely, as it describes a situation whereby synchronic interference or transfer becomes a diachronic element in the host language¹². This is referred to as contact-induced language change and really does not seem surprising, especially if one accepts the fluid nature of the interaction between the languages in a bilingual's repertoire.

3.3.1 Contact-induced change

Two types of contact-induced change are identified. In cases where the two languages have a similar feature, language-specific phonemes or phonetic features may transfer which results in increased variability, as is the case for /r/ in Welsh and English (§1.3). The long-term effect of this may be *convergence* (Backus 2004: 179), as is argued for /l/ in the current study (§1.3), where this variability decreases and eventually one variant remains in both languages. Similarly, features may be transferred from one language to another when there is no similar equivalent in the other languages. The term *borrowing* describes instances where such transfers are permanently adopted into the other language (Thomason & Kaufman 1988: 37).

3.3.1.1 Phonological convergence

Convergence can be defined as 'the mutual sharing of features among members of an areally defined set of languages, whose speakers tend to be in a state of stable bilingualism' (McMahon 1994: 200). It is generally agreed that convergence is a gradual process due to the prolonged co-existence of two or more varieties (Schumann 1978: 154–158), whether these varieties are distinct languages or dialects of the same

¹² Though most studies tend to either concentrate on synchronic transfer or diachronic contact, recent studies have started to examine both (e.g. Sakel 2011).

language (see Hinskens et al. 2005 for of an overview of dialect convergence). Bullock and Toribio (2004: 91) note that convergence is ‘the enhancement of inherent structural similarities found between linguistic systems’.

While it is agreed that convergence describes two varieties becoming closer together, there is no consensus as to whether convergence should be used for situations where the two languages mutually influence each other (Thomason 2001) or if it can also be used in a broader sense to relate to one language influencing another (Myers-Scotton 2002). Backus (2004: 179) manages to avoid this issue somewhat and notes that while transfer may be a causal mechanism of contact-induced change, convergence is the processual mechanism (the effect of transfer) between synchronic transfer and diachronic change. Furthermore, Thomason (2001) points out that convergence can only be applied to features which are already in both languages. Bullock and Gerfen (2004: 96) expand on this further and state that ‘the result of convergence is that the languages in contact have become uniform with respect to a property that was initially merely congruent (i.e. similar)’.

Bullock and Gerfen (2004) found, for example, that the vowel systems of younger French-English bilinguals in Frenchville (Pennsylvania, U.S.A.) were converging towards English when compared to the older generation. Loudon and Page (2005) attempt to apply a phonological framework in order to account for the susceptibility of some sound features to converge over others. They provide an analysis of Pennsylvania German (spoken by Old Order Amish and Old Order Mennonite sectarians) and American English, and report allophonic convergence between the two varieties, with /r/ and /l/ following the patterns of realisation in General American English (Louden & Page 2005: 1389). They contrast this, however, with non-convergence with regards another feature, final devoicing. While American English

does not have this feature, Pennsylvania German maintains strict voicing distinctions in final position. Following Kiparsky (1982; 1988), they account for the differences between convergence of /r/ and /l/ and non-convergence in final devoicing with lexical phonology account. They assert that final devoicing (which belongs to the lexical component of the grammar) is less susceptible to convergence than /r/ and /l/ (which belongs in the postlexical component) because the segments which undergo devoicing are contrastive and salient (Louden & Page 2005: 1391). This, they claim, is indicative of stable bilingualism rather than language shift towards American English.

3.3.1.2 Borrowing

A further consequence of sustained language contact is *borrowing*. As Haugen (1950:212) states, borrowing is ‘the attempted reproduction in one language of patterns previously found in another’. This differs from convergence, where it is assumed that the two varieties in contact contained similar features which became phonologically identical (Thomason 2001; §3.3.1). These ‘foreign features’ which are borrowed into a language (Thomason & Kaufman 1988: 37) may be lexical, grammatical, or phonological structural.

The incorporation of lexical items from one language into another is lexical borrowing, and may be more prevalent at certain phases in a languages history than others (McMahon 1994: 201). In the case of loan translations, sustained usage and diffusion may result in lexical change (if the translation replaces an older form, cf. Backus & Dorleijn 2009) or the formation of new terminology (Stammers 2009: 36). The main debate, which will not be entered into here, is whether code-switching and borrowing are distinct phenomena (Poplack & Meechan 1998: 132) or whether they fall on continuum (Myers-Scotton 1993: 176). Lexical items which are borrowed from one language may be *adopted* fully and maintain their original features or they may be

adapted into the phonological system of the recipient language (cf. phonic substitution; Weinrich 1953: 14; see, e.g., Naim 1998 for an analysis). Such adaptation into the native system may be full or partial (Sankoff 2001: 45).

Partial adaptation seems to be more common in instances where a high proportion of speakers are bilingual, as reported in examinations of partial adaptation in Hawaiian (Schutz 1976) and Irish (Stenson 1993). An example from Welsh is the partial adaptation of English affricates in loan words such as *siocled* [ʃɔklɛd] ‘chocolate’, *jug* [dʒɔg] ‘jug’, and *jam* [dʒam] ‘jam’. Such lexical borrowings have not only resulted into the orthographic borrowing of <j> into the Welsh alphabet but also the phonological borrowing of the affricates [ʃ] and [dʒ] into the language (§3.2.3.2).

Matras (2009) shows in an investigation of Romani and Domari that certain categories are more susceptible to borrowing whereas others are more reliable indicators of genetically inherited material. Categories such as discourse markers and expressions of modality, for example, appear the most susceptible to grammatical borrowing whereas personal pronouns and verb inflection show little or no borrowed elements (Matras 2009: 19–20).

Thomason (2001: 69–71) proposes a borrowing scale for lexicon, phonology, syntax, and morphology which predicts the features which are likely to be borrowed in certain situations. The scale ranges from casual contact, where content words may be borrowed from one language into another to intense contact, categorised by extensive bilingualism. Table 3.3 shows the characteristics of intense contact:

Table 3.3: Borrowing in situations of intense language contact (after Thomason 2001: 69).

Domain	Characteristics of borrowing
Lexicon	Heavy borrowing
Phonology	Loss or addition of entire phonetic and/or phonological categories
Syntax	Changes to features such as word-order, relative clauses, negation etc.
Morphology	The loss of morphological patterns which do not match the source and borrowing languages.

As can be seen from Table 3.3, borrowing in situations of intense or sustained language contact leads to the diminution of differences between the languages in contact. Heavy lexical borrowing means that a number of lexical items are the same or similar in both languages, the phonological systems of both languages resemble each other as distinctive differences are lost and syntactical and morphological features become more alike. In such situations, where languages change in the context of language contact, we can speak of convergence. Let us now look at convergence in more detail.

There are a number of theoretical frameworks which have been proposed in order to account for and describe contact-induced language change. Such frameworks provide terminology about the direction of influence and also aim to ascertain whether contact-induced change occurs as a result of some internal structural need of the recipient language, or because of the external sociolinguistic pressures. Thomason and Kaufman (1988) suggest that any feature of a language can be subject to change and that it is the sociolinguistic situation which dictates primarily whether contact-induced change occurs (Thomason & Kaufman 1988: 35–36). They distinguish between *borrowing* and *substratum interference*. They state that ‘borrowing is the incorporation of foreign features into a group’s native language by speakers of that language’ (Thomason & Kaufman 1988: 37). Substratum influence, according to Thomason &

Kaufman (1988: 57–58), ‘is a subtype of interference from imperfect group learning during a process of language shift’.

Although Thomason & Kaufman (1988: 57–58) do stress the importance of taking into consideration language-internal factors, the main criticism of their framework is the importance given to language external factors (Sankoff 2001: 641). In other words, an emphasis on the sociolinguistic factors seems to ignore or downplay language-internal factors such as the compatibility of the incoming feature with the recipient language (Silva Corvalán 1994: 134) and the tendency for foreign elements to be more likely to appear in less stable components of the grammar (Van Coetsem 2000: 32).

Van Coetsem (1988; 2000) proposes a framework for the transmission process in language contact situations. He starts from the assumption that there is a *source language* (SL, from which the material is transferred) and a *recipient language* (RL, to which the material is transferred). The speaker is termed as the *agent* of the transfer, and it is assumed that the speaker will be dominant (have greater competency) in one of her languages. Van Coetsem (2000: 49) explains that ‘in one case the speaker agent is linguistically dominant in the RL and the RL is the agent language [...], in the other case he is linguistically dominant in the SL and the SL is the agent language’. In the former case, the process is termed to be *borrowing* by Van Coetsem, as material is being borrowed into the dominant language. The latter case is termed as *imposition* within this framework, as speakers are imposing material from their dominant language into the less dominant language. A third distinction, *neutralization*, results when contact is more marked and linguistic dominance is more similar. In such cases it may not be possible to ascertain the direction of influence.

Trubetzkoy (1928, cited in Muysken 1984) coined the term *Sprachbund* ‘linguistic area’ in order to describe situations in which language contact has resulted in similarities in morphology, lexicon, and phonology. The converged features (known as ‘areal features’, Muysken 1984:65), are the result of long-term convergence between numerous languages which are not related but are spoken in a delimited geographical area (Aikhenvald & Dixon 2002: 14). A noteworthy example of this is the Balkan *Sprachbund* (see Schaller 1975). Campbell (2006) provides a thorough overview of the notion of the linguistic area and the conceptual issues associated with the term. Matras (2011) highlights the importance of examining linguistic areas through the framework of convergence. He points out that for a contact-induced change to spread there needs to be both a relatively lax attitude to the norms of the language and a desire amongst the community to maintain the language (Matras 2011: 157).

To summarise, contact-induced language change can be the result of long-term and sustained transfer in the speech of bilinguals in situations of societal bilingualism. In cases where the transferred material has a similar equivalent in the other language, convergence may result in the disappearance of any differences. When there is no such equivalent, material may be adopted from the other language and borrowing is said to occur. In situations where bilingualism is not stable, it is predicted that the obsolescing language will converge towards and borrow from the dominant language. This is examined in the following section.

3.3.2 Linguistic obsolescence

In cases of language obsolescence, certain distinctive structural or lexical items disappear as speakers in a community shift towards a dominant language (McMahon

1994: 285)¹³. Indeed, in such communities there may be a sizeable proportion of speakers who are not completely competent in the language and are semi-speakers (Dorian 1981: 115). Eventually, the obsolescing language may be used for special functions outside of a main communicative role. Sound changes in obsolescing languages are often associated with convergence to the dominant language (Andersen 1982: 95) and the loss of structural features. Chang (2009: 936–938) raises the point, however, that divergence changes are also noted for obsolescing due to overgeneralisation of marked forms.

Two models for language obsolescence are proposed by Schilling-Estes and Wolfram (1999) which account for both the erosion of structural features in an obsolescence framework (the dissipation model) and the heightening of marked forms (the concentration model). Wolfram (2004: 771) adds that ‘the social saliency of marked phonological features during the dying process may support their maintenance’. The reasons behind either dissipation or concentration include the socioeconomic factors (especially those linked with population shifts), attitudinal factors, and attempts to safeguard linguistic identity (Schilling-Estes & Wolfram 1999).

A useful distinction in relation to the openness of the community is proposed by Andersen (1988: 74-75). He claims that a distinction should be made between open and closed communities and endocentric and exocentric communities (cited in Schilling-Estes & Wolfram 1999: 510). The point in this distinction is that communities may be open due to inward migration and increased communications (i.e. an open community), but remain loyal to local norms (i.e. endocentric). Recent studies touch upon the issue of

¹³ Obsolescence differs from language attrition, which can be defined as ‘the non-pathological, non-age related, structural loss of a first language within a late consecutive bilingual, assuming that the acquisition of the first language precedes its loss’ (De Leeuw 2009: 10). Although language attrition has been used in studies of bilinguals acquiring languages in a regional minority language context (Bullock & Gerfen 2004), its use in such circumstances is problematic (see De Leeuw 2009: 8 for discussion).

linguistic obsolescence in Welsh (M. Jones 1998; Thomas & Gathercole 2005; Davies & Deuchar 2007; Thomas et al. 2012) and point to the rapid change between generations and rapid structural loss as indicators of obsolescence in eastern areas (M. Jones 1998; Thomas & Gathercole 2005). This remains to be seen, especially as efforts to foster the use of Welsh continually increase (§3.1.5).

In terms of language variation, most studies have concluded that variation in obsolescing varieties does not exhibit the same susceptibility to linguistic and extra-linguistic influences. Dorian (2010: 32) states that variation in this context is ‘rampant, socially unweighted, [and] idiosyncratic’. This has been found in a number of other studies, and attributed to imperfect acquisition (e.g. Wolfram 2004: 774). This is, however, not always the case and there is a danger that patterned variation is being dismissed as imperfect learning (Schilling-Estes & Wolfram 1999: 518). Nance (2011; 2012) reports on sociophonetic variation in the speech of Gaelic speakers in immersion education in Glasgow, and finds patterns of variation based on speakers’ communities of practice. Language obsolescence is an awkward notion, as a diagnosis requires both a thorough analysis of convergence to the dominant language, structural loss in the non-dominant language, and, perhaps most importantly, a prognosis of the vitality of the language amongst its speakers.

This may be difficult in cases such as Welsh-English bilingualism where it is hoped that new generations of speakers will be created. The future use of Welsh, especially amongst those from English-speaking backgrounds, is not assured and it is to an outcome of language death that we now turn.

3.3.3 Linguistic substrate

In communities where there has been a shift to a new language there may be a *linguistic substrate* from the original language. Linguistic substrate differs slightly from the term *substratum interference* proposed by Thomason and Kaufman (1988), insofar as the former only applies when there has been language shift (Schumann 1978: 157) whereas the latter can be present when both languages are spoken or after a shift (Thomason & Kaufman 1988: 38). As Johanson (2002: 304) points out; ‘when a speech community has shifted to a dominant code, former impositions [...] remain as substratum effects’. Modern-day Irish English, for example, has numerous features which are deemed to be due to an Irish influence, though the majority of the population does not have bilingual competency. Thomason (2001: 79) notes that ‘the shifters’ variety was able to influence the English of Ireland as a whole because the shifters were numerous relative to the original native speakers in Ireland’.

While substrate is the umbrella term for such situations, Muysken (1984: 65) specifies three distinct terms, shown in Table 3.4:

Table 3.4: Descriptions of types of substrate influences (after Muysken 1984: 65).

Type of substrate influence	Description
Substratum	Influence of the language of the dominated groups in a colonial setting.
Superstratum	Influence of a prestige language.
Adstratum	Influence of a neighbouring language

Substrate effects are often noted in Welsh, Scottish, Irish, Maori, and Cajun varieties of English amongst others (Dubois & Horvath 1998), and are a feature of English in postcolonial settings (see Sankoff 2001: 44 for a review). Schneider (2003; 2007) presents a framework for postcolonial Englishes but emphasises the need to look at all instances of language contact as being part of one framework. As Schneider (2007: 11) notes, ‘it is undisputed that both creoles and so-called “New Englishes” are

largely products of language contact, albeit to varying degrees, which provides a common framework for them to be investigated' (italics removed).

Schneider (2003; 2007) presents the 'Dynamic Model' in order to provide a typology for the development of postcolonial English, within the framework of language ecology (Schneider 2007: 4). He states that '[the Dynamic Model] rests upon the assumption that, in selecting from this [feature] pool, speakers keep redefining and expressing their linguistic and social identities' (Schneider 2007: 20). The model comprises five phases: foundation, exonormative stabilisation, nativisation, endonormative stabilisation, and differentiation (Schneider 2007: chapter 3). The foundation phase describes the initial contact between English and the indigenous language, and the start of separate identity formation amongst the settlers and indigenous group. During the second phase, exonormative stabilisation, English is established as the lingua franca and the indigenous group start to become bilingual. The English of those who have settled becomes more local in character as they borrow elements of the indigenous vocabulary. Nativisation develops as both the indigenous group and settlers develop a common identity and orient towards local linguistic features which in many cases are borrowed features from indigenous languages (Schneider 2003: 247). During the fourth phase, endonormative stabilisation, the features which have been borrowed from the indigenous language become accepted as normal usage (Schneider 2003: 250). The fifth phase, differentiation, signals the independence of the colony and the establishment of a distinct variety of English (Schneider 2003: 253).

A further model for language contact, the *feature pool*, is provided by Mufwene (2001; 2008), who also views language as analogous with the biological approach to evolution with languages being species (Mufwene 2008: 11). Mufwene (2001: 4) argues

that contact-induced language change is the result of restructuring as a result of contact. Using the example of both koinéisation and the development of colonial Englishes, Mufwene argues that when similar features from different languages or dialects come into contact, they produce a feature pool. This feature pool represents the sum of the speaker's linguistic knowledge rather than being language specific (Mufwene 2008: 17).

Speakers may use the features in the pool in variation, and do so when they are not correctly identified as belonging to a specific language (interference; Mufwene 2001: 31), or one feature may ultimately be chosen over others to form new output varieties (Mufwene 2001: 6; see also Cheshire et al. 2011: 176). Though the individual speaker is the locus of language contact, identification with a group leads to accommodation with a group and the development of a focussed new variety (Mufwene 2001: 33; Le Page & Tabouret-Keller 1985). Mufwene (2001: 150) adds that 'changes start taking place by selection at the level of individuals who, while interacting with each other, cause their varying features to compete with each other'.

3.4 Language variation

The previous sections have identified processes which occur in individual speech and long-term language contact. Differences have been shown to exist between different types of bilinguals and second language acquirers, which may be the result of an interaction between the languages in the speakers' repertoire or the effect of one language on another. In particular, those who acquire their second language later, such as those from English-speaking homes in North Wales, may produce speech differently than those who have acquired two languages simultaneously. In situations where societal bilingualism occurs, both the borrowing of features between languages and the loss of structural differences between languages is well-attested.

Both linguistic features under investigation in the present study have been reported as appearing cross-linguistically in both Welsh and English due to bilingual processes. The claim that /l/ is dark in all positions in both varieties has been attributed to the influence of Welsh on English, and would suggest that both varieties are converged with respect to this feature. A possible explanation would be that, in this instance, as Welsh monolinguals acquired English they transferred velarised /l/ which became a feature of Welsh English. When language shift occurred in eastern areas, velarised /l/ remained as a substratum effect in English.

The fact that gradient phonetic differences have also been found in previous studies of /l/ (see Chapter 6 for details) suggests that the production of /l/ might not be as uniform between the two varieties as might be assumed.

The production of the coda /r/ and realisation of the alveolar trill in the English of North West Wales is also attributed to Welsh influence in an area where the language has historically been dominant. This pattern assumes a transfer effect from Welsh to English, but it remains to be seen whether this is a transfer effect which appears in the speech of all Welsh-English bilinguals, those from Welsh homes who live in North East Wales, and those from English-language homes who live in North West Wales. Furthermore, transfer from English to Welsh has not been addressed despite the increase in 'new' speakers via immersion education. In short, it remains to be seen what variation does exist in the two languages and whether they are constrained by linguistic and extra-linguistic factors.

The influence that both linguistic and extra-linguistic factors have on language variation has been the main concern of variationist sociolinguistics since early work in the 1960s and 1970s (e.g. Labov 1966). A full review of this work will not be provided here, though relevant examples of previous work will be given in the

forthcoming chapters on methodology and the language attitudes of participants. The following sections do, however, draw upon work on language variation in multilingual and multi-ethnic communities.

3.4.1 Language variation and multilingualism

There have been numerous studies which examine the acquisition and use of variation in their second language (see Bayley 2000). Mougeon et al. (2004) investigate the learning of variation by adolescent school pupils in French immersion education in Canada. They distinguish between two types of variation in the speech of advanced second-language speakers of French. Type 1 variation, according to their framework, describes the variable nature of the interlanguage of L2 speakers. Type 2 variation, which forms the focus of their study, is the sociolinguistic variation present in the speech of L1 speakers (Mougeon et al. 2004: 408-409, see Bayley & Regan 2004 for an overview). They found that sociolinguistic behaviour amongst L2 speakers is different to that of native Québec French speakers (Mougeon et al. 2004: 414). They note that ‘successful acquisition by L2 learners is indicated by the speakers’ knowledge of the full range of native variants, their use of such variants at frequencies comparable to that of first language (L1) speakers of the target language, and their observance of linguistic and extra-linguistic constraints on variation’ (Mougeon et al. 2004: 409).

Recent work in the UK and Ireland has also examined the acquisition of variation in English amongst Polish immigrants (see, e.g., Adamson & Regan 1991 for a similar study of Asian immigrants in the US), in light of recent societal changes which have resulted in higher rates of immigration. Drummond (2010), for example, found that non-native speakers of English in Manchester (England) were acquiring localised features, but that level of English and in particular length of residence were influential

in the acquisition of variants not found in standard pedagogical models of English (Drummond 2010: 225).

Schleef et al. (2011) examined Polish teenagers' acquisition of variation in Edinburgh and London (see also Clark & Schleef 2010 and Meyerhoff & Schleef 2012). They found that while there was a tendency for the Polish teenagers to successfully acquire variation in a similar way to native speakers, there was also evidence that the variation was influenced by some social constraints in ways which were not present in the speech of native speakers (they do not, however, assume that this variation is stable; Schleef et al. 2011: 227–229). They conclude that 'this systemisation involves the emergence of some linguistically and cognitively predictable constraints, but also some interesting social constraints not found in teenage native speakers' (Schleef et al. 2011: 229). More exploratory work on the Polish immigrant community in the Republic of Ireland has uncovered similar results and highlights the role of the discourse *like* in the repertoire of both L1 and L2 Irish English speakers (Nestor et al. 2012).

The literature outlined above indicates a trend to view the L2 variation as part of a speaker's interlanguage. *Interlanguage* (Selinker 1972; 1992), describes non-native like elements in learner speech which may or may not be a result of language transfer (Selinker 1972: 215). Within the context of interlanguage, according to Selinker (1992: 144), 'one of the original breakthroughs [...] was the insight that reframed our conception of "errors" from something negative [...] to something normal and important for learning to occur'. Pavlenko (2000: 177) points out that comparisons with monolingual speakers feed the notion that monolingual speakers represent an ideal speaker. She states that: 'this [monolingual] bias leads linguistic theory to deny or overlook the existence of multilingual contexts of interaction in which (a) a second language could influence second language competence and (b) bilinguals may behave

differently from monolinguals of either language (Pavlenko 2000: 177). In situations of societal multilingualism, in particular, the idea of a 'model' native speaker may not be straightforward (Sridhar 1994; Ortega 2009: 140).

Sankoff & Thibault (1993) investigate language variation amongst L2 French speakers in Montreal and aim to ascertain the extent to which the type of exposure to French influences this variation (see also Blondeau & Nagy 2008). Nagy et al. (2003) compared a morphosyntactic pattern (subject doubling) in the speech of French L2 speakers in Montreal with the speech of native L1 speakers. They found that the pattern did indeed exist in L2 French and that it correlated with the type and amount of acquisition. Perhaps more importantly, however, this study takes into consideration the socio-historical background of the speech community. They note that 'Anglophones who have been required to learn French may not necessarily wish to use this knowledge [of subject doubling] to blend in with Francophones' (Nagy et al. 2003: 74). The problem posed by examining sociolinguistic variation in any kind of minority context is summarised by Nagy et. al (2003: 100). They state that 'it remains an open question whether these findings indicate partial mastery of the L1 grammar [...] or whether L2 speakers [...] do not wish to acquire L1 patterns that would identify them as Francophone'.

In addition to quantitative analyses of sociolinguistic variation in L2 settings, qualitative data have shown that the value of bilingualism (or lack thereof) and language dominance is salient amongst speakers themselves. Gérin-Lajoie (2005) examines how adolescents in a minority setting represent their social and linguistic identity. She found that the vast majority of participants claimed that they had a bilingual identity and a dominant language (Gérin-Lajoie 2005: 910). However, the qualitative data from her research suggested that despite the claim of a bilingual identity there were facets to this

identity which were extremely complex. She notes that ‘what the ethnographic study reveals [...] is that identity paths are neither static, nor linear and consist of moving back and forth between two, in some instances, three linguistic boundaries’ (Gérin-Lajoie 2005: 910).

An important point that is raised from this work is that there is a dichotomy, at least amongst French-English bilinguals in Ontario, between belonging to a wider French culture (francophonie) and valuing French as part of personal identity, and seeing French as a commodity. This dichotomy is fostered in families and can influence bilinguals both in childhood and adulthood (Gérin-Lajoie (2005:910-911). Cardinal (1994: 72) asserts that the problem with trying to classify minority language bilinguals is that they do not form one homogenous group. She notes, in relation to French-speakers in Canada, that;

‘les francophones habitent des îles différentes, avec des populations aux accents mélangés, aux identités multiples, aux caractéristiques rurales ou urbaines, aux racines d’ici ou d’ailleurs’
[French speakers inhabit different islands, with populations with mixed accents, multiple identities, rural or urban characteristics, with roots here or elsewhere].

3.4.2 Language variation and multi-ethnicity

Language variation amongst ethnic minority groups show how variants may arise due to second language learning of the majority language and remain long after language shift has occurred (e.g. Holmes 1996). This is relevant to the present study as it suggests that a non-native variant can ‘go native’. In other words, it can become language-specific and enter into variation with native variants in order to become a feature of the repertoire of minority ethnic groups (e.g. Sharma & Sankaran 2011), and be produced alongside other non-native features in linguistically diverse areas (e.g. Cheshire et al. 2011).

Holmes (1996) discusses the devoicing of the word-final alveolar fricative /z/ in New Zealand English. In her study, Holmes (1996) compared Maori and New-

Zealanders of European ancestry (Pakeha; Holmes 1996: 204) and examined the role of speaker sex, age, socioeconomic background, style, and ethnicity. She found that the devoicing of /z/ was significantly more prevalent in the speech of those from a Maori background and that, amongst that group, devoicing was more likely to be found in conversation style than broadcast interview. She claims therefore that devoicing of /z/ is an effect from the mass acquisition of English by the Maori, which does not have the /z/ phoneme, and that this has remained a feature of Maori English irrespective of the level of individual bilingualism (Holmes 1996: 202). Indeed, the fact that there were no significant differences between Maori-speaking Maori and those Maori who did not speak the heritage language reinforces the view that variants which arise through mass acquisition can index ethnic identity long after language shift.

Similar results have been found in studies of South Asian communities in the United Kingdom. In particular, studies of the British South Asian community have found the persistence of non-native variants such as the production of a more retracted or retroflex variant of /t/ in second generation speakers (Kirkham 2011: 1105). Kirkham (2011) compared 4 Asian and 4 White British speakers aged between 14 and 15 years old, and found differences between the two groups. Alam & Stuart-Smith (2011) take a Communities of Practice approach to the study of second generation Pakistani-Muslim girls in a Glasgow High School. Their study shows that not only might there be differences between the minority and majority community, but that the minority variable may be used differently within the community to index even more local ethnic identity (Alam & Stuart-Smith 2011: 219).

Sharma & Sankaran (2011) examine both first and second generations of the British Asian community in London. The second generation group comprises two subsets based on age (older or younger than 35; Sharma & Sankaran 2011: 412). They

show that the rates of retroflex /ʈ/ decrease from 34.9% ($n=3810$) in the first generation to 15.9% ($n=2330$) in the older second generation group and 8.4% ($n=3210$) in the youngest second generation group (Sharma & Sankaran 2011: 414). They proceed to examine the linguistic and extra-linguistic constraints on variation amongst the three groups. Firstly, the level of speaker bilingualism was a weak predictor for all three groups (Sharma & Sankaran 2011:411). This provides further evidence for the language-specific nature of the variable rather than a language transfer process amongst individual bilinguals.

There is also evidence from Sharma & Sankaran (2011) that the linguistic and extra-linguistic predictors on the non-native variant can also change as variants take on different meanings for different generations of speakers. For instance, they find that the linguistic constraints on retroflex /ʈ/ have changed, but that the main differences lie between the younger group, who favour /ʈ/ in initial position and the other groups who favour /ʈ/ in medial position (Sharma & Sankaran 2011: 415). Social constraints also differed between the three groups: time in the UK had the greatest influence on production of retroflex /ʈ/ in the first generation subset. The variant was more likely amongst those with a denser Asian social network in the oldest of the second generation and, amongst the youngest second generation, sex was the main predictor with retroflex /ʈ/ being more likely amongst males (Sharma & Sankaran 2011: 418-419).

The studies outlined above show that non-native variants which arise through the group acquisition of the majority language can be language-specific rather than depend on the bilingualism of the speaker. It remains to be seen, however, whether variants which are transferred from one language to another in a context of regional minority language bilingualism also take on language-specific properties or whether

they draw from a combined feature pool or repertoire of variants and use them in the same way, regardless of the language they are speaking.

3.5 Summary

This chapter has provided a theoretical overview which will inform the discussion of how speakers manage their repertoire. This comprises the following three areas: individual bilingualism, societal bilingualism and long-term contact, and sociolinguistic variation and bilingualism.

It was shown that the linguistic biography of the individual bilingual speaker, namely the way in which they acquired their two languages, the age of acquisition of both languages, and even the amount of input the bilingual has received influences the extent to which there is cross-linguistic influence between the two languages. This cross-linguistic influence, known as transfer, is present to some degree in all bilingual speech and can even vary according to situation and interlocutor. This has led to the idea of the bilingual having an extended repertoire at their disposal as opposed to two separate systems which occasionally ‘interfere’ with each other.

In situations where languages are in long-term contact due to societal bilingualism, prolonged transfer in the speech of groups of speakers may result in contact-induced language change. Change can involve the gradual convergence of features leading to a loss of distinct features, or the borrowing of new features from one language to another. Rapid convergence, structural loss, and the decline of speaker numbers and proficiency indicate linguistic obsolescence leading to language shift and monolingualism. In cases where this has happened, traces of the original language may remain as a substrate influence.

It is argued throughout this thesis that variants of /r/ and the realisation of coda /r/ appear to be subject to transfer between Welsh and English. This claim is made due to the appearance of features historically associated with one of the languages in the other at the present time. This leads to increased variability as ‘non-native’ features enter into variation with ‘native’ variants. The claim that /l/ in Welsh and Welsh English is dark in all positions suggests that this feature, however, has already been subject to sustained transfer and a contact-induced change has led to convergence between the two varieties. This claim is made on the basis that no phonological variation is reported for /l/ in either variety, and that dark /l/ reportedly remains in the speech of English monolinguals in areas where, historically, language shift occurred (Penhallurick 2004: 110).

Sociolinguistic studies have shown that substrate influences from heritage languages may take on socio-indexical meaning amongst different generations of migrants. In situations where bilinguals or second language learners are performing variation in the non-dominant language it has been shown that they tend to use variation differently to monolinguals or bilinguals more dominant in that language. This does not necessarily mean, however, that such speakers are imperfect learners and this different use of variation may show group identity. More ethnographical analyses of bilingual speakers tend to support this assertion, as they conclude that identities are multi-faceted and linguistic identity and judgments about the value of bilingualism appear to differ.

Distinguishing between individual ‘speaker error’ and patterned behaviour amongst groups of different bilingual speakers will be central to this work. Both are clearly possible and worthy of further study, yet it is the latter which lies at the heart of the research questions addressed by the thesis. The questionnaire data presented in Chapter 5 provides evidence for patterned behaviour in the way that different groups of

speakers *engage* with the Welsh language. The statistical models applied to the data on language variation then allow us to ascertain whether these groups tend to behave differently in the way that they produce /l/ and /r/. This ultimately provides evidence for variation which is conditioned by sociolinguistic factors, namely engagement with Welsh, rather than random speech error.

4 Methodology

4.1 Overview of the methodology

The methods employed in the study aimed to elicit samples of both informal unmonitored speech and formal careful speech in order to investigate the extent to which variation differs according to speech context. To accomplish this, a Labovian variationist framework was adopted for data collection and both sociolinguistic interview and wordlist data were collected. This reflects the common aim in variationist research which seeks to explore the ‘natural repertoire’ of participants as far as possible (Foulkes et al. 2010: 729). The approach is not without its limitations, as the data could be seen as approximations of the participants’ natural repertoire and do not reflect the wide range of stylistic repertoires at their disposal (cf. Sharma 2010; 2011). It was chosen, however, in order to keep the communicative situations as controlled as possible across the dataset.

A random stratified sampling approach was taken to participant recruitment as the aim of the study is to examine variation amongst participants from different linguistic backgrounds. Having defined the ‘sampling universe’ (Tagliamonte 2006: 21-22) as North Wales, schools were approached in both Welsh-dominant and English-dominant areas, and participants were selected as randomly as possible from within the sample (Baranowski 2007: 27). Table 4.1, below, provides a summary of the sample:

Table 4.1: The sample constructed for the present study.

	Caernarfon		Mold	
	Male	Female	Male	Female
Welsh at home	4	4	4	4
English at home	4	4	4	4

This approach to data collection allowed for data to be collected in two languages within a limited space of time. This was necessary as two sessions were held with participants on separate days (one session per language) and because data collection took place in Sixth Form units within schools, where both students and teachers had to negotiate my data collection with other commitments.

All participants in this study were considered to be Welsh-English bilinguals on the basis that they were able to participate in Welsh-medium education, complete examinations in Welsh as a first language, and complete both the sociolinguistic interview and wordlist tasks. The independent variables examined in the study are area (Welsh dominant and English dominant), sex, and home language. A questionnaire designed to elicit data on participants' attitudes towards Welsh, their self-reported usage of Welsh and English, and their self-rated competency in Welsh and English was administered at the end of the second interview. These data were analysed prior to the analysis of the linguistic variables in order to investigate the extent to which they correlated with the independent variables. The results of this investigation are presented in Chapter 5.

The remainder of this chapter outlines the research design. More detail is given on both the independent (§4.2) and control variables (§4.3), before proceeding to an account of how data was collected and analysed (§4.4).

4.2 Independent Variables

4.2.1 North Wales

Figure 4.1, below, shows the area defined as North Wales for this study¹⁴ (population: 623, 744; Welsh Assembly Government 2005), and is based on the inclusion of the counties of Gwynedd, Isle of Anglesey (*Ynys Môn*), and Conwy in the North West, and Denbighshire (*Sir Ddinbych*), Flintshire (*Sir Y Fflint*), and Wrexham County Borough (*Bwrdeistref Sirol Wrecsam*) in the North East:



Figure 4.1: North Wales. Contains Ordnance Survey Data © Crown copyright and database copyright 2012 (created from 1: 1 000 000 scale digital data).

The decision to concentrate on northern Welsh communities and to directly compare a location in the North West with one in the North East was taken due to linguistic, and historical reasons. Firstly, North Wales constitutes a major dialect area in Welsh in particular, and many prominent phonetic and grammatical features, as well as lexical items, are shared by the North East and North West (see §3.2). Historically, as

¹⁴ Whilst a distinction is often made between North Wales and South Wales, both unofficially amongst Welsh people, in certain official contexts (e.g. as a region of the National Assembly for Wales and European parliament constituency; National Assembly for Wales 2012), and in dialect areas (Thomas 1973), the southern boundary of North Wales is arbitrary and depends on the context in which North Wales is being described.

shown in §3.1, the north-eastern areas of Wales, in particular in Flintshire and Wrexham to the east of the Clwydian Range, have been subject to heavier industrialisation and Anglicisation than the rural hinterland of the North West, which provides a convenient, though sometimes crude divide between predominantly Welsh-speaking communities and predominantly English-speaking communities.

Despite more rapid industrialisation, the county of Flintshire and county borough of Wrexham are still described as ‘semi-rural’ as opposed to ‘urban’, whereas the remainder of the region is classed as ‘rural’ (Wales Rural Observatory 2006a). This suggests that although the North East is more urban in nature, the divide between North West and North East is not too great. This contrasts with South Wales, where the divide between the industrial East, which is classed as an ‘urban area’, and the ‘rural’ West is far greater (Wales Rural Observatory 2006a)¹⁵.

The two locations under discussion in the study are Caernarfon (in the North West) and Mold (in the North East)¹⁶. These two market towns are comparable in many ways, especially in terms of population, yet crucially differ linguistically. The following sections explore the two towns in greater detail.

4.2.1.1 Caernarfon

Caernarfon (now only rarely anglicised to Caernarvon) is classified as ‘Town and Fringe – Less sparse’ by the Wales Rural Observatory (2006c). The town itself is situated in the county of Gwynedd, where the River Seiont joins the Menai Strait, and overlooks the Isle of Anglesey. Originally a Roman fort (Owen & Morgan 2008: 64), a

¹⁵ The population density of Wales is highest in the South East, where it’s three most populous cities (Cardiff, Swansea, and Newport are located).

castle was built in Edwardian times (Condry 1987: 161) and the town became the administrative centre for the County of Caernarfonshire and the Principality of North Wales. Despite the intention for the town to become a stronghold for England and the English language (Condry 1987: 161), it has developed into the town with the highest proportion of Welsh speakers in Wales (Davies et al. 2008: 104 – 105). Consequently, it has been an important centre for Welsh-language activism, media production, and publishing (Tomos 2005: 48). Table 4.2, below, shows the population of the electoral wards around Caernarfon:

Table 4.2: Population and Welsh ability data for Caernarfon (after Welsh Assembly Government 2005; Aitchison & Carter 2004).

Ward	Population	Population aged 16 – 18		Welsh-speakers	
	n	n	%	n	%
Peblig	2310	109	4.7	1942	88.0
Seiont	3014	136	4.5	2518	87.2
Y Felinheli	2086	58	2.8	1441	71.9
Menai (Caernarfon)	2145	85	4.0	1741	83.7
Llanrug	1834	69	3.8	1500	86.6
Total	11389	457	4.0	8842	77.6

The areas listed in Table 4.2 reflect the wider catchment areas of the two schools in Caernarfon, and some participants came from the outlying villages, or fringe, around the town centre itself. Figure 4.2 shows the area defined as Caernarfon – town and fringe for the purposes of the study:

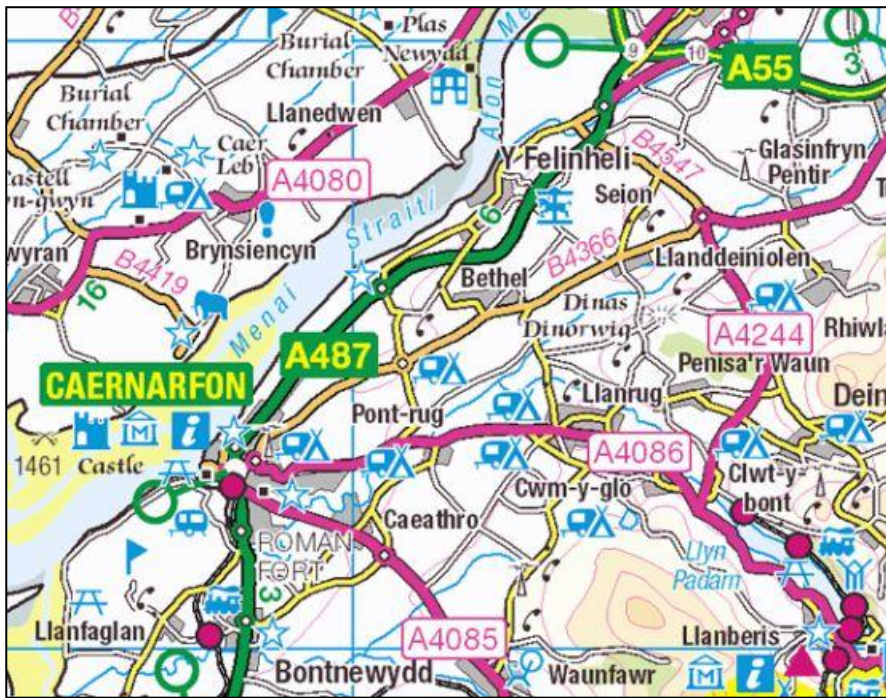


Figure 4.2: Caernarfon. Contains Ordnance Survey Data © Crown copyright and database copyright 2012 (created from 1: 250 000 scale digital data).

Caernarfon, for the purposes of this study, comprises not only the town but also most of the mainland area shown in Figure 4.2. This area includes up to Y Felinheli in the north (4.3 miles¹⁷), Llanrug to the east (3.6 miles) and Penygroes and Bontnewydd to the South (6.5 miles). Y Felinheli is the last settlement on the Caernarfon side of the A487 road before reaching the neighbouring city of Bangor. As can be seen in Figure 4.2, Llanrug is situated in the foothills of Snowdonia and is surrounded by more mountainous terrain to the east, and Bontnewydd and Penygroes are the last main settlements around Caernarfon before the road leads to Porthmadog on the Llŷn Peninsula (13 miles away).

Caernarfon is described as an ‘anchor town’ due to its population (between 4,000 and 10,000), the fact that commuting in exceeds commuting out, because there are middle-order public services (such as community hospitals, secondary schooling, a

¹⁷ All distances given in this chapter were calculated using Google Maps (www.google.co.uk/maps)

supermarket and some national chains), and because there is competition from larger nearby centres (Wales Rural Observatory 2007: 124). In terms of the socio-economic profile of the area, the Welsh Index of Multiple Deprivation provides a useful frame of reference. The index takes into consideration the income, employment, health, education, housing, physical environment, access to services, and community safety of an area and gives them a score. This score is then used to rank each area in Wales (Welsh Assembly Government 2011b). Table 4.3, below, shows the Index Multiple Deprivation ranking for the wards in the Caernarfon area:

Table 4.3: Welsh Index of Multiple Deprivation (2008) ranking for Caernarfon (Welsh Assembly Government 2011b).

Ward	Ranking (out of 1896 = the least deprived in Wales)
Peblig	82
Seiont 1	498
Y Felinheli	1251
Seiont 2	1281
Menai (Caernarfon)	1391
Llanrug	1445

As the above table shows, the areas which comprise Caernarfon differ in their socio-economic status. Notably, the areas of Peblig and Seiont 1 are the more deprived neighbourhoods compared with the others which are roughly in the least deprived third. One area out of six, Llanrug, belongs in the highest quarter in the ranking and the area has a mean ranking of 991.3 out of 1896.

4.2.1.2 Mold

Mold (*Yr Wyddgrug*), as noted in § 4.2.1, is located in the semi-rural county of Flintshire though it is also designated as ‘Town and Fringe – Less sparse’ by the Wales Rural Observatory (2006b). The town has been a county town since 1833, initially of

Flintshire, then of the larger county of Clwyd before the restitution of Flintshire in 1996 (Davies et al. 2008: 563 – 564). Figure 4.3, below, shows the town and fringe of Mold:

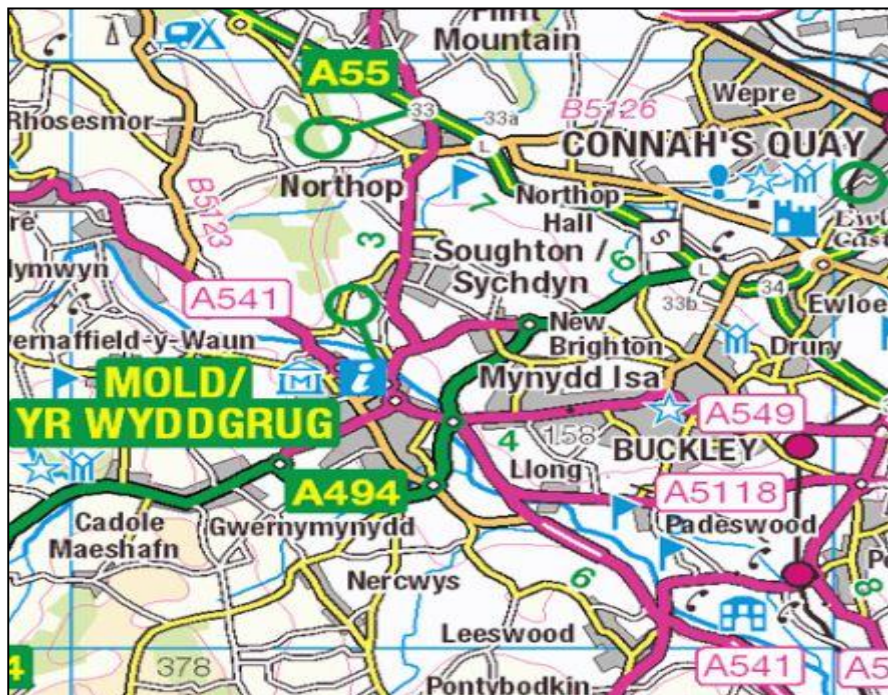


Figure 4.3: Mold. Contains Ordnance Survey Data © Crown copyright and database copyright 2012 (created from 1: 250 000 scale digital data).

The southernmost boundary of the area for data collection in Mold is Nercwys. This lies 2.6 miles from the centre of Mold and 7 miles from the border with Wrexham County Borough. No participants came from the area to the west of Mold. To the North and East, the areas of Northop (*Llaneurgain*), Connah's Quay (*Cei Connah*), and Soughton (*Sychdyn*) were included. These areas lie between 3 and 7 miles from Mold town and around 10 miles from the English city of Chester. Table 4.4 shows the population data for the relevant electoral wards in this area:

Table 4.4: Population and Welsh ability data for Mold (after Welsh Assembly Government 2005; Aitchison & Carter 2004).

Ward	Population	Population aged 16 – 18		Welsh-speakers	
	n	n	%	n	%
Gwernymynydd	1773	76	4.3	361	20.9
Mold Broncoed	2500	99	4.0	456	18.8
Mold East	1974	65	3.3	308	16.3
Mold South	2771	119	4.3	775	29.0
Northop	2980	118	4.0	454	15.7
Total	11998	477	4.0	2354	19.6

The attributes which make Caernarfon an ‘anchor town’ are also applicable to Mold, especially the population size. The most notable difference between the two areas is the percentage of the population who can speak Welsh (77.6% in Caernarfon compared to 19.6% in Mold). There are also differences in terms of the prosperity of the area. Table 4.5, below, shows the Index of Multiple Deprivation ranking for the wards in the Mold area:

Table 4.5: Welsh Index of Multiple Deprivation (2008) ranking for Mold.

Ward	Ranking (out of 1896 = the least deprived in Wales)
Mold Broncoed 2	1072
Mold Broncoed 1	1150
Mold East	1151
Mold South 1	1677
Northop 1	1686
Gwernymynydd	1688
Northop 2	1737
Mold South	1861

The rankings show an overall difference from Caernarfon (see Table 4.3), as five of the eight wards have a ranking which lies in the least deprived quarter. The area has a mean ranking of 1377.8 out of 1896. Though Mold and Caernarfon appear to differ markedly in their socio-economic status, it was decided that this was unavoidable given the need to choose two communities which differ significantly in the proportion of

Welsh-speakers. Instead, it was decided that socio-economic status would be controlled for, as far as is possible, when selecting participants (see § 4.3.2).

4.2.2 Sex

The relevance of a speaker's sex to a sample has been recognised since the shift from traditional dialectology, which relied upon evidence from non-mobile, older, rural males (N.O.R.M.s, Chambers & Trudgill 1998: 29) to the earliest sociolinguistic research which aimed to obtain more representative samples (Chambers 2002: 351; e.g. Trudgill 1974). In studies where sex differences have been found, the results *tend* to support the claim that 'women conform more closely than men to sociolinguistic norms that are overtly prescribed, but conform less than men when they are not' (Labov 2001: 292-293). This has been conceptualised as a gender paradox, as females are more conservative in situations of stable sociolinguistic variation yet adopt incoming forms at a higher rate than men (Labov 2001: 274).

The explanation for sex differences has been subject to debate in the field. Early descriptions focussed on differences between males and females in relation to their position in society. An early conclusion reached by Trudgill, for instance, was that 'the social position of women in our society is less secure than that of men [...]. [Women generally have] to be rated on how they appear' (Trudgill 1974: 94). Following the general influence of feminist theory in the social sciences from the 1970s onwards, there has been discussion about the distinction between the speaker's biological sex and the more complex construct of gender (Cheshire 2002: 423-424). The problem, according to Chambers (1992: 175) is that 'sex differences, being visible, are apparently grasped as the independent variable to be correlated with linguistic variables regardless of gender roles in the community' (Chambers 1992: 175).

More recent studies challenge distinctions based on physiological sex and use more ethnographic methods of data collection and observation in order to make more local claims about gender roles (e.g. Eckert & McConnell-Ginet 1992). Eckert, for instance, argues that ‘gender does not have a uniform effect on linguistic behaviour [...]. Gender, like ethnicity and class and indeed age is a social construction which may enter into a variety of interactions with other social phenomena’ (1989: 253). Holmes (1997: 198) notes that ‘more recent explanations [...] appeal to the linguistic marketplace, suggesting that women’s stylistic flexibility is rather a reflection of the wide range of social identities they are required to control’. These social identities are shaped locally, meaning ultimately that gender roles differ between communities.

Gendered practices in North Wales will be examined in relation to the data presented on attitudes towards Welsh, self-reported usage of Welsh and English, and self-rated ability in Welsh and English (Chapter 5). Though gender has not been found to be significant in previous work (e.g. H.M. Jones 2012), correlations will be sought between speaker sex and the data elicited via questionnaire in order to ascertain whether males and females engage with Welsh differently. Any correlations will provide evidence for gendered practices in North Wales and enrich the analyses of language variation presented in Chapter 6 and Chapter 7.

4.2.3 Home Language

The sample is equally stratified in terms of those who speak Welsh at home and those who speak English at home (cf. Gathercole & Thomas 2009)¹⁸. Firstly, this independent variable denotes age of acquisition of Welsh, and distinguishes between those who acquired Welsh from their primary caregivers and those who acquired Welsh solely

¹⁸ Participants who came from mixed-language homes were excluded from the study due to time constraints.

through primarily Welsh-medium education, starting at five years' old at the latest¹⁹. Secondly, home language provides an indication of a participant's exposure to Welsh outside of the classroom.

4.2.4 Style

Most studies of SLA have focussed on native versus non-native variants in different styles, whereas variationist work examines the frequency of standard versus non-standard items (Major 1986: 218; 2004: 170). This study examines both by eliciting data in English and Welsh in informal and formal contexts. The study of style requires the exploration of intra-speaker variation (Schilling-Estes 2002: 375). In this study, data were elicited via sociolinguistic interview and a wordlist task which represent informal and formal 'contextual styles' (Labov 1972: 79). The wordlist is generally considered the most formal style. Ash (1982: 43) states that 'word list style clearly directs the speaker's attention to his/her speech, thereby eliciting a formal style and close approximation to the speaker's conscious linguistic norms'.

There are undoubtedly more sophisticated techniques to elicit both formal and informal speech. Schilling-Estes (2002: 377) states that 'rather than examining variation based on pre-imposed categorizations of the speech situation [...] or on pre-imposed social categories [...], [many researchers] are conducting extensive ethnographic investigations'. As was stated in §4.1, a primary aim of the methodology for this study was to keep the way in which I collected data as constant as possible for all speakers, in a limited space of time. For this reason a binary distinction between interview and wordlist tasks was made, the content of which is discussed in §4.4.2 and §4.4.3.

¹⁹ Children in the United Kingdom are required to start school in the term following their fifth birthday (Directgov 2012). *Cylch Meithrin*, the Welsh-medium playgroup, allows children to attend from two years old (regardless of the linguistic background of the parent, Mudiad Meithrin 2012). There are schemes in place which allow children from English-medium primary schools to enter into Welsh-medium secondary schools, following intensive language instruction (Estyn 2006). Such children were excluded from the study.

4.3 Control variables

4.3.1 Age

The participants in the study were all aged between 16 and 18 years old at the time the data were collected. The results therefore represent a synchronic picture of language use amongst this age group and reflect the emphasis in the study on language variation rather than language change. In short, the study concerns itself with language variation in the repertoire of bilinguals in order to ascertain what variation is present.

A further motivation for the strict control age is that it was important for all participants to be at the same stage in their lives and share the same characteristics in terms of age and social identity (Eckert 1988; 1997). In other words, they are all in post-compulsory education, belong more or less to the same peer group (in their respective areas) and have the same life choices to make. There was a certain homogeneity in the histories of participants as they had spent either their whole lives in North Wales, or had lived there from very early childhood, shared similar cultural references (mostly orientated around music and television), and were all in the process of deciding where to apply to university.

The attempt to recruit participants who are at the same life stage was also motivated by the knowledge that there is much more variability in the use of Welsh amongst speakers from all backgrounds after leaving education. Collecting data from schools guaranteed, as far as possible, that all speakers were exposed to Welsh on a daily basis regardless of their home language.

4.3.2 Socio-economic background

As shown in § 4.2.1, areas in Caernarfon and Mold differ to varying degrees in terms of socio-economic status, as do the people within these areas. As Baranowski states, ‘the term social class is viewed [...] as a matter of prestige which different social groups are

accorded within a community. It is a subjective dimension which has certain objective indicators' (2007: 36). Social class as an independent variable has been a tenet of sociolinguistic research, leading to the association, at least in studies of English, between lower socioeconomic groups and more localised forms (Ash 2004: 402). The Welsh context differs from this somewhat, as there is a diglossic relationship between traditional dialects and literary Welsh and it is expected (though not proven empirically) that there are no differences between socioeconomic groups (Coupland & Ball 1989: 34).

The way in which socioeconomic status is derived has been challenged somewhat, especially as the methods used are not always reliable (Ash 2004: 415). In studies involving children and adolescents, the assignment of social class based on parents' occupations has also been criticised, given that it is largely agreed that older children acquire the dialect of the peer group (Eckert 1988: 185). Despite this, I aimed to pay attention to parents' occupation as much as possible in order to control for any effect. All participants' parents owned their own homes, and had occupations which would have required some form of post-compulsory further or tertiary education and training.

4.4 Data collection and analysis

The period of data collection took place between September 2010 and April 2011. A total of 86 interviews were obtained during this period from across North Wales.

Potential participants were excluded from the analysis if;

- they did not live in Caernarfon or Mold;
- they had moved to the area after starting compulsory education;
- they had only one Welsh-speaking parent (in cases where participants had two parents with whom they were in contact);
- or had parents who had moved to the area in adulthood.

A subset of 32 speakers was analysed both acoustically and auditorily and are presented here. The remainder of this section reports how participants were recruited, provides information on the three elements of the sociolinguistic interview, and explains how data were analysed.

4.4.1 The participants

The data presented in the thesis were collected from two schools in Caernarfon and one school in Mold. Two schools in Caernarfon were selected as there were not enough participants available in the individual schools due to other commitments, and the majority of students from English-language homes either had one parent who spoke Welsh or had recently moved to the area. The two schools in Caernarfon shared some teaching responsibilities in the Sixth Form, meaning that the students were generally known to each other through school and socialised together in Caernarfon. The participants' schools were taken into consideration when analysing the data statistically, and no differences were found between the two schools in Caernarfon. For this reason, the two schools were merged in subsequent analyses and are merged in the results presented.

Having outlined what would be required of the students to the Head of Sixth Form, a time was arranged to collect the data. As participants were aged over 16, no parental permission was required and participants were selected by teachers on the basis that they were available at a given time. A potential danger is that participants were chosen who were held in the highest esteem by teachers. With this in mind, teachers were asked to select participants randomly rather than according to ability. Given the busy nature of the schools, and smaller numbers in Sixth Form units, teachers were keen to point out that this would be the only way to ensure enough participants in any case.

A week was spent at each school both collecting data and observing students. The observations made during the time at the schools were not intended to inform any ethnographic analysis, but did provide a clearer picture of how students use both languages in schools. Such observations are mentioned in Chapter 5 and complement the questionnaire data.

The two schools in Caernarfon are defined as naturally bilingual comprehensive schools and all pupils study subjects in either Welsh or Welsh and English. Bilingual schools are generally expected to reflect the linguistic composition of the local area, and are found in predominantly Welsh-speaking areas. The two schools included in this study taught all students in Welsh, though terminology and some A-level (post-16) qualifications were taught through the medium of English. All participants had completed at least GCSE Welsh First Language as opposed to second language qualifications which are taught in schools where English is the medium of instruction.

The school in Mold is defined as Welsh-medium and all subjects (apart from English) are taught in Welsh and students are required to complete GCSE Welsh First Language. In areas where Welsh is not the dominant language, parents are able to choose between Welsh and English-medium education and the school in Mold is the designated Welsh-medium school for the county of Flintshire (see §4.2.1).

The most important difference between the schools lies in the percentage of students who come from Welsh-language homes. One school in Caernarfon had around 1190 pupils including 170 Sixth Form students. In this school, 85% of students came from homes where Welsh was the main language²⁰. In the other school in Caernarfon, there were around 508 students including 61 Sixth Form students. 78% of students

²⁰ Background information on the schools was found in reports by Her Majesty's Inspectorate for Education and Training in Wales (Estyn). These reports have not been cited in order to protect the anonymity of the schools involved in the study.

come from homes where Welsh was spoken. In Mold, the school has around 549 pupils and 70 students in the Sixth Form. 10% of students come from homes where Welsh is the main language. The differences between the linguistic background of students in the Caernarfon and Mold schools mirror the differences between the two areas and the effect this has on the use of language is explored in Chapter 5.

Table 4.6, below, shows the sex, age, location, and home language for each of the 32 participants in the study:

Table 4.6: Subset of speakers chosen for analysis.

Alias	Sex	Age	Location	Home Language
Lizzie	F	16	CAERNARFON	ENGLISH
Julia	F	17	CAERNARFON	ENGLISH
Jen	F	18	CAERNARFON	ENGLISH
Cathy	F	16	CAERNARFON	ENGLISH
Carys	F	17	CAERNARFON	WELSH
Llinos	F	17	CAERNARFON	WELSH
Siân	F	18	CAERNARFON	WELSH
Amy	F	16	CAERNARFON	WELSH
Sam	M	17	CAERNARFON	ENGLISH
Andy	M	17	CAERNARFON	ENGLISH
Thomas	M	17	CAERNARFON	ENGLISH
Graham	M	17	CAERNARFON	ENGLISH
Ioan	M	17	CAERNARFON	WELSH
Marc	M	17	CAERNARFON	WELSH
Aled	M	18	CAERNARFON	WELSH
Gwynfor	M	16	CAERNARFON	WELSH
Ffion	F	16	MOLD	ENGLISH
Charlotte	F	18	MOLD	ENGLISH
Jenny	F	16	MOLD	ENGLISH
Nicola	F	16	MOLD	ENGLISH
Glenys	F	16	MOLD	WELSH
Seren	F	18	MOLD	WELSH
Anwen	F	17	MOLD	WELSH
Angharad	F	16	MOLD	WELSH
James	M	17	MOLD	ENGLISH
Richard	M	17	MOLD	ENGLISH
Martin	M	17	MOLD	ENGLISH
Ben	M	16	MOLD	ENGLISH
Huw	M	16	MOLD	WELSH
Rhys	M	18	MOLD	WELSH
Lloyd	M	16	MOLD	WELSH
Glyn	M	16	MOLD	WELSH

Most participants were born in the local area to parents who had been brought up in the area. Three participants, Llinos, Sam, and Siân were unrelated but were born in England to Welsh parents who returned to their local area before schooling began.

The Welsh and English interviews took place on different days during the week that I was at each school. During the first session, participants were given a Participant

Information Sheet and Consent Form for Participants (see appendices A and B). Though the consent forms contained both English and Welsh, only Welsh was spoken during the first session and only English was spoken in the second session. The decision to use Welsh with participants first was taken in order to ensure that all participants were aware that they were speaking to a Welsh-English bilingual. As speaker judgements about their interlocutor may affect the extent to which one language influences another in conversation (cf. Rickford & McNair-Knox 1994), using English first may have led to some speakers judging me to be monolingual English and some speakers judging me to be bilingual.

No group or paired interviews took place in order to maximise the number of tokens from each informant. Each interview lasted on average 30 minutes and was recorded on a Zoom H2 recorder. All interviews were recorded in WAV format with a sampling frequency of 96 KHz and 16 Bit quantization. An omnidirectional Audio-Technica Lavalier microphone with 50 – 18,000 Hz frequency response and -54 dB sensitivity was also used.

4.4.2 The interview

Labov (1972: 209) notes that ‘the aim of linguistic research in the community must be to find out how people talk when they are not being systematically observed; yet we can only obtain these data by systematic observation’. The sociolinguistic interview is a *denotational* text insofar as the speaker provides a description of an event or events (Silverstein 1976; Wortham et al. 2011: 41). This, it is hoped, reduces the effect of the observer’s paradox by minimising the interaction with the interviewer in order to minimize self-editing and attention to speech.

Despite being used in this study, the sociolinguistic interview has been the subject of much criticism in the field. The main criticism is that the interview event

itself cannot elicit casual speech from the interviewee as, as Chambers and Trudgill (1998: 48) note, 'a tape-recorded interview with a stranger is still bound to direct their attention to their speech to a certain extent'. The 'formality principle' (Coupland 1988: 10) associated with the interview has led to researchers using different ways of collecting data, such as paired interviews and giving participants their own tape recorders.

Researchers are also becoming increasingly aware that their strategies of eliciting data can affect the data (Bailey & Tillery 2004: 20). As my interviews took place in the school setting, I was acutely aware that I could be perceived as an authority figure, especially as I was associated with a university at the same time as all of the participants were either choosing university courses or had sent applications. My aim was therefore to establish myself as both an insider and an outsider simultaneously (Hall-Lew 2010: 37) in order to try to access the everyday speech of the participants (Labov 1972: 85). This allowed me to establish common ground with participants but also be interested in their experiences by allowing them to take on 'expert status' (Modan & Shuman 2011: 14).

In order to decrease the level of formality associated with the interview, I downplayed the importance of the project (participants were aware I was a student but not necessarily a postgraduate student), dressed as informally as possible, and used the Welsh T pronoun from the outset. The fact that I spoke a northern variety of Welsh and made reference to my upbringing in Wrexham also helped to establish myself as both an insider (from North Wales) and outsider (coming from another town).

My ability in Welsh also requires mention, as I come from a primarily English-speaking family and have been educated primarily through the medium of English. This could have had the effect that speakers perceived me as a Welsh learner and became

more aware of their own speech as they attempted to ensure that I had understood. I have, however, acquired Welsh in both natural and classroom settings to a standard which has allowed me to work as a part-time lecturer in Welsh at a College of Further Education and a Research Assistant in the School of Welsh at a University. My own history with Welsh was not divulged to participants, nor was the topic raised by participants²¹.

Interview modules (Labov 1984: 33 – 37) were drawn up which could be used in either interview. The modules had the following headings:

1. Childhood
2. Family
3. Travelling
4. High School
5. Free time
6. Local area

Modules 1 – 3 were used in the Welsh interview and modules 4 – 6 were kept for the English interview. Within each module, the type of questions developed from the impersonal and non-specific to personal and specific (Tagliamonte 2006: 38). The traditional danger of death question, which has been successful in eliciting narrative in many previous studies, did not seem to work for this age group in rural North Wales. This, I imagine, was due to the relatively little life experience of the participants and the relative safety of North Wales.

A topic which was successful in eliciting narrative was, however, The Big Weekend (BBC 2010). The Big Weekend was organised by BBC Radio 1 and took

²¹ In addition, all of the teachers with whom I liaised at the schools assumed that I had attended my local Welsh-medium secondary school, which I maintain is a good indicator that I was taken for a native-like speaker.

place in Bangor (North West Wales) in May 2010. It featured many international music artists who ordinarily would not perform in the area and residents of North Wales were able to apply for tickets. Luckily, most of the participants had been successful in obtaining tickets and were able to tell lengthy narratives about the weekend when they saw their favourite artists.

4.4.3 Wordlist

Following the interview, a word-list was given to each participant in order to elicit more careful speech (see Appendices C and D). This was largely successful, though in some cases participants spoke rather quickly and the task could have been delivered via timed presentation with the addition of a carrier phrase (Jones & Nolan 2007: 873).

4.4.4 Questionnaire

As the purpose of the interview was to elicit narratives from the participant, any questions examining speaker attitudes to Welsh and English were avoided. Instead, a questionnaire designed to collect data on the background, language use, and attitudes towards Welsh and English was designed for each participant to complete following the second interview (see Appendices E and F). In addition to asking about the basic biographical information of each participant, the questionnaire asked for the participants' preferred national identity; the language they would normally use in certain domains (such as speaking with friends, at work etc.); and the frequency with which they access media in each language.

The final part of the questionnaire comprised four sections with statements and seven point Likert scales. Each section was designed to elicit the participants' attitudes to different aspects of Welsh-English bilingualism, namely the status and future of Welsh in their area, their opinions on the promotion of Welsh, the extent to which they

attribute certain characteristics to each language, and their own self-reported competency in each language.

4.4.5 Data analysis

Recordings were transferred to an ACER Aspire 5738Z computer and relevant tokens were transcribed using ELAN (Max Planck Institute for Psycholinguistics 2008). ELAN is an annotation tool for multi-modal software, and allows for numerous annotation layers (Brugman, H. & A. Russel. 2004: 2067). When acoustic data were analysed, the token or entire file was exported to Praat (Boersma & Weenink 2009) for analyses.

Statistical analyses were completed using Rbrul (Johnson 2009) in the statistical software environment R (R Core Development Team 2011). The immediate benefits to the study of using Rbrul for the statistical analysis over other variable rule analysis programmes are that, firstly, it is able to handle both logistic regression with binary responses and linear regression with continuous responses. Secondly, it uses mixed-effects modelling instead of fixed-effects modelling, in order to account for both fixed and random effects (Johnson 2009: 362). Whereas the latter takes into consideration only those factors which are repeatable (the possible levels are fixed), the former allows for both fixed and random (e.g. speaker and item; Baayen 2009: 242).

4.5 Summary

This chapter has outlined the methodology used to elicit data from the participants. The speech of 32 speakers is analysed in the thesis, and the sample is equally stratified by speaker sex, area, and home language. Data in both English and Welsh were elicited via sociolinguistic interview and word-list task. A questionnaire was given to each participant in order to collect data on language attitudes, and self-reported ability and use of Welsh. The following chapter explores the results of the questionnaire.

5 Language attitudes and use of Welsh

5.1 Introduction

This chapter investigates participants' attitudes towards Welsh, self-reported language use, and self-rated language ability. Correlations are sought between these data and the extra-linguistic variables 'sex', 'home language' and 'area' and, if present, will show that the independent variables not only reflect the background of the speaker but are also inherently linked to speakers' engagement with the two languages in their repertoire (see §3.5). This data comes from the results of the attitudinal questionnaire given to participants at the end of the recording sessions (see §4.4.4). Where relevant, however, commentaries provided by participants during the sociolinguistic interviews are also included in order to enrich the analysis²².

The rationale for this chapter also lies partly in previous studies of Welsh-English bilingualism, which have shown that both attitudes and usage tend to correlate with speakers' linguistic background (e.g. H.M. Jones 2008; Morris 2007; see §2.1.6). This already provides an indication that the dominance of Welsh in an area and how an individual acquires Welsh can shape speakers' bilingual identity. Previous studies have shown that there is a greater likelihood that speakers who have acquired Welsh via parental transmission will use the language more frequently than those who have acquired the language through immersion education (cf. H.M. Jones 2008). Furthermore, the use of Welsh is inherently linked to its prominence in the local community, with the language being used more regularly in areas where over 60% of the local population speak the language (H.M. Jones 2008: 552). Attitudes towards

²² Recall that participants were given pseudonyms following data collection.

Welsh tend to be quite positive across Wales (cf. NOP 1995; §2.1.5) but amongst speakers of Welsh, however, there appears to be a divide between people who emphasise the need for opportunities to use the language and those who emphasise its cultural (and more symbolic) value. Positive attitudes towards functional use have been shown to be most prevalent in Welsh dominant areas (cf. Coupland et al. 2005).

Further impetus for the analysis of attitudinal and usage data stems from theoretical developments in variationist sociolinguistics. Many accounts of variationist sociolinguistics can be seen as belonging to the Second Wave (cf. Eckert 2005). This saw a departure from the assumption that independent variables such as socio-economic background and sex share identical meanings across different speech communities to more local investigations of the meaning and relevance of independent variables (e.g. Milroy & Milroy 1978; Rickford 1986a; Eckert 1989; Zhang 2005; 2007; Mesthrie 2010; §3.4). The inclusion of home language and area in this study already shows an awareness of such local independent variables, but it remains to be seen whether they correlate with participants' opinions of Welsh, their perception of their own ability, and their usage of Welsh. If this is the case, variation which is influenced by these extra-linguistic factors cannot be seen as a result of varying degrees of exposure to Welsh, but due to a whole 'package' of factors which create distinct groups.

In addition to considering the importance of what independent variables mean locally, it is also necessary to ascertain whether the various themes which arise in the questionnaire data can be used as independent variables, before treating them as such in subsequent analyses of variation. This avoids *multicollinearity* in the statistical models which negatively affects the results. Multicollinearity refers to a situation where an independent variable is highly correlated with another independent variable in a regression analysis (Allen 1997: 176). This is problematic as the purpose of regression

analyses is to estimate the dependency of the dependent variable on independent variables, and it assumes that there is no interdependency between the these independent variables. As Farrar & Glauber (1967: 93) state, multicollinearity is ‘an interdependency condition that can exist quite apart from the nature, or even existence, between X [an independent variable] and y [a dependent variable]’. The data elicited via the questionnaire could have been included as independent variables in the analyses of /l/-velarisation and (r) variation. This would have resulted in multicollinearity, as it will be shown in this chapter that there are correlations between attitudinal and usage data and participants’ home language and area.

In light of the above, it could be argued that participants’ individual scores for opinion of Welsh, use of Welsh, and ability could be used as independent variables in the analyses of phonetic and phonological variation. Although this would arguably allow for a more detailed analysis of *individual* speakers, one of the aims of the current study is to examine the extent to which *groups* of bilinguals differ in speech production. The current independent variables allow for participants to be categorised quite clearly on the basis of their sex, home language, and area.

The following section (§5.2) outlines the structure of the questionnaire in more detail. Questions were organised under the following themes: Opinions of Welsh, opinions of English, self-rated ability in Welsh, and reported use of Welsh (see §5.2.1 and §5.2.2). §5.2.3 gives the results of tests carried out to ensure that the individual questions included under each of the aforementioned themes were reliable indicators of the topic under discussion. A second test measured the correlation between these themes in order to examine internal relationships between the attitudinal data. The correlations between the attitudinal data are shown in §5.2.4. §5.3 outlines the results and begins with an examination of participants’ attitudes towards Welsh-medium education, the

promotion of Welsh, and attributes of Welsh (§5.3.1). §5.3.2 investigates how speakers feel about their ability to speak Welsh, and §5.3.3 compares these attitudes with actual language use. The chapter concludes with a discussion of the results and summary (§5.4; §5.5).

5.2 Methodology and statistical tests

27 out of the 32 participants completed the questionnaire (five of the participants did not have time during the interview to complete it, and did not return it by post²³). This was unfortunate as the patterns of attitudes and usage presented here do not describe the entire dataset. The correlations found, however, are based on data from the majority of speakers and all cells in the sample were represented. This section provides more information on the content of the questionnaire and the tests used to ensure that the data are reliable. A copy of the questionnaire is provided in appendices E and F.

5.2.1 The questionnaire

The aims of the questionnaire were to collect data on the demographic background of the participants and their language use, and examine their attitudes. Not all of the questions are relevant to this chapter, and the data analysed are largely based on how participants responded on a *seven-point Likert scale* to a number of statements which belonged to a similar ‘theme’. Participants were asked to state how much they agreed or disagreed with a statement by selecting a number on the Likert scale, with the first point showing strong disagreement and the last point showing strong agreement. As stated above, the questionnaire elicited information on the following themes in this way:

1. Opinion of Welsh;

²³ These participants were Carys, Marc, Thomas, Cathy, and Amy (§4.3.2).

2. Opinions on the promotion of Welsh;
3. Opinion of English;
4. Self-reported ability;
5. Participants' use of Welsh.

Other responses from participants were elicited using *multiple choice questions* (which also gave participants the opportunity to comment on the reasons for their answers). As mentioned in §5.1, qualitative data are also included where they shed new light on the quantitative data, and come from the sociolinguistic interview. It was not the aim of the interview to elicit meta-sociological analyses (that is to say, provide comments on Welsh-English bilingualism) from participants, though this happened occasionally as speakers talked about growing up or especially their schooling.

The data on language use and language ability are based on self-reports from participants. The reliability of the data may be questionable, especially as speakers' assessments of their own ability were not measured objectively. Schmid (1981: 23) notes that 'self-report data from an area that is as emotionally charged as linguistic proficiency might well be influenced more by how a person wishes to view herself than by an accurate assessment of her linguistic behavior'. Although this is undoubtedly the case, the aim of the questions on ability in Welsh was to elicit data about how the participants *feel* about their ability and how this is correlated with other aspects of their bilingual identity.

There were two reasons why a language test was not administered. Firstly, such a language test was avoided in this study as it would have required more time than was possible. Secondly, it would have stood in direct conflict with the aims of the sociolinguistic interview which was to relax the participants and divert their attention

from language. In other words, a language test may have led to ‘examination stress’ (Clyne 1995: 207) and the idea that they were being judged on their proficiency.

It is also possible that participants may have felt under pressure to answer the questions positively. This is especially true in light of the fact that data collection took place in school, as there may have been fear that answers would be shared with teachers. All participants were reminded that the data provided by their responses to the questionnaire were confidential and not shared with teachers. Furthermore, as the questionnaire was given at the end of data collection, a rapport between myself and the participant had already been established and the informality of the project was emphasised throughout data collection (see §4.4.2).

5.2.2 Quantifying language use

Questions 26 and 27 from the questionnaire measure language use. Question 26 asks which language the participants predominantly used when shopping in the local area, at work, telephoning helplines, completing forms, and with friends. Question 27 asked participants to state how often they completed certain activities in each language. These activities were reading a newspaper, reading a book, watching TV, listening to the radio, visiting websites, going to the theatre, and going to music concerts.

A score based on language use was calculated and zero points were awarded for more frequent usage of English. One point was awarded for equal use of both languages, and two points were given for more frequent usage of Welsh in a given situation or for a given purpose. The same scoring system was used to quantify the participants’ access to media in each language. For instance, if a participant read a book in Welsh every week but read an English book every month, they would receive a score of two. If a participant watched both English and Welsh language television every day, they would receive a score of one.

Measuring language use is problematic in a minority language context, especially as the position of Welsh in an area obviously affects the extent to which speakers will use the language outside of the home and classroom. The scores for use of language when shopping, and at work, were not included in the final calculations, as they largely depend on the community and external circumstances. A further problem is that there are much more choices in terms of media in English. This problem is undeniable, but it is possible for all participants, regardless of area, to access Welsh-language books, newspapers, television and radio stations, websites, and theatre and music concerts in Welsh as well as English.

5.2.3 Statistical tests of internal reliability and correlation

Having calculated the scores from the Likert scales in each theme, the reliability of the statements within each theme was tested using Cronbach's Alpha. Each theme consisted of either four or five statements. For example, participants were asked to state to what extent they agreed with five statements about the promotion of Welsh, as shown in Figure 5.1:

Pearson's r is suitable for comparisons between the different modules of the questionnaires, but it is not a suitable measure for the relationship between ordinal scale and nominal data (Rasinger 2008: 149). In other words, it is not appropriate to use Pearson's r in order to test whether the attitudinal data is linked to participants' area or home language.

The significance of the relationship between attitudes and the nominal independent variables is calculated here using the Mann-Whitney U test (Rasinger 2008: 203)²⁴. The Mann-Whitney U test is the non-parametric equivalent to the unpaired t-test and does not assume a Gaussian distribution (Motulsky 1995: chapter 37). The data is non-Gaussian nature as the mode, median, and mean values for overall scores differ (meaning that the distribution is not bell-shaped). In addition, a non-parametric test is preferable as we are dealing with the scores of participants and their rank in relation to others (Motulsky 1995: chapter 37). While it is possible to use the Mann-Whitney test on samples which are unequal in size, the larger sample should be twenty or fewer which is the case here (Robson 1994: 114). Linear regression using RBRUL or any other environment would also be problematic as the scores do not represent a continuous scale (Drager & Hay 2012: 59).

5.3 Results

This section examines the results of the attitudinal and self-reported usage and ability data. §5.3.1 examines the internal correlations between the different themes of the questionnaire. The remainder of the section questions the extent to which these themes correlate with the independent variables. §5.3.2 explores the participants' attitudes

²⁴ Calculations were performed using The R Commander package (Fox 2005) in the R statistics environment (R Development Core Team 2011).

towards Welsh before examining how speakers rate their own ability (§5.3.3) and how they use Welsh (§5.3.4).

5.3.1 Correlations between the different ‘themes’ of the questionnaire

Table 5.1, below, shows the significant correlations between the themes of the questionnaire based on the Pearson’s *r* correlations (see §5.2.3 and Appendix G for the correlations):

Table 5.1: Significant correlation between themes in the questionnaire.

	PROMO	OW	ABIL	USE
PROMO		***	**	
OW	***		**	*
ABIL	**	**		***
USE		*	***	

- * Correlation is significant at the 0.05 level
- ** Correlation is significant at the 0.01 level
- *** Correlation is significant at the 0.001 level

Table 5.1 shows that there is an interplay between attitudes, how speakers perceive their ability, and their language use which together constitutes their bilingual identity. Promotion of Welsh (PROMO) and opinion of Welsh (OW) are, perhaps unsurprisingly, highly correlated and show that those who rate Welsh higher in terms of beauty and friendliness are also more likely to agree that more should be done to promote the use of Welsh. As both themes examine opinions towards Welsh in general terms, they were conflated when examined in relation to sex, home language, and area. Both promotion of Welsh and opinion of Welsh are linked to how participants rated their ability in the language (ABIL), and opinion of Welsh also correlated less significantly with use of Welsh. Finally, use of Welsh (USE) is highly correlated with

speakers' self-rated ability in the language, which suggests that those who use Welsh more are more inclined to rate their abilities positively (this is examined further in §5.3.3).

The correlations outlined above already highlight a complex interaction between aspects which comprise the identity of Welsh-English bilinguals. Broadly, attitudes towards Welsh are intertwined with reported ability and reported usage. Language use has, however, been shown to vary according to the linguistic background of the speaker and herein lies the importance of examining the relationship between the attitudinal data and the independent variables.

5.3.2 Attitudes towards Welsh

The participants' attitudes towards Welsh were gauged by three questions on the questionnaire. Question 23 asked participants whether they would want their own children to be educated primarily through the medium of Welsh, question 29 presented five items on a seven-point Likert scale about Welsh language planning, and question 30 presented three items on a seven-point Likert scale which asked the extent to which participants agreed that Welsh was useful, friendly, and beautiful²⁵.

This section shows a tendency to support Welsh-medium education (§5.3.3.1) and language policies (§5.3.3.2) which would provide further opportunities to use Welsh. They also tend to equate positive attributes with Welsh, which they deem to be friendly, beautiful, and useful (§5.3.1.3). Amidst this overall support, a few participants had negative feelings towards Welsh which also manifested in how they view their national identity and rate their ability in Welsh (§5.3.1.4).

²⁵ The questionnaire also asked whether participants agreed that Welsh is a modern language. This was omitted from the analysis as in hindsight it is not obvious whether modernity is a positive attribute.

5.3.2.1 Welsh-medium education

There is overwhelming support for Welsh-medium education amongst the participants.

96.3% of participants ($n=26$) would choose to educate their children through the medium of Welsh. Rhys, the only participant who said he would not, comes from a Welsh language home in Mold and believes that acquisition via parental transmission is enough. He stated that:

1. '[children] can learn Welsh at home, they don't need it in education'.
Rhys (Mold Welsh).

It is, however, unclear from this assertion whether he does not see the merits of Welsh-medium education in general, which would place him firmly against immersion education, or whether he believes that Welsh-medium education would not be necessary if he were to have children.

A number of themes arose from participants' statements on why they would choose to educate their children through the medium of Welsh rather than English.

These are summarised in Table 5.2, below:

Table 5.2: Reasons for wanting to educate children through the medium of Welsh.

Theme	Typical participant	Participant names
Because Welsh is the first language of the parent.	Welsh as a home language	Siân (Caernarfon Welsh) Lloyd (Mold Welsh) Seren (Mold Welsh) Anwen (Mold Welsh)
Bilingualism is a useful skill.	Participants from Mold Caernarfon English	Huw (Mold Welsh) Glyn (Mold Welsh) Jenny (Mold English) Martin (Mold English) Andy (Caernarfon English) Jen (Caernarfon English) Graham (Caernarfon English)
Importance of learning the <i>national</i> language.	English as a home language	James (Mold English) Sam (Caernarfon English) Sarah (Mold English)
There is a duty to keep the language alive.	English as a home language	Nicola (Mold English) Chloe (Caernarfon English) Catrin (Caernarfon English) Charlotte (Mold English) Ben (Mold English) Richard (Mold English) Ioan (Caernarfon Welsh) Anwen (Mold Welsh)

Table 5.2 shows a division between naturalistic or functional reasons for Welsh-medium education (because Welsh is the L1 and education in Welsh is the natural choice) and capitalistic or symbolic reasons (because Welsh is useful for future employment or important for Welsh heritage). For Siân (Caernarfon Welsh), Lloyd (Mold Welsh), Seren (Mold Welsh), and Anwen (Mold Welsh) there are naturalistic reasons for wanting Welsh-medium schooling because Welsh is their first language. The more capitalistic or symbolic reasons are that bilingualism is a commodity or skill, and that there is a duty to keep the national language alive. This corresponds roughly with Hodges (2012), who also found that the majority of parents from English-monolingual backgrounds chose Welsh-medium education for cultural, educational, economic, or personal reasons.

Two participants who came from Welsh-speaking backgrounds, Ioan (Caernarfon Welsh) and Anwen (Mold Welsh), also gave more symbolic reasoning for educating their children through Welsh, and believed that there was a duty to learn the national language. Though neither participant elaborated on this further, both of them mentioned in the interview that they were enthusiastic towards Welsh and sought as many opportunities as possible to use the language. For instance, Ioan mentioned that he moved from a rugby club outside of Caernarfon because it was not wholly Welsh-speaking. Anwen was the only participant from Mold who mentioned that she liked attending *Maes B*, the youth area of the National Eisteddfod of Wales²⁶, because the use of Welsh was normalised:

2. ‘Dw i’n meddwl bod yn grêt cael, jyst bod yn rhywle, a bod ti’n gallu siarad Cymraeg gyda gymaint o bobl a sdim rhywun yn deud “*why are you speaking Welsh?*” achos dyma be’ maen nhw’n fel fama’ [I think that it’s great to have, just be somewhere, and you can speak Welsh with so many people and not have someone saying “why are you speaking Welsh?” because that’s what they’re like here].
Anwen (Mold Welsh)

Both Ioan and Anwen also tended to strongly agree that the Welsh government should do more to safeguard Welsh. In fact, Ioan scored the highest for all the participants regarding language planning, and was the only participant to strongly agree with all items. Let us now examine the attitudes towards the promotion of Welsh in more detail.

5.3.2.2 Language planning

Participants were asked to rate the extent to which they agreed with the following statements:

1. Private companies should do more to offer a bilingual service.

²⁶ The National Eisteddfod of Wales is an annual Welsh-language cultural festival which travels around Wales (see National Eisteddfod of Wales 2012).

2. More jobs should be filled by Welsh-speakers in order to offer a bilingual service.
3. Councils should ensure that those who do not speak Welsh do not move into villages where the language is strong.
4. The National Assembly concentrates too much on language (reversed item).
5. Councils should create more Welsh-medium schools.

The median scores in response to the statements above show a tendency for these young Welsh-English bilinguals to support the improvement to bilingual provision in Wales. The strongest agreement is for more bilingual services amongst companies and more Welsh-medium schools. There is also agreement that the National Assembly should do more for the language and that more jobs should require the use of Welsh.

Figure 5.2 shows the mean Likert scores for each of the statements:

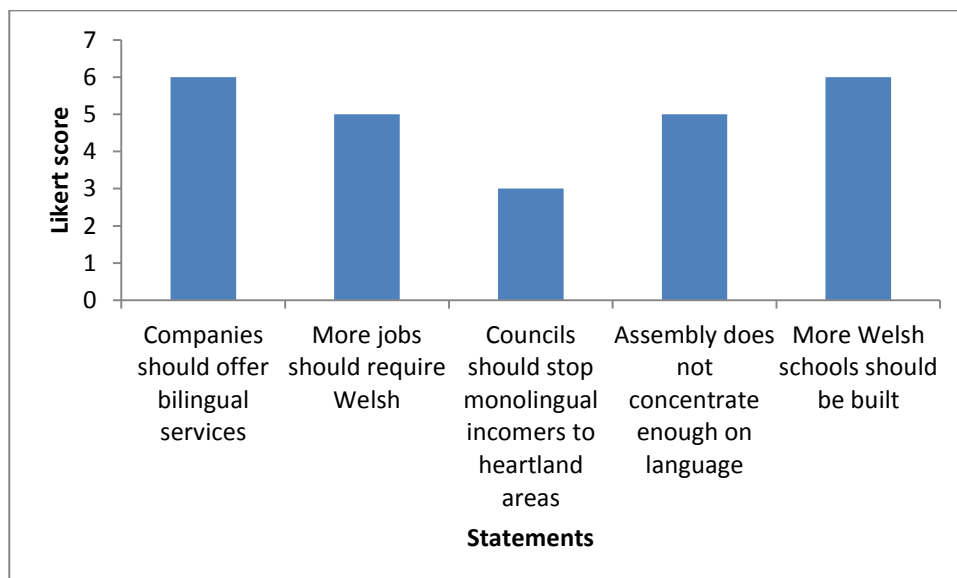


Figure 5.2: Median Likert scores for statements on language planning (1 = strongly disagree, 7= strongly agree).

There were no significant differences between language planning and area ($U=55.5$, $p=0.1128$), home language ($U=93.5$, $p=0.9224$), or sex ($U=84$, $p=0.7514$). This suggests that there is widespread support for the language across North Wales, rather than support being restricted to Welsh-dominant areas or L1 speakers. It remains to be seen, however, whether this translates into actual use of Welsh. Coupland et al. (2005)

investigated differing attitudes towards what they define as *interactional use* and *ceremonial use*. Interactional use describes the use of Welsh in families and workplaces whereas ceremonial use refers to the use of Welsh in traditional songs, place names, and during cultural events (Coupland et al. 2005: 10). They state that:

Students across the board feel that it is uncontroversially right for Welsh to feature in names, songs, ceremonies and so on, and feel this quite strongly, but they are less strongly committed to a further move into interactional use. There is no significant covariation of school and ceremonial use, because students in all four schools endorse the importance of this function for Welsh. On the other hand, commitment to interactional use of Welsh is predicted by both school membership and Welsh language competence. Gwynedd [the county in North West Wales where Caernarfon is situated] students and the two highest Welsh competence categories do feel it is important for Welsh to feature in the home and the workplace, as it typically already does for them in their own lives.

This is not strictly the case here, as students in both Welsh-dominant Caernarfon and English-dominant Mold do tend to want to see changes which would result in more opportunities to use Welsh.

Participants tended to disagree with the most controversial measure, which would be to regulate local housing in heartland areas²⁷. A number of participants in Caernarfon mentioned that the area had changed in their lifetimes due to an influx of English monolinguals from either other parts of Wales or England, but participants did not seem to view this as particularly negative. Carys, for example, mentioned the change in dynamic between her time in primary school and secondary school:

²⁷ Property laws which aim to safeguard the language by giving priority to local people have been proposed by language pressure groups, namely *Cymdeithas Yr Iaith Gymraeg* 'The Welsh Language Society' (see Cymdeithas Yr Iaith Gymraeg 2012) and *Cymuned* 'Community' (see Cymuned 2012).

3. ‘Dod i fyny i ysgol [Uwchradd], ma’ ‘na lot o Saesneg yn cymharu efo ysgol fach.[...] Mae lot o bobl o deuluoedd Saesneg’ [Coming up to [secondary] school there’s a lot of English compared with little school. [...] There’s a lot of English families].
Carys (Caernarfon Welsh)

She continues, however, to state that Welsh is still necessary in the school:

4. ‘Swm i’ m licio bod yn yr ysgol swm i ddim yn siarad Cymraeg achos Cymraeg dan ni’n siarad gyda’n gilydd’ [I wouldn’t like to be in the school if I didn’t speak Welsh because it’s Welsh that we speak with each other].
Carys (Caernarfon Welsh)

Carys appears to view inward migration by English monolinguals as a societal trend which has increased during her lifetime. She does not, however, see this as particularly threatening to her own use of Welsh and believes that Welsh is ingrained as a community language in Caernarfon.

Graham (Caernarfon English) scored the second lowest for positive attitude towards language planning (12 out of 35), and was the only participant to mention language policies in the interview. He mentioned that:

5. ‘When I’m working [...] I get a lot of people coming to us saying we need to do more signs in Welsh. It’s unnecessary’.
Graham (Caernarfon English)

Graham also disagreed that Welsh is useful and strongly disagreed that Welsh is friendly and beautiful. He scored the lowest for this area (5 out of 35) and was the only participant to fall under the halfway score for opinion of Welsh. It is clear that Graham has negative views towards his bilingual identity which is reflected in his attitudes. This became clearer in his interview, where he positioned himself as outside of the Welsh-speaking community and believed he was discriminated against for having a more English outlook:

6. ‘They’re really protective of their language [...]. Sometimes I get really ridiculed for speaking English [...]. No one else can see it but me because it’s happening to me’
Graham (Caernarfon English).

5.3.2.3 Opinions of Welsh

The median Likert scores for qualities attributed to Welsh reveal strong agreement that Welsh is useful, friendly, and beautiful. Figure 5.3, below, shows the median Likert scores for the individual items:

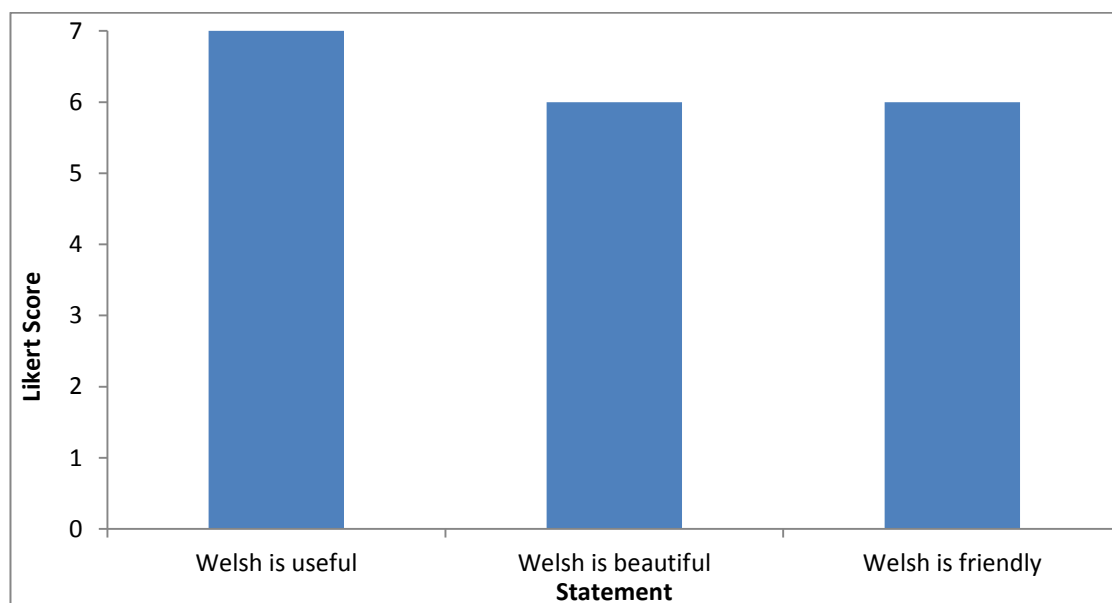


Figure 5.3: Median Likert scores for statements on opinion of Welsh (1 = strongly disagree, 7= strongly agree).

There were no significant differences between Caernarfon and Mold ($U=96$, $p=0.708$), those from Welsh-language homes and English-language homes ($U=70.5$, $p=0.33$), or females and males ($U=123$, $p=0.129$) in relation to the opinions of Welsh. The scores for the ‘Welsh is beautiful’ and ‘Welsh is friendly’ statements indicate overall affection for the language on the part of the participants, regardless of their background. The strong agreement that Welsh is a useful language could be seen as a success of language planning in the Welsh context, as Welsh is seen as a useful commodity to have despite all of its speakers being bilingual with English. This was not

mentioned to any great extent in the interviews, though, and the correlation between opinions towards Welsh and self-reported language use was weaker than other correlations in the data (see §5.3.1).

5.3.2.4 Correlations between attitudes and other independent factors

Closer inspection of the results of the Pearson's r shows a significantly strong correlation between self-reported ability and both promotion of Welsh ($r=0.368$, $p=0.006$) and opinion of Welsh ($r=0.511$, $p=0.006$). As was mentioned in §5.2.4, these two themes were conflated due to strong internal correlation and Figure 5.4 shows the correlation between the total scores for both promotion of Welsh and opinion of Welsh (OPIN), and self-reported ability (ABIL):

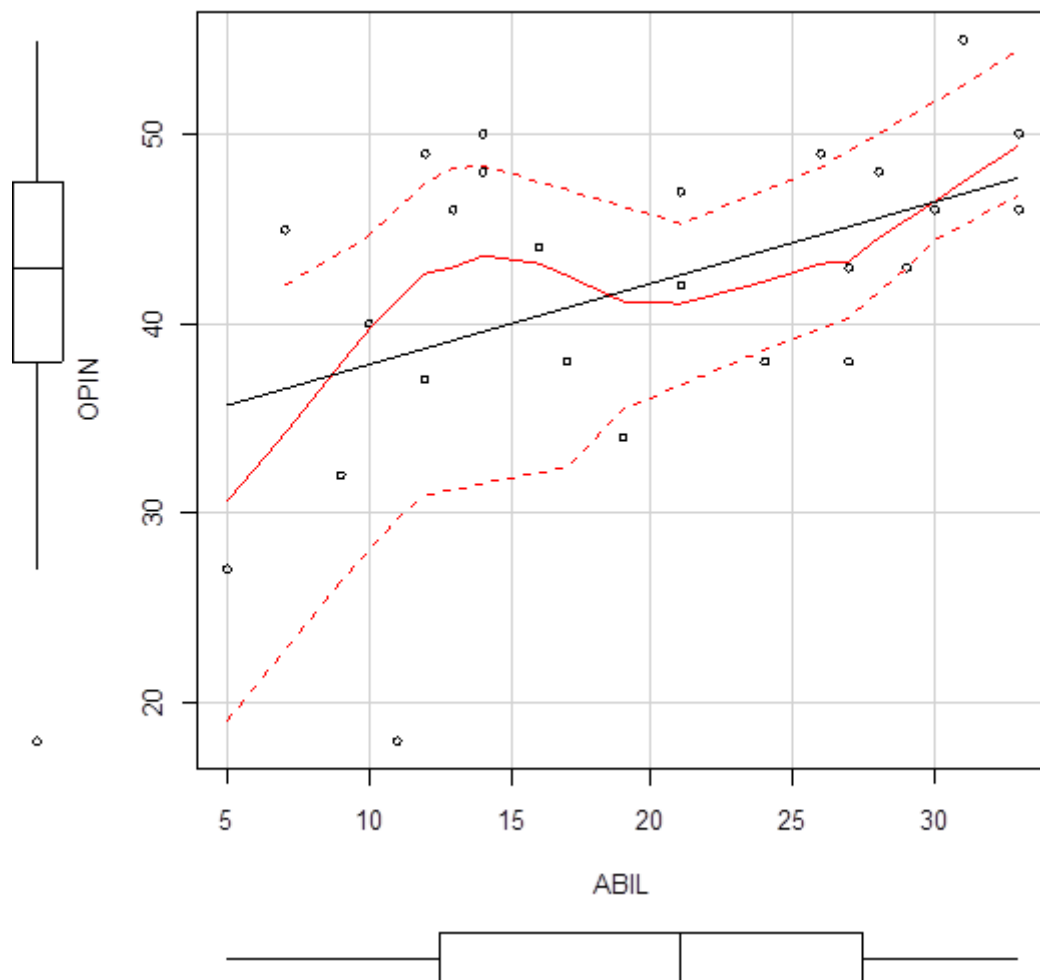


Figure 5.4: Correlation between opinions of Welsh and self-rated ability.

Figure 5.4 suggests a tendency for those who feel less confident in their ability in Welsh to be less likely to hold very positive attitudes towards the language. For the combined attitudinal score, there is a moderate correlation between self-reported ability and attitudes towards Welsh ($r=0.473$, $p=0.013$).

The interview data from both Jen (Caernarfon English) and Graham (Caernarfon English; see 5.3.1.2 above) suggest that both speakers feel separate to Welsh-speakers. During the English interview, Jen stated that:

7. 'I think I can't [speak Welsh] though 'cause I remember the school was quite bitchy 'cause I was in primary school they used to start on me for it a lot for not being able to say it properly. 'Cause I was like one of the better performing kids in my year for everything apart from reading Welsh [...] and that was really embarrassing and I think that's why I don't like it. [...] I got good [grades] in the GCSEs, like I got Bs and stuff but I just don't like it'

Jen (Caernarfon English).

In light of the above, it is perhaps unsurprising that this group of speakers have some of the lowest scores for the different themes of the questionnaire data. Jen and Graham have the lowest scores for positive attitude towards Welsh and they also have the lowest score in their respective home language/area groups for their use of Welsh. For instance, Graham strongly disagreed that Welsh was a beautiful or friendly and both Jen and Graham strongly disagreed with the statements which assessed their attitudes towards the promotion of Welsh. For these two speakers in particular, it is clear that they have a negative view of Welsh which manifests in various aspects of respondents' identity. In Jen's case, as shown in the extract above, this is also linked to the belief that she is unable to speak Welsh. Low self-belief in Welsh ability is examined in the following section.

5.3.3 Self-reported ability

Question 31 aimed to discover whether students, firstly, felt that they made few mistakes in Welsh and consequently did not need to improve their language skills and, secondly, whether students felt they spoke, read, and wrote in Welsh better than they did in English. Self-rated ability is not generally investigated in great detail in questionnaires which examine Welsh-English bilingualism (see, however, Law 2013), and the tendency is to focus on usage rather than speaker feelings towards their own competency.

Males and females also do not tend to rate their ability in Welsh differently, as the correlation between sex and ability was not significant ($U=114, p=0.274$). In the context of Welsh-English bilingualism this is perhaps not surprising, as sex has not produced significant trends, though this factor has been significant in a number of language tests performed on learners in the context of Second Language Acquisition. In such studies, female learners tend to achieve greater fluency than males (see Ellis 1994: 202).

Figure 5.5 shows participants from the two home-language groups differed in their scores for ability:

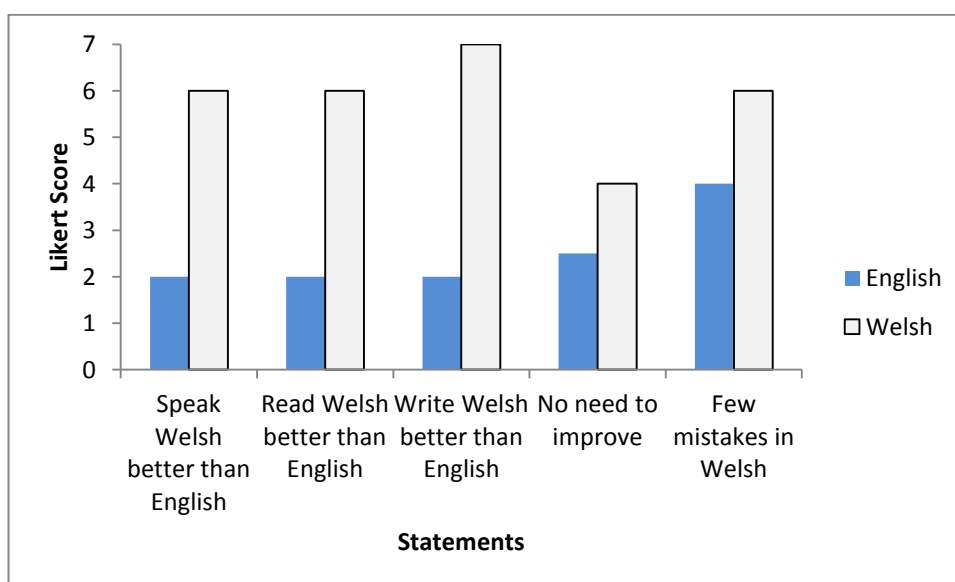


Figure 5.5: Median Likert scores for statements on ability in Welsh by home language (1 = strongly disagree, 7= strongly agree).

The median scores above indicate that those who speak Welsh as a home language and who are educated primarily or solely in Welsh strongly rate their abilities in speaking, reading and writing. This group also tend to claim that they are able to speak, read, and write better in Welsh than in English. Interestingly, they still tended to agree that they needed to improve their Welsh-language skills and that they made mistakes. These latter two results should be treated with caution, as assessing language

ability is arguably more appropriate for speakers of a second or foreign language than for Early Childhood Bilinguals.

The results for those who speak English at home show that this group tend to disagree quite strongly that they speak, write, or read Welsh better than English. This is perhaps unsurprising in light of research in immersion education contexts where those acquire the language via parental transmission obtain higher scores in tests which are designed to test their ability (cf. Arzamendi & Genesee 1997: 160-162 for the Basque Country, Though this group agreed quite strongly that they made mistakes in Welsh they tended to neither agree nor disagree that they needed to improve the level of their language. This could imply that they see their language skills as fit-for-purpose, especially if they are performing to their expectations academically and do not envisage using Welsh after completing their education.

The differences between the Welsh and English home-language group was significant ($U=11, p=0.005$). The differences between the overall scores for both home-language groups can be seen in Figure 5.6, below:

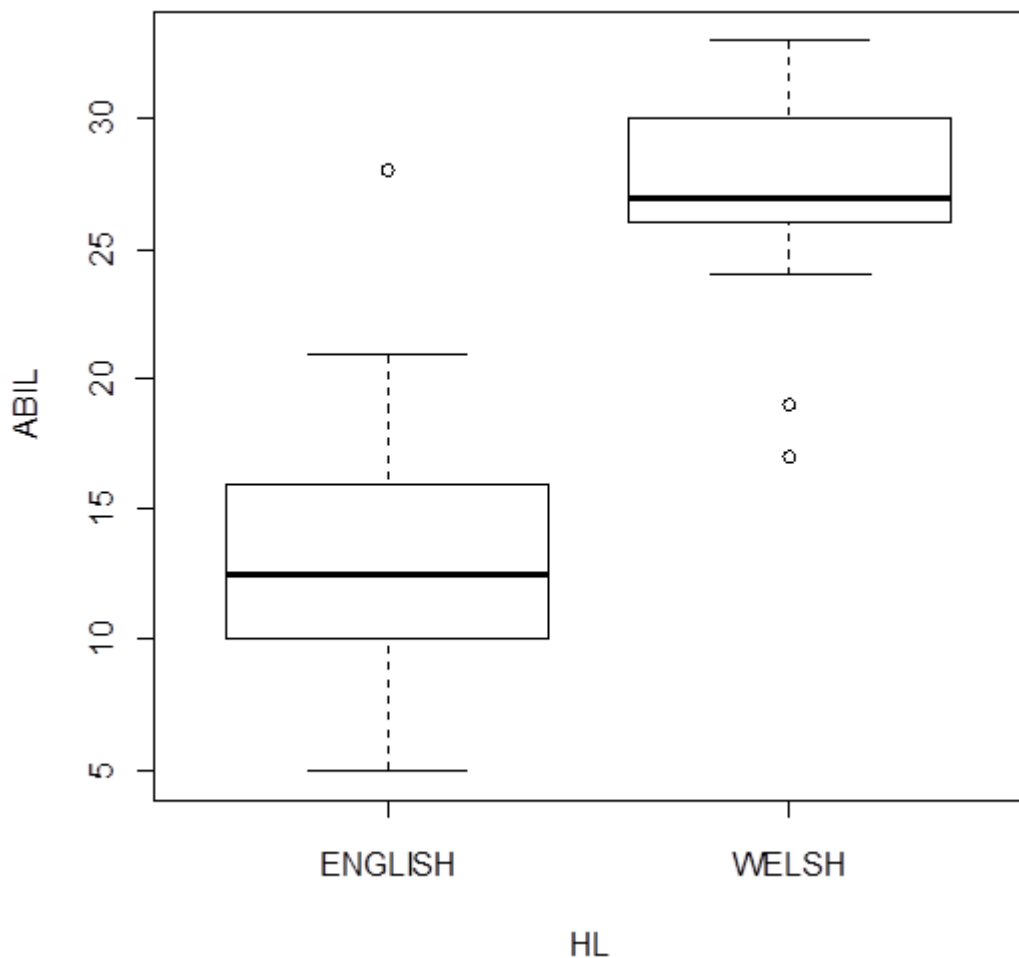


Figure 5.6: Participant ratings for self-reported ability by home language.

It is striking that, with the exception of three outliers, the ranges between the two home-language groups do not overlap. This is not wholly unexpected, given the results of previous studies which show that increased input aids acquisition and that adults who acquired Welsh via parental transmission have a better command of idioms and vocabulary than those from English-speaking or mixed language homes (e.g. Gathercole & Thomas 2009: 233).

Participants living in a Welsh-dominant area do not rate their abilities as higher than those living in an English-dominant area. The difference between responses from Mold and Caernarfon was not significant ($U=99, p=0.604$). Whereas previous studies

claim that the extent to which Welsh is spoken in an area influences the extent to which they acquire and use the language, the data here suggest that this does not affect how speakers themselves see their ability. In light of the correlation between home language and ability, the participants from Mold and participants from Caernarfon were compared *within* each home-language group.

Area is not significant factor within the English home language subset ($U = 21$, $p = 0.7461$). The same claim is valid for those from Welsh-speaking homes, as there was no significant difference between area and ability in Welsh for the Welsh home language subset ($U = 30$, $p = 0.1608$). This might seem surprising at first, especially in the case of those who are acquiring Welsh as a L2, as it could be expected that there would be more contact with the language. This is often not the case, however, as a number of proficiency tests on French-English bilinguals in Canada have yielded no significant differences in terms of area (Genesee 1983: 33). Furthermore, Genesee's work on language use in French-dominant bilingual cities such as Montréal has shown that, even when the opportunity to access the immersion language is widespread, the take-up is particularly low amongst immersion students (Genesee 1983: 33). The use of Welsh amongst the participants is dealt with in the following section, in which the correlation between ability and use will also be explored.

5.3.4 Language use

Question 26 asked participants to specify what they considered the main language they used when talking with friends, phoning helplines, and completing official forms²⁸.

Question 27 asked them to specify how often they accessed certain media in both

²⁸ Participants were also asked for information on shops and workplace but this was not included.

languages. Answers were scored in order to catalogue language use quantitatively (§5.2.2).

Despite a higher proportion of the population speaking Welsh in Caernarfon than in Mold, area does not have a significant effect on the overall reported use of Welsh in North Wales ($U=121, p=0.1062$). Speaker sex also plays no significant role in the use of Welsh ($U=93.5, p=0.9221$). This corresponds with both language attitudes and self-reported ability as neither area nor sex produced significant trends.

The participants' home language was highly significant, however, and means that those who speak Welsh at home are likely to use Welsh outside of the home and access services and media in Welsh ($U=13, p<0.001$). Figure 5.7, below, shows the range of scores by home language:

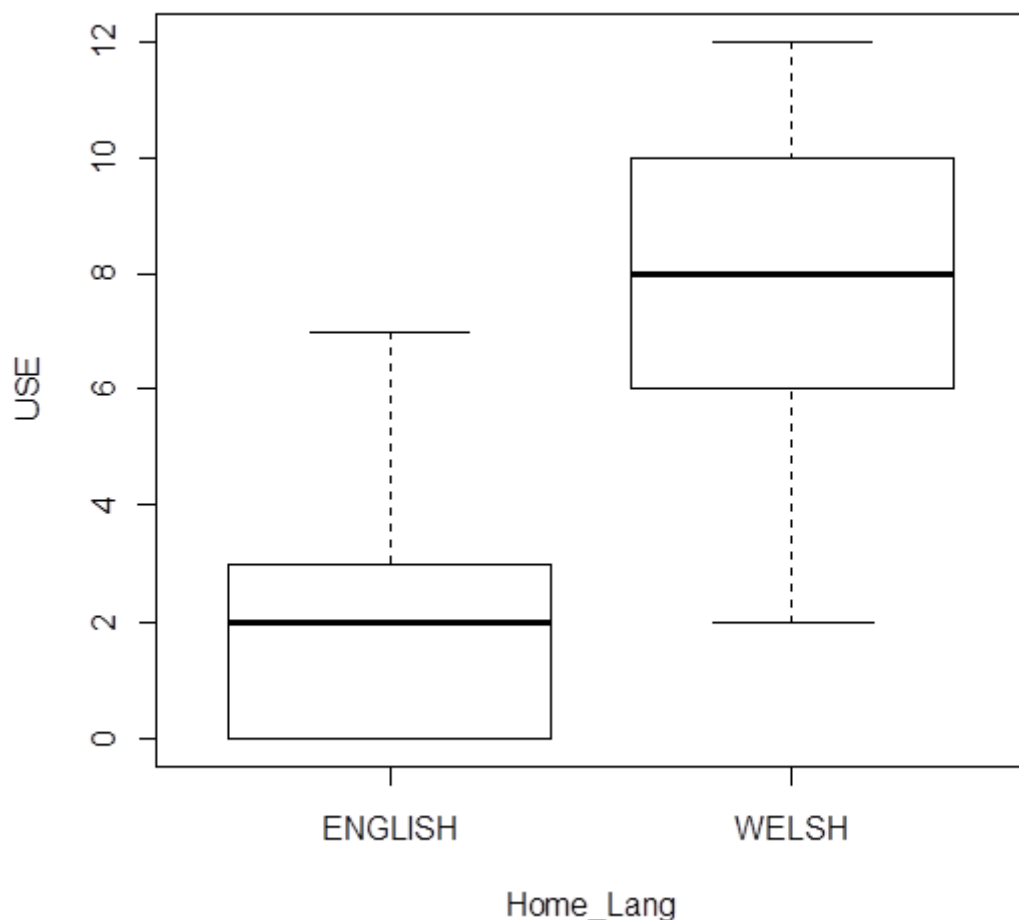


Figure 5.7: Participant scores for language use by home language.

Figure 5.7 shows that the majority of participants in the English home-language group ($n=10$) scored between 0 and 3 for their use of Welsh. These participants all spoke English with their peers and accessed English media more frequently than Welsh media. The remaining four speakers in this group tended to come from Caernarfon, speak both Welsh and English in the peer group, and access some media in Welsh as frequently as their equivalent in English.

Living in a Welsh-dominant community does not, however, guarantee increased usage of Welsh amongst those from monolingual English homes. The difference between Mold and Caernarfon amongst those from English-speaking homes was not significant ($U=37.5$, $p=0.08392$). This is noteworthy when considered with the results

for ability, where again there was no significant difference between those from Caernarfon and Mold, and suggests that living in Welsh-dominant area does not necessarily result in the normalisation of speakers from English-speaking homes to the Welsh language.

The dominance of Welsh as a community language in North West Wales is emphasised in both the previous literature, and has been reflected in the commentaries given by some participants who stressed that Welsh was necessary to communicate in the community (§5.3.2.1). Although a high percentage of Welsh-English bilinguals in an area undoubtedly increases the likelihood that Welsh will be spoken more frequently, the results reported here suggest that many Welsh-speakers from monolingual English backgrounds are able to avoid using the language to a large extent. Siân (Caernarfon Welsh) spoke about how she views friendship groups in the school, and states that:

8. ‘Mae gynnych chi’r criw Cymraeg a’r criw Saesneg [...] a’r half and half ‘de, hanner Cymraeg, hanner Saesneg. [...] Iaith ydy’r clics mwy ‘na dim byd’ [You’ve got the Welsh crew and the English crew [...] and the half and half like, half Welsh half English. [...] Language is the cliques more than anything].
Siân (Caernarfon Welsh).

This corresponds to Musk’s (2006) distinction between Welsh-dominant, English-dominant, and ‘floaters’. Another possibility is that some students are being non-convergent in their modes of talk and speaking their own preferred languages. Gafaranga & Torras i Calvo (2001: 212) differentiate between normative and non-normative conduct in bilingual contexts. They present examples which show two separate cases of bilingual modes of talk. In the first example speakers become aware that their talk is divergent (that they are speaking in different languages) and one speaker accommodates to the other speaker’s language. This shows that for the interlocutors non-convergence is non-normative behaviour. In another example, however, the fact that speakers continue to speak different languages in conversation

leads Gafaranga & Torras i Calvo (2001: 212) to conclude that this is normative conduct for the speakers. In Caernarfon, this certainly seemed to be the case for many interactions and there were many instances where conversations between participants and teachers could be counted as non-convergent modes of talk.

Figure 5.6 shows that the range of use of Welsh for those participants from Welsh-speaking homes is larger than those from English-speaking homes. Those who used Welsh less came from Mold and, for this reason, there was a significant difference between those from Welsh-speaking homes who live in Caernarfon and those who live in Mold with regards to language use ($U=34, p=0.046$). One possibility is that the dominance of English in Mold results in the normalisation of the language in domains which are not associated with the family. This would include the peer group and, perhaps but not necessarily, cultural activities and media access.

Both observation and statements made by participants suggest that peer group dynamics in Mold are different, and it is clear that the main language of larger peer groups is English, as has been found in studies of other schools in areas which are less bilingual than Caernarfon (Mayr et al., forth.). An interesting account of the experience of those from Welsh-speaking homes in Mold is given by Glenys. Glenys, herself from a Welsh-speaking home in Mold, scores highly for opinion of Welsh (43 out of 56) and ability (27 out of 35) in Welsh. She also comes from a family who is highly involved in the Welsh-speaking community. Glenys explained that it was normal to speak Welsh with friends in primary school but that people switch languages shortly after starting secondary education. She says that:

9. ‘On i’n siarad Cymraeg gyda ffrindie fi [o’r ysgol Gynradd] a wedyn dw i’n cofio oedd ‘na rywun yn galw fi[‘n] swot yn siarad Cymraeg ac on i’n teimlo rili upset [...]. Dw i dal efo ffrind gore fi [...] yn siarad Cymraeg ond Saesneg dan ni’n siarad [gyda phobl eraill] rili’ [I used to speak Welsh with my friends [from primary school] and then I remember there was someone who used to call me swot for speaking Welsh and I felt really upset [...]. I still speak Welsh with my best friend but it’s English that we speak [with other people] really].
Glenys (Mold Welsh).

The data from her interview, such as the statement above, indicate that she is aware of ‘fitting in’ with her peers and even claims that she does not want to get picked on for using Welsh with the peer group. In the English interview, Glenys went on to talk about how she strikes a balance between the Welsh language and her family, and the dynamics of her peer group:

10. ‘I don’t speak Welsh with, like, loads of people from school, but if friends come to my house everybody knows to speak Welsh because like my Mum would go absolutely crazy [...]. I’ve decided that it’s kind of better not to get bullied and speak English [...]. You don’t get bullied actually but... erm...yeah [...]. When I have children I want to speak Welsh to them and go to a Welsh-speaking school and stuff’.
Glenys (Mold Welsh)

The dynamics of language use in schools where English is dominant is understudied, and previous studies have focussed on areas where Welsh is more widely spoken in the local community (e.g. Morris 2007; Musk 2006). These brief extracts suggest that, just as English is dominant in the local community, English is dominant in the peer group. Musk’s (2006) distinction between Welsh-dominant, English-dominant and floaters (see above), does not apply here, and English dominates life outside of the classroom.

There is a highly significant correlation between use of Welsh and self-reported ability ($r=0.620, p<0.001$). Figure 5.8 shows this correlation across the entire dataset:

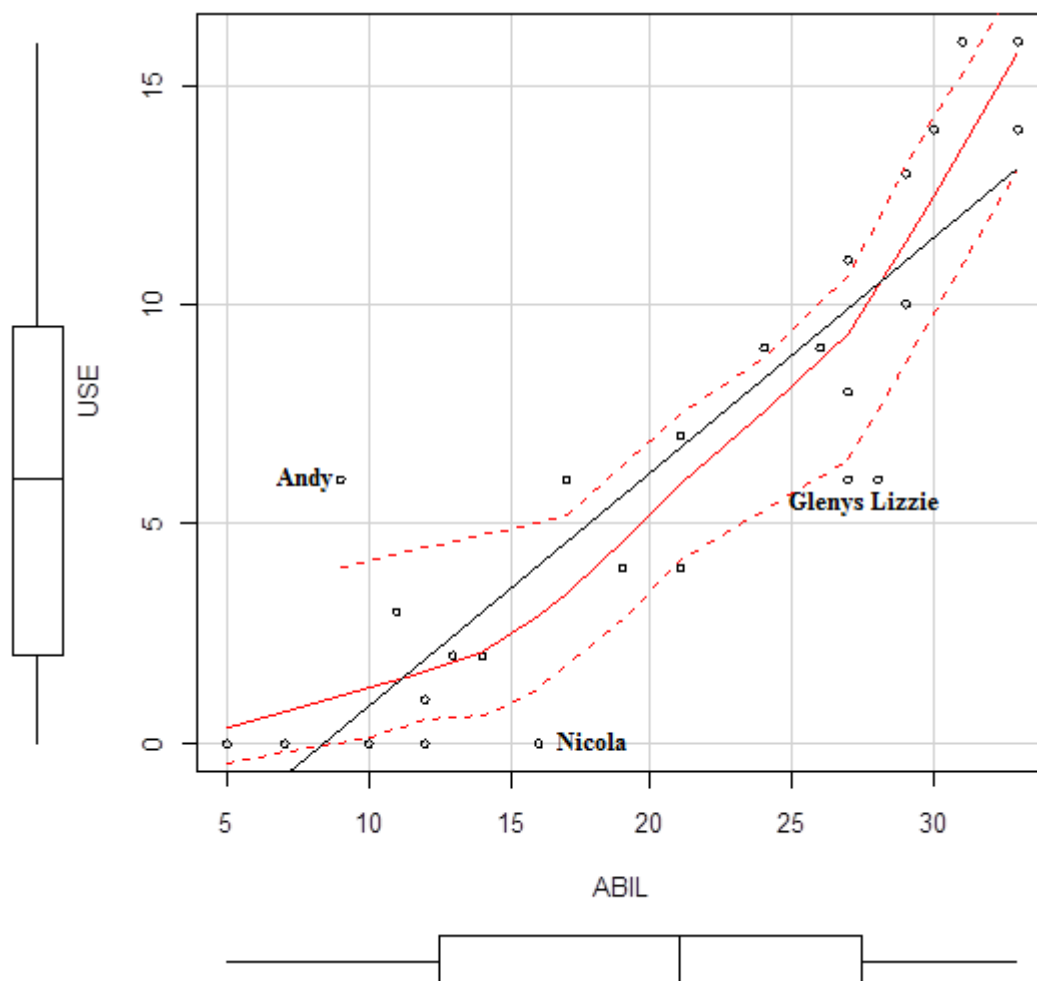


Figure 5.8: Correlation between self-reported ability and language use.

Figure 5.8 shows that language use increases amongst those who have more confidence in their Welsh-language abilities. There are, however, a few exceptions. We have dealt with Glenys above, and in light of the qualitative evidence it is not surprising that her self-rated ability is high but her language use is relatively low. Andy (Caernarfon English), has low self-rated ability but relatively high use. This score comes from him listening to Welsh-language radio and attending Welsh-language theatre productions as frequently as he did in English (daily and monthly respectively). Perhaps most importantly, Andy and Lizzie (also Caernarfon English) are the only two participants

from English-speaking homes to belong to friendship groups where they are the only people from English-speaking homes. Nicola (Mold English) also has a high self-rated ability compared to her actual language use score. Though her score was low, she did listen to the radio and read books in Welsh every few weeks, which was more frequently than she did in English. She also agreed that her written Welsh was better than her English (scoring 5 out of 7) which contributed to her high score in self-rated ability.

5.4 Discussion

Studies of both second language acquisition and bilingual first language acquisition rightly emphasise the importance of home language and community language on acquisition. These factors relate to input and exposure to language and, although they tend to be reliable indicators, researchers in this field are increasingly calling for more comprehensive data on behaviour in order to assess exposure more rigorously (e.g. Paradis 2011; Bedore et al. 2012). At the same time, developments in variationist sociolinguistics have shown that the constraints on variation are shaped by the socio-cultural history of an area and shared social practices and norms. Examining language variation in the context of Welsh-English bilingualism provides the opportunity not only to discover whether input factors influence language variation, but whether these factors create distinct groups of speakers who have shared behaviours in terms of their language attitudes and use.

The data examined in this chapter have shown that positive opinions towards Welsh are moderately correlated with how a speaker rates her ability. In turn, ability is highly correlated with language use. This provides an indication that how much speakers choose to use Welsh is intertwined with how they feel about Welsh and how

confident they feel as Welsh speakers. We cannot be certain that it is the low use of Welsh which causes speakers to feel less confident and less positive about the language, or whether it is a consequence of these feelings. The correlations between these factors suggest, however, that the extent to which a Welsh-English bilingual engages with Welsh varies in North Wales and therefore could act as an independent variable on language variation in both English and Welsh.

The correlations between the questionnaire data and the other factors indicate that speakers' engagement with Welsh is not independent. Instead, it is behaviour, or in the case of Welsh usage, a social practice, which tends to be shaped by speakers' linguistic backgrounds. The quantitative data have shown speakers' those from Welsh-speaking and English-speaking homes engage differently with Welsh. Those who acquire Welsh via parental transmission engage with Welsh language and culture much more frequently than those from monolingual English homes.

A further distinction can be made between Welsh home-language speakers in Caernarfon and Mold as those in Mold tend to engage less frequently with the Welsh language. A possible explanation for this lies in the peer group dynamics of both groups. In Caernarfon, language-specific peer groups and non-convergent modes of talk are common. This means that those from Welsh-speaking homes are the dominant group and their peer groups and cultural activities are largely played out in the Welsh language. In Mold, there are no language-specific peer groups as communication is largely through English. The use of Welsh with peers appears to be stigmatised in Mold, which means that those from Welsh-speaking homes are using the language less than those from Caernarfon in situations outside of the home. There were, however, hints that communication between individuals belonging to the Mold Welsh group would be

through Welsh and examples of ‘brave’ individuals who engaged in non-convergent modes of talk were given.

While the minority Mold Welsh group tend to assimilate to the linguistic and cultural norms of the dominant Mold English group, the minority Caernarfon English group behave quite differently. Those who come from monolingual English homes and live in a Welsh-dominant area tend to form peer groups which exclusively use English. There were, of course, exceptions (Lizzie and Andy, see §5.3.3) who did become normalised into Welsh-speaking peer groups but on the whole there is little orientation towards Welsh amongst those from monolingual English backgrounds in the sample.

Finally, it is perhaps not surprising that speaker sex did not correlate with any of the attitudinal data. None of the previous accounts of Welsh acquisition or use (§2.1.3) have found sex to be a significant indicator. Furthermore, the societal roles ascribed to males and females are perhaps less pronounced in North Wales than in many other regional minority language bilingual situations, where language proficiency and use has differed between males and females due to differences in social position (e.g. Gal 1978; see also Ehrlich 1997).

5.5 Summary

This chapter has examined the attitudinal and usage data elicited from participants at the end of their final recording session. A number of correlations were discovered between attitudes towards Welsh, self-reported ability and language use. In addition, there were a number of correlations between these themes and the independent variables area and home language.

Overall attitudes towards the Welsh language were positive, and participants are in favour of Welsh-medium education and language planning measures which fosters

the use of Welsh in Wales. They also tended to attribute positive values to the language and saw it as friendly, useful, and beautiful. This support was not universal, however, and there was a moderate correlation between opinions towards Welsh and self-reported ability. In other words, those who rated themselves as more competent users of Welsh tended to have more positive attitudes towards the language.

Speakers who came from Welsh-language homes had significantly higher scores for ability in Welsh than those from English-language homes, regardless of exposure to Welsh in the community. Despite this, however, speakers from English-language homes tended to disagree that they needed to improve their Welsh which may be due to their low use of Welsh outside of the classroom. The low use of Welsh amongst the English home-language group was the main tendency across North Wales. This was shown to be primarily due to peer group. In Caernarfon, participants tended to belong to a peer group based on their home language, whereas in Mold, English was the language of all peer groups.

In short, the chapter has shown that home language and community are not merely factors which describe a participant's exposure to Welsh, but partly correlate with ability, use, and attitudes. It remains to be seen whether home language and area influence variation and it is to the analysis of the dependent variables that we now turn.

6 Degree of velarisation in the production of alveolar laterals

6.1 Introduction

Northern varieties of both Welsh and Welsh English are reported as being heavily velarised in all word and syllable positions (*cf.* S. Jones 1926: 10; G.E. Jones 1984: 49; Wells 1982: 390; Thomas & Thomas 1989: 33; Penhallurick 1991: 146–149; Penhallurick 2007: 162). Velarised productions of /l/, known as dark [ɫ], involve both an apicoalveolar closure and a dorsovelar or dorsopharyngeal constriction (Recasens *et al.* 1995: 38). This differs from non-velarised productions, known as light [l], which involve only an apicoalveolar closure and are reported as being a feature of southern Welsh and Welsh English (see references above) and many other varieties of English (see Wells 1982; Carter 2003 for an overview).

Acoustic and articulatory studies of /l/ have shown, however, that velarisation is *gradient* (Sproat & Fujimura 1993; Recasens *et al.* 1997; van Hofwegen 2009), and the degree to which /l/ is velarised differs between syllable positions (with [ɫ] being more velarised in coda position than in onset position) and varieties (e.g. Sproat & Fujimura 1993; Recasens *et al.* 1997; Carter & Local 2007). In addition, recent studies of /l/-velarisation within a variationist sociolinguistics framework have indicated that factors such as speaker age, and socio-economic status may also produce significant trends (e.g. Mathisen 1999; Stuart-Smith 1999; van Hofwegen 2011), and that home language and locality may influence velarisation in bilingual speech (Simonet 2008; 2010; Davidson 2012).

This chapter investigates the extent to which, firstly, both Welsh and the English of Welsh-English bilinguals can be described as phonologically converged in all syllable and word positions. This is achieved by an analysis of raw formant data (which

reflect the degree of velarisation) and comparison with previous studies. Secondly, variation and phonetic divergence are considered in a series of separate multivariate analyses on /l/ in word-final coda, word-initial onset, and word-medial intervocalic positions. In these analyses, both the English and Welsh data are combined, and a series of pairwise interactions are tested, in order to ascertain whether the language being spoken is a factor which influences variation. Where this is the case, a more traditional comparative sociolinguistics approach is adopted (Tagliamonte 2002; §1.1.2) and separate analyses are run on both languages. This will allow us to assess whether variation is identical in both languages, and whether different norms emerge for different groups of bilinguals.

The decision to examine the alveolar lateral was informed by a gap in our knowledge of varieties in contact: it is well known that languages in contact converge over time as structural differences between them disappear. What is understudied, however, is whether there remain language-specific phonetic variation between features which are said to have undergone convergence and whether this variation is sociolinguistically conditioned.

The fact that both Welsh and Welsh English are reported as being converged with respect to this feature, but have not been compared acoustically²⁹, raises a number of questions which are relevant for an analysis of Welsh-English bilingual speech:

1. Are there overall phonetic differences between Welsh and English and differences between word-initial onset, word-medial intervocalic, and word-final coda positions? Does this suggest that /l/ is phonologically dark?

²⁹ There have been two studies which examine /l/-velarisation in Welsh acoustically (Ball & Williams 2001; Carter & Cooper 2012), but none which compare Welsh and English and examine the role of extra-linguistic factors on variation.

2. In each position, to what extent do the neighbouring sounds, syllable stress, and duration of /l/ influence the degree of /l/-velarisation?
3. Do the extra-linguistic factors of speaker sex, home language, area, and style (interview or wordlist) produce significant trends?
4. Which individual speakers, if any, maintain a distinction between /l/ in English and Welsh, and do those from similar linguistic backgrounds tend to behave similarly?

Following a number of previous studies (e.g. Recasens *et al.* 1995; Carter 2003; Carter & Local 2007; de Leeuw 2009; Simonet 2008; 2010; van Hofwegen 2011), the degree of /l/-velarisation is measured acoustically. The constriction created in velarised productions is reflected acoustically in a raising of F1 values and a lowering of F2 values (Simonet 2008: 222-223). This study uses the arithmetic difference between bark-transformed F1 and F2 values as a measure of the degree of velarisation (cf. van Hofwegen 2011).

A review of the literature on /l/-velarisation follows in §6.1 and the methods of data analysis are presented in §6.2. The results are given in §6.3, where it is shown that the degree of /l/-velarisation is influenced primarily by syllable position (§6.3.1). As has been found to be the case with other languages, /l/ in both Welsh and English tends to be darker in word-final coda position than in word-initial onset or word-medial intervocalic positions. For this reason, the results are reported according to syllable position (§§6.3.2–6.3.4) and it will be shown that, despite variability in the data, there are indications that speakers (and female speakers in particular) have distinct phonetic categories for /l/ in both Welsh and English in word-medial onset and word-medial intervocalic positions. The individual differences between speakers are explored in §6.3.5. This section investigates which individual speakers have distinct phonetic

categories between Welsh and English, and aims to ascertain whether there is a tendency for certain groups to do this over others. The results are summarised in §6.4 and discussed in terms of the interaction between bilinguals' Welsh and English.

6.2 /l/

6.2.1 Clear and dark /l/

The dorsovelar or dorsopharyngeal constriction involved in velarisation has led to a categorical distinction between dark and light /l/. In the former, this constriction occurs with an apicoalveolar closure, whereas in the latter only the apicoalveolar constriction occurs (cf. Browman & Goldstein 1995; Recasens 2004: 594; Simonet 2008: 223). Treating /l/-velarisation as categorical leads to a three-way distinction between languages with light realisations of /l/ (e.g. German, Spanish, French and Italian), languages with dark realisations (e.g. Catalan), and languages where light allophones occur in initial position and dark allophones in final position. This is the case for many varieties of English, where /l/ is said to be light in initial onset position and dark in final coda position (this is disputed by some however; cf. Yuan & Liberman 1999).

Phonetic differences are apparent between dark and light varieties (with F2 being higher in clear varieties and lower in dark varieties; see Recasens 2012). The boundary between the two is not wholly clear, though reviews of the literature show F2 values for dark varieties in contexts either preceding or following /a/ having a range of around 924Hz to 1450Hz for dark /l/, whereas varieties of clear /l/ have a range of 1681Hz to 2195Hz (Recasens & Espinosa 2005: 3). These values are somewhat arbitrary, due to differences in data elicitation and measurement techniques and linguistic influences, though they do provide an indication of the differences between varieties which have either dark or clear /l/.

Phonetic differences are also apparent within dark and light varieties, and acoustic data has shown that velarisation is a gradient feature. Such differences are largely allophonic, with /l/ in syllable initial position being lighter (having a higher F2) than /l/ in syllable final position regardless of whether /l/ is light or dark. In varieties with either light or dark /l/ these differences have been found to range between 200-300Hz, whereas these differences are larger in varieties with a light/dark distinction (Recasens 2012:381).

This phonetic *degree* of /l/-velarisation has also been shown to be influenced primarily by speaker sex, with females producing less velarised tokens due to differences in the size of the vocal tract. Acoustic studies of /l/ therefore tend to either compare males and females separately (e.g. Recasens *et al.* 1997; de Leeuw 2008), or use normalisation in order to minimise differences between males and females (e.g. Simonet 2010; van Hofwegen 2011). Neighbouring vowels also influence velarisation, and lighter /l/s tend to be produced when in the context of front vowels. The reason for this resistance lies in the articulation of velarised /l/ which relies on dorsum lowering and retraction, and which contrasts with tongue raising and fronting for the production of [i] (Recasens *et al.* 1995: 37). Velarisation has been shown to be affected by duration of the segment in certain varieties of English and appears to be lighter in tokens of a shorter duration (Sproat & Fujimura 1993; Huffman 1997; Carter 2003; van Hofwegen 2010).

6.2.2 Measuring /l/ acoustically

Phoneticians have employed various techniques to measure /l/, including X-ray (e.g. Sproat & Fujimura 1993), ultrasound imaging (e.g. Wrench & Scobbie 2003; Carter & Cooper 2012) and acoustic analyses (e.g. Carter 2003; Carter & Local 2007; van Hofwegen 2011). The spectrographic analyses have been fruitful as the technology is

widely available and can be applied to large numbers of tokens. Furthermore, despite being susceptible to coarticulatory influence from neighbouring vowels, liquids generally have a clear formant structure which can be distinguished from neighbouring sounds (e.g. Espy-Wilson 1992; Narayanan *et al.* 1997).

Acoustic studies have used Centre of Gravity (CoG) measurements and formant values. Van Hofwegen (2011: 382) comments that ‘Center of Gravity involves combining spectral prominences of the high frequency formants to create a preemphasized signal, which can be converted into an auditory excitation pattern that is scaled in decibels’. Hawkins & Nguyen (2004) found that centre of gravity values did not show coarticulation effects as precisely as formant values. Formant analyses generally focus on F1 and F2 values, or the difference between them. Velarisation affects the first two formant values, F1 and F2, by causing a rise in the former and a lowering in the latter (Recasens 2004: 594). The more velarised /l/ is, the smaller the difference between the two formant values.

There is a tendency for phonetic studies which examine /l/-velarisation to examine either male speech (e.g. Recasens *et al.* 1995; Carter 2003; Recasens 2012) or, less frequently, female speech (e.g. Huffman 1997; Carter & Cooper 2012) in order to control for physiological differences. Recently, more sociolinguistic work has merged male and female data and normalised the formant values (e.g. Simonet 2010; Van Hofwegen 2011). Normalisation is a technique which is used extensively in sociolinguistic work on vowels (see Flynn 2011 for an overview). Normalisation aims to eradicate differences in formant values which may occur due to differences in the shape of the vocal tract.

6.2.3 /l/ in previous studies of bilingualism

There are a number of studies which examine the acquisition of /l/ in bilinguals (e.g. Leopold 1947; Burling 1971; Holm & Dodd 1999). Most studies focus on bilinguals whose languages have different phonological /l/, and find that they maintain a distinction between dark and light /l/. Khattab (2002) examined the acquisition of /l/ in Arabic-English bilingual children who were growing up in Yorkshire (England). As Khattab (2002: 335) states, ‘/l/ was chosen due to the existence of different patterns for clear and dark variants in its production in English and Arabic that vary according to contextual and dialectal factors’. It was found that despite interaction between the two languages in the speech of the parents, where clear /l/ was often found in all positions in parents’ English, the children kept the two systems apart in most situations and produced rates of clear initial /l/ and dark final /l/ which compared with their monolingual peers (Khattab 2002: 351).

It has been shown that there is a phonetic influence, however, between languages where /l/ is light in one variety and dark in the other. Simonet (2008; 2010) has investigated the interaction between the phonetic systems of Catalan-Spanish bilinguals in some detail. Through an examination of F2 bark values, the arithmetic distance between F2 and F1, Simonet (2010: 674) found that /l/ was different in Catalan and Spanish when it was produced by dominant speakers in the respective languages. Catalan-dominant speakers tended to produce darker /l/ in their Spanish whereas Spanish-dominant speakers produced lighter /l/ in Catalan. This leads him to conclude that the speakers transferred the phonetic characteristics of their dominant language into their non-dominant language (Simonet 2010: 676). Furthermore, most speakers tended to maintain a strict division between laterals in Spanish and Catalan, although Spanish-

dominant females behaved differently and there was no significant difference between instances of /l/ in both languages.

It has also been shown that the influence of one language on another in a bilingual's repertoire can affect either F1 or F2. De Leeuw (2008) examined language attrition in German-English bilinguals in Canada. Whereas /l/ is relatively clear in word-final position in German, it is velarised in Canadian English. Participants, who had all acquired German natively before moving to Canada, were compared with both monolingual English and Germans. Interestingly, the bilinguals performed the same as the monolinguals in each language with respect to F2 values. However, the F1 values in speakers' German were much higher than German monolinguals and resembled values in Canadian English. This leads de Leeuw (2008: 131) to conclude that not only is this a sign of language attrition, but also that attrition can affect the F1 and not the F2. This suggests that both dimensions should be taken into account.

Both Simonet (2008; 2010) and de Leeuw (2008) use Flege's Speech Learning Model (SLM, see Flege 1995; 2007; Flege *et al.* 2003; §3.1.3) in order to account for differences between his speakers. Recall that, according to the model, sounds in the L2 which are perceived to be similar to sounds in the L1 may be assimilated (where they are converged in the speakers' system), a new category may be formed for the L2 sound, or the categories may become dissimilated (where to avoid confusion both sounds may diverge and differ from monolinguals; see Flege 2007: 371).

The studies outlined above have shown that phonetic differences in the production of /l/ can be expected where phonologically speakers maintain a distinction between their languages. It is not clear whether phonetic differences between languages exist where languages are said to be phonologically converged and this is a contribution made by the current study.

6.2.4 /l/ in the Welsh and English of North Wales

Accounts of Welsh dialects note /l/ is invariably dark in northern varieties of Welsh (Thomas & Thomas 1989: 33). It also appears in all positions in northern varieties of Welsh English, and is noted as being a feature in the speech of both bilinguals and monolinguals (Penhallurick 1991: 146–149). One claim that velarisation may vary in Welsh is made by G.E. Jones (1984: 49), who notes that ‘in final position, this dark quality occurs regardless of the nature of the vowel context, but it is particularly marked in the context of the central vowels [ɨ] and [ɨ̞] [...]; medially, however, in the context of the front vowels [i, ɛ, a], the lateral is less dark’.

Ball & Williams (2001: 112) report the formant structure of the lateral productions of two speakers; one from northern Wales and one from southern Wales.

The results of their study are reported in Table 6.1 below:

Table 6.1: Mean formant values for /l/ from two Welsh speakers (from Ball & Williams 2001: 112).

	Context	F1 (Hz)	F2 (Hz)	F3 (Hz)
Northern Welsh speaker	#_V	300	700	2200
	V_V	300	850	2000
	V_#	300	750	1800
Southern Welsh speaker	#_V	250	1000	2500
	V_V	250	1000	2500
	V_#	250	1000	2500

As can be seen from the table, the northern Welsh speaker produces darker /l/ than the southern Welsh speaker who has relatively light (and identical) realisation in all positions. This difference can be seen in the F1 and F2 values, as F1 is higher and F2 is lower for the Northern Welsh speaker (§6.1). Ball and Williams’ (2001) study is more exploratory however, and does not provide information on the number of tokens or even the sex of the speakers.

More recently, Carter & Cooper (2012) examined F2 values of 10 female speakers from North Wales, South Wales, and Patagonia. They compared values from

speakers' productions of the lateral approximant with those of the lateral fricative. The lateral fricative /ɬ/ is a feature of Welsh (§2.2.3.3) which is represented orthographically as <ll> (e.g. *llwy* 'spoon'). The average F2 values for the lateral approximant are reported in Table 6.2 below:

Table 6.2: Median F2 values for the lateral approximant of Welsh speakers from North Wales, South Wales, and Patagonia (after Carter & Cooper 2012).

Median	Initial (Hz)	Initial Mutated (Hz)	Medial (Hz)	Final (Hz)
North Wales	1344	1412	1255	1129
South Wales	1397	1411	1547	1290
Patagonia	1620	1605	1586	1498

Carter & Cooper's (2012) data comes from recorded conversations and tokens were extracted from the speech of three female speakers. There was a significant difference between northern Welsh and the other varieties ($p < 0.001$) and in Northern Welsh F2 was significantly darker in final position than in word-initial and word-medial positions ($p = 0.043$)³⁰. The findings from this study indicate that, despite small differences between North and South Wales in initial position, Northern Welsh is still dark compared to Southern Welsh and Patagonian Welsh, and that word position influences phonetic variation. This study builds on these findings by including more speakers from both sexes, and examining the role of other linguistic and extra-linguistic factors in Welsh and English.

6.2.5 /l/-vocalization and voiceless /l/

Another factor to be taken into consideration is /l/ vocalization, which is more likely to affect dark [l] in syllable final position (Simonet 2008: 225). Vocalized instances of /l/ resemble a back vowel (Hardcastle & Barry 1989) and are common across languages as either an optional feature subject to sociolinguistic variation or a phonologized

³⁰ See Carter & Cooper (2012) for the analysis of the alveolar lateral fricative and Jones & Nolan (2007) for an acoustic study of Welsh fricatives.

categorical feature (Simonet 2008: 225). Previous studies of vocalized /l/ as a sociolinguistic variable will not be reviewed here (see Hall-Lew & Fix 2010 for an overview of the literature), though there are two main points which are relevant for the present study.

The first point is that /l/ vocalization is a feature of many varieties of British English (as well as US, Australian, and New Zealand), and has been found to correlate with various sociolinguistic factors (Hall-Lew & Fix 2010). Thus, it would not be wholly surprising if there are instances of vocalization in bilinguals' English or Welsh. Secondly, /l/ vocalization is hard to measure acoustically as both /l/ and back vowels share the same spectral characteristics. For this reason, all tokens of /l/ were subject to auditory coding by the author prior to running Praat scripts which automatically collect formant data. The same consideration was given to voiceless /l/, as partially devoiced or voiceless /l/ can be expected when /l/ occurred in C#_V or C_V positions following voiceless aspirated plosives. Let us now turn to the methods used for the investigation of /l/-velarisation.

6.3 Methods of data analysis

6.3.1 Coding for /l/

240 tokens of /l/ were transcribed for each speaker³¹: 60 tokens were coded in temporal order after the first ten minutes of the sociolinguistic interviews in Welsh and in English. No more than three instances of the same word were transcribed per speaker, and each speaker produced enough tokens in their interview. This yielded 120 tokens from interview data for each participant. A further 60 tokens in each language were obtained via wordlists at the end of each interview ($n=7680$).

³¹ ELAN (Max Planck Institute for Psycholinguistics 2008) was used for transcription.

Tokens which were switches from English were not recorded (there were very few switches into Welsh during the English interviews), though recent loanwords were recorded. The most pertinent examples are the tag *like*, which appeared frequently in Welsh interviews but was not counted, and *lot* ‘lot’, which was included (up to three times per speaker). The reason for this is that *like* is a direct switch from English whereas ‘lot’ has been adopted into Welsh, assigned a sex (feminine) and plural suffix (-*iau*), and appears in the dictionary.

Similar to the other Celtic languages, Welsh has a system of initial consonant mutation, whereby the initial segment in the canonical form changes to another consonant, and this is triggered by either the preceding lexical item or the grammatical status of the word (Borsley et al 2007: 223). The voiced lateral fricative /ɬ/, represented orthographically as <ll> (see §6.1.5 above), is part of the soft mutation system, and mutates to the lateral approximant /l/ in certain environments³². Due to the low number of tokens which had undergone mutation (*n*=48), no distinction was made in the coding.

All segments were listened to individually. At this stage, any instances of clearly light, vocalised, voiceless, deleted /l/, or acoustically unclear tokens were noted. 5.05% of tokens (*n*=388) belong to this category and Table 6.3 provides more information:

Table 6.3: Number of tokens and percentage of entire dataset not submitted to formant analysis.

Classification	<i>n</i>	% of total dataset
Deleted	5	0.07
Vocalised	5	0.07
Voiceless	150	1.95
Unclear	227	2.96
Total	388	5.05

³² Details on the environments which trigger initial consonant mutation can be found in Borsley *et al.* (2007). In the dataset, all instances of soft mutation from /ɬ/ to /l/ were either due to a preceding preposition (e.g. *llefydd > i lefydd* (‘to places’) or the masculine possessive determiner (eg. *llyfr > ei lyfr o* (‘his book’)).

Only five tokens in the dataset were vocalised, and these were five instances of the Welsh word *ysgol* ‘school’. Despite being present in other varieties of UK English (§6.2.2), and being susceptible to sociolinguistic influences, it appears not to be a feature in the current dataset. Unfortunately, all of the unclear tokens come from two speakers, Andy (Caernarfon English) and Amy (Caernarfon Welsh), whose interviews were not of sufficient quality for acoustic analysis due to background noise. Having removed these tokens, there remained a total of 7292 tokens in the dataset.

Only the tokens found in the following contexts were included in the final analysis:

- Word-final coda position preceded by a vowel and followed by a pause or consonant.
- Word-initial onset position preceded by a pause or stop and followed by a vowel.
- Word-medial intervocalic position.

The above contexts minimise effects from resyllabification and morphosyntactic sensitivity. The resyllabification of /l/ would be expected where /l/ in word-final coda position is followed by a vowel, in cases such as at *heal it* (see Bermúdez-Otero 2007 for an overview). This effect has been minimised here by ensuring that all tokens were followed by a pause or consonant. Similarly, stem-final /l/ before a suffix has been shown to vary in darkness in word-medial onsets in stressed syllables (Hayes 2000). In words such as *healing*, for example, we would expect that /l/ is light in languages which make an allophonic distinction between /l/ in coda and onset position. This has been found not be the case (see also Turton 2012). Instances of stem-final /l/ before a suffix were not present in the dataset and a post-hoc analysis of the data showed that English

tokens were either monomorphemic or that the /l/ token was taken from the suffix itself, e.g. *family*.

Table 6.4 shows the number of tokens for males and females in each language and context:

Table 6.4: Environments in which /l/ was analysed and number of tokens per environment.

Sex/Language	Coda	Initial	Medial	Total
Male/English	556	389	367	1312
Male/Welsh	617	374	298	1289
Female/English	612	433	386	1431
Female/Welsh	614	376	307	1297
Total	2399	1572	1358	5329

6.3.2 Measuring /l/

The ELAN file was exported to Praat (Boersma & Weenink 2009) in order to segment tokens into individual sounds. Praat was set to 0.025 seconds window length, 30.0dB dynamic range, and 1.0mm dot size. The formant range was 0–4000Hz.

Where the lateral followed a vowel, in word-medial intervocalic position or word-final coda position, the onset of the lateral was marked at the first point where there was a decrease in intensity and an onset of F2 transition (Sproat & Fujimura 1993; Carter & Local 2007: 467; Simonet 2010: 668). When /l/ preceded a vowel, a marker was placed at the end of the transition out of the lateral which is characterised by the stability of F2 and increase in intensity (see Figure 6.1 below; Hofwegen 2011).

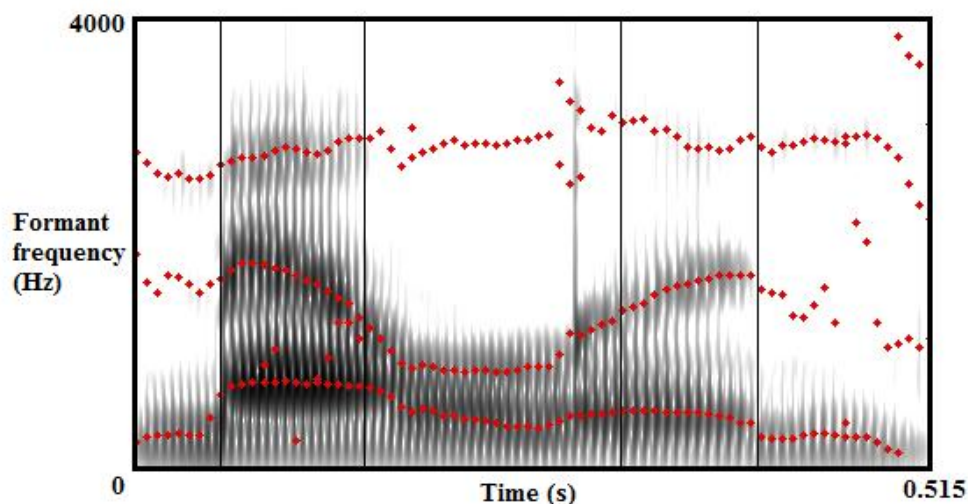


Figure 6.1: Spectrogram of 'melon'. Vertical lines show durational boundaries.

The beginning of F2 was used as an indicator of the beginning of /l/ after pauses and voiceless stops. Where /l/ followed voiced stops there was a clear transition into the liquid, marked either by an increase (bilabial stops) or decrease (velar stops) into the liquid. The end of laterals which preceded a pause was marked at the last point where F2 could be observed.

F1 and F2 values were taken at the midpoint of /l/, and the duration was recorded. In order to assess possible coarticulatory effects, namely the influence of the neighbouring vowel(s) on /l/-velarisation, the F1 and F2 values of any neighbouring vowels were recorded 30ms from the offset of a preceding vowel and at 30ms into the onset of a following vowel. Taking measurements at 30ms is arbitrary, but allowed for measurements to be taken at the steady state of the vowel. The arithmetic difference between the F2 at the midpoint of /l/ and the F2 at 30ms into the preceding or following vowel provides an indication of vowel frontness/backness. Front vowels have a higher F2 and therefore the distance between the F2 of front vowels and the F2 of the /l/ will be greater than for back vowels. If there is a positive correlation between the difference

between the two bark-transformed F2 values and degree of /l/-velarisation, then we can claim that /l/ is lighter in the context of front vowels (Van Hofwegen 2011: 383).

The data were collected using three separately adapted Praat scripts using Burg algorithms (/l/ midpoint, 30ms from the end of a preceding segment, and 30 ms into a following segment). Following extraction, formant frequencies which were highly divergent were checked and modified manually. This amounted to 13% of the dataset ($n=948$). A further 48 tokens per speaker were selected at random (12 per interview and 12 per wordlist) with the exception of the two speakers whose interviews had not been recorded clearly (see §6.3.1, $n=1513$). 51 of these tokens were modified (3.4%). In total, 33.75% of analysable tokens were manually checked following data extraction by the automated scripts ($n=2461$). 40.59% of these tokens were modified ($n=999$) which corresponds to 13.7% of the dataset.

The main measurement for analysis is the arithmetic difference between bark-transformed F2 (Z2) and F1 (Z1), taken at the midpoint of each /l/ token. The bark transform (cf. Traunmüller 1997) is a normalisation technique which does not require the measurement of all vowels– it is vowel intrinsic. Traummüller's (1997) formula was used to convert the formant values into Bark, where Z_i indicates the Bark value for a given formant and F_i indicates the formal value:

$$Z_i = 26.81/(1+1960/F_i) - 0.53$$

Bark transformation was preferred for this study which relies heavily on naturalistic speech and where enough tokens are not guaranteed. A further benefit of using a vowel-intrinsic measure is that data can be compared across languages. If a vowel-extrinsic measurement had been applied to the whole dataset it would have assumed that Welsh and English vowels are identical. If such a measure had been applied separately to the

Welsh and English data, the resulting values would not necessarily be comparable (Thomas & Kendall 2010; Flynn 2011: 3).

The decision to use a combined measurement of F1 and F2 (Z2-Z1) values was taken in light of previous research which shows that both formants influence velarisation (see §6.1.1; e.g. Carter & Local 2007). While a combined result does not show how the two formants influence this feature differently, this is not the theme of this study (see also van Hofwegen 2011). Having said this, an overview of the raw F1 and F2 values, as well as the combined Z2-Z1 values are given in §6.2.2 for comparison with other varieties.

The vast majority of studies of /l/ rely on laboratory data and are easily able to control for vowel position. Of all the studies cited above, only Hofwegen (2011) and Carter & Cooper (2012) look at naturalistic data and include preceding and/or following vowels. This study follows Hofwegen (2011) and the effect of the preceding and/or following vowel uses the bark-transformed F2 data from 30ms into the vowel. In the case of preceding vowels, the data is taken 30ms from the vowel offset, and in following vowels the data is taken from 30ms into the vowel onset. The effect of the vowel is measured by calculating the arithmetic difference between the bark-transformed F2 (Z2) of the /l/ at midpoint and the bark-transformed F2 (Z2) of the vowel at 30ms. It would be expected that the higher the distance between the two F2 values (Z2-Z2), the fronter the vowel (because vowel frontness is associated with higher F2). If this measure is a positive predictor on /l/-velarisation, this suggests that /l/ is less velarised in the context of neighbouring front vowels (cf. Hofwegen 2011).

6.3.3 Statistical analysis

Throughout this thesis, mixed-effects models using word and speaker as random effects were applied to the data using Rbrul (Johnson 2009) in the R statistical software

environment (R Core Development Team 2011). Mixed-effects models are able to estimate effects of both linguistic and extra-linguistic factors on continuous data (Johnson 2009: 362), and allow speaker and item to be integrated into the model as random effects (Baayen 2009: 275). When continuous data is the dependent variable in such models, a log-odds coefficient for each predictor is generated. These coefficients can be added together to show the correlation between factors (e.g. speaker sex and home language) and linguistic behaviour (Johnson 2009: 361). Language was used as a factor in each initial model, in order to ascertain whether the language being spoken by the bilingual was a constraint on variation. Where language was found to be significant, further models were run on the Welsh and English data separately. All of the factors used in the models are summarised in Table 6.5:

Table 6.5: Independent and dependent variables used in the mixed-effects model.

Dependent variable	Description
/l/-velarisation	Arithmetic difference between bark converted F2-F1 (Z2-Z1)
Independent variables	Description
Sex	Male/Female
Language	English/Welsh
Home language	English/Welsh
Area	Caernarfon/Mold
Style	Interview/Wordlist
Preceding/Following vowel	Arithmetic difference between bark converted F2 of /l/ midpoint and F2 of preceding vowel (at 30ms from offset) or following vowel (at 30ms into onset).
Log-transformed duration	Log-transformed values of duration for /l/. Following van Hofwegen (2011: 386), log-transformed durations were used in order to centralise the distribution of the values.
Position	Word-initial onset in stressed syllable/Word-initial onset in unstressed syllable/Word-medial intervocalic/Word-final coda.
Context (Word-medial tokens)	Word-medial onset in stressed syllable/Ambisyllabic Weak/Ambisyllabic Strong (after Wrench & Scobbie 2003; see §6.4.4)

A series of pairwise interactions were included in each model, primarily in order to ascertain whether the influence of a particular independent variable was language specific. The pairwise interactions included in the models were, where applicable, language and preceding vowel, language and following vowel, language and following sound, language and stress, language and log duration, language and area, language and home language, language and style, and language and sex. Area and home language, sex and area, and sex and home language were also included to test for interactions between the extra-linguistic variables. No pairwise interactions were found, and therefore when language was a significant predictor on variation further language-specific models were undertaken.

The following section outlines the results of the study. Firstly, the mean F1, F2, and Z2-Z1 values are given and a series of ANOVAs provide an indication of cross-linguistic and syllabic differences. The remainder of the results focusses on phonetic variation in English and Welsh in word-final coda, word-initial onset, and word-medial intervocalic positions.

6.4 Results

§6.4.1 examines the role of language and syllable position in /l/-velarisation, presenting the mean F1, F2, and Z2-Z1 results. The analysis of these three measurements has been included in order to compare data with previous studies, and to ascertain whether all three measurements indicate significant differences between English and Welsh, and /l/ in word-initial, word-medial, and word-onset positions. This will shed light on whether /l/ is phonologically dark in both varieties. The following sections examine /l/-velarisation in word-final coda, word-initial onset, and word-medial intervocalic positions. Here, multivariate analyses are conducted in order to assess whether speakers produce phonetically different realisations of /l/ in Welsh and English when other linguistic (e.g. duration, neighbouring vowels) and extra-linguistic factors (e.g. sex, style) are taken into consideration.

6.4.1 Overall results

The mean values for F1, F2, and arithmetic difference between bark-transformed F2-F1 values (Z2-Z1) are outlined here. A series of two-way ANOVAs were conducted on the data in order to examine overall differences between the languages and word positions. As the mean F1 and F2 data are not normalised, the results for females and males are presented separately. The main aim of this section is to investigate whether

there are overall phonetic differences between the two languages and word positions, and to find out whether /l/ is dark in all positions.

6.4.1.1 Mean F1 (Hz) values

Let us firstly examine the first formant values. Recall that higher F1 values indicate a greater degree of /l/-velarisation (§6.2.2). Table 6.6 shows the mean F1 values for females in both English and Welsh in coda, initial, and medial positions:

Table 6.6: Mean F1 (Hz) values for females in English and Welsh word-final coda, word-initial onset and word-medial intervocalic positions.

Position	English			Welsh		
	Mean (Hz)	Std Dev.	<i>n</i>	Mean (Hz)	Std Dev.	<i>n</i>
Initial	492.31	97.30	433	503.84	97.16	376
Medial	513.02	84.40	386	542.78	92.74	307
Coda	516.25	89.65	612	536.26	92.45	614

The data were submitted to a two-way ANOVA with language and word position as main factors. Language is a significant effect on mean F1 values for females, which provides the first indication that /l/ might be, firstly, more language-specific than was previously thought and, secondly, darker in Welsh than in English ($F(1, 2722) = 31.722, p < 0.001$).

Position was also a significant effect on the data ($F(2, 2722) = 26.783, p < 0.001$). There was, however, no significant interaction between language and position ($F(2, 2722) = 1.806, p = 0.16$). A post-hoc Tukeys HSD test was applied to the Welsh data and found that the mean F1 in onset position was significantly lower than the mean F1 in medial ($p < 0.001$) and coda ($p < 0.001$) positions. The difference between medial and coda positions was not significant ($p = 0.674$). There were no significant differences between F1 in initial and coda ($p = 0.09$), medial and coda ($p = 0.85$), or medial and initial ($p = 0.34$) positions in English.

The mean F1 values for males, shown in Table 6.7 below, show a slightly different story:

Table 6.7: Mean F1 (Hz) values for males in English and Welsh word-final coda, word-initial onset and word-medial intervocalic positions.

Position	English			Welsh		
	Mean (Hz)	Std Dev.	<i>n</i>	Mean (Hz)	Std Dev.	<i>n</i>
Initial	446.62	93.93	389	450.6059	89.02	374
Medial	452.08	102.16	367	457.9704	78.29	298
Coda	469.25	79.48	556	491.9992	86.57	617

The results from the ANOVA indicate that there is a significant interaction between F1 and language ($F(1, 2595) = 13.978, p < 0.001$). The differences between languages mirror the female data, though here the differences are smaller, and F1 values are higher in Welsh than they are in English.

Position was also returned as a significant factor ($F(2, 2595) = 35.974, p < 0.001$), and there is a slightly significant interaction between language and position ($F(2, 2595) = 3.322, p = 0.04$). In Welsh, Tukey's HSD showed that there was no significant difference between word-initial and word-medial mean F1 values ($p = 0.5$), yet the difference between both word-initial and word-final ($p < 0.001$), and word-medial and word-final ($p < 0.001$), were significant. This result was mirrored in English: There was no significant difference between word-initial and word-medial mean F1 values ($p = 0.69$) but there were significant differences between both word-initial and word-final ($p < 0.001$), and word-medial and word-final ($p = 0.01$).

The F1 measurements are significantly higher in Welsh than in English for both males and females. The extent to which the measurements vary in different word positions is both language- and sex-specific. This is somewhat unexpected, as vocal tract differences between men and women usually result in differences in the mean frequency rather than in terms of variation.

6.4.1.2 Mean F2 (Hz) values

The main indicator of velarisation has been taken by most studies to be the second formant frequency (§6.2.2), and lower F2 values generally indicate a darker /l/.

Table 6.8 shows the mean F2 values for females:

Table 6.8: Mean F2 (Hz) values for females in English and Welsh word-final coda, word-initial onset and word-medial intervocalic positions.

Position	English			Welsh		
	Mean (Hz)	Std Dev.	<i>n</i>	Mean (Hz)	Std Dev.	<i>n</i>
Initial	1190.57	273.45	433	1111.53	273.45	376
Medial	1311.27	296.39	386	1200.59	269.14	307
Coda	1046.78	210.13	612	1086.3	207.94	614

The F2 data indicate that /l/ is darkest in coda position in both English and Welsh, and lightest in word-medial intervocalic position. This differs from the data in Table 6.7, where in English the F1 values for word-medial intervocalic position were higher (indicating a darker /l/). Again, there was a significant effect of language ($F(1, 2722) = 8.596, p=0.003$) and the differences between the two languages are larger than those reported for the mean F1 values in word-initial and word-medial positions. Surprisingly, however, the mean F2 in coda position is lower in English than it is in Welsh. This suggests that females may have a converged /l/ category in coda position, but that the languages diverge in word-medial and word-initial position.

Word position was again returned as a significant factor ($F(2, 2722) = 94.526, p<0.001$) on F2 and there was also a significant interaction between language and word position ($F(2, 2722) = 17.349, p<0.001$). A post-hoc Tukey's HSD confirmed that English word-initial and word-medial means were significantly different ($p<0.001$), as were word-initial and word-final means ($p<0.001$), and word-medial and word-final data ($p<0.001$). This was not the case in Welsh, however, where the differences between word-medial and word-coda were significant ($p<0.001$), as were the means in word-

initial and word-medial position ($p < 0.001$). The difference between word-initial and word-final means was not, however, found to be significant ($p = 0.5$). This suggests, for females at least, that there is allophonic distinction between onsets and codas in English that is not present in their Welsh. This will be discussed further after examining the combined Z2-Z1 results.

Returning to F2 values, Table 6.9 shows the results for male speakers in the dataset:

Table 6.9: Mean F2 (Hz) values for males in English and Welsh word-final coda, word-initial onset and word-medial intervocalic positions.

Position	English			Welsh		
	Mean (Hz)	Std Dev.	<i>n</i>	Mean (Hz)	Std Dev.	<i>n</i>
Initial	987.90	225.33	389	993.25	235.88	374
Medial	1141.56	290.34	367	1060.58	257.67	298
Coda	920.46	241.69	556	942.82	171.46	617

The two-way ANOVA did not find language to be a significant factor for males F2 values, which suggests that females may differentiate amongst their languages whereas males do not ($F(1, 2595) = 0.914, p = 0.34$).

There was an effect of word position on mean F2, however, which suggests that although speakers may not distinguish between Welsh and English, they do make intrinsic allophonic distinctions between /l/ in initial, medial, and coda positions ($F(2, 2595) = 112.19, p < 0.01$). Indeed, a post-hoc Tukey's HSD test reported a significant difference between word-initial and word-medial position ($p < 0.001$), word-initial and word-final position ($p < 0.001$), and word-medial and word-final position ($p < 0.001$).

There was, however, an interaction between word position and language ($F(2, 2595) = 10.52, p < 0.01$) which indicates that speakers may merge language categories in certain positions and differentiate between languages in other positions. This will be examined further in the multivariate analyses which follow this section.

6.4.1.3 Mean degree of velarisation (Z2-Z1)

The previous sections have shown that F1 and F2 give different results when submitted to the two-way ANOVAs. For example, there was a significant difference between English and Welsh in the F1 data for males, but this distinction was not present in their F2 data. In order to consider both F1 and F2 movement, this section examines the bark-transformed arithmetic difference between the two formant frequencies. Table 6.10 shows the data for female speakers:

Table 6.10: Mean Z2-Z1 values for females in English and Welsh word-final coda, word-initial onset and word-medial intervocalic positions.

Position	English			Welsh		
	Mean (Z2-Z1)	Std Dev.	<i>n</i>	Mean (Z2-Z1)	Std Dev.	<i>n</i>
Initial	4.63	1.52	433	4.13	1.42	376
Medial	5.08	1.59	386	4.28	1.44	307
Coda	3.69	1.18	612	3.69	1.24	614

Recall that more velarised productions of /l/ have a higher F1 and lower F2. The greater the difference between them, and the higher the value in Table 6.11, below, the lighter the token. For females, tokens are darker in coda position, followed by initial. The lightest tokens are in intervocalic position. Taking both F1 and F2 values into consideration has eradicated the anomaly in the female F1 data which indicated darkest productions in word-medial position in Welsh.

The results from the ANOVA indicate, as was shown for F1 and F2 values, that females produce significantly lighter /l/ in English than in Welsh ($F(1, 2722) = 43.781$, $p < 0.001$). It is striking, however, that the Z2-Z1 value is 3.69 in coda position for both English and Welsh, and that it is only in word-initial and word-medial positions that speakers appear to distinguish between languages. Coda /l/ is less susceptible to influences from neighbouring vowels than /l/ in onset position, so the differing

influence of neighbouring vowels, and other factors, cannot be ruled out at this stage and will be explored further in the multivariate analysis.

Word position was also found to be significant, with the lightest tokens appearing in word-medial intervocalic position and word-initial position ($F(2, 2722) = 136.015, p < 0.001$). There was also a two-way interaction between language and position ($F(2, 2722) = 20.265, p < 0.001$). The results from the ANOVA suggest that, firstly, there is an allophonic distinction between onsets and codas, and that this distinction is different in Welsh and English. Post-hoc Tukey's tests confirm significant differences in English between all positions ($p < 0.001$). Figure 6.2 shows boxplots for the English data:

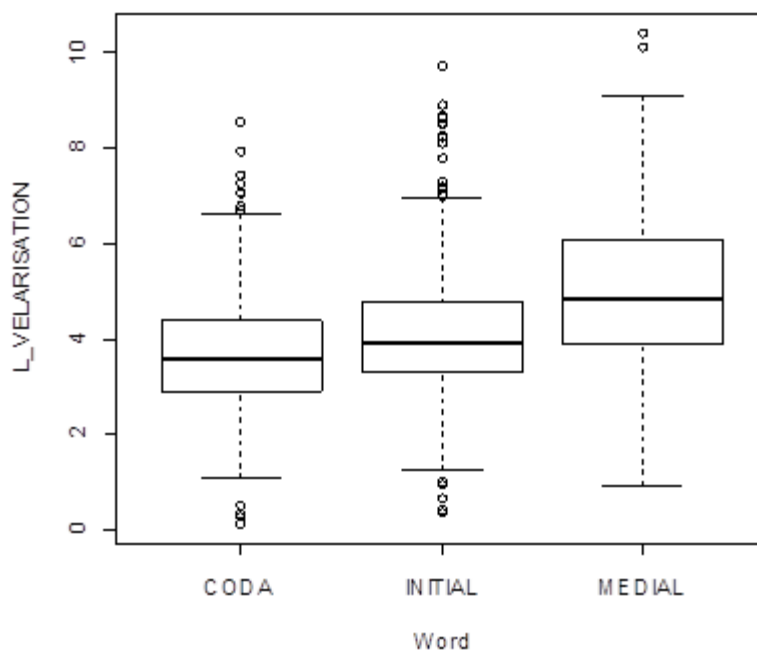


Figure 6.2: Boxplots showing mean velarisation (Z2-Z1) for female tokens in English word-final coda, word-initial onset, and word-medial intervocalic positions.

Figure 6.2 shows that, despite being significant, the differences between each word position are relatively small. This suggests that we are dealing with phonetic variation in the production of dark /l/, rather than an extrinsic allophonic distinction between light /l/ in onsets and dark /l/ in coda.

Figure 6.3, below, shows boxplots for the Welsh data. Tukey's post-hoc tests confirm that in females' Welsh there is a significant difference between /l/ in word-final position and /l/ in both word-initial ($p < 0.001$) and word-medial ($p < 0.001$) positions. There is no significant difference between /l/ in word-initial and word medial position ($p = 0.3$).

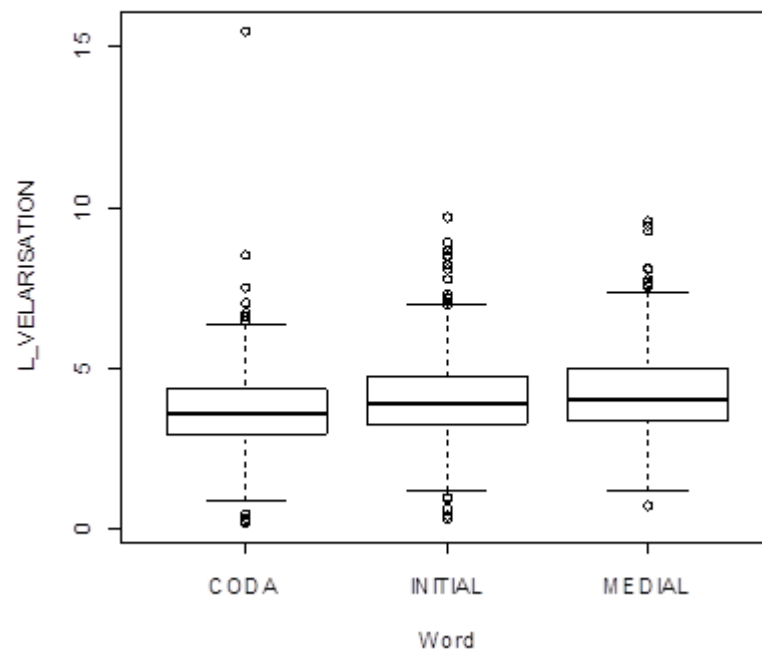


Figure 6.3: Boxplots showing mean velarisation (Z2-Z1) for female tokens in Welsh word-final coda, word-initial onset, and word-medial intervocalic positions.

Comparing Figures 6.2 and 6.3, it is clear that the data are very similar which would support the claim of phonological convergence. I return to this in the summary. Let us firstly examine the data for males, shown in Table 6.11 below, where it is clear that tokens are lightest in word-medial intervocalic position and darkest in coda position:

Table 6.11: Mean Z2-Z1 values for males in English and Welsh word-final coda, word-initial onset and word-medial intervocalic positions.

Position	English			Welsh		
	Mean (Z2-Z1)	Std Dev.	<i>n</i>	Mean (Z2-Z1)	Std Dev.	<i>n</i>
Initial	3.94	1.26	389	3.93	1.43	374
Medial	4.72	1.83	367	4.23	1.59	298
Coda	3.31	1.2	556	3.29	1.12	617

Similar to females, the results for coda position do not show a great difference between languages. The difference between Welsh and English is also not as clear as it was for females, especially in word-initial position. Nonetheless, there was a significant effect of language on /l/-velarisation ($F(1, 2595) = 6.1556, p=0.013$).

There was a highly significant effect of word position on /l/-velarisation ($F(2, 2595) = 163.80, p<0.001$) and an interaction between word position and language ($F(2, 2595) = 7.267, p<0.001$). Figures 6.4 and 6.5 show these results for males in English and Welsh respectively:

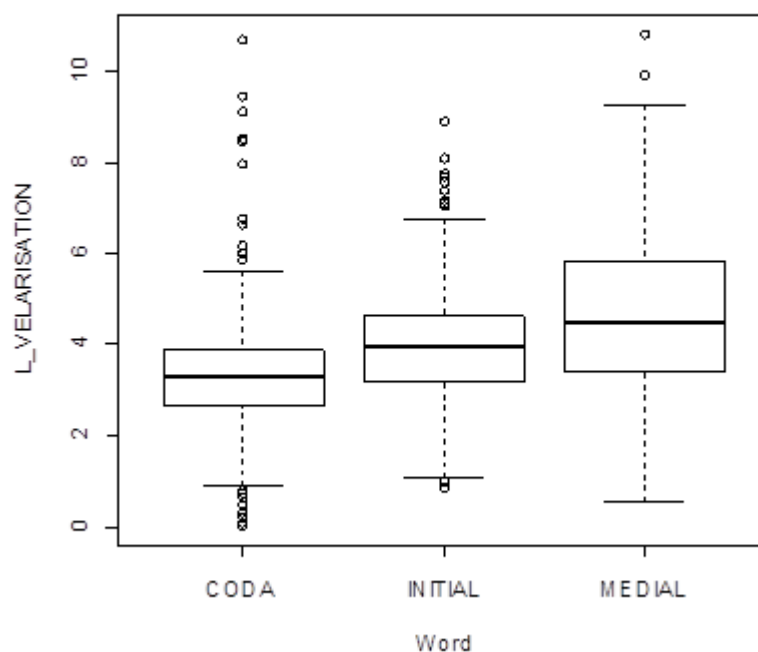


Figure 6.4: Boxplots showing mean velarisation (Z2-Z1) for male tokens in English word-final coda, word-initial onset, and word-medial intervocalic positions.

There is a significant difference between all word positions, as shown by the results of a post-hoc Tukey's HSD (all differences were significant at $p < 0.001$). This differs from the females who only make a binary distinction. Figure 6.5 shows the Welsh data:

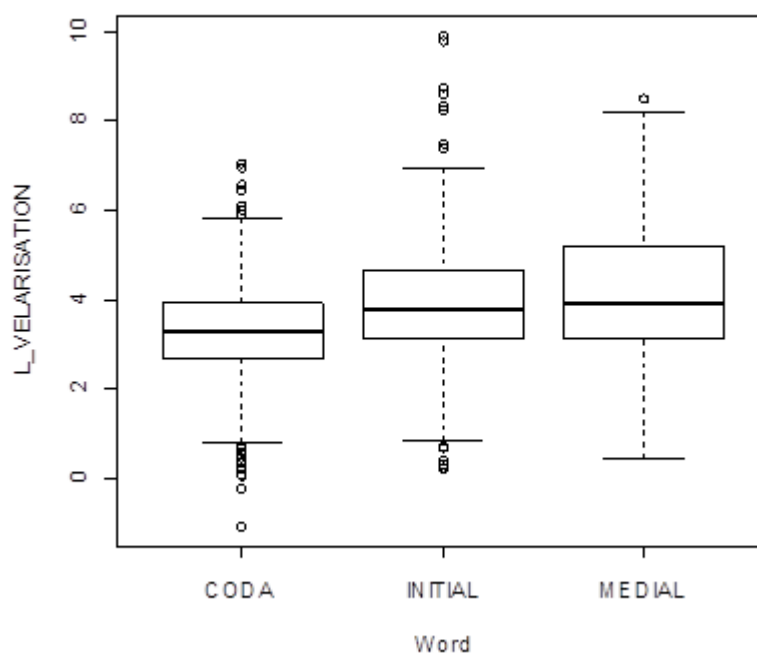


Figure 6.5: Boxplots showing mean velarisation (Z2-Z1) for male tokens in Welsh word-final coda, word-initial onset, and word-medial intervocalic positions.

The post-hoc Tukey's HSD found that the difference between coda and initial ($p < 0.001$), coda and medial ($p < 0.001$), and initial and medial positions ($p = 0.009$) were all significant.

6.4.1.4 Summary

This section has reported the mean F1 and F2 values for males and females in English and Welsh. It has been shown that, as concluded by de Leeuw (2008), when examined separately, there may be slightly different interactions. The bark-transformed measure of degree of velarisation, based on the arithmetic difference between the F2 and F1

values, has shown that for both males and females there is a significant difference between the two languages and three word positions.

Language and word position has been found to be significant for female speakers. This is not surprising as lower formant values reflect the lower and less fronted tongue position which characterises the production of consonants in word-final position (Recasens 2012: 369). For females, the mean degree of velarisation in initial position in English was 4.63, compared to 4.13 in Welsh. Figure 6.6, below, shows the overall plot of means, with 95% confidence intervals for females:

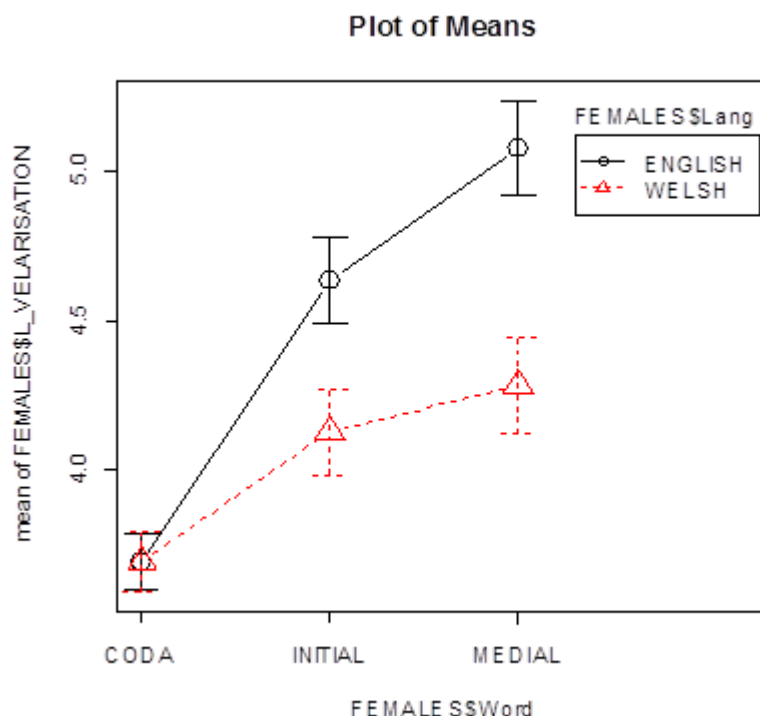


Figure 6.6: Plot of means showing mean velarisation (Z2-Z1) for female tokens in English and Welsh word-final coda, word-initial onset, and word-medial intervocalic positions (95% C.I. intervals).

Figure 6.6 shows a clear overlap between languages in coda position, and a clear difference in mean degree of velarisation in initial and medial positions.

Language and word position were also found to be significant for the subset of male speakers. Males appear only to differentiate between the languages in word-medial

position. The difference between the two languages for males was very slight (3.94 in English and 3.92 in Welsh). Figure 6.7 shows the data from the male speakers:

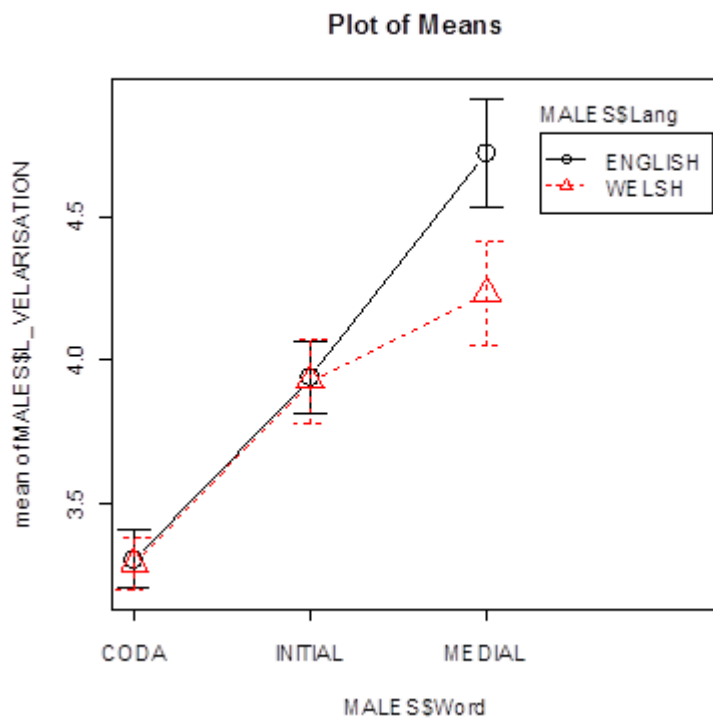


Figure 6.7: Plot of means showing mean velarisation (Z2-Z1) for male tokens in English and Welsh word-final coda, word-initial onset, and word-medial intervocalic positions (95% C.I. intervals).

The main difference between males and females appears to be that whereas females differentiate between Welsh and English in medial and onset position, males only appear to produce lighter English tokens in medial position. Differences between males and females have not, however, been tested statistically and will be examined further in the following sections.

The F2 values and Z2-Z1 values suggest that, despite variation, both the Welsh and Welsh English of bilinguals can be characterised as phonologically dark. The mean F2 values for male speakers range between 920.46Hz and 1141.6Hz in English, and 942.8Hz and 1060.58Hz in Welsh. For females, the mean values range between

1046.8Hz and 1311.3Hz in English, and 1086.3 and 1200.6Hz in Welsh. Although most cross-linguistic studies of /l/-velarisation compare only male speech (Recasens & Espinosa 2005; Recasens 2012), both the male and female data formant frequencies are comparable with other ‘dark’ varieties cited in Recasens & Espinosa (2005) and Recasens (2012).

Further evidence for the claim that the two languages are phonologically dark is provided by both the F2 and Z2-Z1 values. The differences between these values in the different word positions are small, and do not exceed 265Hz. As shown in §6.2.1, such small differences suggest intrinsic allophonic variation (i.e. phonetic variation in the production of dark /l/ in different word positions) rather light /l/ in onset position and dark /l/ in coda position. Indeed, Recasens (2012) finds that these differences do not exceed 300Hz (Recasens 2012: 386). We can therefore claim that, firstly, both Welsh-English bilinguals’ /l/ is phonologically converged and dark. Secondly, there is phonetic variation in the realisation of [ɫ] which is influenced by language and word-position.

The remainder of the chapter will use multivariate analysis to examine each word-final coda, word-initial onset, and word-medial position separately. This will allow us to see the extent to which other linguistic factors and extra-linguistic factors affect velarisation and whether these factors are indeed language-specific.

6.4.2 Word-final coda position

This section investigates the extent to which other linguistic factors (apart from word position) and extra-linguistic factors influence the degree of /l/-velarisation in word-final coda position. This will allow us to ascertain whether there is phonetic variation in the way speakers produce /l/, and whether there are phonetic differences between Welsh and the Welsh English of bilinguals. The data subset used for this analysis ($n=2399$) contains instances of /l/ found post-vocally in word-final coda position and

preceding a consonant or a pause. Mixed-effects models were applied to the data and the most reliable models (indicated by a significantly lower deviance) are reported here. The independent variables were speaker sex, area, home language, language mode, style (interview or wordlist), log duration, syllable stress, preceding vowel coarticulation (the sum of the difference between the bark-transformed F2 (Z2) of /l/ and the bark-transformed F2 (Z2) of the preceding vowel at 30ms before the onset), and following sound (consonant or pause). Both speaker and word were entered into the model as random variables. Table 6.12 shows the Rbrul output for /l/ in word-final coda position:

Table 6.12: Rbrul output for /l/ in V_# and V_#C position

Context	Coda			
Deviance	6317.316			
Intercept	4.08			
df	7			
Grand Mean	3.501			
Factor	Coef.	Tokens	Mean	p
PRECEDING VOWEL				< 0.001
+l	0.461	2399	N/A	
SEX				0.004
<i>Females</i>	0.204	1226	3.69	
<i>Males</i>	-0.204	1173	3.3	
SYLLABLE STRESS				0.005
<i>Stressed</i>	0.141	1820	3.503	
<i>Unstressed</i>	-0.141	579	3.492	
FOLLOWING SOUND				< 0.001
<i>Consonant</i>	0.121	603	3.788	
<i>Pause</i>	-0.121	1796	3.404	

Not Significant: AREA, HOME LANGUAGE, LANGUAGE, STYLE, LOG DURATION.

Random Factors: SPEAKER, WORD.

The strongest predictor on /l/-velarisation in coda position is the preceding vowel (coefficient = 0.461). As shown in Figure 6.8, the greater the difference between the bark-transformed F2 of /l/ and the bark-transformed F2 of the preceding the vowel

(the coarticulation measure), the greater the degree of velarisation, as shown by Figure 6.8:

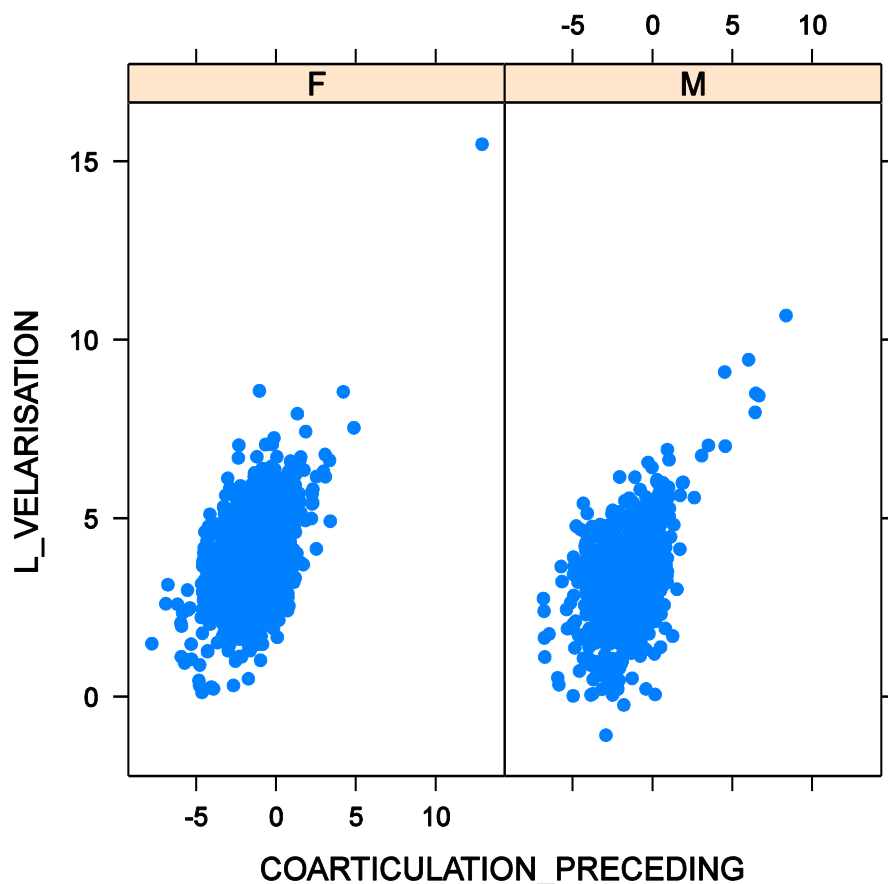


Figure 6.8: Correlation between degree of /l/-velarisation and measure of coarticulation from the preceding vowel.

The data for preceding vowels is based on the difference between bark-transformed F2 values. F2 values are indicative of the frontness of vowels, with larger F2s indicating more fronting. The greater the difference between Z2 of the vowel and Z2 of the /l/, the more fronted the vowel will be.

Speaker sex was also found to predict /l/-velarisation in coda position (coefficient = 0.204), with females producing lighter tokens than males. This result supports the differences noted in the overall results (§6.4.1). The mean degree of velarisation for females was 3.69, compared to 3.3 for males. This could be due to

physiological differences, though there are indications from Van Hofwegen (2011) that this may not be the case. Using the same technique employed in the current study, and the same normalisation technique, Van Hofwegen (2012) compared three datasets – African Americans living in a majority African American community, old recordings of former slaves, and European Americans living in the same community. Significant sex differences were found when these datasets combined, but disappeared when only the African Americans were included in the modelling.

Lighter realisations of /l/ were found when /l/ occurred in the coda of a stressed syllable (coefficient = 0.141) and when preceding a consonant (coefficient = 0.121). These are the lowest two significant predictors of /l/-velarisation. Stress effects in coda position are thought to be minimised due to the influence of the preceding vowel (Andrade 1999). In order to examine whether the articulatory gestures involved in consonant production might be the cause of the higher formant values, Consonant type was added as a further independent variable in order to ascertain whether /l/ is likely to be lighter or darker before certain consonants over others. Consonants following /l/ were divided into plosive, nasal, fricative, and approximant groups. There were no significant differences between the consonant types and /l/-darkening, as shown in Table 6.13:

Table 6.13: Rbrul output for /l/ in V_#C position.

Context	V_#C			
Deviance	1630.08			
Intercept	4.402			
df	6			
Grand Mean	3.788			
Factor	Coef.	Tokens	Mean	p
PRECEDING VOWEL				< 0.001
+l	0.579	601	N/A	
SEX				0.01
<i>Females</i>	0.171	307	3.939	
<i>Males</i>	-0.171	294	3.63	

Not Significant: AREA, HOME LANGUAGE, LANGUAGE, STYLE, LOG DURATION, FOLLOWING CONSONANT TYPE, SYLLABLE STRESS.

Random Factors: SPEAKER, WORD.

To summarise, there is no difference between Welsh and Welsh English for /l/ in word-final coda position. The biggest influence on mean velarisation is the preceding vowel, with higher F2 (fronter vowels) decreasing the extent to which /l/ is velarised. As was shown in §6.5.1, differences between the sexes remain. Furthermore, lighter realisations of /l/ are produced word-finally when followed by a pause rather than a consonant, and when in stressed syllables. Let us now examine word-initial onset position.

6.4.3 Word-initial onset position

To minimise coarticulation effects and avoid ambiguous tokens due to resyllabification, tokens of /l/ which were preceded by a vowel were not included. Instead, tokens were included in #_V, C#_V, and C_V positions ($n=1572$). A regression analysis of all tokens in onset position reported significant effects of sex and, as well as a significant correlation between mean /l/-velarisation and the following vowel. These correlations are explored further in this section, and the Rbrul return for this model is shown in Table 6.14 below:

Table 6.14: Rbrul output for /l/-velarisation in #_V, C#_V, and C_V positions.

Context	Onset			
Deviance	4770.285			
Intercept	4.894			
df	8			
Grand Mean	4.174			
Factor	Coef.	Tokens	Mean	p
FOLLOWING VOWEL				< 0.001
+l	0.481	1572	N/A	
SEX				0.004
<i>Females</i>	0.233	809	4.399	
<i>Males</i>	-0.233	763	3.935	
LANGUAGE				< 0.001
<i>English</i>	0.148	821	4.307	
<i>Welsh</i>	-0.148	751	4.028	

Not Significant: AREA, HOME LANGUAGE, LANGUAGE, STYLE, LOG DURATION, SYLLABLE STRESS, PRECEDING SOUND.

Random Factors: SPEAKER, WORD.

Once again, the strongest influence on /l/-velarisation is the vowel which appears in a neighbouring context. Unlike in coda position, however, language is a significant predictor on /l/-velarisation in word-initial onset position and lighter tokens are predicted in English than in Welsh (0.148). Although lighter tokens are expected in onset position than in coda, it is noteworthy that speakers may produce even lighter onsets in English than in Welsh. It is more relevant to this study, however, to investigate whether the same factors influence /l/-velarisation in each language. With this in mind, further regression models were conducted on the English tokens and the Welsh tokens. Controlling for differences between the two languages improved the robustness of the model, indicated by the lower deviance values, but the independent variables which influence mean /l/-velarisation are the same in both languages. The Rbrul outputs for Welsh and English data are shown in Tables 6.15 and 6.16 below:

Table 6.15: Rbrul output for /l/-velarisation in Welsh in #_V, C#_V, and C_V positions.

Context	Onset (W)			
Deviance	2201.926			
Intercept	4.593			
df	6			
Grand Mean	4.028			
Factor	Coef.	Tokens	Mean	p
FOLLOWING VOWEL				< 0.001
+l	0.527	750	N/A	
SEX				0.046
<i>Females</i>	0.16	376	4.128	
<i>Males</i>	-0.16	374	3.928	

Not Significant: AREA, HOME LANGUAGE, STYLE, LOG DURATION, SYLLABLE STRESS, PRECEDING SOUND.

Random Factors: SPEAKER, WORD.

Table 6.16: Rbrul output for /l/-velarisation in English in #_V, _V, and C_V positions.

Context	Onset (E)			
Deviance	2560.196			
Intercept	5.084			
df	6			
Grand Mean	4.307			
Factor	Coef.	Tokens	Mean	p
FOLLOWING VOWEL				< 0.001
+l	0.403	822	N/A	
SEX				0.002
<i>Females</i>	0.31	434	4.635	
<i>Males</i>	-0.31	388	3.942	

Not Significant: AREA, HOME LANGUAGE, STYLE, LOG DURATION, SYLLABLE STRESS, PRECEDING SOUND.

Random Factors: SPEAKER, WORD.

Only the following vowel and speaker sex have a significant influence on /l/-velarisation in Welsh, which indicates that the linguistic extra-linguistic constraints operate identically across both of the languages. Females are more likely to produce lighter /l/ in both Welsh (coefficient = 0.16) and English (coefficient = 0.31). The fact

that the influence is weaker in Welsh suggests that males and females may not differ in their realisations as much as they tend to do in English. Figure 6.9 shows the differences in the mean degree of velarisation between males and females in both Welsh and English:

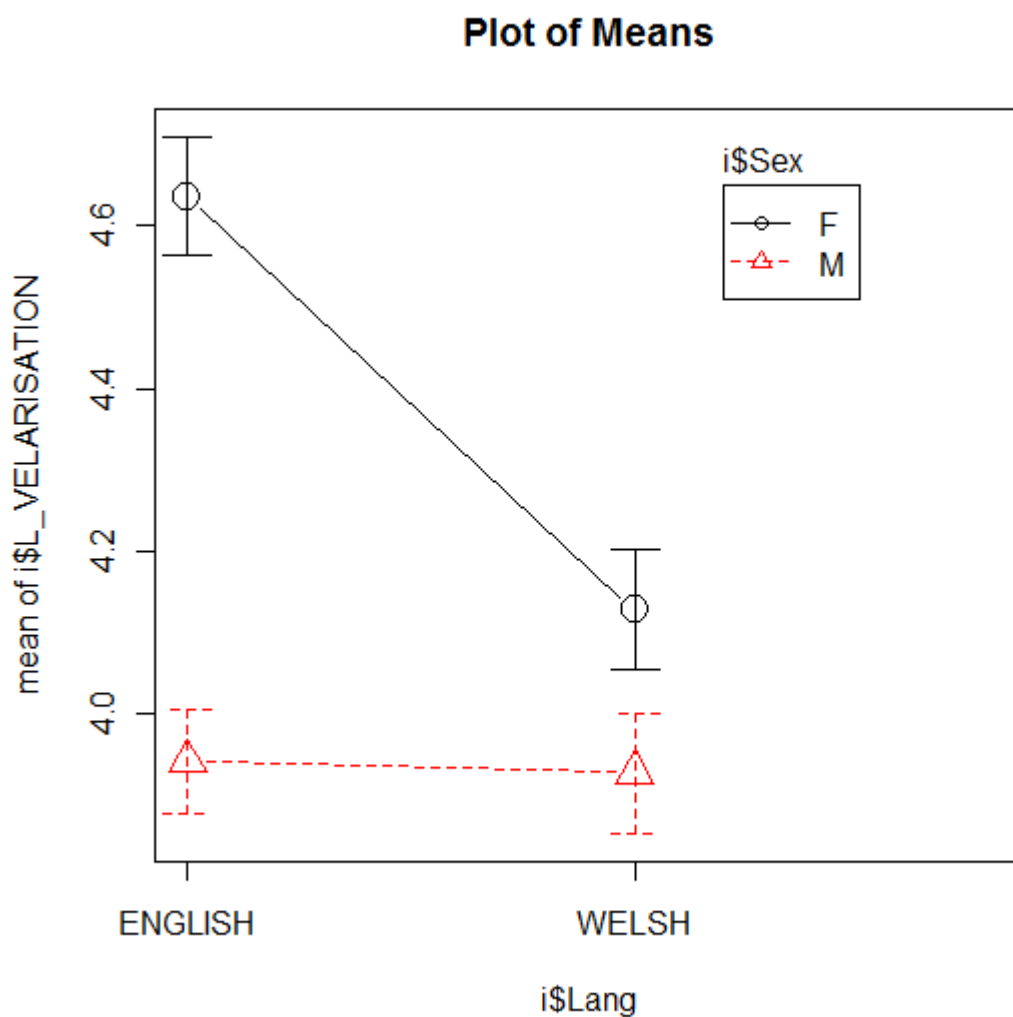


Figure 6.9: Mean /l/-velarisation in English and Welsh in C_V, #_V, and C#_V positions.

Females tend to produce lighter tokens than males in both English and Welsh. This is illustrated in Figure 6.9 and shown to be significant in the Rbrul output for the whole word-initial onset dataset (Table 6.14). The figure also shows that females tend to produce much lighter realisations of /l/ in English than they do in Welsh, which explains

the stronger influence of speaker sex in the English data. In order to investigate this further, multivariate analyses were run separately on the females' and males' data.

Table 6.17 shows the results for females:

Table 6.17: Rbrul output for /l/-velarisation in #_V, C#_V, and C_V positions in English and in Welsh for females.

Context	Onset (F)			
Deviance	3175.072			
Intercept	5.068			
df	6			
Grand Mean	4.413			
Factor	Coef.	Tokens	Mean	p
FOLLOWING VOWEL				< 0.001
+l	0.389	809	N/A	
LANGUAGE				< 0.001
<i>English</i>	0.295	433	4.649	
<i>Welsh</i>	-0.295	376	4.127	

Not Significant: AREA, HOME LANGUAGE, STYLE, LOG DURATION, SYLLABLE STRESS, PRECEDING SOUND.

Random Factors: SPEAKER, WORD.

The effect of language, which is present in the overall data for word-initial onset position, is also significant in the subset of female tokens. Indeed, the coefficient (0.295) has increased. Let us now consider male speech in Table 6.18:

Table 6.18: Rbrul output for /l/-velarisation in #_V, C#_V, and C_V positions in English and in Welsh for males.

Context	Onset (M)			
Deviance	2153.636			
Intercept	4.681			
df	5			
Grand Mean	3.935			
Factor	Coef.	Tokens	Mean	p
FOLLOWING VOWEL				< 0.001
+l	0.545	763	N/A	

Not Significant: SEX, AREA, HOME LANGUAGE, STYLE, LOG DURATION, SYLLABLE STRESS, PRECEDING SOUND.

Random Factors: SPEAKER, WORD.

The data so far have shown that females produce significantly lighter /l/ than males in both word-final coda and word-initial onset positions. In coda position, Welsh and English are phonetically converged for all speakers. In onset position, however, English and Welsh diverge in females' speech but not in males' speech (see Figure 6.20 above). The reasons for this are not immediately clear, as anatomical differences between men and women do not explain the differences between languages. This is explored further in §6.5.

To summarise, the strongest influence on the realisation of /l/ in word-initial onset position is the vowel which follows it. As has been found for previous studies (e.g. Van Hofwegen 2011), /l/ is more likely to be lighter when followed by front vowels which have a high F2. Both language and speaker sex were found to be significant predictors, with /l/ being lighter in females' speech and in English. Further analysis of the data showed that females produce lighter tokens than males in both Welsh and English. Furthermore, females produce significantly lighter /l/ in their English than in their Welsh whereas males do not distinguish between languages in this position. Let us now see whether this distinction between the sexes remains in word-medial intervocalic position.

6.4.4 Word-medial intervocalic position

Tokens in V_V position ($n=1358$) are included in the analysis here. In §6.4.1, we found that the difference between bark-transformed F1 and F2 was the highest for vowels in intervocalic position for both males and females. This means that /l/ is lighter in this position, though it is not significantly lighter than /l/ in word-initial onset position for females (see §6.4.1). Following Wrench & Scobbie (2003), tokens in word-medial position were classified as appearing in one of the following intervocalic contexts, as shown in Table 6.19 below:

Table 6.19: Syllabic contexts of /l/ in word-medial intervocalic position.

Context	Description	Example
Word-medial onset in stressed syllable.	/l/ precedes a fully stressed vowel and appears in the onset.	alone
Ambisyllabic weak	/l/ follows and precedes an unstressed vowel.	bungalow
Ambisyllabic strong	/l/ follows a stressed vowel and precedes an unstressed vowel.	yellow

Syllabic context did not, however, prove to be a significant factor in /l/-velarisation in word-medial intervocalic position. The Rbrul output for this subset of the data is shown in Table 6.20, below:

Table 6.20: Rbrul output for /l/-velarisation in V_V position.

Context	V_V			
Deviance	3970.26			
Intercept	5.318			
df	7			
Grand Mean	4.625			
Factor	Coef.	Tokens	Mean	p
PRECEDING VOWEL				< 0.001
+l	0.279	1358	N/A	
FOLLOWING VOWEL				< 0.001
+l	0.29	1358	N/A	
LANGUAGE				< 0.001
<i>English</i>	0.278	749	4.909	
<i>Welsh</i>	-0.278	609	4.271	

Not Significant: AREA, HOME LANGUAGE, STYLE, LOG DURATION, SYLLABLE CONTEXT.

Random Factors: SPEAKER, WORD.

The most noticeable difference between this model and previous outputs is that speaker sex has disappeared as a predictor. In addition, the fact that /l/ is both preceded and followed by vowels has not resulted in a doubling of the effect of coarticulation compared to coda and initial positions. The influence of language is also much stronger here than in word-initial onset position (coefficient = 0.278). In order to examine the extent to which there may be different predictors influencing /l/-velarisation in English than in Welsh, and vice versa, let us compare the model outputs for English and Welsh data separately. Table 6.21 shows the output for the English data:

Table 6.21: Rbrul output for /l/-velarisation in V_V position in English.

Context	V_V (E)			
Deviance	2320.216			
Intercept	5.574			
df	6			
Grand Mean	4.909			
Factor	Coef.	Tokens	Mean	p
PRECEDING VOWEL				< 0.001
+l	0.244	753	N/A	
FOLLOWING VOWEL				< 0.001
+l	0.29	753	N/A	

Not Significant: AREA, STYLE, LOG DURATION, SYLLABLE CONTEXT.

Random Factors: SPEAKER, WORD.

There are no new predictors when we examine the English data only and only the F2 differences between /l/ and the preceding and proceeding vowels remain. The greater the difference between the bark-transformed F2 of the /l/ and bark-transformed F2 of the vowel (at either 30ms into the onset or before the offset), the lighter the realisation of /l/.

Table 6.22 shows the results of the multivariate analysis on the Welsh data in word-medial intervocalic position. These data show a similar pattern, with only the preceding and following vowels proving influential on /l/-velarisation:

Table 6.22: Rbrul output for /l/-velarisation in V_V position in Welsh.

Context	V_V (W)			
Deviance	1627.381			
Intercept	5.037			
df	6			
Grand Mean	4.271			
Factor	Coef.	Tokens	Mean	p
PRECEDING VOWEL				< 0.001
+l	0.324	605	N/A	
FOLLOWING VOWEL				< 0.001
+l	0.271	605	N/A	

Not Significant: AREA, STYLE, LOG DURATION, SYLLABLE CONTEXT.

Random Factors: SPEAKER, WORD.

The neighbouring vowels have been shown to be the strongest predictor of lighter realisation of /l/ in word-medial intervocalic positions, though there is also divergence between Welsh and English in this position. Again, English tokens are more likely to be lighter than Welsh tokens in this position. This claim is valid for both males and females, as speaker sex was not found to be a significant predictor in the multivariate analysis on /l/ in word-medial intervocalic position.

6.4.5 Differences between Welsh and English in individuals' repertoire

The analysis has hitherto considered the role of language as a predictor of degree of velarisation in word-final coda, word-initial onset, and word-medial intervocalic positions. The findings suggest that females tend to produce lighter /l/ in English than in Welsh in word-initial onset and word-medial intervocalic positions. Males, on the other hand, only produce divergent realisations of /l/ in word-medial position. Although language and speaker sex have been found to be significant in word-initial onset position, and language has been a significant predictor in word-medial position, all

coefficients have been relatively low compared to the influence of the preceding and/or following vowel. In order to investigate this further, this section considers the differences between the mean English and Welsh tokens for each speaker in each position and uses t-tests in order to see if the difference between the two values is significant. As language was only a significant predictor in initial and medial positions, only data from these two subsets are compared.

Figure 6.10 considers the data from word-initial onset position, and shows the difference between mean velarisation in English and Welsh for individual female speakers:

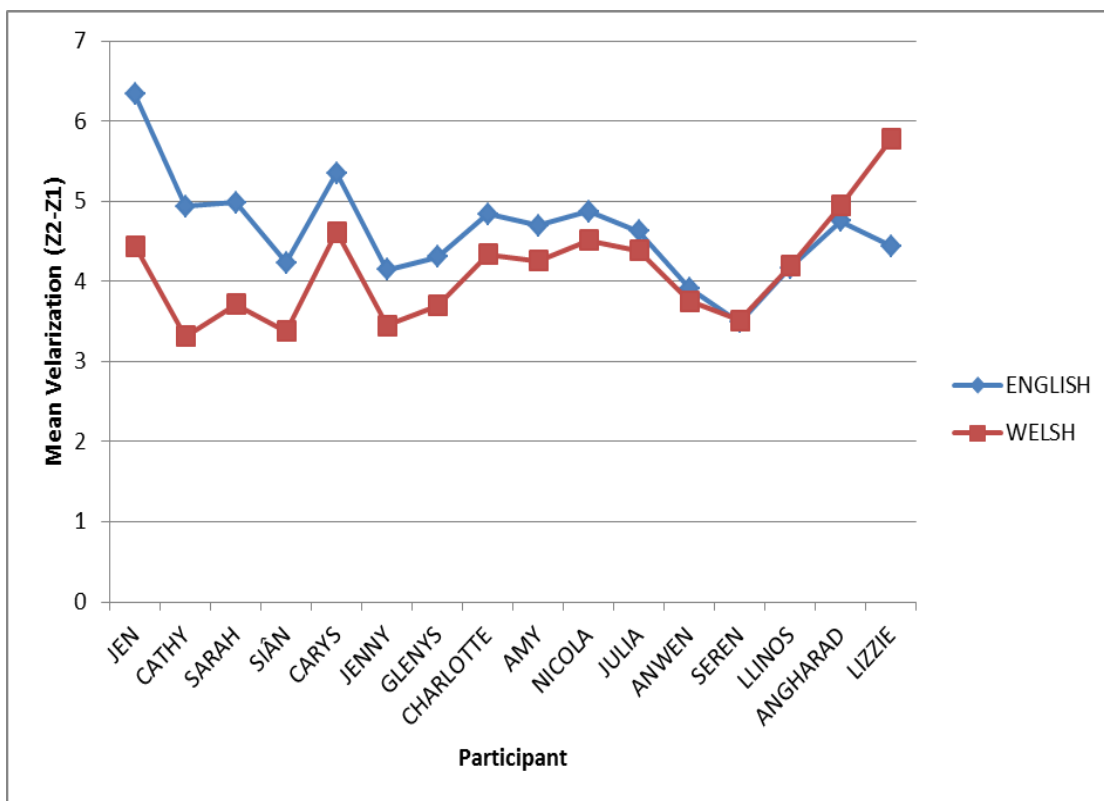


Figure 6.10: Mean Velarisation (Z2-Z1) of /l/ for each female speaker in English and in Welsh in word-initial onset position.

The figure shows that the majority of female speakers differentiate between Welsh and English in their productions of /l/ to some extent. When the data for each participant was submitted to a t-test, there were significant differences for English and Welsh data

for the following speakers: Jen ($t(27)=4.73$, $p<0.001$), Cathy ($t(18)=3.1568$, $p=0.005$), Sarah ($t(27)=2.9471$, $p=0.007$), Siân ($t(26)=2.5488$, $p=0.02$), Lizzie ($t(23)=-2.2009$, $p=0.04$), and Carys ($t(25)=2.0509$, $p=0.05$). This shows that, while less than half of female speakers differentiate between Welsh and English, there is a trend for certain speakers to produce divergent realisations.

As can be seen from Figure 6.10 and the negative t-value above, Lizzie both differentiates between English and Welsh and produces significantly lighter tokens in her Welsh data. This is contrary to the trend, and there is no concrete explanation for this. Further inspection of her biographical data suggested that she has cousins in South Wales, where /l/ is light in all positions. A possible scenario is that she produces a lighter /l/ due to a southern Welsh influence, though further studies on southern Welsh data would be needed to validate this claim.

The multivariate analysis did not return language as a predictor for /l/-velarisation in male speech in word-initial position. This is clear from Figure 6.11 which shows the differences between mean velarisation in Welsh and English for male speakers in word-initial onset position:

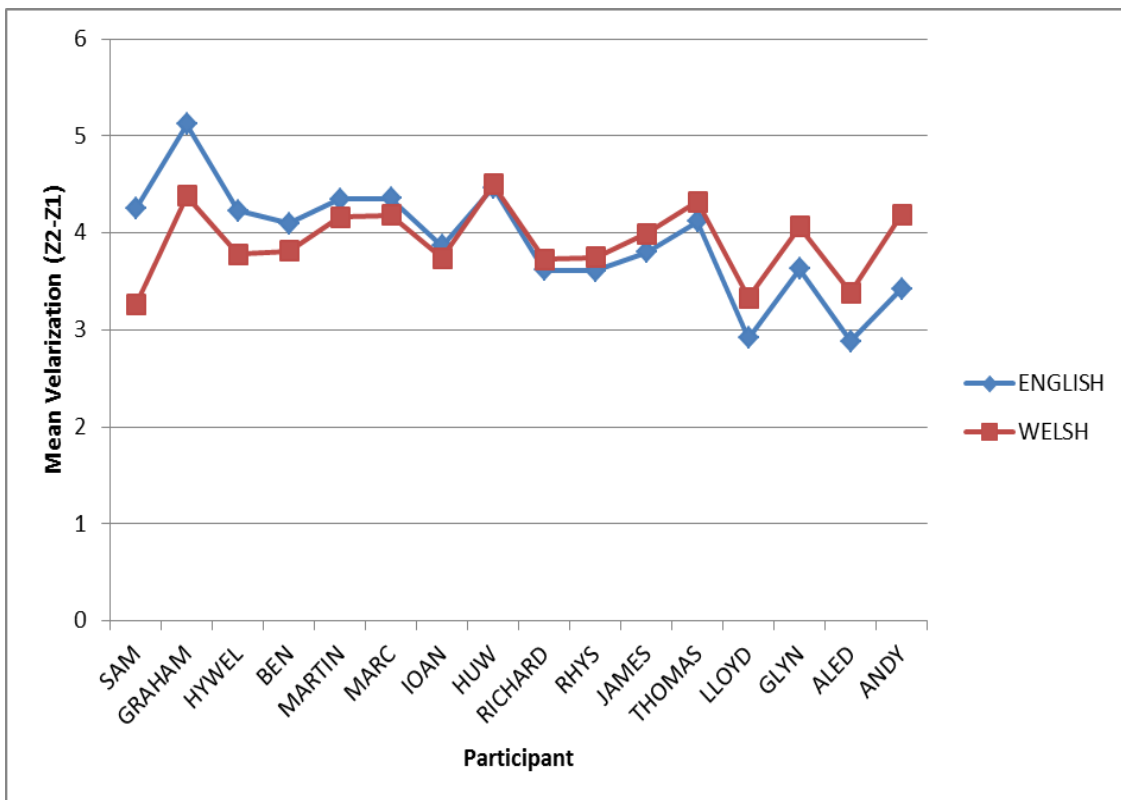


Figure 6.11: Mean Velarisation (Z2-Z1) of /l/ for each male speaker in English and in Welsh in word-initial onset position.

The mean degree of velarisation in the two languages was submitted to t-tests. Despite the general tendency for convergence amongst males, Sam produces tokens which are significantly lighter in English than in Welsh ($t(16)=2.6711$, $p=0.01$). Indeed, compared to the individual females’ data men show a clear tendency towards convergence in their realisation of word-initial /l/.

Having discovered that these individual speakers produce significantly different tokens in English than in Welsh, it remains to be seen whether there are any extra-linguistic factors which are influencing this behaviour. The biographical data for each of the speakers with significant differences between English and Welsh are shown in Table 6.23:

Table 6.23: Participants who produce significantly distinct productions of /l/ in Welsh and English in word-initial onset positions.

Participant	Sex	Area	Home Language
Jen	Female	Caernarfon	English
Cathy	Female	Caernarfon	English
Lizzie	Female	Caernarfon	English
Siân	Female	Caernarfon	Welsh
Carys	Female	Caernarfon	Welsh
Sarah	Female	Mold	English
Sam	Male	Caernarfon	English

Apart from the aforementioned differences between speaker sex, we cannot draw definite conclusions about whether extra-linguistic factors influence the differentiation between English and Welsh. 5 out of a total 8 female participants in Caernarfon produced significantly lighter tokens in English (these five speakers are shown in Table 6.27 above), though area was not reported as being a significant predictor in the multivariate analysis and this result is therefore inconclusive.

In word-medial intervocalic position, language produced significant trends but the differences between males and females disappeared. Let us now examine individual differences in this position:

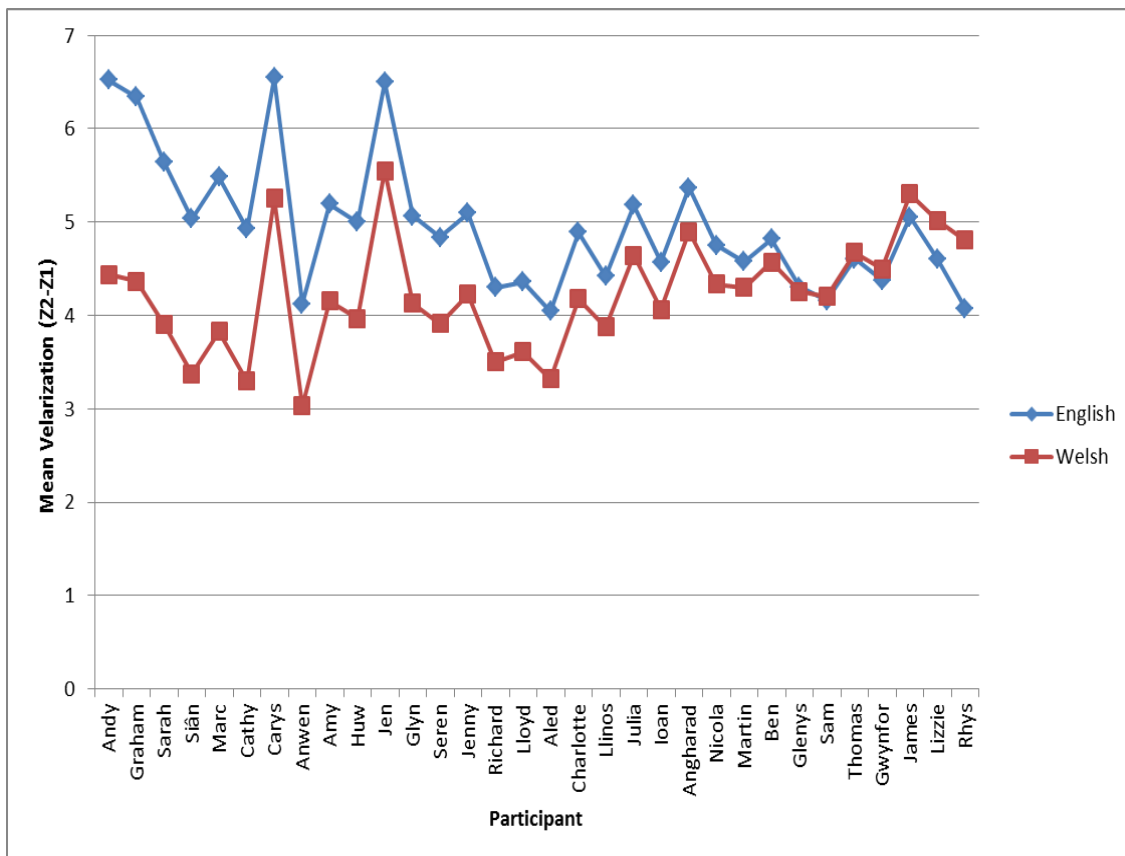


Figure 6.12: Mean Velarisation (Z2-Z1) of /l/ for each male speaker in English and in Welsh in V_V position.

Once again, the individual means in each language were submitted to t-tests. The results are as follows (only significant results are reported here): Andy ($t(21)=4.3764$, $p<0.001$), Graham ($t(14)=3.2614$, $p=0.005$), Sarah ($t(14)=3.1933$, $p=0.006$), Siân ($t(16)=6.1508$, $p<0.001$), Marc ($t(12)=6.5305$, $p<0.001$), Cathy ($t(14)=3.5801$, $p=0.003$), Carys ($t(13)=3.4395$, $p=0.004$), Anwen ($t(13)=3.2792$, $p=0.006$), Amy ($t(14)=3.1019$, $p=0.008$), Huw ($t(10)=3.1345$, $p=0.01$), Seren ($t(21)=2.2305$, $p=0.04$), and Jenny ($t(23)=2.6677$, $p=0.01$).

More individual male speakers differentiate between English and Welsh in word-medial intervocalic positions. A summary of all participants who produced significantly distinct productions of /l/ in Welsh and English in this position is given in Table 6.24:

Table 6.24: Participants who produce significantly distinct productions of /l/ in Welsh and English in word-medial intervocalic position.

Participant	Sex	Area	Home Language
Cathy	Female	Caernarfon	English
Siân	Female	Caernarfon	Welsh
Carys	Female	Caernarfon	Welsh
Amy	Female	Caernarfon	Welsh
Anwen	Female	Mold	Welsh
Seren	Female	Mold	Welsh
Sarah	Female	Mold	English
Jenny	Female	Mold	English
Andy	Male	Caernarfon	English
Graham	Male	Caernarfon	English
Marc	Male	Caernarfon	Welsh
Huw	Male	Mold	Welsh

Comparing Tables 6.23 and 6.24, the differences that existed in the speech of Jen, Lizzie, and Sam in word-initial onset position have disappeared in word-medial intervocalic position. There are also no concrete trends apart from the fact that it is females who tend to differentiate between English and Welsh more. It is interesting that twice the number of participants mentioned in Tables 6.27 and 6.28 come from Caernarfon ($n=10$) rather than Mold ($n=5$). Possible reasons for this will be explored as the results are discussed in the following section.

6.5 Discussion

I propose firstly that /l/ in bilinguals' Welsh and English is both phonologically converged and dark. The overall data explored in §6.4.1 showed that speakers produce lighter realisations in word-initial and word-medial positions when compared to word-final position. This does not mean, however, that speakers are making an allophonic distinction where light /l/ appears in onsets and dark /l/ appears in coda. Instead, such differences are well-attested in both dark and light varieties. This leads Recasens (2012) to distinguish between intrinsic and extrinsic allophonic differences. In the former, there is variation between word positions but the phoneme is still either dark or light

(Recasens 2012). This is problematic for those who do not subscribe to the theory that dark and light /l/ are different phonemes within the speaker's phonology (e.g. Sproat & Fujimura 1993), but follows the majority of studies in making this distinction (see §6.2.1). The small differences between word positions, accompanied by relatively low formant values, suggest that both the Welsh and English of bilinguals are phonologically converged. In other words, /l/ is dark in all environments as has been claimed by previous studies (see §6.2.4).

Despite phonological convergence, language is a significant predictor on /l/ variation in both word-onset and word-medial positions for females, and in word-medial positions for males. /l/ is generally less susceptible to the variation in coda position than in onsets, which may mean that the fine-grained language-specific realisations do not become apparent in this position. The deviance for the multivariate analyses is relatively high in all positions, and suggests that the statistical models are not a wholly accurate fit for the data (Johnson 2009). This reflects the inherent variability in the data, and looking at the individual data has allowed us to address this³³. We can distinguish between two types of speaker – those who maintain a phonetically converged category for /l/ and those who tend to produce phonetically language-specific realisations of /l/. The participants who produce phonetically distinct realisations provide evidence for fine-grained divergence in the phonetic implementation of a phoneme which is converged in their bilingual repertoire.

Such language-specific productions of /l/ might be explained by vowel differences between the two languages. There were no pairwise interactions between language and preceding/following vowel in the data, and no differences between the

³³ Note that the previous studies of /l/ which use regression analyses do not report the model deviance (Simonet 2010; Van Hofwegen 2011; Carter & Cooper 2012), though similar values are reported on other large datasets (e.g. Barras 2010: 115).

vowel systems of Welsh and English have been reported (with the exception of the additional /i/ vowel in the Welsh system; see §2.2.2). The findings for /l/ indicate that such differences may exist, however. Comparisons of Welsh-English bilinguals' vowels are currently being undertaken, and the results may indicate subtle differences which inform the results for /l/ (Mayr et al., forth.).

The differences between the two languages cannot be attributed to the influence of speakers' L1 on their L2, as no home language effects were found. Simonet (2010), for example, examined convergence between /l/ in the bilingual speech of Catalan-Spanish bilinguals. He found that Catalan-dominant bilinguals tended to produce darker /l/ in their Spanish than Spanish-dominant bilinguals. Conversely, Spanish-dominant bilinguals tended to produce lighter /l/ in their Catalan than Catalan-dominant participants (recall that Catalan is 'dark' and Spanish is 'light'). In other words, speakers transferred phonetic properties of their home language to their other language which results in variation and divergence in each language. Simonet (2010) applied the Speech Learning Model to his data, and concludes that his Catalan-Spanish data provide evidence of phonetic category assimilation (Flege 1987; §6.2.5). He states that 'it seems that L1 phonetic categories acted as "attractors" for L2 phonetic categories or that L2 laterals were classified at some level as equivalent to L1 laterals' (Simonet 2010: 674). The fact that no home language differences were found in the Welsh-English data makes it difficult to apply the same model here.

The role of speaker sex, however, suggests that there might be a more sociolinguistic explanation. Whether the bark-transform is suitable for minimising physiological differences is debated in the literature (cf. Thomas & Kendall 2010; Adank et al. 2004; Flynn 2013), and the fact that females produce lighter tokens may be anatomical. What cannot be immediately explained by physiology, however, is why

females produce lighter tokens in English than in Welsh in word-initial onset and word-medial intervocalic positions and males only do so in word-medial intervocalic position. Analysis of the independent speakers showed that those who produce significantly lighter tokens in English than in Welsh in initial position were female speakers from Caernarfon. This could, therefore, be a feature which is socio-indexical of gender in Caernarfon, regardless of the linguistic background of the speaker. This goes against the evidence for distinct social groupings based on home language in Caernarfon, and merits further attention.

6.6 Summary

This chapter has examined variation in the degree of /l/-velarisation in participants' Welsh and Welsh English. Historically, northern varieties of both Welsh and Welsh English have been known as 'dark' and are reported as being heavily velarised. The phonetic analysis has shown that this is the case. However, the degree to which /l/ is velarised depends on syllable structure, with /l/ being darker in word-final coda position. In both word-initial onset and word-medial intervocalic positions /l/ is not only lighter, but it is likely to be lighter in English than in Welsh. Word-initially, females are more likely to differentiate between Welsh and English, whereas word-medially both sexes tend to produce lighter tokens in their English. Although these results show an overall trend, the analysis of individual speakers has shown that certain speakers produce *significantly* lighter tokens in English than in Welsh. This appears to be idiosyncratic, but tends to be more prevalent in the speech of females in Caernarfon.

7 (r) variation

7.1 Introduction

This chapter presents the findings from two variables which previous studies have identified as being susceptible to transfer between Welsh and Welsh-English (§2.2.3.4.2). The chapter firstly presents data from an analysis of coda /r/ in the two languages. Here, the *realisation and non-realisation* of variants of /r/ in postvocalic position are compared. The second part of the chapter investigates variation in the *production* of variants of /r/ in word-initial prevocalic and intervocalic positions.

This contributes to a plethora of previous studies which have focussed on (r) variation in English (e.g. Labov 1972; Baugh 1979; Feagin 1990; Sharma 2005; Chand 2010), and in particular in varieties of English spoken in the United Kingdom (e.g. Romaine 1978; Stuart-Smith et al. 2007; Llamas et al. 2008; Barras 2010; Llamas 2010).

Welsh is described as being a rhotic language where every instance of etymological <r> is realised as either [r] or [r̥] (Wells 1982: 379; Penhallurick 2004: 110; Walters 2001: 290). In Welsh English, there is a distinction between *r*-less areas, i.e. areas where coda /r/³⁴ is not pronounced, and areas where both *r*-ful and *r*-less pronunciations have been recorded. These areas are predominantly Welsh-speaking, leading to the assumption that the realisation of postvocalic [r] or [r̥] in these areas is a transfer effect from the Welsh language amongst bilinguals.

In word-initial prevocalic and word-medial intervocalic positions, the voiced alveolar trill [r] is reported as being the most commonly realised variant of /r/ in Welsh, with partial devoicing occurring when it follows a preceding voiceless consonant. The

³⁴ Coda /r/ is used to refer to the realisation versus non-realisation of any variant of /r/ in postvocalic coda position. This chapter does not investigate patterns of variation amongst the variants of /r/ (e.g. [r], [r̥], or [ɹ]) in this position.

voiced alveolar tap [ɾ] is often used in word-medial intervocalic position in the North West (§3.2.3.4.2). The voiced uvular trill [ʀ] or voiced uvular fricative [ʁ] is a dialectal feature of the Bala area of Gwynedd (the county to which Caernarfon belongs), though there is no mention of the uvular variants in the speech of Caernarfon³⁵. The voiced alveolar approximant [ɹ] may appear in the clusters /tr/ and /dr/ and, according to G.E. Jones (1984: 49-50), is an idiosyncratic feature for some speakers. The approximant is noted as being a dialectal feature for east Powys only (an area in Mid-Wales which borders England; Davies 1971). The trilled and tapped variants of /r/ are cited as being a feature of English for Welsh-English bilinguals, and in particular in the speech of those living in the North West. Elsewhere, it is assumed that it is the approximant which tends to occur in Welsh English with some speakers producing the trill and tap (Penhallurick 1991: 132; §3.2.3.4.2).

There have been no quantifiable studies of the realisation versus non-realisation of /r/ or variants of /r/ in word-initial prevocalic and word-medial intervocalic positions in either variety. This chapter examines the extent to which bilinguals transfer variants typically associated with one language to the other and ask whether this is influenced by linguistic and extra-linguistic factors. We seek to discover whether;

1. the transfer of the phonological rule/variants from one language to another is restricted to one locality.
2. linguistic factors produce play a significant role,
3. home language, style and/or speaker sex are predictors of variation,
4. and whether these constraints operate identically in both languages.

³⁵ Bala is located 45 miles south-east of Caernarfon and 33 miles south-west of Mold, and is more accessible from the eastern counties than from Caernarfon due to the Snowdon mountain range.

The chapter is organised as follows: The methodological considerations specific to this chapter are reported in §7.2. §7.3 presents the results for variation in the realisation of coda /r/, and §7.4 examines the data on (r) variation in prevocalic and intervocalic positions. §7.5 provides a brief summary of the results.

7.2 Methodology

Three aspects of the methodology are not covered in Chapter 3: the selection of /r/ tokens; coding tokens; and statistical analysis.

7.2.1 Selecting tokens for analysis

The first 50 tokens of /r/ after the initial ten minutes of each interview of were transcribed in ELAN (Max Planck Institute for Psycholinguistics 2008; §4.4.5). The extraction of tokens was in temporal order, but only the first three instances of the same word were coded. A maximum of 25 tokens were collected of tokens which contained etymological <r> in coda position. The remaining 25 tokens contained /r/ in word-initial onset or word-medial intervocalic positions. The wordlist yielded a further 40 tokens per speaker and language, meaning that a total of 180 tokens were coded for each speaker ($n=5660$).

The tokens included in the analysis of coda /r/ appear word-medially (e.g. *nervous*) in pre-consonantal position or word-finally (e.g. *car*) in pre-pausal or pre-consonantal contexts (V_C#, V_#C, and V_#) in order to control for possible occurrences of *linking-r* in the English data. ‘Linking-*r*’ describes the realisation of /r/ in *r*-less varieties intervocalically at morpheme or word boundaries. Linking-*r* and ‘intrusive-*r*’ (which describes the insertion of non-etymological /r/ in the same context;

Uffmann 2007: 452³⁶) comprise ‘*r-sandhi*’ phenomena which occur in varieties which are categorically *r*-less³⁷. For example, in *r*-ful varieties of English the word ‘car’ might be realised as [kɑ:ɹ] whereas in *r*-less varieties the surface form might be [kɑ:]. In both varieties, however, the realisation of ‘car and bike’ as [kɑ:ɹ ənd baɪk] is perfectly plausible.

The tokens included in the analysis of prevocalic and intervocalic positions are confined to word-medial intervocalic contexts (V_V) and word-initial tokens which follow a pause (#_V). Instances of prevocalic /r/ after a consonant were avoided, as the alveolar approximant is more likely in this context due to phonotactic constraints (G.E. Jones 1984: 49-50).

Table 7.1 shows the number of tokens in each context:

Table 7.1: Total number of tokens analysed for (r) variation.

Feature	Context	Welsh tokens (n)	English tokens (n)	Total
Coda /r/	V_C#	388	346	734
	V_#C	185	330	515
	V_#	553	417	970
Prevocalic and intervocalic /r/	#_V	458	774	1232
	V_V	467	324	791
Total		2051	2191	4242

To summarise, 2219 tokens were analysed for coda /r/ variation (1126 Welsh tokens and 1093 English tokens) and 2023 tokens were analysed for prevocalic and intervocalic /r/ variation (1098 English tokens and 925 Welsh tokens). The following section explains how these tokens were coded.

³⁶ For example, the realisation of ‘tuna oil’ as [tju:nəɹ ɔɪl] in English.

³⁷ Hyper-rhoticity is also possible. This involves the insertion of non-etymological [r] following final schwa in pre-pausal or pre-consonantal position, as in: the mere idea, dear [ðə mi:ə aɪdi:ə di:ə] (Britton 2007: 525).

7.2.2 Coding tokens

Tokens were coded auditorily by the author, though each token was checked acoustically in Praat before a final decision was made (Irwin & Nagy 2007; Chand 2010). Table 7.2 summarises the acoustic indicators:

Table 7.2: Acoustic cues for the classification of rhotic variants.

Variant	Acoustic cues
[ɹ]	Decrease in the distance between F2 and F3 caused by lowering of F3 and increase in F2 out of the vowel accompanied by a decrease in amplitude (Ladefoged 2003: 149).
<i>R</i> -colouring	Lowering of F3 during the period of periodic voicing for the vowel (Hayward 2000: 167) leading to convergence between F2 and F3 (Chand 2010: 9).
[r]/ [r̥]	Decrease in glottal energy at the end of the vowel, shown on the spectrogram as a decrease in amplitude and loss of formant structure, followed by a single contact for [r̥] and two or more contacts for [r] (M.J. Jones, forthcoming).

Each token was categorised as *r*-coloured, approximant, tap, trill, or zero realisation. In the case of coda /r/, *r*-coloured, approximant, tap, and trill tokens were coded as *r*-ful, and non-realisation of coda /r/ were coded as *r*-less. Although both Sharma (2005) and Chand (2010) distinguish between the non-realisation of coda /r/, [ɹ] and [r] in coda position, this study reports findings based on a binary distinction between *r*-ful and *r*-less tokens. This decision was taken in order to focus on the application of a phonological rule associated with Welsh on the one hand (the realisation of coda /r/, and variation in speech production on the other hand (/r/ in prevocalic and intervocalic positions)).

Uvular variants were found in the prevocalic and intervocalic speech of one speaker and were classified on the basis of auditory coding only. A ternary distinction

was made between voiced, partially devoiced, and devoiced productions but these were later merged. In addition to the word position, syllable stress, the preceding vowel, and following segment were coded. Whereas position and syllable stress were coded separately for coda /r/, a merged category was formed for tokens in prevocalic and intervocalic positions.

A number of previous studies have coded for number of /r/ in the word, which appears to increase the likelihood that coda /r/ will be deleted (cf. Irwin & Nagy 2007: 140). All words in the current dataset contained one instance of /r/ only, so this was not taken into consideration. Vowel category and syllable stress were coded for separately and they were entered into the multivariate models as both independent factors and a pairwise interaction (Chand 2010: 7).

7.2.3 Statistical analysis

In order to investigate the relationship between the independent variables and (r) variation, the data were submitted to multivariate analyses using Rbrul, and the most reliable models (those with the lowest deviance) are reported here. The factors used in the regression analyses are outlined in Table 7.3 (below). Various pairwise interactions were also considered but were not returned as significant in the models reported in this chapter. Note that individual speaker and word were included in the model as random effects.

Table 7.3: Dependent and independent variables used in the mixed-effects models.

Dependent variable	Description
Coda /r/	The production of coda /r/ (<i>r</i> -ful and <i>r</i> -coloured tokens) <i>versus</i> zero realisation.
<i>or</i> Variant	The production of the alveolar approximant <i>versus</i> tap, trill, or uvular variants. N.B. Voicing is not taken into consideration in this analysis.
Independent variable	Description
Sex	Male/Female
Language	English/Welsh
Home Language	English/Welsh
Area	Caernarfon/Mold
Style	Interview/Wordlist
Position (coda /r/)	Word-internal Word-final
Syllable Stress	Stressed/Unstressed
Position (prevocalic and intervocalic /r/)	#_V in stressed position #_V in unstressed position V_V in onset position (/r/ precedes a fully stressed syllable and appears in onset position, e.g. <i>erased</i>). V_V in ambisyllabic strong (/r/ follows a stressed and precedes an unstressed vowel, e.g. <i>terror</i>) ³⁸
Preceding vowel	[i:]/[i:]/[ɪ]/[ɛ]/[u:]/[o:]/[a]/[ə]/[ɔ]
Following segment	Consonant/Pause

The results of two non-parametric tests of independence (conducted in QuickCalcs; Graphpad Software 2013) are also reported throughout this chapter. These tests were conducted in order to ascertain whether there were significant differences between certain data subsets. Pearson's Chi-squared tests with Yates' Correction (Yates 1934) were conducted in cases where all cells had more than five tokens. In cases where there were five or fewer tokens per cell, Fisher's Exact tests were used (as the Chi-squared test is not valid for categories with low counts; Boslaugh & Batters 2008: 194-196). For clarification, the test used is stated before the results. All tests are unpaired unless otherwise stated.

³⁸ There were no instances of weak ambisyllabic /r/ (instances where /r/ follows and precedes an unstressed vowel).

In the Rbrul models, there are two ways in which intra-group homogeneity can be assessed. Firstly, the overall deviance of the model provides an indication of the ‘fit’ or accuracy of the results (Johnson 2010: 381). Secondly, the individual log-odds of groups within a factor also show the strength of the correlation, with higher log-odds indicating a more robust influence of a given group on the realisation of a certain variant. All models conducted on the (r) variation data indicate a strong degree of intra-group homogeneity. For this reason, analyses of individual speakers are not presented here. This differs from the previous chapter, where the high deviance of the models, and the relatively low log-odds, warranted further investigation of individual speakers.

7.3 Coda /r/

A total of 2219 tokens of coda /r/ were analysed, and Table 7.4 shows the distribution of *r*-ful tokens in both English and Welsh:

Table 7.4: Number of *r*-ful and *r*-less tokens in Welsh and English.

Language	<i>r</i> -ful tokens (%)	<i>r</i> -ful tokens (<i>n</i>)	Total
English	8.5	93	1093
Welsh	92.4	1040	1126
Total		1133	2219

It is clear from the table that the speakers’ English is predominantly *r*-less, as coda /r/ was only realised in 8.5% of tokens. This somewhat contradicts the claim that rhoticity is a widespread feature in some areas of North Wales, and highlights a lack of transfer of this rule from Welsh to English overall. Having said this, the realisation of coda /r/ is clearly a variable feature which requires further attention as it remains to be seen whether it is a feature which is confined to Caernarfon (as would be expected) and whether it occurs in the repertoire of speakers from differing linguistic backgrounds.

The realisation of coda /r/ is clearly not categorical, and 7.6% of Welsh tokens (*n*=86) were *r*-less across North Wales. It is clear that a similar rate of transfer occurs

from English to Welsh as from Welsh to English, which is surprising as no previous accounts of Welsh have *r*-less tokens of Welsh, whereas dialectal accounts of English in North West Wales cite rhoticity as a defining feature of the local dialect (e.g. Wells 1982; Penhallurick 2004).

A paired chi-squared test showed that the difference between the two languages with respect to this feature is significant (Chi-squared with Yates' Correction = 1557.227, $df = 1$, $p < 0.001$). The English and Welsh data for coda /r/ are presented in the following sections.

7.3.1 English data

The realisation of coda /r/ in Welsh English is cited as being restricted to North West Wales, where the majority of the population are Welsh-English bilinguals. This was tested in the multivariate analysis which revealed area, home language, and syllable stress to be significant factors (deviance = 478.529). As syllable stress is only a significant factor on the data of those from Welsh-speaking homes in Caernarfon (examined below), further tests were conducted which included only social factors. This allows us to see the overall constraints on coda /r/ variation in North Wales. Table 7.5 shows the results, which indicate that the realisation of coda /r/ is more frequent in the speech of those in Caernarfon and those from Welsh-speaking homes.

Table 7.5: Rbrul output for the realisation of coda /r/ in English (social factors).

Realisation of coda /r/ in English					
Deviance	478.529				
df	5				
Intercept	-4.356				
Grand Mean	0.085				
Speaker Std. Dev.	1.661				
Factor	Log-Odds	Tokens	Proportion of application [rhoticity]	Weight	p
AREA					0.002
<i>Caernarfon</i>	1.214	561	0.139	0.771	
<i>Mold</i>	-1.214	532	0.028	0.229	
HOME LANGUAGE					0.002
<i>Welsh</i>	0.979	554	0.134	0.727	
<i>English</i>	-0.979	539	0.035	0.273	

Not Significant: SEX; STYLE.

Random Factors: SPEAKER, WORD.

Area is the most influential factor on the production of coda /r/ in English (log-odds = 1.214), with coda /r/ being most likely to be realised in the speech of those from Caernarfon. 13.9% ($n=78$) of tokens in Caernarfon were *r*-ful compared to just 2.8% in Mold ($n=15$). This confirms that rhoticity is not a feature of the English spoken by Welsh-English bilinguals in Mold. Home language also proved significant, with *r*-ful tokens being more likely in the speech of those from Welsh-speaking homes (13.4%, $n=74$) than English-speaking homes (3.5%, $n=19$).

Although a pairwise comparison between area and home language did not prove to be significant, the realisation of coda /r/ in English is clearly a feature of the speech of those from Welsh-speaking homes in Caernarfon only. Figure 7.1 shows the distinction between the Caernarfon Welsh home-language group and the other groups quite clearly:

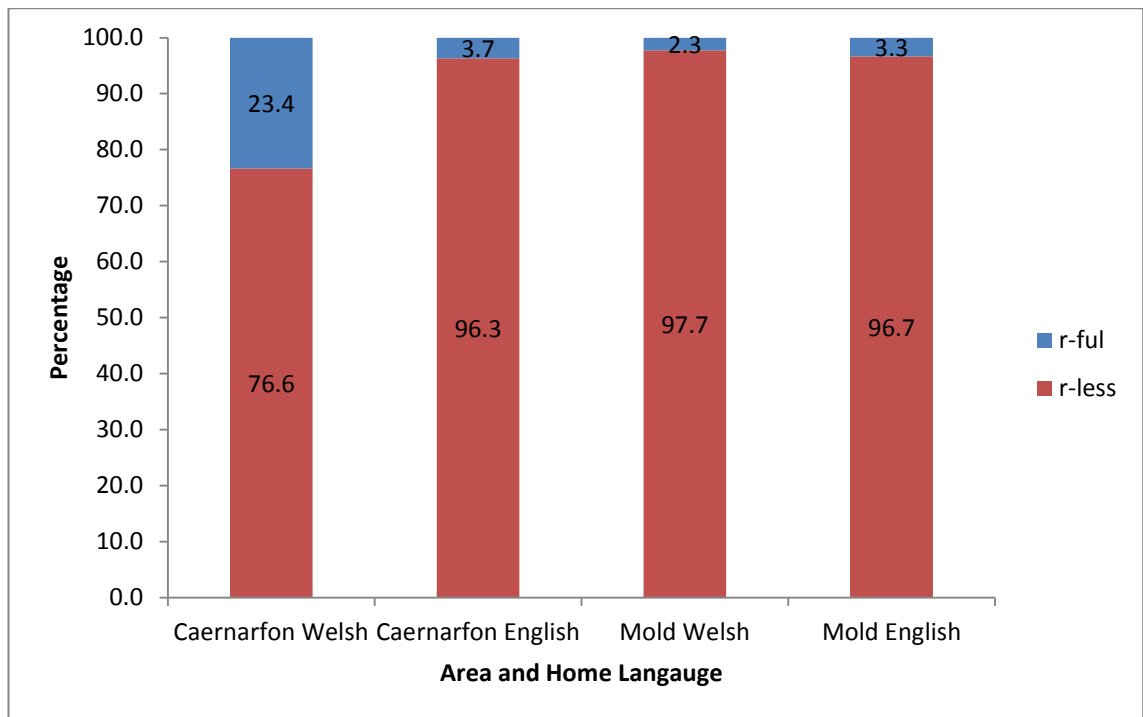


Figure 7.1: Proportion of *r*-ful and *r*-less tokens in English by area and home language.

Amongst these speakers, the realisation of coda /r/ is not merely a transfer feature associated with Caernarfon. It is an L1 transfer feature of those from Welsh-speaking homes in Caernarfon. The possible reasons for the differences in the behaviour of those from Welsh-speaking homes in Caernarfon and the other groups will be explored in §7.3.3, but it is clear that L1 speakers of Welsh in Mold do not transfer this feature, and that those from English-speaking homes in Caernarfon do not adopt this feature in their English speech despite it being prevalent in their community (as most people in Caernarfon come from Welsh-speaking homes).

The number of *r*-ful and *r*-less tokens for each group, upon which Figure 7.1 is based, is shown in Table 7.6:

Table 7.6: Number of *r*-ful and *r*-less tokens in English by area and home language.

	Caernarfon Welsh	Caernarfon English	Mold Welsh	Mold English	Total
<i>r</i> -ful	68	10	6	9	93
<i>r</i> -less	223	260	257	260	1000
Total	291	270	263	269	1093

The low frequency of tokens in the speech of the other groups impedes further analysis³⁹, and it is only in the Caernarfon Welsh data that linguistic and extra-linguistic constraints on variation may be apparent. The remainder of this section examines variation in the speech of those from Welsh-speaking homes in Caernarfon.

The multivariate analysis conducted on the data of those from Welsh-speaking homes in Caernarfon show that coda /r/ is more likely to be produced in wordlist data than interview data, and that it favours realisation in stressed rather than unstressed syllables:

³⁹ There were no significant predictors on the data of those from English-speaking homes in Caernarfon (deviance= 63.717, df= 3, intercept= -11.39, grand mean= 0.037, speaker std. dev.= 2.479) or those from Mold (deviance= 82.424, df= 3, intercept= -26.629, grand mean= 0.028, speaker std. dev.= 12.255).

Table 7.7: Rbrul output for the realisation of coda /r/ in English by those from Welsh-speaking homes in Caernarfon.

Realisation of coda /r/ in English (Caernarfon Welsh home-language group)					
Deviance	277.75				
df	5				
Intercept	-1.431				
Grand Mean	0.234				
Speaker Std. Dev.	0.991				
Factor	Log-Odds	Tokens	Proportion of application [rhoticity]	Weight	p
STYLE					0.01
<i>Wordlist</i>	0.671	98	0.316	0.662	
<i>Interview</i>	-0.671	193	0.192	0.338	
STRESS					0.02
<i>Stressed</i>	0.465	142	0.261	0.614	
<i>Unstressed</i>	-0.465	149	0.208	0.386	

Not Significant: SEX; WORD POSITION; PRECEDING VOWEL; FOLLOWING SEGMENT; SYLLABLE STRESS:PRECEDING VOWEL.

Random Factors: SPEAKER, WORD.

The influence of syllable stress has varied in previous studies (Berg 1999, cited in Chand 2010: 17). Stressed syllables have been shown to favour the realisation of coda /r/ in previous studies of English, though there is also an interaction between syllable stress and preceding vowel (e.g. Feagin 1990; Irwin & Nagy 2007; Becker 2009; Barras 2010). The realisation of coda /r/ is more likely in stressed syllables in the Welsh English data (log-odds = 0.465), though no pairwise interaction between vowel and syllable stress was found.

The realisation of coda /r/ is primarily influenced by style, with *r*-ful realisations being more likely in careful wordlist speech than naturalistic interview data (log-odds = 0.671). Coda /r/ has been found to be a stylistic marker since the earliest studies in varieties of American English, with speakers tending to realise coda /r/ in more formal

speech contexts (e.g. Labov 1966; 1972; Baugh 1979). The explanation for this style-shifting lies in the apparent stigmatisation of non-rhoticity in US English, whereas the stigmatisation of rhoticity in England is not as widespread (Watt 2007: 7; cf. Barras 2010: 114 for East Lancashire).

In Scottish English, *r*-ful and *r*-less realisations of coda /r/ appear in variation, but research since the 1980s has suggested that this is influenced by both sex and social class with middle class speakers orienting towards *r*-ful tokens (Romaine 1978). More recent work has shown that this is the case, with working class speakers in Glasgow being more likely to produce *r*-less tokens (Stuart-Smith et al. 2007). Stuart-Smith et al. (2007: 241) found that most participants tended to produce more Standard Scottish (rhotic) variants in more careful speech, with the exception of working class speakers.

The more frequent realisation of coda /r/ in the more careful speech is slightly surprising if we accept that speakers are more likely to be conscious of their speech production when reading a wordlist than during a sociolinguistic interview. We might expect speakers who are transferring elements from their Welsh to do this less frequently when paying attention to their speech as they orient towards a more Standard English model. This is not the case, and speakers instead appear to be orienting less towards Standard English and more towards community norms. Llamas et al. (2008) show a comparable situation in Scotland, where speakers in the town of Gretna oriented less towards Standard Scottish and more towards *r*-less speech.

Previous studies had reported that the realisation of coda /r/ was a feature of English in North West Wales, and was most likely attributed to a transfer effect from Welsh in the speech of bilinguals. This raised questions about whether there was a distinction between bilinguals who acquired the language differently (at home or via

immersion education), and how Welsh-English bilinguals in English-dominant areas behaved.

The data in this section have shown that the realisation of coda /r/ is a feature of those in North West Wales who have acquired Welsh via parental transmission in Caernarfon. The other groups included in the study have minimal *r*-ful tokens. The data from the Caernarfon Welsh group indicates that the realisation of coda /r/ is subject to both extra-linguistic (style) and linguistic factors (syllable stress). Although previous studies predict that coda /r/ is more likely to be realised in stressed syllables, it is surprising that speakers are producing more *r*-ful tokens in careful speech. This is discussed further in §7.5, following an analysis of the realisation of coda /r/ in Welsh, and in §8.4.1 where the data for coda /r/ and /r/ in word-initial and word-medial positions are compared.

7.3.2 Welsh data

The fact that 92.4% ($n=1040$) of Welsh tokens were *r*-ful suggests that Welsh is predominantly *r*-ful (rather than categorically *r*-ful as is generally assumed). Though there are relatively few instances of *r*-less tokens in the Welsh data, this section will show that the realisation of coda /r/, despite being dominant amongst speakers, is actually subject to other constraints. Table 7.8, below, shows the Rbrul output for the realisation of coda /r/ in Welsh. As was found for the English data, both home language and area affect the likelihood that coda /r/ will be realised:

Table 7.8: Rbrul output for the realisation of coda /r/ in Welsh (social factors).

Realisation of coda /r/ in Welsh					
Deviance	504.77				
df	5				
Intercept	-3.481				
Grand Mean	0.924				
Speaker Std. Dev.	0.751				
Factor	Log-Odds	Tokens	Proportion of application [rhoticity]	Weight	p
HOME LANGUAGE					<0.001
<i>Welsh</i>	0.98	572	0.969	0.727	
<i>English</i>	-0.98	554	0.877	0.273	
AREA					<0.001
<i>Caernarfon</i>	0.739	573	0.956	0.677	
<i>Mold</i>	-0.739	553	0.890	0.323	

Not Significant: SEX; STYLE; AREA:HOME LANGUAGE, AREA:SEX, HOME LANGUAGE:SEX.

Random Factors: SPEAKER, WORD.

The strongest influence on the realisation of coda /r/ in Welsh is home language, with those from Welsh-speaking homes being more likely to realise this feature than those from English-speaking homes (log-odds = 0.98). This differs from the realisation of coda /r/ in English, where area was the most influential factor, and shows a clear transfer effect amongst those who acquire Welsh via immersion education. This is not the full picture, however, as the non-realisation of coda /r/ is, however, also more likely in Mold than in Caernarfon (log-odds = 0.739). Figure 7.2 shows the proportion of *r*-ful and *r*-less tokens by home language and area:

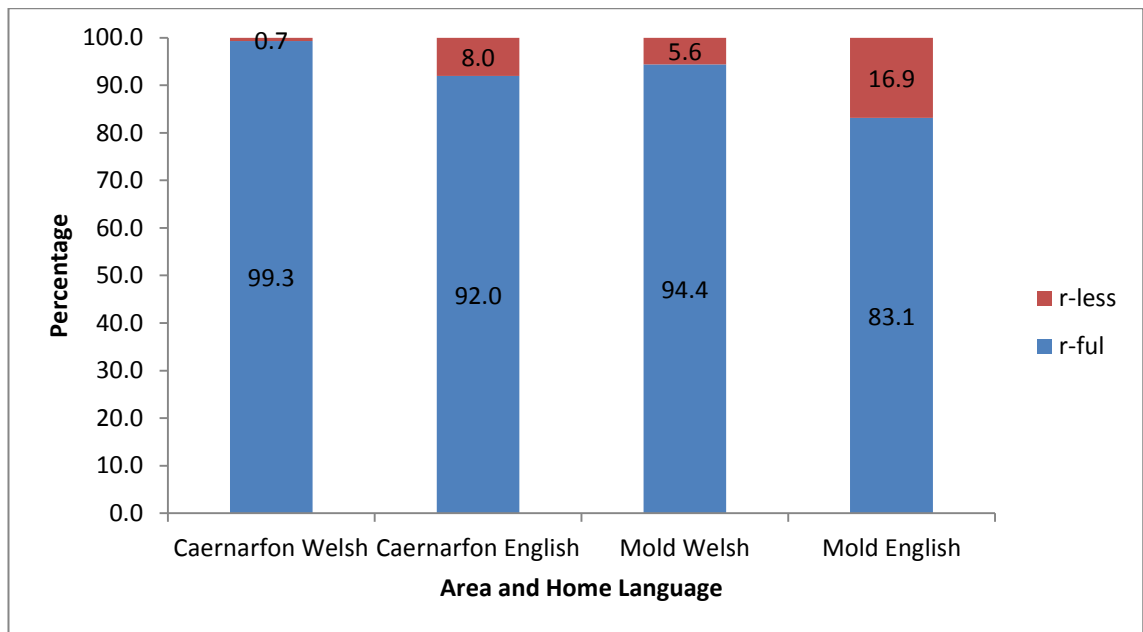


Figure 7.2: Proportion of *r*-ful and *r*-less tokens in Welsh by area and home language.

Figure 7.2 confirms that there are both home language and community differences in the realisation of coda /r/. *R*-less tokens feature more in the speech of the Mold participants than in the speech of the Caernarfon teenagers: 5.6% of the tokens by the Welsh language home group in Mold ($n=16/286$) were *r*-less compared to 0.7% in the speech of those from Welsh language homes in Caernarfon ($n=2/286$). Amongst the English home-language group there were differences between areas, with 16.9% ($n=45/267$) of tokens being *r*-less in Mold compared to 8% in Caernarfon ($n=23/287$).

As was seen for the English data, there is a distinction between those from Welsh-speaking homes in Caernarfon and other speaker groups. Speakers from English-speaking homes and Welsh-speaking homes in English-dominant areas are not producing coda /r/ categorically in their Welsh as would be expected. This supports previous work on the acquisition of Welsh across North Wales (§3.1.2), where both home language and dominant language in the community affect knowledge of vocabulary and grammatical sex as well as plural suffixes (e.g. Thomas & Gathercole

2005; Thomas et al. 2012). Here, the extent to which speakers realise coda /r/ in their Welsh is proportionate to their self-reported language use. Those from Welsh-speaking homes in Caernarfon use Welsh the most, followed by those from Welsh-speaking homes in Mold and those from English-speaking homes.

In order to assess the role of linguistic factors on the realisation of coda /r/, separate logistic regressions were conducted on the data from those from English-speaking homes in Caernarfon, those from English-speaking homes in Mold, and those from Welsh-speaking homes in Mold. In Mold, there were no fixed predictors on the realisation of coda /r/ for each home-language group⁴⁰. There are, however, linguistic constraints on the realisation of coda /r/ in the speech of those from English-speaking homes in Caernarfon which are shown in Table 7.9, below:

⁴⁰ There were no significant predictors in the data from those from Welsh-speaking homes (Deviance= 304.588 df= 15, intercept= 3.247, grand mean= 0.089, speaker std. dev.= 1.036) or from English-speaking homes (deviance= 223.777, df= 3, intercept= 1.93, grand mean= 0.831, speaker std. dev.= 1).

Table 7.9: Rbrul output for the realisation of coda /r/ in Welsh (Caernarfon English home-language group).

Realisation of coda /r/ in Welsh (Caernarfon English home-language group)					
Deviance	119.551				
df	4				
Intercept	7.85				
Grand Mean	0.91				
Speaker Std. Dev.	0.12				
Factor	Log-Odds	Tokens	Proportion of application [rhoticity]	Weight	p
STRESS					0.02
<i>Stressed</i>	0.866	195	0.954	0.704	
<i>Unstressed</i>	-0.866	61	0.770	0.296	
PRECEDING VOWEL					0.02
[ɛ]	1.422	52	0.942	0.806	
[ɪ]	1.401	44	0.955	0.802	
[a]	0.646	72	0.931	0.656	
[u:]	-0.361	16	0.938	0.411	
[o:]	-0.585	28	0.929	0.358	
[ə]	-2.523	44	0.773	0.074	

Not Significant: STRESS:PRECEDING VOWEL; SEX; WORD POSITION; FOLLOWING SEGMENT.

Random Factors: SPEAKER, WORD.

Table 7.9 indicates that the realisation of coda /r/ in the Welsh of those from English-speaking homes in Caernarfon is subject to linguistic constraints. Syllable stress and preceding vowel influence the pronunciation of coda /r/, though there was no pairwise interaction between the two factors. Table 7.10 shows the number and percentage of *r*-ful tokens in stressed and unstressed syllables for the Caernarfon English home-language group:

Table 7.10: Number and percentage of *r*-ful tokens in stressed and unstressed syllables in the Welsh of the Caernarfon English home-language group.

Syllable stress	<i>r</i> -ful (%)	<i>r</i> -ful (n)	Total
Stressed	95.4	186	195
Unstressed	77.0	47	61
Total		233	256

The influence of stress on the realisation of coda /r/ is well-attested in many varieties of English where coda /r/ is a variable (see §7.3.1). The influence of preceding vowels has also been found to be significant in previous studies, and Table 7.11 shows the number and percentages of *r*-ful and *r*-less tokens for each vowel category for the Caernarfon English home-language group (the vowels /ɔ/ and /i:/ were omitted from the multivariate analysis, above, as coda /r/ was realised in all instances):

Table 7.11: Number and percentages of *r*-ful and *r*-less tokens for each vowel category for the Caernarfon English home-language group.

Vowel	<i>r</i> -ful (n)	<i>r</i> -less (n)	Total
/ə/	34	10	44
/o:/	26	2	28
/a/	67	5	72
/u:/	15	1	16
/ɛ/	49	3	52
/ɪ/	42	2	44
/ɔ/	10	0	10
/i:/	21	0	21
Total	264	23	287

Vowel	<i>r</i> -ful (%)	<i>r</i> -less (%)
/ə/	77.3	22.7
/o:/	92.9	7.1
/a/	93.1	6.9
/u:/	93.8	6.3
/ɛ/	94.2	5.8
/ɪ/	95.5	4.5
/ɔ/	100.0	0.0
/i:/	100.0	0.0

The influence of the preceding vowel varies according to other studies. For instance, Feagin (1990) found that front vowels favoured the realisation of coda /r/ in Alabama, whereas back vowels were found to favour *r*-ful pronunciation in Boston (Nagy & Irwin 2007: 142). *R*-ful tokens were more likely after back vowels in the English of East Lancashire (Barras 2010: 183). The realisation of coda /r/ in Welsh is favoured by both a front and back vowel, with a preceding schwa being less conducive to *r*-ful pronunciation. *R*-less instances of coda /r/ appear, at least in the English context, to be

associated with reduced vowels in unstressed syllables (Stuart-Smith & Scobbie 2008: 107). Although vowel reduction is not thought to be a feature of Welsh, where schwa can appear in stressed and unstressed positions, there were instances ($n=15$) of reduced vowels and non-realisation of coda-*r* in the words *hanner* ‘half’, *mercher* ‘Wednesday’, *arfer* ‘usual’, and *amser* ‘time’ (where the vowel / ϵ / would be expected). Vowel reduction is not examined further here, and as there was no pairwise relationship between preceding vowel and syllable stress no further differences between stressed and unstressed / ∂ / were investigated.

7.3.3 Summary

The realisation of coda / r / is influenced by speaker home language and area in both English and Welsh. In English, *r*-ful pronunciations are restricted to the speech of those from Welsh-speaking homes in Caernarfon, for whom coda / r / is more likely to be realised in the coda of stressed syllables and in more careful speech. The orientation to more *r*-ful pronunciations in more careful speech suggests that this feature is a stylistic marker, insofar as there is both social and stylistic stratification (cf. Labov 1972: 314). It remains to be seen, however, whether the realisation of coda / r / in Caernarfon English is above the level of speakers’ awareness. This issue could be examined in future work using methods which gauge speakers’ perceptions of dialect and variation (e.g. Preston 1986).

In light of previous references to *r*-ful pronunciations in Caernarfon English, it appears that the adolescent speakers from Welsh-speaking homes in Caernarfon are orienting towards wider community norms in more careful speech. It is noteworthy, however, that those from English-speaking homes avoid *r*-ful pronunciations. This will be examined further in §7.5.

The Welsh data show mostly *r*-ful pronunciations, but this feature is subject to social constraints. Home language is the most powerful predictor on the realisation of coda /r/ in Welsh, with *r*-ful pronunciations being more frequent amongst the speech of those from Welsh-speaking homes. The non-realisation of coda /r/ in Welsh is primarily a transfer effect in the speech of those who have less exposure to Welsh in their daily lives and have completely *r*-less English. This is not just a case of L1 transfer, as area is also a significant predictor on *r*-ful pronunciations in Welsh and those from Welsh-speaking homes in Mold also produce *r*-less tokens.

It is only in the speech of those from English-speaking homes in Caernarfon that the realisation of coda /r/ in Welsh is subject to other constraints. For this group, both syllable stress and preceding vowel produce significant trends. It appears that this group are acquiring new constraints on this feature, and these constraints are language-specific as they do not appear in this group's English.

7.4 /r/ in word-initial prevocalic and word-medial intervocalic positions

This section examines the realisation of /r/ in word-initial prevocalic and word-medial intervocalic positions. In Welsh, the voiced alveolar trill [r] and tap [ɾ] are expected in these positions whereas the voiced alveolar approximant is most commonly cited in English (§7.1). Table 7.12 shows the number of raw tokens and percentages for each variant in word-initial prevocalic and word-medial intervocalic positions:

Table 7.12: /r/ variants in Welsh and English.

Variant	Welsh	English
Approximant	64.4% (<i>n</i> =596/925)	89.2% (<i>n</i> =979/1098)
Tap	21.1% (<i>n</i> =195/925)	5.3% (<i>n</i> =58/1098)
Trill	11.8% (<i>n</i> =109/925)	5.1% (<i>n</i> =57/1098)
Uvular	2.4% (<i>n</i> =22/925)	0.0% (<i>n</i> =0/1098)
Zero	0.3% (<i>n</i> =3/925)	0.4% (<i>n</i> =4/1098)

A glance at the overall proportions of the different variants in Welsh and English shows that, firstly, the alveolar approximant is more common in Welsh than has previously been attested as 64.4% (*n*=596) of the Welsh tokens were realised as this variant. Secondly, there is more variability in Welsh than in English where there are fewer instances of the tap (5.3%, *n*=58) and trill variants (5.1%, *n*=57). Thirdly, there are instances of uvular variants in the Welsh speech, which account for 2.4% (*n*=22). These tokens were produced by one speaker whose Grandfather came from an area where uvular variants in Welsh are attested (§7.1).

The application of the alveolar approximant was chosen for the multivariate analyses in the following section. A paired chi-squared test between the historically English alveolar approximant and historically Welsh tap, trill, and uvular variants revealed that the approximant is significantly more likely in English than in Welsh (Chi-squared with Yates' Correction = 180.7, *p*=0.001) and it is to the English data that we first turn.

7.4.1 English data

As was found for the realisation of coda /r/, area and home language are influential factors on the likelihood of producing the approximant in English speech. In addition to this, style is a significant predictor with Table 7.13 shows the best Rbrul output for the English data:

Table 7.13: Rbrul output for the realisation of the approximant in #_V and V_V positions in English.

_V/V_V (English)					
Deviance	379.689				
df	6				
Intercept	5.884				
Grand Mean	0.892				
Speaker Std. Dev.	2.727				
Token Std. Dev	0.83				
Factor	Log Odds	Tokens	Proportion	Weight	p
AREA					0.009
<i>Mold</i>	2.16	541	0.994	0.897	
<i>Caernarfon</i>	-2.16	557	0.792	0.103	
HOME LANGUAGE					0.009
<i>English</i>	1.294	555	0.953	0.785	
<i>Welsh</i>	-1.294	543	0.892	0.215	
STYLE					0.0495
<i>Interview</i>	0.525	330	0.975	0.628	
<i>Wordlist</i>	-0.525	768	0.875	0.372	

Not Significant: AREA:HL, SEX:AREA, SEX:HOME LANGUAGE, CONTEXT (V_V/_V), STRESS, SYLLABLE POSITION, PRECEDING VOWEL, PROCEEDING VOWEL

Random Factors: SPEAKER, TOKEN.

The strongest influence on the realisation of the alveolar approximant in English is area, and in Mold the alveolar approximant appears to be near-categorical (99.4%). This is not the case in Caernarfon, where 79.2% of tokens were realised as approximants. This supports previous claims that traditionally Welsh variants are common in the English of North West Wales (Penhallurick 1991: 132). Home language also produces significant trends, however, and it remains to be seen whether the production of typically Welsh variants in English speech is a feature of those from

Welsh-speaking homes in Caernarfon, as was shown to be the case for the realisation of coda /r/.

The multivariate analysis for the overall data also shows a significant trend for the alveolar approximant to be more frequent in interview speech than in the wordlist. This is somewhat surprising, as it suggests that speakers are shifting to a more locally marked variety in more careful speech. It is not clear, however, whether style remains a significant constraint for each area and home-language group. This is examined in the following sections and we begin with an examination of the Caernarfon subset.

7.4.1.1 Caernarfon

The data in Table 7.14 show the number of tokens for each variant of /r/ and the percentages in the interview data from Caernarfon. The results are stratified by home language:

Table 7.14: /r/ variants in the Caernarfon English interview data by home language.

Variant	Welsh home language	English home language
Approx.	74.4% (<i>n</i> =58/78)	96.8% (<i>n</i> =92/95)
Tap	21.8% (<i>n</i> =17/78)	2.1% (<i>n</i> =2/95)
Trill	3.8% (<i>n</i> =3/78)	1.1% (<i>n</i> =1/95)
Zero	0	0

The interview data for Caernarfon shows that it is in the speech of those from Welsh-speaking homes that there is more variability. Those from English-speaking homes tend to produce the approximant in casual speech. The difference between the two groups in producing the approximant versus other tokens is significant (Fisher's Exact, $p < 0.001$). In order to examine style-shifting, Table 7.15 shows the number of tokens from the wordlist data:

Table 7.15: Number of /r/ variants in the Caernarfon English wordlist data by home language.

Variant	Welsh home language	English home language
Approx.	62.5% (<i>n</i> =120/192)	89.1% (<i>n</i> =171/192)
Tap	17.7% (<i>n</i> =34/192)	2.6% (<i>n</i> =5/192)
Trill	19.8% (<i>n</i> =38/192)	7.8% (<i>n</i> =15/192)
Zero	0	0.5% (<i>n</i> =1/192)

A comparison between Table 7.14 and Table 7.15 shows that there is a decrease in the number of approximants in the wordlist task. For those from English-speaking homes, the frequency of approximant tokens decreases from 96.8% (*n*=92) in their interview speech to 89.1% (*n*=171) in the wordlist task, although the group still produce significantly more approximant tokens than the Welsh home-language group (Chi-squared with Yates' Correction = 35.473, 1df, *p*<0.001). The differences between the two tasks and the two groups are shown in Figure 7.3 below:

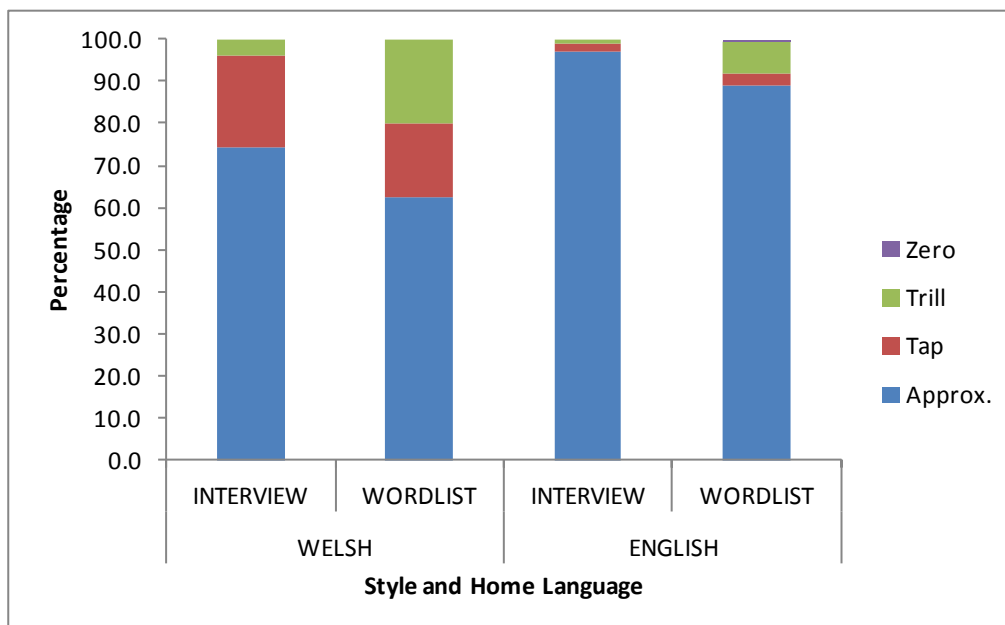


Figure 7.3: Percentage of /r/ variants in the Caernarfon English data by home language and style.

Both Table 7.15 and Figure 7.3 indicate that it is actually the trill which increases in frequency when speakers shift from casual speech to more careful speech. The increase is significant for both the Welsh home language (Fisher's Exact, $p < 0.001$) and English home-language groups (Fisher's Exact, $p = 0.00252$). The tap decreases in more careful speech for the Welsh home-language group, though this difference is not significant (Chi-squared with Yates' Correction = 0.367, $df = 1$, $p = 0.5445$), and does not significantly increase for the English home-language group (Fisher's Exact, $p = 1$).

In order to examine whether style was a significant predictor for both groups in multivariate analyses, Rbrul analyses were conducted on the Welsh home-language and English home-language groups separately. Style was found to be a significant predictor for the Welsh home-language group, which confirms that this group is more likely to produce the approximant in more casual speech than in more formal speech. This mirrors their behaviour in relation to the realisation of coda /r/, where *r*-ful tokens were found to be more prevalent in wordlist speech. Table 7.16 shows the Rbrul output:

Table 7.16: Rbrul output for the production of the approximant in English (Caernarfon Welsh home-language group).

Production of [ɹ] in English (Caernarfon Welsh home-language group)					
Deviance	277.983				
df	4				
Intercept	1.457				
Grand Mean	0.659				
Speaker Std. Dev.	0.902				
Factor	Log-Odds	Tokens	Proportion of application [ɹ]	Weight	p
STYLE					0.04
<i>Interview</i>	0.445	78	0.744	0.61	
<i>Wordlist</i>	-0.445	192	0.625	0.39	

Not Significant: SEX; STRESS; PRECEDING VOWEL; PROCEEDING VOWEL; CONTEXT.

Random Factors: SPEAKER, WORD.

Only two speakers from English-speaking homes in Caernarfon had less than categorical productions of the approximant. Despite the differences between the interview and wordlist raw data, suggests that the Caernarfon English group do not tend to style-shift with regards to this feature.

7.4.1.2 Mold

Table 7.17 and Table 7.18 show the overall variants of /r/ in the speech of those from Mold in the interview and wordlist:

Table 7.17: /r/ variants in the Mold English interview data by home language.

Variant	Welsh home language	English home language
Approx.	100% (n=81/81)	100% (n=76/76)
Tap	0	0
Trill	0	0
Zero	0	0

Table 7.18: /r/ variants in the Mold English wordlist data by home language.

Variant	Welsh home language	English home language
Approx.	99.5 (n=191/192)	99.0 (n=190/192)
Tap	0.0	0.0
Trill	0.0	0.0
Zero	0.5 (n=1/192)	1 (n=2/192)

Tables 7.17 and Tables 7.18 show that the tap and trill do not feature in the English speech of the Mold Welsh-English bilinguals, regardless of their home language.

Unsurprisingly, there were no fixed predictors on the Mold data⁴¹. The results have therefore shown that there is variation in the production of /r/ in a Welsh-dominant area (Caernarfon) which does not exist in an English dominant area (Mold). In the latter area the alveolar approximant is produced very near categorically by all speakers, regardless of linguistic background.

Home language does exhibit a significant influence on /r/ variation in Caernarfon. Speakers who come from Welsh language homes produce fewer instances of the approximant when compared to those from English language homes. Moreover, those from Welsh language homes tend to produce more typically Welsh variants in

⁴¹ Deviance= 36.343, df= 3, intercept= -6.95, grand mean= 1, speaker std. dev.= 1.212.

more careful speech whereas this tendency was not found to be true of those from English-speaking homes.

7.4.2 Welsh data

The influence of extra-linguistic factors on /r/ in prevocalic and intervocalic positions is not the same in Welsh as it is in English. For Welsh, speaker sex also influences the production of the approximant in addition to area, home language, and style. The Rbrul output is shown in Table 7.19, below:

Table 7.19: Rbrul output for the realisation of the approximant in #_V and V_V positions in Welsh.

_V/V_V (Welsh)					
Deviance	864.145				
df	7				
Intercept	-1.18				
Grand Mean	1				
Speaker Std. Dev.	1.195				
Token Std. Dev	0.547				
Factor	Log Odds	Tokens	Proportion	Weight	p
SEX					0.0174
<i>Male</i>	0.583	473	0.735	0.642	
<i>Female</i>	-0.583	452	0.549	0.358	
AREA					0.001
<i>Mold</i>	1.024	453	0.797	0.736	
<i>Caernarfon</i>	-1.024	472	0.498	0.264	
HOME LANG.					<0.001
<i>English</i>	0.859	464	0.778	0.71	
<i>Welsh</i>	-0.859	461	0.51	0.29	
STYLE					<0.001
<i>Interview</i>	0.544	381	0.745	0.633	
<i>Wordlist</i>	-0.544	544	0.574	0.367	

Not Significant: AREA:HL, SEX:AREA, SEX:HOME LANGUAGE, CONTEXT (V_V/_V), STRESS, SYLLABLE POSITION, PRECEDING VOWEL, PROCEEDING VOWEL

Random Factors: SPEAKER, TOKEN.

The strongest influence on the realisation of the approximant in Welsh is once again *area* and the approximant is more likely to feature in the speech of those from Mold rather than Caernarfon (log-odds = 1.024), Home language is once again a significant predictor with those from English-speaking homes being more likely to

transfer the approximant into their Welsh speech (log-odds = 0.859). All of the previous multivariate analyses have shown a similar patterning for (r) variation, with either area or home language being the most significant indicator for the realisation of coda /r/ in English and Welsh, and the production of the alveolar approximant in English.

Sex has appeared for the first time as a significant predictor on variation, with the alveolar approximant in Welsh being more likely in the speech of males than females (log-odds = 5.83). This is not wholly surprising in light of the tendency for females to use more standard forms in situations of stable sociolinguistic stratification (Labov 1990: 210; Labov 2001). The fact that style also plays a significant role, with the approximant appearing more frequently in interview than wordlist speech, confirms that the Welsh tap and trill are considered to be the more standard forms. It remains to be seen, however, whether the sex and style differences apply across the dataset or whether this kind of stratification is only present in the speech of certain speaker groups, as was found in the English data. Let us first turn to the Caernarfon data to explore this further.

7.4.2.1 Caernarfon

A further multivariate analysis was conducted on the data from Caernarfon only, in order to ascertain whether, firstly, speaker sex, home language, and style were retained as significant predictors. Table 7.20 shows the output for this subset:

Table 7.20: Rbrul output for the production of the alveolar approximant in Caernarfon Welsh data.

Production of [ɹ] in Welsh (Caernarfon Welsh)					
Deviance	537.351				
df	6				
Intercept	0.158				
Grand Mean	0.498				
Speaker Std. Dev.	0.873				
Factor	Log-Odds	Tokens	Proportion of application [ɹ]	Weight	p
SEX					0.01
<i>Male</i>	0.692	236	0.623	0.666	
<i>Female</i>	-0.692	236	0.373	0.334	
HOME LANGUAGE					<0.01
<i>English</i>	0.686	222	0.613	0.665	
<i>Welsh</i>	-0.686	250	0.396	0.335	
STYLE					<0.01
<i>Interview</i>	0.563	200	0.620	0.637	
<i>Wordlist</i>	-0.563	272	0.408	0.363	

Not Significant: STRESS; PRECEDING VOWEL; PROCEEDING VOWEL; CONTEXT.

Random Factors: SPEAKER, WORD.

The results of the multivariate analysis confirm that speaker sex, home language, and style remain significant predictors on the Caernarfon data. The alveolar is most common in the informal speech of males from English-speaking homes in this area. Speaker sex is the most powerful predictor on the Caernarfon subset. This is the first result which is not related to speakers' exposure and usage of Welsh outside of the classroom. Let us examine the Caernarfon data in more detail.

Table 7.21 shows the total count for the /r/ variants in the Welsh data, stratified by speakers' home language and sex:

Table 7.21: /r/ variants in the Caernarfon Welsh interview data by home language and sex.

Variant	Caernarfon Welsh Females	Caernarfon Welsh Males	Caernarfon English Females	Caernarfon English Males
Approx.	65.6% (<i>n</i> =42/64)	50.0% (<i>n</i> =25/50)	34.2% (<i>n</i> =13/38)	91.7% (<i>n</i> =44/48)
Tap	25.0% (<i>n</i> =16/64)	48.0% (<i>n</i> =24/50)	44.7% (<i>n</i> =17/38)	8.3% (<i>n</i> =4/48)
Trill	9.4% (<i>n</i> =6/64)	2.0% (<i>n</i> =1/50)	21.1% (<i>n</i> =8/38)	0.0
Zero	0.0	0.0	0.0	0.0

The females from English-speaking homes produce the fewest instances of the approximant in the interview (34.2%, *n*=13). They not only produce significantly fewer than males from the same home-language group but also significantly fewer than females (Chi-squared with Yates' Correction = 8.248, 1df, *p*=0.0041) from the Welsh home-language group.

The males from Welsh-speaking homes also produce relatively fewer approximant tokens (50%, *n*=25), and there is no significant difference between them and females from English-speaking homes (Fisher's Exact *p*=0.3105). There is no statistically significant difference in the frequency of the approximant in interview data between males and females from Welsh-speaking homes in Caernarfon (Chi-squared with Yates' Correction = 2.220, 1df, *p*=0.1362). Overall, 58.7% of tokens from this group were approximants (*n*=67).

The males from English-speaking homes approach near-categorical productions of the approximant in the interview data (91.7%, *n*=44), which differs significantly from both the Welsh home language males (Fisher's Exact, *p*<0.001) and females (Fisher's Exact, *p*=0.0013).

These results from the Caernarfon are summarised in Figure 7.4:

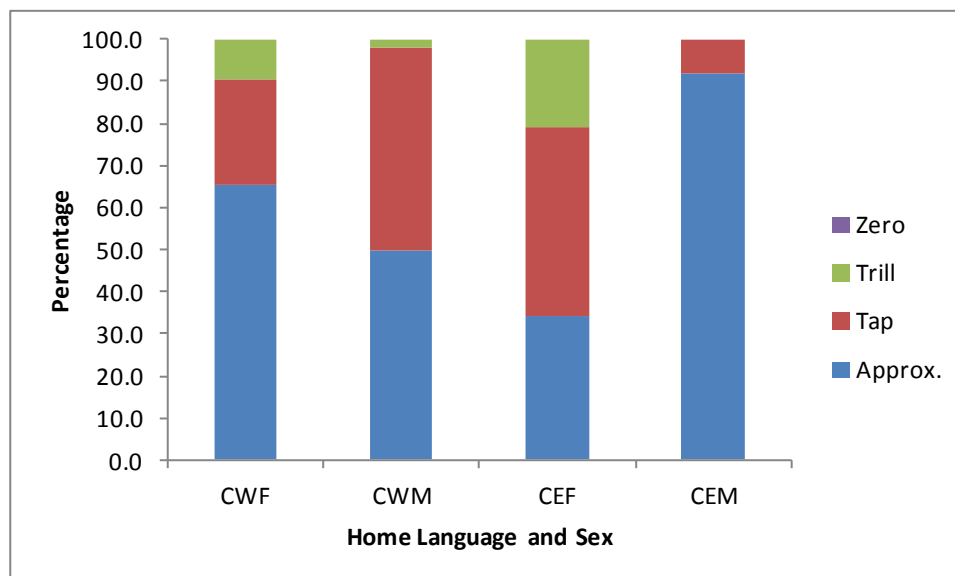


Figure 7.4: Percentage of /r/ variants in Caernarfon Welsh interview data by home language and sex.

Let us now examine the wordlist data from Caernarfon. Table 7.22 shows the token numbers and proportion of each variant per speaker group:

Table 7.22: /r/ variants in the Caernarfon Welsh wordlist data by home language and sex.

Variant	Caernarfon Welsh Females	Caernarfon Welsh Males	Caernarfon English Females	Caernarfon English Males
Approx.	11.8% (n=8/68)	35.3% (n=24/68)	36.8% (n=25/68)	79.4% (n=54/68)
Tap	47.1% (n=32/68)	29.4% (n=20/68)	29.4% (n=20/68)	11.8% (n=8/68)
Trill	41.2% (n=28/68)	35.3% (n=24/68)	32.4% (n=22/68)	8.8% (n=6/68)
Zero	0.0	0.0	1.5% (n=1/68)	0.0

The females from Welsh language homes now produce the fewest approximant realisations (11.8%, $n=8$). They produce significantly fewer instances of the approximant than males from the same group (Chi-squared with Yates' Correction = 9.195, 1df, $p=0.0024$), females from English-speaking homes (Chi-squared with Yates'

Correction = 20.334, 1df, $p < 0.001$), and males from English-speaking homes (Chi-squared with Yates' Correction = 60.026, 1df, $p < 0.001$).

Within the English group, the distinction between males and females is also significant (Chi-squared with Yates' Correction = 23.678, 1df, $p < 0.001$) with males producing 79.4% ($n=54$) approximant tokens compared to 36.8% ($n=25$) in the speech of females.

The percentage of approximant tokens in the speech of males from Welsh-speaking homes and females from English-speaking homes is again similar (35.3% ($n=24$) and 36.8% ($n=25$) respectively), and this difference is not significant (Chi-squared with Yates' Correction = 0.032, 1df, $p = 0.8582$).

Figure 7.5 shows the percentage of /r/ variants by home language and sex:

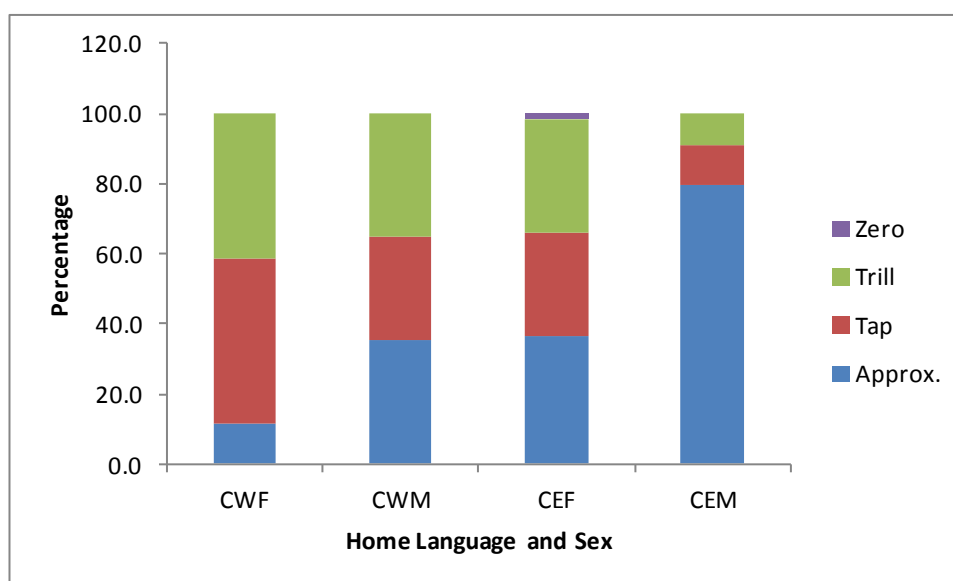


Figure 7.5: Percentage of /r/ variants in Caernarfon Welsh wordlist data by home language and sex.

Comparison between the interview and wordlist data has indicated that all speaker groups produce fewer instances of the alveolar approximant in more careful speech, and that speaker sex is the most powerful predictor on the realisation of the approximant. Separate multivariate analyses were conducted on the female and male data, in order to find out whether home language and style remain significant predictors.

These are summarised in the tables which follow. Table 7.23 shows that home language is not a significant predictor on the realisation of the alveolar in female speech:

Table 7.23: Rbrul output for the production of the alveolar approximant in the Welsh speech of females in Caernarfon

Production of [ɹ] in Welsh (Females in Caernarfon)					
Deviance	282.038				
df	4				
Intercept	-0.593				
Grand Mean	0.373				
Speaker Std. Dev.	0.525				
Factor	Log-Odds	Tokens	Proportion of application [ɹ]	Weight	p
STYLE					<0.01
<i>Interview</i>	0.699	102	0.539	0.661	
<i>Wordlist</i>	-0.699	134	0.246	0.339	

Not Significant: SEX; STYLE; STRESS; PRECEDING VOWEL; PROCEEDING VOWEL; CONTEXT.

Random Factors: SPEAKER, WORD.

Table 7.23 shows that only style is a significant predictor on females speech in Caernarfon, whereas home language is not a significant predictor. This is not the case in the speech of males, where both home language and style are significant:

Table 7.24: Rbrul output for the production of the alveolar approximant in the Welsh speech of males in Caernarfon.

Production of [ɹ] in Welsh (Males in Caernarfon)					
Deviance	248.347				
df	5				
Intercept	-0.794				
Grand Mean	0.623				
Speaker Std. Dev.	0.747				
Factor	Log- Odds	Tokens	Proportion of application [ɹ]	Weight	p
HOME LANGUAGE					<0.001
<i>English</i>	1.204	117	0.838	0.769	
<i>Welsh</i>	-1.204	119	0.412	0.231	
STYLE					0.02
<i>Interview</i>	0.699	102	0.539	0.661	
<i>Wordlist</i>	-0.699	134	0.246	0.339	

Not Significant: SEX; STYLE; STRESS; PRECEDING VOWEL; PROCEEDING VOWEL; CONTEXT.

Random Factors: SPEAKER, WORD

Two final analyses were run on the males' data from each home-language group, in order to find out whether both sets of males distinguished between the interview and wordlist task. There were no significant predictors on the speech of males from Welsh-speaking homes⁴², meaning that they do not distinguish between style. Style was a significant predictor on the speech of males from English-speaking homes in Caernarfon, however, as shown by Table 7.25:

⁴² Deviance= 149.031, df= 2, intercept= 0.425, grand mean= 1, speaker std. dev.= 0.869.

Table 7.25: Rbrul output for the production of the alveolar approximant in the Welsh speech of males from English-speaking homes in Caernarfon.

Production of [ɹ] in Welsh (Males from English-speaking homes in Caernarfon)					
Deviance	99.749				
df	3				
Intercept	1.865				
Grand Mean	0.838				
Speaker Std. Dev.	0.219				
Factor	Log-Odds	Tokens	Proportion of application [ɹ]	Weight	p
STYLE					0.04
<i>Interview</i>	0.568	48	0.917	0.638	
<i>Wordlist</i>	-0.568	134	0.783	0.362	

Not Significant: STRESS; PRECEDING VOWEL; PROCEEDING VOWEL; CONTEXT.

Random Factors: SPEAKER, WORD.

To summarise, this section has shown that sex, home language, and style are significant predictors on the realisation of the alveolar approximant in Caernarfon. More detailed analysis of the data and further multivariate analyses have shown that, firstly, females are more likely to produce standard variants in Welsh, regardless of home language. They are also more likely to produce fewer alveolar approximants in careful wordlist speech than in casual interview speech. Amongst the male speakers, home language is a significant predictor and the alveolar approximant is more frequent in the speech of males from English-speaking homes. This group do, however, produce fewer alveolar approximants in careful speech whereas style is not a significant predictor for males from Welsh-speaking homes. Let us now turn to the Mold data.

7.4.2.2 Mold

Table 7.26 shows the results of a multivariate analysis conducted on the Mold data only.

It shows that, unlike in Caernarfon, speaker sex is not a significant predictor in Mold:

Table 7.26: Rbrul output for the production of the alveolar approximant in Caernarfon Welsh data.

Production of [ɹ] in Welsh (Mold)					
Deviance	324.092				
df	5				
Intercept	-2.398				
Grand Mean	1				
Speaker Std. Dev.	1.705				
Factor	Log-Odds	Tokens	Proportion of application [ɹ]	Weight	p
HOME LANGUAGE					0.03
<i>English</i>	1.162	242	0.930	0.762	
<i>Welsh</i>	-1.162	211	0.645	0.238	
STYLE					<0.01
<i>Interview</i>	0.548	181	0.884	0.634	
<i>Wordlist</i>	-0.548	272	0.739	0.366	

Not Significant: SEX; STYLE; STRESS; PRECEDING VOWEL; PROCEEDING VOWEL; CONTEXT.

Random Factors: SPEAKER, WORD.

Home language has been retained in the model and the alveolar approximant appears more frequently in the speech of those from English-speaking homes. There is also evidence that there are stylistic differences in Mold. The data for the Mold interview data are shown in Tables 7.27 below:

Table 7.27: /r/ variants in the Mold Welsh interview data by home language.

Variant	Welsh home language	English home language
Approx.	76% (n=57/75)	97.2% (n=103/106)
Tap	17.3% (n=13/75)	1.9% (n=2/106)
Trill	5.3% (n=4/75)	0
Uvular	1.3% (n=1/75)	0
Zero	0	0.9% (n=1/106)

The total counts for the Mold data show that the approximant is near-categorical in the speech of those from English-speaking homes. A Fisher's exact test was conducted which compared the number of alveolar approximant productions with the number of tap, trill, and uvular production between the two groups. The difference between the two groups is significant ($p < 0.001$). Table 7.28 shows the wordlist data:

Table 7.28: /r/ variants in the Mold Welsh wordlist data by home language.

Variant	Welsh home language	English home language
Approx.	58.1% (n=79/136)	89.7% (n=122/136)
Tap	22.1% (n=30/136)	6.6% (n=9/136)
Trill	6.6% (n=9/136)	3.7% (n=5/136)
Uvular	13.2% (n=18/136)	0
Zero	0	0

Tables 7.27 and 7.28 show a clear tendency for both speaker groups to produce more typically Welsh variants in careful speech compared to in the interview data. The difference between the two groups remains significant (Chi-squared = 32.787, $df=1$, $p < 0.001$). The difference between interview and wordlist data for the two groups is not

found to be significant when speaker and word are considered as random factors in multivariate analyses. There were no predictors on the realisation of those from Welsh-speaking homes in Mold⁴³. Style was retained as a significant predictor on the speech of those from English-speaking homes, however. The Rbrul output is shown in Table 7.29:

Table 7.29: Rbrul output for the production of the alveolar approximant in the Welsh data of those from English-speaking homes in Mold.

Production of [ɹ] in Welsh (Mold English home-language group)					
Deviance	114.971				
df	4				
Intercept	3.08				
Grand Mean	0.93				
Speaker Std. Dev.	0.796				
Factor	Log-Odds	Tokens	Proportion of application [ɹ]	Weight	p
STYLE					0.02
<i>Interview</i>	0.675	106	0.972	0.663	
<i>Wordlist</i>	-0.675	136	0.897	0.337	

Not Significant: SEX; STRESS; PRECEDING VOWEL; PROCEEDING VOWEL; CONTEXT.
Random Factors: SPEAKER, WORD.

The results of the multivariate analysis suggest that, despite the alveolar approximant being more frequent in the speech of those from English-speaking homes in Mold, this variant is not fully converged in their repertoire and typically Welsh variants are used more frequently in more careful speech.

7.4.3 Summary

Area, home language, and style are significant predictors on the realisation of the alveolar approximant in word-initial prevocalic and word-medial intervocalic positions in English. The alveolar approximant is categorical in Mold, regardless of home

⁴³ Deviance= 212.007, df= 3, intercept= 1.325, grand mean= 0.465, speaker std. dev.= 2.394.

language, and no further significant predictors were found. In Caernarfon, the approximant was near-categorical in the speech of those from English-speaking homes in Caernarfon. It was only in the speech of those from Welsh-speaking homes in Caernarfon where style differences became apparent. This group produce Welsh variants in their English and are more likely to do so in more careful speech. This mirrors the data from coda /r/, where *r*-ful tokens were confined to the speech of those from Welsh-speaking homes.

Area, home language, sex, and style were found to be significant predictors on the realisation of the alveolar approximant in Welsh. In Caernarfon, sex was the strongest predictor, and females were less likely to produce the alveolar approximant in Welsh regardless of their home language. This was the first predictor to transcend home-language groupings, whereas in male speech the alveolar approximant was significantly more frequent in the speech of males from English-speaking homes. In Mold, where the alveolar approximant is more frequent in Welsh than in Caernarfon, there were no sex differences. Here, the alveolar approximant was more frequent for those from English-speaking homes who produced significantly more Welsh-variants during the wordlist task than during the interview.

The remainder of the chapter discusses the relationship between the independent variables in more detail and focusses on the restriction of Welsh variants in English to the repertoire of those from Welsh-speaking homes in Caernarfon, the role of extra-linguistic factors on the two languages, and compares the realisation of variants in English and Welsh.

7.5 Discussion

Chapter 5 explored the correlation between area and home language and participants' self-reported ability in Welsh and language use. I argued that in both Caernarfon and Mold there were differences between how speakers from differing linguistic backgrounds engage with the Welsh language, with those from English-speaking backgrounds tending to minimise their usage of Welsh in favour of English. In addition, there were clear differences in the linguistic behaviour of those from Welsh-speaking homes in the two areas. Speakers from Welsh-speaking homes in Mold, where Welsh is less dominant, tended to use Welsh much less than their counterparts in Caernarfon and assimilate to the cultural norms of the dominant Mold English group.

The differences between the groups are seen, to a certain extent, in the results of this chapter. Area and home language were found to be significant predictors of (*r*) variation in both English and Welsh. In English, there is a clear distinction between those from Welsh-speaking homes in Caernarfon, who transfer variants from Welsh, and all other groups who do not. The result is two distinct, or focussed (cf. Le Page & Tabouret-Keller 1985), varieties in English. In Welsh, differences between speaker groups exist but all speaker groups transfer from English and the differences between groups are less clear (see §8.4 where this is examined further). Let us firstly examine the English data in order to assess the relevance of area and home language in detail.

The results from the English data suggest that typically Welsh variants are absent from the English speech of bilinguals in Mold. This was shown in both the total counts, where speakers in Mold produced near-categorical *r*-less English and the alveolar approximant, and the results of the multivariate analyses. The lack of transfer effects from Welsh to English in the Mold data is most likely attributable to the history of contact between the two languages in North East Wales, and the dominance of

English monolingualism rather than Welsh-English bilingualism. In this area, a shift from Welsh to English occurred largely as a result of inward migration to the area by monolingual English speakers (R.O. Jones 1993: 546). This differs from North West Wales, where there was never a shift to monolingualism on the same scale, and no comparable population of incoming native English speakers (cf. Thomason 2001: 79). Consequently, there is more of a Welsh influence on the Welsh English of North West Wales than in North East Wales, where only certain features remain as substrate effects (§3.3.3).

It is somewhat surprising, however, that typically Welsh variants did not appear in the speech of those from Welsh-speaking homes in Mold. For this group, it might have been hypothesised that there would be L1 transfer or interference (§3.2.2; e.g. Weinrich 1953), especially in light of the existing claim that Welsh variants are an idiosyncratic feature amongst some speakers in the area (Penhallurick 1991: 132). This was not the case, though, and it appears that speakers orient towards the norms of the wider (largely monolingual) community without any interference or transfer from Welsh (see §8.3 and §8.4 for further discussion).

The findings from the English data in Caernarfon can also partially be viewed in light of the socio-historical development of bilingualism in North West Wales. As was shown above, this area is marked by the mass acquisition of English amongst the native population, which in many other areas results in the formation of dialects which contain features from the native language (§3.3.3). The realisation of coda /r/ in the English of North West Wales, in addition to the production of [r] and [r̥], are features which are claimed to be a feature of the English of Caernarfon. The fact that these features are already established in the dialect suggests that the appearance of these features in English is not solely attributable to transfer or the dominance of Welsh of individual

speakers, but that these features have become normalised in the English of the local area.

Parallels can be drawn here with the development of so-called ‘New Englishes’ in postcolonial contexts. Endonormative stabilization forms part of a theory of the development of post-colonial Englishes (Schneider 2003) and describes the final stage of development. Prior to this, the non-native language imposed on colonial communities is subject to ‘nativization’ whereby the native language influences the non-native language (Schneider 2003: 248). Endonormative stabilization describes the stage when these community specific norms are accepted by the local community. This appears to be the case in Caernarfon English, but it is noteworthy that the typically Welsh variants increase in more formal speech rather than decrease as is common in the case of other New Englishes (e.g. Singaporean English; Alsagoff 2010: 343).

There is one finding in the English data which is not supported by the claim that Welsh-English bilinguals adhere to community norms in English, which differ in the extent to which Welsh variants are present. Recall that the speech of those from English-speaking homes in Caernarfon also contained near-categorical instances of *r*-less English and the alveolar approximant. There appear to be two possible explanations for this finding. The first possibility is that the minority of people from English-speaking homes in Caernarfon who are native to the area do not acquire these features. This would have important consequences for the claims that Welsh features have undergone endonormative stabilisation in the community, which assumes that the features are not merely transfer effects but are a substrate in the speech of monolinguals (Johanson 2002: 304; §3.3.3). Further work is needed with older generations in Caernarfon, in order to find out whether this is the case.

The attitudinal data may also play a role in explaining the linguistic behaviour of those adolescents from English-speaking homes in Caernarfon. The quantitative data from this group indicated a tendency to engage much less with Welsh, despite living in a Welsh-dominant area. In fact, their self-reported use of Welsh was not significantly different from that of those from English-speaking homes in the English-dominant community of Mold. Furthermore, the qualitative data suggested that peer groups were largely language-specific, with those from English-speaking homes belonging to peer groups which used English exclusively.

There is no data in the current study to suggest that those from English-speaking homes are in increased contact with speakers who do not use Welsh variants in their speech as a result of their distinct social practices (cf. Eckert 1989), but there is an indication that adolescents from English-speaking backgrounds are distinguishing themselves from those from Welsh-speaking homes and from the Welsh language by forming English-language peer groups (§5.4). Further ethnographic work is required to substantiate this claim and could form the basis of future research. Area and home language were also found to be significant predictors on the Welsh data. Home language was found to be the most significant predictor on the non-realisation of coda /r/, though area was also found to be significant. In the examination of the total counts for the data, it was found that the realisation of coda /r/ is categorical in the speech of those from Welsh-speaking homes in Caernarfon whereas there was slight variation in all other groups. This corresponds with previous work on the acquisition of Welsh, which shows the importance of exposure to the language on the acquisition of historically ‘correct’ forms of the language (M. Jones 1998; Thomas & Gathercole 2005; Gathercole & Thomas 2009; Thomas et al. 2012). Those for whom engagement with Welsh is more

limited, i.e. those from English-speaking homes and Welsh-speaking homes in Mold, appear to be transferring the postlexical non-realisation of coda /r/ from their English.

It is not clear whether this is a feature which will take on social significance, as has been found in previous studies of coda /r/ (e.g. Labov 1966, 1972; Romaine 1978). On the one hand, the relatively low frequency of *r*-less tokens in the data suggest that this is low-level interference from English in the speech of those who are more exposed to this language. On the other hand, it is noteworthy that syllable stress and preceding vowel are significant predictors on the realisation of coda /r/ in the Welsh of the English home-language group in Caernarfon. Although these linguistic constraints have been found in previous studies of English (e.g. Feagin 1990; Irwin & Nagy 2007), this group are transferring the non-realisation of coda /r/ to their Welsh and adopting new linguistic constraints. The status of coda /r/ as a transfer feature is discussed further in Chapter 8.

The realisation of the alveolar approximant in Welsh was subject to a much more complex patterning of variation than the other variables. Area was the strongest predictor on the realisation of the alveolar approximant in Welsh, with more approximants featuring in the speech of those from Mold. This highlights dialectal differences between the two areas which have not been recorded previously, though it would be inappropriate to suggest that the alveolar approximant is merely a dialect feature associated with the North East.

The alveolar approximant is a common feature in speech across North Wales, and the influence of other extra-linguistic constraints suggests that in Welsh the trill and tap are more frequent in more formal speech for both females and those from English-speaking homes. The widespread production of the alveolar approximant in Welsh may be seen as surprising as it has been unreported in previous work (§1.3). Equally, the fact

the alveolar approximant is not the more prestigious variant (i.e. not produced more frequently in formal speech) might not have been predicted given the dominance of English, especially in North East Wales.

The style-shifting towards typically Welsh variants in more careful speech is, somewhat predictable in the case of those from English-speaking homes. In cases of Second Language Acquisition, Major (2004: 170) notes that ‘the more formal the style, the less L1 transfer and the greater the frequency of targetlike forms’. It could be stated, then, that those from English-speaking homes tend to transfer less from English in more formal speech. Having said this, the fact that females from Welsh-speaking homes in Caernarfon also follow the same pattern of behaviour is indicative that stylistically constrained (r) variation is not confined to those who have acquired Welsh via immersion education. In other words, this behaviour may not be due to the effects of Second Language Acquisition, at least in North West Wales where those from Welsh-speaking homes style-shift. Data from older speakers will allow us to ascertain whether the alveolar approximant is increasing in Welsh, and leading to convergence with English. While this might be seen as a further sign of language obsolescence, where the minority language generally moves towards the dominant language (§3.3.2), the fact remains that speakers in the North West orient towards Welsh variants in formal speech. This suggests that, rather than being a sign of obsolescence, the variants of (r) operate identically in both languages for some speakers and that the situation is relatively stable.

Sex is the strongest predictor on the Caernarfon dataset, with the alveolar being less frequent in the speech of females regardless of home language. This is a somewhat surprising result in light of the significance of home language across the dataset. However, the relative conformity of females to standard or prestige variants is a result that has been found in previous sociolinguistic studies (see Labov 2001: 266 and

references therein). The tendency for females to produce more standard forms than males can be stated as follows:

Perhaps the broadest and most widely instantiated sociolinguistic generalization concerns the careful behaviour of women with stable sociolinguistic variables. It can be stated as *Principle 2*, the linguistic conformity of women: *For stable sociolinguistic variables, women show a lower rate of stigmatized variants and a higher rate of prestige variants than men* (Labov 2001: 266).

Whilst the overall data showed that females produce more of the standard Welsh variants than males in Caernarfon, the behaviour of females is also characterised by systematic style-shifting and the tendency for females to produce more standard Welsh variants in more formal speech. This was particularly the case for females from Welsh-speaking homes, who showed the most extreme style shifting. This could indicate that this group in particular, and females in general in Caernarfon, show ‘the greatest recognition of external standards of correctness’ (Labov 1990: 224), though further insights into how speakers perceive this variable would be needed to substantiate this claim.

7.6 Summary

The first section in this chapter examined coda /r/ in both Welsh and Welsh English. It was found that the realisation of the feature is primarily language specific, with Welsh tending to be *r*-ful and English tending to be *r*-less. In the case of the latter variety, the section has quantified claims that the realisation of coda /r/ is a feature of North West Wales English. In particular, *r*-ful tokens of English are most likely to occur in the English speech of those from Welsh-speaking homes in Caernarfon. For this group, coda /r/ is categorically realised in Welsh and is a common feature of their English as speakers orient towards community norms. Furthermore, it is more common in more

careful speech. For other groups, however, English is almost categorically *r*-less and there are instances of *r*-less tokens in Welsh.

The second section examined the frequency of the alveolar approximant, most often associated with English, in the participant's bilingual speech. As was found for coda /r/, the production of typically Welsh variants in English is confined to those from Welsh-speaking homes in Caernarfon, especially in more careful speech. Those from English-speaking homes in Caernarfon tended not to produce Welsh variants in their English speech although this was more likely than in the speech of those from Mold. This areal distinction was explained by the socio-historical differences which have resulted in the appearance of typically Welsh variants in Caernarfon. In Caernarfon, parallels can be drawn with post-colonial Englishes where local variants, influenced by language contact, become normalised. Further study is needed to investigate why those speakers from monolingual English homes are not orienting towards local norms as frequently as those from Welsh-speaking homes.

The alveolar approximant is a feature of North Wales Welsh. Area and home language were the strongest predictors on its production and it is more common in Mold than in Caernarfon. In Caernarfon, sex is the strongest predictor: females in this area tend to produce fewer approximants in Welsh, especially in formal speech and regardless of home language. Amongst males in Caernarfon, there is a home language distinction and males from English-speaking homes produce much more frequent realisations of the approximant. The same was found for those from English-speaking homes in Mold, though both of these groups also produced significantly more Welsh variants in more careful speech.

8 Convergence, transfer, and accounting for variation in Welsh-English bilinguals' speech

8.1 Introduction

The context for the present study was Welsh-English minority language bilingualism. This situation is characterised by long-term language contact, language shift in eastern areas and regional bilingualism in western areas, and language revitalisation across the region, Welsh-English bilingual speech had not been the subject of variationist sociolinguistic research. The study takes a variationist approach to this situation of regional minority language bilingualism, in order to investigate the complex relationship between individual bilingualism, societal language contact, and phonetic and phonological variation.

I firstly argue that it is possible for sounds to converge at the phonological level whilst retaining language-specific features at the phonetic level of implementation (§8.2). Secondly, I provide evidence for three distinct transfer processes based on the data for (r) variation which are defined as interference, transfer, and constrained transfer (§8.3). Thirdly, I attempt to conceptualise phonological variation in this instance of regional minority language bilingualism by drawing upon previous work in the field of language contact §8.4. Finally, §8.5 discusses the results in terms of language change and obsolescence in Welsh.

8.2 Phonological convergence and phonetic divergence

The study of /l/-velarisation was included in this thesis in order to examine the state of convergence, in which two languages or varieties in contact develop structural similarities (§2.2.3; Bullock & Toribio 2004: 91). /l/ was chosen for analysis as it is velarised (or dark) in all positions in northern varieties of both Welsh and Welsh English. This differs from many other varieties of English, where /l/ is light in syllable onset position and dark in syllable coda position, and suggests that Welsh and Welsh English have converged. In consideration of recent studies which have shown the gradient phonetic nature of velarisation in other varieties (e.g. Sproat & Fujimura 1993; Recasens 2005), and the extra-linguistic constraints which can influence it (e.g. Van Hofwegen 2010), the chapter aimed to examine variation in /l/-realisations in both languages phonetically and consider both linguistic and extra-linguistic influences (§6.1).

The mean values for F1, F2, and the arithmetic difference between bark-transformed F1 and F2 values were subjected to multiple two-way ANOVAs with language and word position as independent variables. Firstly, each ANOVA returned language as a significant factor, with English /l/-realisations tending to be lighter. Secondly, post-hoc Tukey's tests of the bark-transformed F2-F1 differences showed that, in all cases, word-initial and word-medial realisations were significantly lighter than word-final realisations, and that word-medial realisations were significantly lighter than word-initial realisations in all cases apart from the female Welsh data subset (§6.2.1). Mixed-effects models were then run on the data in each word position separately, with word and speaker as random effects. These tests yielded the following results:

1. Females produce lighter realisations of /l/ than males in word-initial onset and word-final coda position in both Welsh and English.
2. In word-final coda position, speakers do not distinguish between Welsh and English.
3. In word-initial onset position, females produce significantly lighter tokens in Welsh than in English ($p < 0.001$). The difference between English and Welsh was not found to be significant for males.
4. In word-medial intervocalic position, both females and males produce significantly lighter /l/-realisations in English than in Welsh ($p < 0.001$).

Finally, individual speaker differences showed that in all positions, there were speakers who differentiated between the two languages and speakers for whom English and Welsh were converged phonetically.

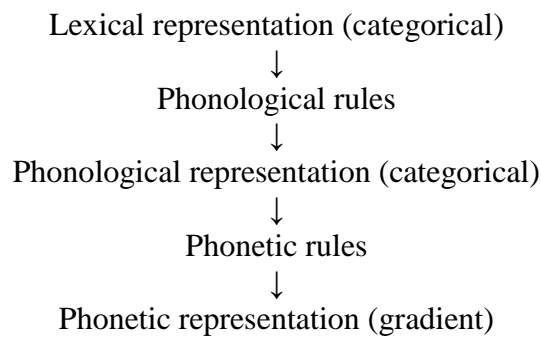
That many speakers distinguish between Welsh and English adds to an established body of evidence which shows language-specific differences in the phonetic implementation of phonologically identical speech sounds (Scobbie 2005: 1; e.g. Cho & Ladefoged 1999). I suggest that /l/ in both Welsh and English can be categorised as ‘dark’ for the following reasons: Firstly, F2 values from previous studies of other varieties, especially Recasens (2012) who compares 23 different languages and dialects, suggest that the values from both Welsh and bilinguals’ Welsh English can be considered dark. Secondly, language was a relatively weak, albeit significant, predictor on /l/-variation across the dataset. The differences are therefore small and indicate fine-grained phonetic variation rather than phonological variation.

The Speech Learning Model (SLM; e.g. Flege 1991; 1995) was highlighted in §3.2.1 as a model for the acquisition of two phonetic systems. This model does not assume maturational constraints on language acquisition and can therefore be applied to

early bilinguals through to adults acquiring a second language. The model predicts that speakers may form a new phonetic category for sounds which they perceive to be different to those already established in a new language. If this new category shares a portion of phonetic space with an existing category in the L1, they may dissimilate from each other and cause realisations which are dissimilar to monolinguals in both languages. If a speaker does not form a new category for a sound from the L2 (if she perceives it to be similar to an existing L1 sound), a merged category may be created (*phonetic category assimilation*). The model predicts that, in this case, the L2 productions will be similar to the L1 (Flege 2003: 330).

The findings from the study of /l/-velarisation are not suitable for analysis using the SLM. Firstly, there is no monolingual data included in the study to investigate dissimilation. Secondly, ‘home language’ did not produce significant trends which suggests that is not a case that those from Welsh-speaking homes are producing a more Welsh-influenced /l/ in English and those from English-speaking homes are producing a more English-influenced /l/ in their Welsh (cf. Simonet 2010). Instead, the phonetic differences between the two varieties appear to be much more fine-grained.

I suggest that the data provides evidence for both phonological convergence and phonetic divergence. Cognitively, this can be conceptualised in Lexical Phonology (for an overview see Gussenhoven & Jacobs 2005: chapter 8) as a modular feed-forward model of speech production, which distinguishes between lexemes, phonological encoding and phonetic outcomes as three distinct cognitive levels (Pierrehumbert 2002: 134). The schematisation below, after Bermúdez-Otero (2007b: 5), shows the feed-forward model:



The significance of ‘language’ as a predictor of velarisation indicates that language-specific phonetic implementation causes marginal differences between Welsh and English, despite the fact that the categorical phonological rules of both languages specify that /l/ must be dark. A possible problem with this model is that there are differences between word-initial onset, word-medial intervocalic, and word-final coda positions. This could suggest that speakers are implementing an allophonic rule in both languages which states that /l/ is light in onset position and dark in coda position. The mean F2 values in these positions does not support this claim, and previous studies posit the view that syllable position along with the influence of the neighbouring vowels are phonetic effects which cause variation regardless of whether a realisation is phonologically light or dark (Recasens 2012; Sproat & Fujimura 1993).

The distinction between Welsh and English is perhaps surprising in the context of minority language bilingualism, where phonological and phonetic differences would be expected to decrease with sustained language contact (§2.2.3; Schumann 1978: 154–158). There is a dearth of work which examines phonetic variation of phonologically converged features, though the results from this study suggest that phonological convergence may not mean phonetic convergence in situations of long-term language contact. In addition to the language-specific phonetic realisation of /l/, there is a correspondence between linguistic and social factors and degree of /l/-

velarisation which is specific to the phonetic implementation of this feature (Foulkes & Docherty 2006: 411).

The finding that language is a predictor of the degree of velarisation in addition to other factors suggests that the language of the speech event is taken into consideration when producing /l/. With regard to cognition, if we accept that phonology and phonetics have two separate levels of representation, it seems perfectly acceptable to claim that /l/ is converged at the phonological level of representation. At the phonetic level, language-specific rules would be implemented which result in slight differences between the two languages. However, most theories of phonology, regardless of whether they accept the distinction between phonological and phonetic rules of representation, now concur that the child's knowledge of speech production is abstracted from phonetic data during acquisition (cf. Pierrehumbert 2002). Therefore, I would argue that Welsh and English are convergent in that the same phonological properties apply in relation to /l/, but emphasise that the phonological categories are language-specific as they are abstractions which are based on language-specific phonetic data (Strycharczuk 2012: 44).

It is also important to note that the tendency to have separate phonetic realisations of /l/ was not universal. The within-subject comparisons showed that the distinction between English and Welsh, which provides evidence for the formation of distinct phonetic categories, was only applicable to certain speakers. 15 out of the 32 participants differentiated between the two languages in word-initial position and/or word-medial position. Interestingly, there appeared to be no clear reason why certain participants should behave differently from others, which was also found to be the case in previous studies of /l/ in bilinguals (Simonet 2010: 675; de Leeuw 2009: 211). Having said this, there was an impressionistic trend that divergence between Welsh and

English in word-initial position was more apparent in the speech of females of Caernarfon.

To summarise, phonological convergence has been shown to exist alongside phonetic divergence. In terms of how speakers manage the languages within their repertoire, there is evidence that /l/ is language specific for some speakers in terms of its realisation and that, as learnt abstractions, we must be careful that the term convergence refers to the phonological behaviour affecting features rather than the *sharing of the same feature*. Let us now turn to examine how the examination of language transfer in a variationist framework can shed light on how bilinguals manage their two languages cognitively.

8.3 Phonological transfer

Phonological transfer is a bilingual speech process which describes the use of phonemes historically associated with one language in the speech of another (§3.2.2). Transfer may occur both in the speech of the individual and at the societal level, where groups of bilinguals ‘borrow’ phonemes from one of their languages and insert them in to another. The study of (r) variation examines this in more detail. It had been previously attested that the Welsh variants [r] and [r̥] were features of English in Caernarfon (and in areas where the majority of people are L1 Welsh-speakers), and that coda /r/ was regularly realised. This contrasted with accounts of other varieties of Welsh English where /r/ is produced as [ɹ] and variants of /r/ in coda position are not realised.

The aim of Chapter 7 was to examine whether this was an effect of L1 transfer amongst those who come from Welsh-language homes regardless of where they live (i.e. a feature of both Mold and Caernarfon L1 Welsh speech), or whether this was an areal feature which occurred in the speech of all bilinguals in Caernarfon. In addition,

the same aims were applied to transfer from English to Welsh which had hitherto been unreported.

The main findings for (r) variation are summarised below:

1. The realisation of coda /r/ and the production of [r] and [ɾ] in English is restricted to speakers from Welsh-language homes in Caernarfon. This group is more likely to produce the Welsh variants in more careful English speech than in casual speech, and in stressed syllables in English.
2. The non-realisation of coda /r/ in Welsh is largely restricted to speakers from English-speaking homes in Mold, though it was also found in the speech of those from Welsh-speaking homes in Mold and English-speaking homes in Caernarfon to a lesser extent.
3. The realisation of coda /r/ in Welsh is subject to linguistic constraints for those from English-speaking homes in Caernarfon. Realisation is favoured in stressed syllables following the vowels [i] and [ɔ].
4. The production of [ɾ] is widespread in Welsh, though the frequency with which it is produced is determined by speaker home language and area (with those from English-language homes in Mold being more likely to produce [ɾ]).
5. Speaker sex produces a significant trend in Caernarfon, and males are more likely to produce [ɾ]-realisations in Welsh. This is an overall trend for the area, regardless of home language.
6. In the speech of females in Caernarfon, and those from English-speaking homes, [ɾ]-realisations are more likely in informal speech and [r]-realisations are more likely in formal speech in Welsh.

I propose that the results of the study of (r) variation provide evidence for three distinct types of transfer. A two-way distinction has been proposed previously (Paradis 1993; Grosjean 2012), and Grosjean (2012) uses the terms *transfer* and *interference*, (§2.1.3), to refer to two separate phenomena. He proposes that;

a feature that is given a high presence or acceptability value is a transfer, that is, it is a permanent trace of one language on the other. It now belongs to the linguistic competence of the people who make the judgements. On the other hand, a feature that is given a low presence or acceptability value corresponds to an interference, that is, it is a dynamic element of one language which slips into the output of the other language (Grosjean 2012: 16).

Based on low frequency, the realisation of Welsh variants in the English of all groups apart from those from Welsh-language homes in Caernarfon can be classified as interference. The production of [ɹ] in Welsh is both frequent and accepted by speakers across North Wales. For this reason, I would argue that this is transfer.

These transfer effects are constrained by linguistic and extra-linguistic factors for some speaker groups. For examples, style and syllable stress were significant predictors on the realisation of coda /r/ in English for those from Welsh-speaking homes in Caernarfon. In Welsh, coda /r/ was more likely following certain vowels and in stressed syllables for those from English-speaking homes in Caernarfon only. In such instances, the transferred features are influenced by the speech context or linguistic factors. This, I propose, merits another distinction which is *constrained transfer*.

8.3.1 Interference

Those from English-language homes in the two areas, and from Welsh-language homes in Mold, produced near-categorically *r*-less tokens in English (0.03% of tokens from the three groups, $n=25$). These speakers maintain a strict division between languages and essentially disassociate the realisation of coda /r/ in their English speech. The behaviour of this group is summarised in Figure 8.1, below:

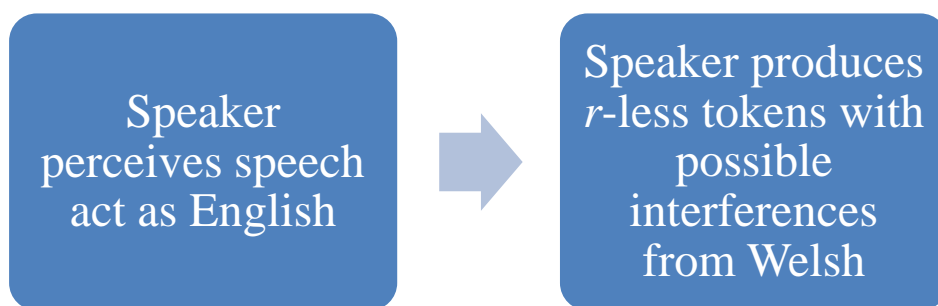


Figure 8.1: Schematisation of the cognitive processes involved in the (non-)production of coda /r/ in English (all speaker groups with the exception of those from Welsh-speaking homes in Caernarfon).

Figure 8.1 shows that, unlike those from Welsh-language homes in Caernarfon (see §8.3.2 below), the other groups in the study do not subconsciously alter their speech according to the speech context (in this study, the wordlist or interview tasks) when producing coda /r/. Instead, the *language* of the speech act is a cue to essentially realise this feature. This results, in the case of English, in essentially *r*-less realisations in all contexts regardless of the level of formality or attention paid to speech though it is possible for low-frequency interference to occur.

In Mold, I would argue that there is both low frequency and low acceptability for *r*-ful English due the historical context of contact, where there was both mass inward migration coupled with a shift to monolingualism (§3.1.3.2). Consequently, the realisation of coda /r/ is not a feature of English in this area and evidently not a feature which is acquired and used by speakers regardless of their linguistic background. Mold Welsh-English bilinguals do not use this feature in English and the few occurrences observed can be attributed to interference.

The situation in Caernarfon is more complex. The majority group (those from Welsh-language homes) *do* produce higher frequencies of *r*-ful English and the realisation of coda /r/ is a local norm to which those from Welsh-language homes orient. Those from English-language homes in the area, however, have few instances of *r*-ful English which satisfies the criteria for low frequency. The realisation of coda /r/ appears

to be acceptable to speakers in the local area, based on its frequency and the increase in its realisation in more formal contexts. However, it is a trend in which residents from English-language homes do not tend to participate. Based on this, I would argue that the realisation of coda /r/ in the English of those from English-speaking homes in Caernarfon constitutes interference rather than transfer.

A problem in the distinction between interference and transfer arises when we examine the case of the non-realisation of coda /r/ in Welsh. The main predictor on this variant was home language, and there was a weaker influence from area. Table 8.1 summarises the raw frequencies and percentages of the non-realisation of coda /r/ in Welsh for each group:

Table 8.1: Percentage and number of *r*-less coda /r/ tokens in Welsh by area and home language.

Group	<i>r</i>-less tokens (%)	<i>r</i>-less tokens (n)
Caernarfon Welsh home- language group	0.7	2
Caernarfon English home- language group	8	23
Mold Welsh home-language group	5.6	16
Mold English home-language group	16.9	45
<i>Total</i>	7.6	86

The frequency of the non-realisation of coda /r/ in Welsh is relatively low compared to the overall production of the alveolar approximant in Welsh (64.4%, $n=596$), but the question of where the line can be drawn between interference and transfer remains. The situation is complicated by the fact that linguistic factors influence the realisation of coda /r/ in Welsh amongst the Caernarfon home-language group.

Grosjean (2012) proposes that the criterion in distinguishing between interference and transfer is acceptability. Perception tests would be required to ascertain whether the non-realisation of coda /r/ in Welsh is acceptable amongst adolescent speakers, and whether there is a difference between acceptability in Mold and Caernarfon. In the absence of such tests, I would still suggest that *r*-less instances of Welsh should be counted as interference rather than transfer. The rationale behind this

claim lies in the fact that it is not present in the speech of all speaker groups (less than 1% of tokens from the Welsh-language home group in Caernarfon were *r*-less), and that it remains low-frequency compared to the production of [ɹ] in English. The claim that this is interference does, however, require investigation in further studies.

8.3.2 Transfer

Evidence for transfer in the dataset is found primarily in the presence of the alveolar approximant in Welsh (§7.4.2). The token frequency results found that the approximant was in variation with the more historically Welsh variants (the tap, trill, and uvular variants) for all speakers and overall accounted for 64.4% ($n=596$) of Welsh tokens. Though reporting raw token frequencies and percentages can be misleading, and may fail to give a proper indication of the influence of constraints on variation, the fact remains that in the data collected for this feature the majority of variants were the voiced alveolar approximant which is a feature historically associated with English. I would therefore argue that the use of the alveolar approximant in Welsh differs from the realisation of coda /r/ and production of [r] and [ɹ] in English due to its higher frequency, and constitutes *transfer* rather than interference.

Multivariate analysis showed that area (log-odds = 0.853, $p=0.017$), home language (log-odds = 1.024, $p=0.001$), and speaker sex (log-odds = 0.583, $p=0.017$) were significant predictors on the occurrence of the alveolar approximant in Welsh. [ɹ] occurred with the highest frequency in the speech of those from English-speaking homes in Mold, yet further analysis revealed that these speakers still differentiate between English and Welsh with regards to this feature. From this, we may infer that the majority of speakers tailor their use or non-use of the alveolar approximant language-specifically.

I suggest that the term ‘transfer’ should be applied to instances where:

1. A feature typically associated with language A appears in language B, and satisfies Grosjean's (2012) criteria of high frequency and acceptability.
2. The realisation of this feature is not found to be subject to linguistic and/extra-linguistic constraints in language B.

For example, no linguistic or extra-linguistic factors influenced the realisation of [ɹ] in the data of participants from Welsh-speaking homes in Mold and males from Welsh-speaking homes in Caernarfon, as shown in Figure 8.2, below:

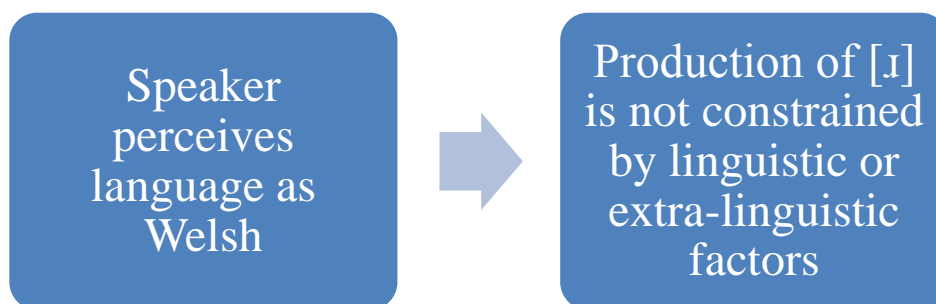


Figure 8.2: Schematisation of the use of /r/ in Welsh amongst those from Welsh-language homes in Mold, and males from Welsh-language homes in Caernarfon.

This group has language-specific behaviour when producing /r/ although they make use of all of the variants in their repertoire when speaking Welsh.

I would argue that the voiced alveolar approximant is an omnipresent and *accepted* feature of the Welsh of adolescent speakers in North Wales, which characterises the results as transfer rather than interference. Both the frequency and extra-linguistic constraints on the realisation of this phoneme provide evidence for the acceptability of the feature. Furthermore, the lack of the meta-linguistic commentary about the use of the alveolar approximant in Welsh suggests that this is a sociolinguistic marker (as there is social stratification and style-shifting) rather than a stereotyped feature (Labov 1972: 314).

The suggestion that we should distinguish between transfer (with variants in free variation) and constrained transfer is admittedly problematic. Meyerhoff (2006: 10)

describes free variation as ‘the idea that some variants alternate with each other without any reliable constraints on their occurrence in a particular context or by particular speakers’. The problem which arises from this is that it is extremely difficult to prove free variation exists empirically (Labov 1972: 188-189). This has led to many theorists working in variationist sociolinguistics to view the term with suspicion (e.g. Preston 1996: 25; Meyerhoff 2006: 10). For instance, in the case of the alveolar approximant in Figure 8.2, it is quite possible that there are constraints on variation which have simply not been taken into consideration in the current study. Furthermore, individual speaker was entered into each statistical model as a random factor in order to minimise the effect of individual variation (Johnson 2009: 365). The production of the alveolar approximant in Welsh could be constrained by linguistic and extra-linguistic factors for individuals, which would by definition be a case of constrained transfer. Distinguishing between transfer and constrained transfer on the basis of the presence or lack of free variation could therefore be seen as controversial.

The term ‘free variation’ is much more common, and arguably more justified, in SLA and language obsolescence literature (§3.3.2). Ellis (1999: 475) argues that producing variants in free variation is an important developmental process of second language learners, and that this free variation arises as learners are unable to determine functional differences between two forms. He takes issue with the more variationist view and states that ‘there is a methodological need to accept that free variation exists if a rigorous search for systematicity has failed to reveal any (Ellis 1999: 476). In cases of language obsolescence, free variation is often cited as a result of the ‘destabilisation’ of the language (Broderick 1999: 81; Campbell & Muntzel 1989: 189).

It is not within the scope of this thesis to reconcile the two viewpoints, though I would still argue for a distinction between transfer and constrained transfer based on the

evidence provided in this study. The claim that the alveolar approximant in Welsh is transfer (rather than constrained transfer) for certain speaker groups does not exclude the possibility that other constraints may exist or that individuals within these groups may behave differently, but it also does not presuppose that there must be other constraints. Furthermore, and in light of the evidence from SLA and language obsolescence, I would argue that free variation is not wholly unexpected in this case of regional minority language bilingualism.

Evidence has been provided for two distinct types of interaction between Welsh and English, termed interference and transfer, based on frequency and acceptability. These distinct processes suggest different processes in the mind of the bilingual. Low-level interference, on the one hand, suggests that the speaker perceives the language being spoken and excludes certain variants from the discourse as much as possible. High frequency transfer, on the other hand, indicates the non-exclusion of variants from the discourse and instead the speaker modifies the frequencies of variants within the extended repertoire according to the language being spoken.

8.3.3 Constrained transfer

The term *constrained transfer* describes high frequency transfer effects which have been found to be constrained by linguistic or extra-linguistic factors. The term does not stipulate that the constraints and their order must be the same in both varieties, but can be used to describe the following situations:

3. A feature typically associated with language A appears in language B and satisfies Grosjean's (2012) criteria of high frequency and acceptability.
4. The realisation of this feature is found to be subject to linguistic and/extra-linguistic constraints in language B.

The influence of style on the realisation of [ɹ] in the speech of females from Caernarfon and those from English-speaking homes provides an example of constrained transfer. Here, an additional process must be added as they change their behaviour depending on the style or context in which they are speaking.

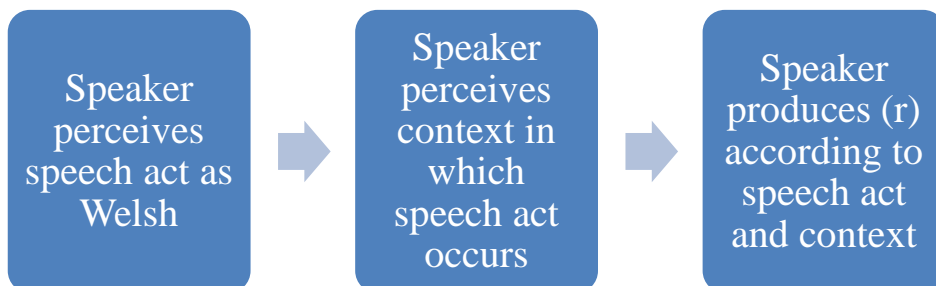


Figure 8.3: Schematisation of the use of /r/ in Welsh amongst female speakers in Caernarfon and English-speaking homes in Mold.

In general terms, we can state that it is possible for the transferred variant to enter into variation with the historically ‘native’ variant(s). In cases where there are consistent style effects (such as the above), the variable may have become a marker or stereotype depending on the level of social awareness of the variation (Labov 1972: 314; §7.3.3). It is equally possible, of course, that the variable was already a marker or stereotype, and that the transferred variant has increased the variability associated with a certain feature.

The term transfer does not differentiate between high frequency features for which no constraints on variation have been found, and those which are subject to linguistic or extra-linguistic constraints. I suggest that such a distinction should be made as additional factors are affecting speech production. The realisation of coda /r/ in the English of those from Welsh-language homes in Caernarfon provides further evidence for constrained transfer. In this case, transfer is influenced by both linguistic and extra-linguistic factors:

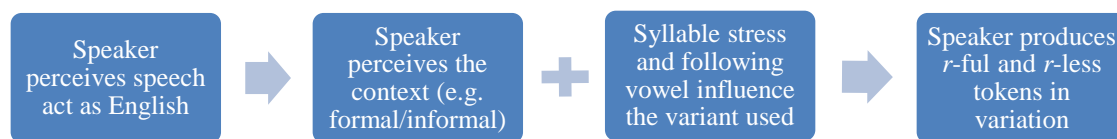


Figure 8.4: Schematisation of the cognitive processes involved in the (non-)production of coda /r/ in English (those from Welsh-speaking homes in Caernarfon).

Figure 8.4 shows that the speaker must perceive both the language of the speech act and its context. In addition to this, linguistic factors play a role in determining the variant which will be produced. Ultimately, both of these factors, that is to say language and context, affect the likelihood that coda /r/ will be produced by the speaker.

Similarities can be drawn between the concept of constrained transfer and previous work which has examined variation and the transfer of constraints in bilingual contexts⁴⁴. In their study of the acquisition of Canadian French by immersion school pupils, for instance, Mougeon et al. (2004) found that certain speakers appeared to be transferring their sociolinguistic knowledge of a variant in English (e.g. the adverb *just*) to a counterpart variant in French (in this case *juste*; cf. Mougeon et al. 2004: 426; see also Blondeau & Nagy 2008 for a similar finding). This suggests that it is not only features of the L1 which may transfer in cases of second language acquisition, but also the constraints which operate on variation.

This work has been developed in recent years by work on the acquisition of variation amongst Polish immigrants in England and Scotland (e.g. Clark & Schlee 2010; Schlee et al. 2011; Meyerhoff & Schlee 2012; Meyerhoff & Schlee forth.),

⁴⁴ The definitions of interference and transfer follow those of Paradis (1993) and Grosjean (2012; §8.3).

leading to a number of concepts describing the acquisition of variation in a second language. Table 8.2 describes these concepts:

Table 8.2: Concepts for the acquisition of variation in a second language (after Schlee et al. 2011; Meyerhoff & Schlee, forth).

Term	Description
Replication of constraints	The L2 speakers acquire local or supralocal constraints on variation for a feature (cf. Schlee et al. 2011: 226).
Rejection of constraints	A factor which is significant for native speakers is not significant for the L2 speakers (cf. Meyerhoff & Schlee forth.)
Transformation under transfer	Constraints on variation in native speech are acquired by L2 speakers, but the ordering of these constraints are altered (cf. Meyerhoff 2002; Meyerhoff & Schlee forth.)
Innovation under transfer	Constraints are present in the speech of L2 speakers which are not present in the source language (Meyerhoff & Schlee forth.).

Constrained transfer differs from this terminology insofar as it describes the synchronic transfer of *features* (in this thesis, the transfer of phonemes) from one language to another in the speech of bilinguals, rather than the (non-)acquisition of native variation by second language acquirers. In certain situations, however, constrained transfer could be used in conjunction with the terms outlined above. If we suppose, for instance, that a group of L2 speakers tended to transfer a variant from their native language into the L2, and that this variant entered into variation with other variants of an existing variable. This would constitute constrained transfer, though it would also be possible to ascertain whether the L2 speakers had replicated, rejected, or re-ordered native-speaker constraints (as they pre-existed prior to transfer), or even introduced new constraints.

There are also differences between constrained transfer and the notion *reallocation* (Trudgill 1986), which is cited in the context of koinéization. Trudgill (1986: 126) states that:

Even after koinéization [...] some variants left over from the original mixture may survive. Where this occurs, reallocation may occur, such that variants originally from different regional dialects may in the new dialect become social-class dialect variants, stylistic variants, areal variants, or, in the case of phonology, allophonic variants.

Reallocation describes a process which occurs in the context of dialect contact and koinéization (Kerswill & Williams 2005: 1023) rather than contact between two languages. In this context, the speakers are mono-dialectal in the new koiné, and the reallocated features are those which remain from a mixture of other influences, despite dialect levelling and simplification (Trudgill 1986: 126). Constrained transfer describes a process in the context of language contact and bilingualism. Here, speakers are bilingual and the feature in question is transferred from the other language in their repertoire.

8.3.4 Summary

The evidence from (r) variation motivates an analysis in which use of phonological variants in a language, when they are typically associated with a different language, is classified in three different ways. These distinct types all have implications for the way in which speakers organise the sounds in their languages and use the sounds to which they have access. A summary is provided below in Figure 8.5:

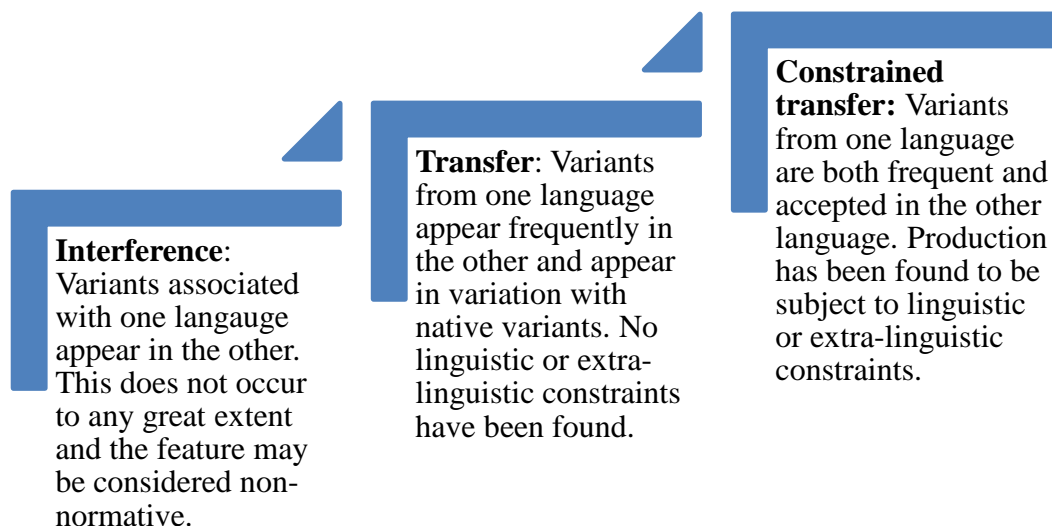


Figure 8.5: Schematisation of transfer effects.

The three transfer effects are presented in order of the effect on the recipient language, and it is in no way assumed that one effect leads to another over time⁴⁵. The difference between interference and transfer crucially lies in frequency and acceptability.

Interferences are generally low in frequency amongst bilingual speakers and may not be norms of the standard language or of monolingual speakers in general. The realisation of coda /r/ in the English of speakers from Mold is both low frequency and not part of the monolingual speech of the area: this confirms the status of coda /r/ as an interference variable in this community.

Transfer effects differ from interference in that they occur much more frequently and occur in variation with ‘native’ variants. The widespread production of the voiced alveolar approximant in Welsh was given as an example of this. Finally, more constrained transfer describes situations in which a feature from one of a bilingual’s

⁴⁵ This may indeed be the case, though further diachronic studies would be needed to substantiate the claim.

language is not only transferred to her other language, but is constrained by linguistic or extra-linguistic factors. This differs from transfer insofar as the bilingual speaker has to not only produce proportions of ‘standard’ and ‘transferred’ variants which are acceptable in the language being spoken, but also adapt their behaviour depending on a number of various other factors.

8.4 Conceptualising variation in the speech of Welsh-English bilinguals

It has been argued in the previous section that there are three distinct types of transfer operating on the (r) variation of adolescent Welsh-English bilinguals, and that speaker area, home language, and sex are useful predictors for which type of transfer will occur. This section shows that this transfer can be viewed within a wider framework of societal bilingualism, and draws upon the notion of the ‘feature pool’ (Mufwene 2001; see §3.3.3). The feature pool has been used to describe contact-induced change in situations of societal multilingualism in the context of creole formation (Mufwene 2001), post-colonial Englishes (Schneider 2003), and multiethnolects (Cheshire et al. 2011). I propose here that it can also be applied to regional minority language bilingualism.

Schneider’s (2003; 2007) dynamic model rests upon the assumption that speakers in post-colonial contexts are able to shape their identities by selecting from a feature pool (Schneider 2007: 20; see §3.3.3). Selection of features takes place at the individual level, but in the course of interaction with members of the same group convergence occurs. The feature pool contains all variants available to speakers which are in competition for selection, and selection is determined by both linguistic (structural) and extra-linguistic (non-structural) factors (Mufwene 2001: 57). Linguistic factors which favour selection include high frequency, saliency, and transparency. Typically, features from the language of the dominant group have been favoured over those from the weaker group at the lexical level (Mufwene 2001: 57). Over time, the emergence of a

more focussed variety may occur, where groups of speakers have selected features which distinguish them from other groups. Le Page & Tabouret-Keller (1985: 181) explain this development further:

By verbalizing as [the speaker does], he is seeking to reinforce his models to the world, and hopes for acts of solidarity from those with whom he wishes to identify. The feedback he receives from those with whom he talks may reinforce him. [...] The extent to which he is reinforced, his behaviour in that context may become more regular, more focussed.

The development of a focussed variety is therefore the result of group interaction and speakers' identification with one group, and the decline of variability in production as the group adopt one feature over another. A further indication of focussing is the distinction between one group and another. Let us now examine this further in the context of (r) variation in the Welsh and English of adolescent bilinguals in North Wales.

The variation, both in /r/ in prevocalic and intervocalic positions and in the realisation of coda /r/, is language-specific. The multivariate analyses for each home language and area grouping still revealed that 'language' was a significant predictor, which suggests that neither feature has undergone a contact-induced change which has resulted in convergence. In English, there is both evidence for two more focussed varieties and competition amongst variants of /r/ and coda /r/. In Welsh, the data reveal a less focussed patterning. The fact that speaker sex and style were significant predictors for certain groups in both languages suggests that this situation may change. Let us first examine the English data using this framework.

8.4.1 English

There are two distinct patterns in the English data on (r) variation. The first pattern is characterised by the transfer of the Welsh variants [r] and [r̥] and the realisation of coda /r/, and is confined to the speech of those from Welsh-speaking homes in Caernarfon. In the second pattern, which characterises the speech of all other

groups, variants which are typically associated with Welsh are avoided and, consequently, there is less variability. Table 8.2, below, shows the total number of Welsh variants in the speech of those from Welsh-language homes in Caernarfon.

Table 8.3: Total number of typically Welsh variants in the English speech of those from Welsh-speaking homes in Caernarfon.

	%	N	Total
The realisation of coda /r/	23.4	68	291
[r] and [r̥]	34.1	92	270
Total	28.5	160	561

28.5% of English tokens produced by those from Welsh-speaking homes in Caernarfon contained (r) variants which are typically Welsh. This contrasts significantly (Chi-squared with Yates' Correction = 312.8, $p < 0.001$) with all other speakers, where the Welsh variants only accounted for 3% of the dataset. Table 8.3 shows the data from the other groups:

Table 8.4: Total number of typically Welsh variants in the English speech of those from English-speaking homes in Caernarfon, and those from Mold.

	%	N	Total
The realisation of coda /r/	3.2	25	780
[r] and [r̥]	2.8	23	828
Total	3	48	1608

The distinction between these two groups is not due to acquisitional or areal factors alone, as those from Welsh-speaking homes in Mold and English-speaking homes in Caernarfon tend not to transfer Welsh variants. The English spoken by those from Welsh-speaking homes in Caernarfon is, however, marked by the transfer of variants which enter into competition with English variants. This results in the variability absent from other groups. As was shown in §7.3.1, there appear to be community norms in the English of each area which speakers, regardless of linguistic background, adhere to. The exception to this is those from English-speaking homes in Caernarfon.

The attitudinal data examined in Chapter 5 may shed further light on why those from English-speaking homes in Caernarfon have different norms when producing (r) in

English. The attitudinal data showed that these groups do not use Welsh as much in their daily lives as those from Welsh-speaking homes in Caernarfon and, furthermore, *choose* to play out their social lives primarily through the medium of English. This reflects differences between the two areas in terms of peer group relations. In Mold, the students in the sixth form tended to form a more unified peer group where English was the main language. In Caernarfon, there were indications of two separate friendship networks, and home language appeared to be the defining characteristic of each group. I would suggest that the tendency of those from Mold, and those from English-speaking homes in Caernarfon, to interact with peers and the wider community in English rather than Welsh is reflected in their linguistic behaviour, where Welsh variants in English are non-present and speakers either adhere to community norms (in the case of those from Mold) or eschew them (as has been seen in the data of those from English-speaking homes in Caernarfon).

8.4.2 Welsh

The findings from the Welsh data suggest a different situation to that outlined above. In comparison to the occurrence of Welsh variants in English speech, the production of [ɹ] was much more prevalent and occurred in the speech of all speakers. Its high frequency, and occurrence across the dataset, was taken as an indication that its production constituted transfer or constrained transfer rather than interference. The prevalence of [ɹ] across all speaker groups indicates that this variant is in competition with [r] and [r̥] across North Wales, which leads to a more diffuse (rather than focussed) variety (cf. Le Page & Tabouret-Keller 1985: 181). Table 8.4 shows the number and percentage of alveolar approximants in the Welsh speech of each home language and area group:

Table 8.5: Total number of alveolar approximant productions in Welsh speech by home language and area.

Group	%	N	Total
Welsh-language homes in Caernarfon	39.6	99	250
English-language homes in Caernarfon	61.3	136	222
Welsh-language homes in Mold	64.5	136	211
English-language homes in Mold	93	225	242
Total	64.4	596	925

Table 8.6 shows the distinction made in the English data is not possible here. The striking result from the table is that the alveolar approximant is approaching categorical amongst those from English-language homes in Mold. The multivariate analyses, presented in §7.4.2, confirm this and showed that area followed by home language were the biggest predictors on the production of [ɹ].

The fact that [ɹ] is more frequent in the speech of those from English-language homes in Caernarfon and Welsh-language homes in Mold, and near-categorical in the speech of those from English-language homes in Mold, might suggest the emergence of a distinct variety amongst these groups, as was claimed in relation to the English data in §8.5.1. The difference between the two languages lies in the fact that [ɹ] is in variation with the traditionally Welsh variants for all groups, whereas a clear distinction can be made in English between those who use Welsh variants and those who do not. While extra-linguistic factors have been shown to influence the selection of features, as Mufwene (2001: 57) predicts, the distinction between each group is not as clear as it is in the English data.

This is supported by the influence of speaker sex on variation in Caernarfon. Speaker sex was the most influential factor on the production of /r/ in word-initial prevocalic and word-medial intervocalic positions in Caernarfon, and males were more likely to produce [ɹ] (log-odds = 0.692). This factor was more influential than home language (log-odds = 0.686). When a multivariate analysis was conducted on females in

Caernarfon separately, home language was not a significant predictor. As was discussed in §7.4.3, females in both home-language groups orient more towards overtly prescribed norms with respect to this feature, and do this even more so in more careful speech. In the males' data, however, home language remained a significant predictor. The consequence of this is less focussing and more variability in Welsh than in English as, instead of a clear distinction between males and females or home-language groups, variation is influenced by both factors.

8.5 Language change

The high frequency of the alveolar approximant in the Welsh dataset may be seen as an indication of obsolescence, especially in Mold where it does not appear to be constrained by linguistic and extra-linguistic factors in the speech of those from Welsh-speaking homes and most frequent in the speech of those from English-speaking homes. In situations of obsolescence we would expect that as the status of once compulsory rules decline and that free variation ensues (as we have seen for in the case of coda /r/ and tap versus trill production, cf. Campbell & Muntzel 1989: 190). Although it has been claimed that Welsh is in obsolescence in North East Wales (Thomas & Gathercole 2005; M. Jones 1998), it appears rather short-sighted to apply this framework to the data on variation. Obsolescence of a language is marked by decrease in proficiency and loss of structural features. This study does not provide evidence for this and instead shows linguistic variation which is shaped by locally salient extra-linguistic factors.

It remains to be seen whether the competition amongst features in Welsh, outlined in the sections above, are indicative of linguistic changes in progress or whether they are solely the result of the differences in the way Welsh-English bilinguals engage with their two languages. In the case of the former, we would expect that [ɹ] production would increase for all speaker groups and, ultimately, that differences between the

speaker groups would disappear as Welsh and English converge. The non-realisation of coda /r/ in Welsh is not as entrenched amongst all speaker groups at this point, though a similar trajectory might be predicted and should be taken into consideration in future studies.

We cannot confirm that there is language change in progress as no comparisons have been made with older speakers. As there are no other quantitative studies of this feature, no predictions can be made about its status within Welsh. It is equally as plausible that, instead of being a contact-induced change in progress, (r) variation is stable in Welsh and English, and that [r] and [r̥] tend to be more frequent in more careful speech. In other words, [r] and [r̥] may remain in the repertoire but may be used stylistically (a similar argument is outlined in Regan 1996 for deletion of 'ne' in French). This is supported by the claim made in §8.3.2 that this feature is not stereotyped and is below the level of speaker awareness. Instead, it is part of a bilingual repertoire and [r] and [r̥] are produced when speakers respond to the speech situation they are faced with (cf. Bell 1984: 167).

The role of the other extra-linguistic factors on (r) variation in Welsh also suggests that /r/ in Welsh is a stable sociolinguistic variable rather than a converging change in progress. The significance of home language and area on this feature is unsurprising in light of the varying degrees of exposure to Welsh each group receives. As was outlined in the analysis of the attitudinal data, home language and area are more than just indicators of input as they correlate with self-reported usage and ability in Welsh, and are highly predictive of the role Welsh will play in the life of an adolescent speaker. The fact that this influences (r) variation is not indicative of language change but rather the simple fact that, in this case of regional minority bilingualism, there are speakers from differing backgrounds who bring their own patterns of production. This

has been shown to be the case in previous studies of second language acquirers and immersion education contexts. These speakers may reorganise the constraints which are present in native speech (cf. Meyerhoff & Schlee 2012 and references therein), or they may also only partially master the constraints in native speech or avoid vernacular variants (cf. Mougeon et al. 2004).

A further consideration is that this is a study of adolescents. There is a large body of literature devoted to language variation in adolescent speech, and in particular of adolescence and linguistic change (for an overview, see Kirkham & Moore forthcoming). Adolescence marks an important period in linguistic development and speakers turn away from caregivers as their models of acquisition and inevitably turn to their peer group (e.g. Kerswill & Williams 2000). The majority of variationist studies have relied upon the notion of apparent time (Labov 1966) to examine language change. Apparent time studies are synchronic analyses of the speech of different generations, and assume that speakers' use of a particular variant stabilises after acquisition in late adolescence (Labov 2001: 441). From this, researchers make 'temporal inferences' (Sankoff & Blondeau 2007: 561) and the use of the incoming variant is higher amongst the younger generation.

The second scenario is that speakers' bilingual identities change over the lifespan, and that this is reflected in their choice of variants. An alternative analysis of the 'regular slope with age' (Labov 1994: 83) is that age-grading is taking place. This assumes that use of a particular variant is associated with a particular life stage and therefore as speakers become older they become more conservative in their linguistic behaviour (Evans Wagner 2012: 377). This may particularly be the case for variables which are above the level of speaker awareness and have a 'strong social index' (Pope et al. 2007: 623; see also Evans Wagner 2012). Further work on how speakers perceive

the acceptability of [ɹ] and the non-realisation of coda /r/ will shed light on whether these variants are above speakers' levels of awareness, though the evidence presented in §7.4.2 suggested that this was not the case for [ɹ].

8.6 Summary

This chapter aimed to account for variation in the speech of Welsh-English bilinguals theoretically. Despite the widespread use of variants from English in Welsh (and vice versa in the speech of the most dominant Welsh speakers), the main theme throughout this chapter has been that speakers perceive the language of the speech act above all else and react accordingly. The degree of /l/-velarisation is, for many speakers, language-specific in its phonetic implementation rather than its phonological representation. It was argued, however, that as a child's phonology is abstracted from the phonetic detail she acquires then the phonology too is language-specific.

The data on (r) variation provides evidence for three different types of transfer, which all entail different cognitive processes in the mind of the bilingual. In cases of interference, features are overwhelmingly specific to one language and rarely feature as part of the repertoire in the other language. This is not the case with transfer, where speakers perceive the language being spoken but produce variants from across their repertoire in proportions which the speaker deems appropriate for that language. Finally, in more elaborate forms of transfer speakers again use variants from across their linguistic repertoire but variants from one language are constrained by either linguistic or extra-linguistic factors when appearing in the other.

The role of transfer in (r) variation was examined through the framework of the feature pool, which asserts that features from languages in contact may share a common space and be in competition for selection. Transfer from Welsh to English is restricted to those from Welsh-speaking homes in Caernarfon, which results in a distinction

between their English, in relation to this feature, and the English of other groups. This, it was asserted, is due to the dominance of English in the lives of the other groups both and the tendency of those from English-speaking homes in Caernarfon to orient away from community norms. In Welsh, the situation is less focussed and the alveolar approximant in particular is in competition with Welsh variants for all speakers.

Finally, the possibility of future changes was explored further. It was argued that extra-linguistic factors, and in particular, the influence of sex amongst those from Welsh-speaking homes in Caernarfon could signal language change in both Welsh and English. In English, this could result in the disappearance of differences between groups and the selection of the alveolar approximant and non-realisation of coda /r/ across North Wales. The frequency of the alveolar approximant in Welsh could also result in levelling across groups, leading to contact-induced change and convergence between Welsh and English. The position of coda /r/ in Welsh is less certain. One prediction would be that non-realisation increases in frequency in Welsh and leads to a situation where either there is again a distinction between those from Welsh-speaking homes in Caernarfon and other groups, or where Welsh becomes more diffuse with respect to this feature. This, it was asserted, may well depend on whether those from these other groups continue to use Welsh past adolescence.

9 Conclusion

This study adds to a limited number of previous research which examines language variation in the context of regional minority language bilingualism. It has examined variation in the Welsh and English of bilinguals living in North Wales, in order to provide a fuller account of cross-linguistic interaction in a situation of long-term language contact. The aims of the study were two-fold:

- To quantify claims of phonological convergence and transfer in the speech of Welsh-English bilinguals by using a variationist sociolinguistics methodology, which also considers the influence of linguistic and extra-linguistic factors (and in particular home language and area) on variation.
- To make empirically-informed theoretical claims about the nature of phonological convergence and transfer in the context of regional minority language bilingualism, and conceptualise cross-linguistic interaction in the speech of Welsh-English bilinguals in light of existing frameworks.

9.1 Variation in the speech of Welsh-English bilinguals

The first step in quantifying phonological convergence between /l/ in Welsh and English involved an analysis of the formant values in both languages. Here, I compared F2 values with those of previous studies and found that the formant values belong within the range of other categorically dark varieties. Furthermore, the difference between formant values in onset and coda position is smaller than would be expected if Welsh-English bilinguals have both light and dark /l/ as allophones within their speech repertoire.

Further results in relation to the degree of /l/-velarisation support previous studies which show gradient phonetic variation in varieties with only one category of /l/.

The linguistic influences on this variation are word and syllable position, and the influence of neighbouring vowels. /l/ is lighter in word-initial onset and word-medial positions, and when preceded or followed by more fronted vowels. Females also tend to produce lighter tokens of /l/ than males in word-initial onset and word-final coda positions.

The key finding in relation to /l/-velarisation is, however, that there is phonetic variation between Welsh and English despite phonological convergence between the two languages. In word-initial onset position, females tend to produce significantly lighter realisations of /l/ in English than they do in Welsh. In word-medial intervocalic position, both males and females tend to differentiate between the two languages and produce lighter English tokens. Further analysis of individual speakers showed that there is inherent variability in whether speakers maintained a phonetically converged category for /l/ or differentiated between the two languages.

The realisation of coda /r/ and variation in the production of /r/ are influenced by both home language and area in English and Welsh. The appearance of typically Welsh variants in English speech is not only an areal feature associated with a Welsh-dominant area, as was previously assumed, but is largely restricted to the speech of those from Welsh-speaking homes and is more frequent in formal speech and stressed syllables. This result was interpreted as the systematic style shifting of this group towards local community norms which have developed in North West Wales through mass learning of a non-native language, and which are similar to postcolonial contexts of language contact.

The finding that those from English-speaking homes in Caernarfon tend not to orient towards these local norms is open to interpretation. On the one hand, it was proposed that this group of speakers do not produce Welsh variants in their English as

they do not acquire it, which would suggest that the realisation of coda /r/ and production of trills and taps is an L1 transfer feature and not a substrate feature of the area. On the other hand, the use of Welsh amongst speakers in Caernarfon suggested that those from English-speaking homes tended to belong to English-speaking peer groups and behaved differently to those from Welsh-speaking homes in the way they engaged with Welsh. It was suggested that this may have resulted in two distinct peer groups which use variants differently, and that further ethnographic work in the area would shed light on the extent to which this is the case.

Both the realisation of coda /r/ and production of variants of /r/ are subject to more variation in the Welsh data. The first key finding is that the realisation of coda /r/ is not categorical in Welsh, as was previously assumed. Both home language and area are significant predictors on its realisation and it is only in the speech of those who are exposed to the Welsh language the most, i.e. those from Welsh-speaking homes in Caernarfon, for whom rhoticity is categorical. There is a clear correlation between self-reported use of Welsh and the realisation of coda /r/, with *r*-less tokens being more frequent in the speech of those from Welsh-speaking homes in Mold and most frequent in the speech of those from English-speaking homes – the groups who use Welsh the least.

The study of variation in the realisation of /r/ in Welsh showed a more complex patterning and the production of the alveolar approximant was frequent in the speech of all participants. The following trends emerged: Firstly, area is the strongest predictor on the overall data – those from Mold are more likely to use the alveolar approximant in their Welsh. This suggests that the alveolar approximant may be a dialectal feature in North East Wales. In Mold, however, the alveolar approximant is more frequent in the speech of those from English-speaking homes, who produced near-categorical levels of

the approximant in their interview speech. Rather than signalling complete convergence between the two languages, however, this group style shifted and produced fewer approximant tokens in the wordlist task.

Further evidence for dialectal differences between Mold and Caernarfon were found in the Caernarfon data, where the extra-linguistic constraints on variation are different. Here, sex is the strongest predictor on variation and females produce significantly fewer approximant tokens than males and produce fewer approximant tokens in the wordlist task. Amongst male speakers, those from English-speaking homes produced more approximant tokens and, similar to their counterparts in Mold, produce more alveolar tokens in the interview than in the wordlist task. The tendency for females in Caernarfon to produce more trill and tap variants, coupled with the style shifting seen in this group and amongst those from English-speaking backgrounds, was argued to reflect their status as standard variants in Welsh.

The tendency for L2 speakers of Welsh to conform to more standard variants in more careful speech is well-attested, though the behaviour of females from Welsh-speaking homes was more open to interpretation as they showed the most extreme style-shifting. Again, it was suggested that more ethnographic work may enable a more enlightened explanation of gendered practices in Caernarfon.

9.2 Theoretical claims

Chapter 8 considered the data in order to, firstly, contribute to our existing knowledge of phonological convergence and transfer and, secondly, conceptualise the cross-linguistic interaction between Welsh and English theoretically.

The phonetic differences between Welsh and English provide evidence for language-specific phonetic divergence in features which have undergone phonological convergence due to language contact. This can be accounted for by any model of phonology which accepts that phonological encoding and phonetic outcomes represent different levels of representation for the speaker. In relation to the Welsh-English data, I argued that /l/ is converged at the phonological level of representation but that the realisation of /l/ at the phonetic level could be language-specific for some speakers. The idea that abstract phonological categories are derived from language-specific phonetic data suggests that phonological convergence may describe situations where the abstraction derived from language-specific input is the same for both languages.

A ternary distinction was made between transfer, based on the data from (r) variation in Welsh-English bilingual speech. Citing the very low amounts of *r*-ful tokens in the English of those from English-speaking homes, and those from Welsh-speaking homes in Mold, I subscribed to Grosjean's (2012) claim that features which are low in frequency and acceptability are distinct from more robust transfer and should be treated as interference. The more frequent appearance of the alveolar approximant in Welsh provided evidence for two further categories of transfer. I argued that this distinction should be made on the basis of whether non-native features appear frequently and in seemingly free variation with native variants, or whether their appearance is also subject to linguistic and/or extra-linguistic constraints. In the latter case, I argued that the term *constrained transfer* might describe the situation more

precisely and provide more precise explanations for the role of transferred variants in bilingual contexts.

The notion of the ‘feature pool’ (Mufwene 2001) was used to conceptualise variation in Welsh-English minority language bilingualism. The feature pool describes the sum of the speakers’ linguistic knowledge for a feature and asserts that features from two languages in contact are in competition for selection. The association of a particular feature with one group results in a more focussed variety. I suggested that the societal variation in the speech of Welsh-English bilinguals could be explained by this framework. In English, I asserted that there are two distinct varieties – the English of those from Welsh-speaking homes in Caernarfon which contains Welsh variants, and English which does not contain Welsh variants as spoken by other groups. In Welsh, the widespread use of the alveolar approximant by all speakers, and the complex influence of extra-linguistic factors lead to a less focussed variety and more variability.

9.3 Future work

The focus of this study has been language variation in Welsh-English bilingual speech, and no concrete claims can be made about language change in either language. The first avenue for future research lies in a comparison between older generations of speakers in order to ascertain whether the patterns of variation reported here reflect linguistic changes in apparent time. This seems of particular importance to the findings for (r) variation, where data from older speakers might show the decrease of typically Welsh features in both English and Welsh, and highlight an area of phonological convergence.

There were also unanswered questions from the data on (r) variation, which could be addressed in future studies. Firstly, style shifting was apparent in the English speech of those from Welsh-speaking homes in Caernarfon and in the Welsh data. It remains to be seen whether the use of non-standard Welsh features are actually

stereotyped features in Welsh and this could be examined through further studies which take into consideration speakers' perceptions of variants. Secondly, the role of speaker sex on the Caernarfon Welsh data and the non-use of Welsh variants in English by those from English-speaking homes suggest that ethnographically-informed studies of adolescent social structure may produce interesting findings.

Finally, there is still a great deal to be done investigating the nature of convergence between Welsh and English and other varieties in long-term contact. The advances made in the field of sociophonetics highlight the extent to which social factors can influence fine-grained phonetic behaviour but these techniques are applied to bilingual data. It is my hope that research continues in this area, and that such techniques may shed new light on sociolinguistic variation in the context of regional minority language bilingualism.

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Appendix A: Participant Information Sheet

School of Languages, Linguistics and Cultures

Participant Information Sheet

You are being invited to take part in a research study as part of a student project. Before you decide it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Please ask if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part. Thank you for reading this.

Who will conduct the research?

Mr. Jonathan Morris, Postgraduate Researcher.

SLLC, University of Manchester,
Oxford Road, Manchester, M13 9PL

Title of the Research

Variation in North Wales

What is the aim of the research?

I hope to examine differences between life in North East and North West Wales.

Ysgol leithoedd, leithyddiaeth a Diwylliannau

Taflen Wybodaeth I'r Cyfranogwr

Gwahoddir i chi gymryd rhan mewn prosiect myfyriwr. Cyn i chi benderfynu ar gymryd rhan, mae'n bwysig i chi ddeall pwrpas yr ymchwil a beth sy'n mynd i ddigwydd. Darllenwch y wybodaeth ganlynol yn ofalus a'i thrafod â phobl eraill os y dymunwch. Gofynnwch os oes rhywbeth nad yw'n glir neu os hoffech rhagor o wybodaeth. Cymerwch amser i benderfynu os yr ydych am gymryd rhan neu beidio. Diolch yn fawr am gymryd yr amser i ddarllen y daflen hon.

Pwy fydd yn arwain yr ymchwil?

Mr. Jonathan Morris, Ymchwilydd
Ôl-raddedig.

SLLC, University of Manchester,
Oxford Road, Manchester, M13 9PL

Teitl yr ymchwil

Amrywiad yng Ngogledd Cymru

Beth yw nod yr ymchwil?

Yr wyf yn gobeithio edrych ar gwahaniaethau cymdeithasol rhwng Gogledd Ddwyrain a Gogledd Orllewin Cymru.

Why have I been chosen?

You have been chosen because you live in North Wales.

What would I be asked to do if I took part?

The researcher would conduct an anonymous and informal interview with you.

What happens to the data collected?

The data is stored on an external hard drive and at the University of Manchester. The information from the interview is analysed and will be used to write the dissertation.

How is confidentiality maintained?

All data is anonymous so your name is not used and you are given a codename. The information is protected by password and only the researcher has access to it.

What happens if I do not want to take part or if I change my mind?

It is up to you to decide whether or not to take part. If you do decide to take part you will be given this information sheet to keep and be asked to sign a consent form. If you decide to take part you are still free to withdraw at any time without giving a reason and without detriment to yourself

Will I be paid for participating in the research? No.

Pam cefais i fy newis?

Yr ydych wedi cael eich dewis gan eich bod chi'n byw yng Ngogledd Cymru.

Pe bawn i'n cymryd rhan, beth buasai rhaid i mi wneud?

Mi fyddai'r ymchwilydd yn cynnal cyfweiliad anhysbys ac anffurfiol gyda chi.

Beth fydd yn digwydd i'r data?

Cedwir y data ar yrrwr caled allanol ac ym Mhrifysgol Manceinion. Bydd y wybodaeth y rhoir gennych yn cael ei dadansoddi a'i defnyddio er mwyn ysgrifennu traethawd hir.

Sut gynhelir cyfrinachedd?

Anhysbys yw'r data i gyd, felly ni defnyddir eich enw a rhoir ffugenw i chi. Diogelir y wybodaeth gan gyfrinair a'r ymchwilydd yn unig fydd yn ei gwybod.

Beth sydd yn digwydd os nad ydw i eisiau cymryd rhan, neu'n newid fy meddwl?

Chi sydd yn dewis os yr ydych yn cymryd rhan neu beidio. Os yr ydych am gymryd rhan mi fydddech yn cael copi o'r daflen hon i'w chadw. Ymhellach, gofynnir eich bod yn llofnodi ffurflen ganiatâd. Os yr ydych yn penderfynu ar gymryd rhan, gallwch atal heb reswm ac afles ar unrhyw adeg.

A fyddaf yn cael fy nhalu am gymryd rhan? Na fyddwch.

What is the duration of the research?

The interview will last around one hour.

Where will the research be conducted?

You are able to choose the location of the interview, although the place should be quiet.

Will the outcomes of the research be published?

Yes.

For further information contact:

Mr. Jonathan Morris

SLLC, University of Manchester,
Oxford Road, Manchester, M13 9PL

Telephone: 07837 389207

E-mail:
jonathan.morris@postgrad.manchester.ac.uk

Faint o amser fydd y cyfweiliad yn ei gymryd?

Mi fydd y cyfweiliad yn cymryd tua awr.

Lle cynhelir yr ymchwil?

Gallwch ddewis lleoliad y cyfweiliad ond dylai fod yn lle tawel.

A fydd y canlyniadau'n cael eu cyhoeddi?

Bydden.

I gael rhagor o wybodaeth cysylltwch â:

Mr. Jonathan Morris

SLLC, University of Manchester,
Oxford Road, Manchester, M13 9PL

Ffôn: 07837 389207

E-bost:
jonathan.morris@postgrad.manchester.ac.uk

Appendix B: Participant Consent Form

**School of Languages,
Linguistics and
Cultures**

**Consent Form for
Participants Taking Part
in Student Research
Projects**

Title of Project: Variation in North
Wales

Name of Researcher:

JONATHAN MORRIS

School: Languages, Linguistics and
Cultures

Participant (volunteer)

Please read this and if you are
happy to proceed, sign below.

The researcher has given me my
own copy of the information sheet
which I have read and understood.
The information sheet explains the
nature of the research and what I
would be asked to do as a
participant. I understand that the
research is for a student project and
that the confidentiality of the
information I provide will be
safeguarded unless subject to any
legal requirements. He has
discussed the contents of the
information sheet with me and given
me the opportunity to ask questions
about it.

I agree to take part as a participant
in this research and I understand
that I am free to withdraw at any

**Ysgol leithoedd,
leithyddiaeth a
Diwylliannau**

**Ffurflen Ganiatâd i
Gyfranogwyr yn
Cymryd Rhan mewn
Prosiectau Ymchwil**

Teitl y prosiect: Amrywiad yng
Ngogledd Cymru

Enw'r ymchwilydd:

JONATHAN MORRIS

Ysgol: leithoedd, leithyddiaeth a
Diwylliannau

Cyfranogwr (gwirfoddolwr)

Darllenwch hyn a llofnodwch isod,
os yr ydych yn hapus i gymryd rhan.

Rhodddwyd copi o'r daflen
wybodaeth i mi gan yr ymchwilydd.
Yr wyf wedi ei darllen ac wedi ei
deall. Mae'r daflen wybodaeth yn
esbonio'r ymchwil a'r hyn buasai'r
ymchwilydd yn gofyn i mi wneud.
Deallaf mai ar gyfer prosiect
myfyriwr yw'r ymchwil hwn. Diogelir
y cyfrinachedd y wybodaeth y rhoir
gennyf, oni bai am unrhyw ofynion
cyfreithiol. Mae o wedi trafod y
manyion ar y daflen wybodaeth â fi
ac wedi rhoi'r cyfle i mi ofyn
cwestiynau amdani.

Cytunaf i gymryd rhan fel
gyfranogwr yn yr ymchwil hwn.

time without giving any reason, and without detriment to myself.

Deallaf y gallaf atal ar unrhyw adeg heb esboniad a heb afles.

Signed:

Llofnod:

Date:

Dyddiad:

.....

.....

Family Name (BLOCK LETTERS)

Cyfenw (LLYTHYRENNAU BRAS)

.....

.....

Other Name(s) (BLOCK LETTERS)

**Enw arall/Enwau eraill
(LLYTHYRENNAU BRAS)**

.....

.....

Researcher

Ymchwilydd

I, the researcher, confirm that I have discussed with the participant the contents of the information sheet.

Yr wyf i, yr ymchwilydd, yn tystio fy mod i wedi trafod cynnwys y daflen wybodaeth â'r cyfranogwr.

Signed:

Llofnod:

Date:

Dyddiad:

.....

.....

Appendix C: Welsh word-list

Darllenwch y geiriau, os gwelwch yn dda. Ewch i lawr o'r gair 1af yn y golofn ar y chwith.

pen	celf	bol	bys	cwm
glas	golchi	rŵan	tipyn	paced
ymladd	picio	pwl	ffôl	cul
prynhawn	golau	cofl	taclus	bwyty
aml	lelog	mil	bod	lliw'r
mae	gwlyb	ymladd	cŵl	dewr
pedwar	Dylet ti	palmant	bws	gair
lolfa	lolfa	ail	lôn	het
dal	sofl	rîm	budd	brat
budr	sylwi	caled	ymladd	rwdins
cyfres	arafu'r car	aur	cic	cwt
lwmp	calon	lwfans	genau	del
aer	pecyn	oer	gair	ymlâdd
telyn	yn llwyr	ael	ap	i fyny'r allt
riwl	clirio	ei lyfr	siop	toc
bydd	hac	byth	twp	lwc
roced	bedd	ras	melyn	cip
cer	taro	oeri	cil	palas
lefelu	coron	berwi	pêl	atal
ruban	rydw i	gwylio	bedydd	tipyn
cwrdd	cyrchu	ymlâdd	dal	rysâit
lori	Y Bala	tâp	tâl	potel
rownd	lliw'r haul	bodd	diogel	ei laddwr
meipen	tafl	dagr	digon	bwyty
Gwelir	gorau'r dref	cwd	lapio	dadl
eto	ymlâdd	lefelu	sut	baban
haul	hael	bysus	cwpan	lawr
tri	ei lwyrddeb	haul	lein	llety
gwefr	petawn	cot	lelog	blodyn
ti	tir	del	lindys	pwtyyn
Guto	llaw	tocyn	lol	ei loches
cacen	blêr	byr	atat ti	tatws
llew	haul	yw	ymlâdd	dringo
lwcus	llywydd	gwir	gwydr	carol
cipolwg	cartref	llwy	Llun	testun
Betws	môr	neu	reis	Badd
capel	Allet ti	car	pobl	patrwm
popty	taro	lliw	mul	caled
cacen	dŵr	troi	poeth	clec
tŷ	ymlâdd	coch	brat	odl

Appendix D: English word-list

Please read the words. Go down from the first word in the column on the left.

hat	lot	terror	dialect	pep
board	lolly	barrel	analog	slap
bit	lawn	narrow	palace	top
sat	lent	torrid	ribbon	put
chat	luck	carrot	pill	jacket
mat	lump	corral	eel	racket
butter	lint	melon	ale	pecking
batter	shelf	rim	bell	mud
matter	Molly	radio	pal	sipping
sabbath	jelly	rocket	Roald	Dahl
loud	silver	ruler	idol	bottle
adopted	dabble	rent	bowl	teatowel
line	bulb	ribbon	pool	metal
bat	Billy	rudder	beer	bobble
Dad	golfer	rice	kir	dilly-dally
tool	hoard	round	fair	lucky
deal	silly	rustle	square	seedy
meal	red	rare	tar	plodding
mile	riot	rate	bar	body
dial	romance	real	car	giggle
check	reed	run	more	goggle
jacket	strut	race	ear	biggott
blocking	foot	fittie	air	cat
pot	but	metal	her	cot
slipping	debt	battle	editor	come
preppie	full	bottle	eraser	packet
rapper	level	smutty	opener	pill
stopping	look	picking	stir	lapland
putting	cub	heed	ever	heered
dole	rub	hid	odour	tepid
set	hum	head	harris	tackle
got	salmonella	had	heard	could
spot	look	hard	agree	sip
get	hide	hod	eerie	hured
kicking	tipping	sick	rarer	hade
howd	hoed	hood	tired	abrupt
sack	abroad	who'd	partridge	
mock	hared	Hudd	tournament	
guide	furry	typing	hoid	

Appendix E: Questionnaire (Welsh)

Holiadur

Mae'r holiadur hwn yn fy helpu i drefnu fy ngwaith, a'r cyfweiliadau, yn gliriach.
Gofynnwch i'r ymchwilydd os nad ydych chi'n siŵr am gwestiwn.

1. Enw: _____
2. Rhif ffôn: _____
3. E-bost: _____
4. Rhyw: Benyw Gwryw
5. Beth oedd eich oed ar eich pen-blwydd diwethaf? _____mlwydd oed.
6. Lle gawsoch chi eich geni? _____
7. Lle ydych chi'n byw rŵan? _____
8. Ydych chi erioed wedi byw unrhyw le arall?

Nac ydw → Ewch at 10.

Ydw

9. Rhestrwch lle arall chi wedi byw:

Lle	O	Tan	Rheswm
e.e. Manceinion	2001	2004	Coleg

10. Sut fydddech chi'n disgrifio'ch hunaniaeth genedlaethol? Ticiwch bob blwch sy'n berthnasol.

Cymreig

Prydeinig

Arall → Nodwch: _____

11. Pe rai o'r cymwysterau hyn sydd gennych? Ticiwch bob blwch sydd yn berthnasol, gan gynnwys cymwysterau eich bod chi'n gweithio tuag atynt ar hyn o bryd.

Dim cymwysterau

TGAU/Lefel Mynediad

Lefelau AS

Lefel A/GNVQ/Bagloriaeth

Cymhwyster arall

→ Nodwch: _____

12. Lle dysgoch chi'r Gymraeg yn gyntaf?

Adref

Yr ysgol

Lle arall → Lle? _____

13. Ym mha iaith oeddech chi'n siarad i'ch rhieni/gofalwyr *fel arfer*? Rhowch X yn y blychau perthnasol.

	Person 1 (e.e. Mam)	Person 2 (e.e. Tad)
Cymraeg		
Saesneg		
Iaith arall		

14. Os yr ydych yn siarad Saesneg gyda'ch rhieni/gofalwyr: Ydy eich rhieni/gofalwyr yn siarad Cymraeg?

Ydyn – y ddau ohonyn nhw

Ydyn – un ohonyn nhw

Nac ydyn

15. Lle mae'ch rhieni/gofalwyr yn dod?

Person (e.e. Mam, Tad)	Lle

16. Beth oedd/yw *prif* iaith eich ysgol gynradd ac ysgol Uwchradd?

Ysgol	Cymraeg	Saesneg	Dwyieithog
Gynradd			
Uwchradd			

17. Beth yw'ch cymhwyster uchaf yn y Gymraeg? Mae hyn yn gynnwys cymhwyster eich bod chi'n gweithio tuag ato ar hyn o bryd.

Dim cymhwyster

TGAU → Iaith Gyntaf Ail Iaith

Lefel AS → Iaith Gyntaf Ail Iaith

Lefel A → Iaith Gyntaf Ail Iaith

Arall → Nodwch: _____

18. Pe byddai gennych blentyn, fydddech chi ei anfon i Ysgol Gymraeg?

Byddwn → Pam? _____

Na fyddwn → Pam lai? _____

Ddim yn gwybod

19. Pa iaith ydych chi'n defnyddio yn y sefyllfaoedd canlynol *fel arfer*?

Sefyllfa	Cymraeg	Saesneg
Siopa		
Ffonio llinell gymorth (e.e. cwmni trydan, y cyngor)		
Cwblhau ffurflenni swyddogol		
Sgwrsio gyda ffrindiau		
Yn y gwaith		

20. Pa mor aml ydych chi'n gwneud y gweithgareddau canlynol?

Gweithgaredd	Bron pob dydd	Pob wythnos neu ddwy	Pob mis neu ddau	Un neu ddwy waith y flwyddyn	Yn llai nag un waith y flwyddyn
Darllen papur newydd yn Saesneg					
Darllen papur bro yng Nghymraeg					
Darllen llyfr yn Saesneg					
Darllen llyfr yng Nghymraeg					
Gwyllo rhaglen deledu yn Saesneg					
Gwyllo rhaglen deledu yng Nghymraeg					
Gwrando ar raglen radio yn Saesneg					
Gwrando ar raglen radio yng Nghymraeg					
Ymweld â thudalennau we yn Saesneg					
Ymweld â thudalennau we yng Nghymraeg					
Mynd i sioe theatr yn Saesneg.					
Mynd i sioe theatr yng Nghymraeg					

Mynd i gyngerdd o gerddoriaeth Saesneg					
Mynd i gyngerdd o gerddoriaeth Gymraeg					

21. Mae'r datganiadau canlynol yn ymwneud â'r Gymraeg yn eich ardal lleol chi. Dywedwch faint rydych chi'n cytuno neu'n anghytuno â phob un (1 = anghytuno'n gryf, 7 = cytuno'n gryf):

Mae gan yr iaith dyfodol yn yr ardal hon.

Anghytuno'n gryf					Cytuno'n gryf	
1	2	3	4	5	6	7

Dim ond yn yr ysgol mae pobl yn defnyddio'r Gymraeg yn yr ardal hon.

Anghytuno'n gryf					Cytuno'n gryf	
1	2	3	4	5	6	7

Mae pobl yn yr ardal yn falch o'r Gymraeg.

Anghytuno'n gryf					Cytuno'n gryf	
1	2	3	4	5	6	7

Mae pobl yn yr ardal yn cefnogi'r iaith.

Anghytuno'n gryf					Cytuno'n gryf	
1	2	3	4	5	6	7

Mae ddigon o gyfle i ddefnyddio'r Gymraeg yn yr ardal.

Anghytuno'n gryf					Cytuno'n gryf	
1	2	3	4	5	6	7

22. Mae'r datganiadau canlynol yn ymwneud â'r gwaith a wneir er mwyn hybu'r Gymraeg. Dywedwch faint rydych chi'n cytuno neu'n anghytuno â phob un (1 = anghytuno'n gryf, 7 = cytuno'n gryf):

Dylai cwmnïau preifat wneud rhagor i gynnig gwasanaeth dwyieithog.

Anghytuno'n gryf					Cytuno'n gryf	
1	2	3	4	5	6	7

Dylai mwy o swyddi gael eu llenwi gan siaradwyr Cymraeg yn unig, er mwyn cynnig gwasanaeth dwyieithog.

Anghytuno'n gryf					Cytuno'n gryf	
1	2	3	4	5	6	7

Dylai cynghorau wneud rhywbeth i sicrhau bod pobl di-Gymraeg ddim yn symud i bentrefi lle mae'r Gymraeg yn gryf.

Anghytuno'n gryf					Cytuno'n gryf	
1	2	3	4	5	6	7

Mae'r Cynulliad Cenedlaethol yn canolbwyntio'n ormod ar yr iaith.

Anghytuno'n gryf					Cytuno'n gryf	
1	2	3	4	5	6	7

Dylai cynghorau dros Gymru greu rhagor o ysgolion Gymraeg.

Anghytuno'n gryf					Cytuno'n gryf	
1	2	3	4	5	6	7

23. Mae'r datganiadau canlynol yn ymwneud â'r Gymraeg a'r Saesneg. Dywedwch faint rydych chi'n cytuno neu'n anghytuno â phob un (1 = anghytuno'n gryf, 7 = cytuno'n gryf):

Iaith fodern yw'r Gymraeg.

Anghytuno'n gryf					Cytuno'n gryf	
1	2	3	4	5	6	7

Iaith ddefnyddiol yw'r Gymraeg.

Anghytuno'n gryf					Cytuno'n gryf	
1	2	3	4	5	6	7

Iaith bert yw'r Gymraeg.

Anghytuno'n gryf					Cytuno'n gryf	
1	2	3	4	5	6	7

Iaith gyfeillgar yw'r Gymraeg.

Anghytuno'n gryf					Cytuno'n gryf	
1	2	3	4	5	6	7

Iaith fodern yw'r Saesneg.

Anghytuno'n gryf					Cytuno'n gryf	
1	2	3	4	5	6	7

Iaith ddefnyddiol yw'r Saesneg.

Anghytuno'n gryf					Cytuno'n gryf	
1	2	3	4	5	6	7

Iaith bert yw'r Saesneg.

Anghytuno'n gryf					Cytuno'n gryf	
1	2	3	4	5	6	7

Iaith gyfeillgar yw'r Saesneg.

Anghytuno'n gryf					Cytuno'n gryf	
1	2	3	4	5	6	7

24. Mae'r datganiadau canlynol yn ymwneud â'ch Cymraeg chi. Dywedwch faint rydych chi'n cytuno neu'n anghytuno â phob un (1 = anghytuno'n gryf, 7 = cytuno'n gryf):

Rwyf yn siarad y Gymraeg yn well na Saesneg.

Anghytuno'n gryf					Cytuno'n gryf	
1	2	3	4	5	6	7

Rwyf yn darllen y Gymraeg yn well na Saesneg.

Anghytuno'n gryf					Cytuno'n gryf	
1	2	3	4	5	6	7

Rwyf yn ysgrifennu'r Gymraeg yn well na Saesneg.

Anghytuno'n gryf					Cytuno'n gryf	
1	2	3	4	5	6	7

Mae angen i mi wella'r safon fy Nghymraeg.

Anghytuno'n gryf					Cytuno'n gryf	
1	2	3	4	5	6	7

Rwyf yn gwneud llawer o gamgymeriadau yn siarad Cymraeg.

Anghytuno'n gryf					Cytuno'n gryf	
1	2	3	4	5	6	7

Appendix F: Questionnaire (English)

Questionnaire

This questionnaire helps me to organise my work, and the interviews, more clearly.

Ask the researcher if you are not sure about a question.

1. Name _____
2. Telephone number: _____
3. E-mail: _____
4. Sex: Male Female
5. What was your age on your last birthday? _____ years old.
6. Where were you born? _____
7. Where do you live now? _____
8. Have you ever lived anywhere else?
No → Go to 10.
Yes
9. List where else you have lived:

Place	From	Until	Reason
e.g. Manchester	2001	2004	University

10. How would you describe your national identity? Tick each relevant box:

Welsh

British

Other → Specify: _____

11. Which of these qualifications do you have? Tick each relevant box, including qualifications which you are working towards at the moment.

No qualifications

GCSEs/Entry Level

AS-Levels

A-Level/GNVQ/Baccalaureate

Other qualification

→ Specify: _____

12. Where did you learn Welsh first?

Home

School

Elsewhere → Where? _____

13. In which language do you *normally* speak to your parents/carers? Put a X in the relevant box.

	Person 1 (e.g. Mum)	Person 2 (e.g. Dad)
Welsh		
English		
Other language		

14. If you speak English with your parents/carers: Do your parents/carers speak Welsh?

Yes – the two of them

Yes – one of them

No

15. Where do your parents/carers come from?

Person (e.g. Mum, Dad)	Place

16. What is/was the *main* language of your primary school and secondary school?

School	Welsh	English	Bilingual
Primary			
Secondary			

17. What is your highest qualification in Welsh? This includes qualifications which you are working towards at the moment.

No qualification

GCSE → 1st language 2nd language

AS Level → 1st language 2nd language

A Level → 1st language 2nd language

Other → Specify: _____

18. If you don't have a child: If you were to have a child, would you send them to a Welsh-medium school?

Yes → Why? _____

No → Why not? _____

Don't know

19. Which language do you *normally* use in the following situations?

Situation	Welsh	English
Shopping		
Telephoning a help-line (e.g. electricity company, council)		
Completing official forms		
Chatting with friends		
At work		

20. How often do you do the following activities?

Activity	Nearly every day	Every few weeks	Every few months	One or two times a year	Less than once a year
Read the newspaper in English					
Read the newspaper in Welsh					
Read a book in English					
Read a book in Welsh					
Watch a T.V. programme in English					
Watch a T.V. programme in Welsh					
Listen to a radio programme in English					
Listen to a radio programme in Welsh					
Visit a website in English					
Visit a website in Welsh					
Go to a theatre show in English					
Go to a theatre show in Welsh					
Go to a music concert in English					

Go to a music concert in Welsh						
--------------------------------	--	--	--	--	--	--

21. The following statements are about Welsh in your local area. Say how much you agree or disagree with each one (1 = strongly disagree, 7 = strongly agree):

The language has a future in this area.

Strongly disagree					Strongly agree		
1	2	3	4	5	6	7	

People only use Welsh in school in this area.

Strongly disagree					Strongly agree		
1	2	3	4	5	6	7	

People in this area are proud of the Welsh language.

Strongly disagree					Strongly agree		
1	2	3	4	5	6	7	

People in the area support the language.

Strongly disagree					Strongly agree		
1	2	3	4	5	6	7	

There's enough opportunity to use Welsh in this area.

Strongly disagree					Strongly agree		
1	2	3	4	5	6	7	

22. The following statements are about the work which is being done to promote Welsh. Say how much you agree or disagree with each one (1 = strongly disagree, 7 = strongly agree):

Private companies should do more to offer a bilingual service.

Strongly disagree						Strongly agree
1	2	3	4	5	6	7

More jobs should be filled by Welsh-speakers only, in order to offer a bilingual service.

Strongly disagree						Strongly agree
1	2	3	4	5	6	7

Councils should do something to ensure that people who don't speak Welsh do not move into areas where the language is strong.

Strongly disagree						Strongly agree
1	2	3	4	5	6	7

The National Assembly concentrates too much on the language.

Strongly disagree						Strongly agree
1	2	3	4	5	6	7

Councils across Wales should create more Welsh-medium schools.

Strongly disagree						Strongly agree
1	2	3	4	5	6	7

23. The following statements are about Welsh and English. Say how much you agree or disagree with each one (1 = strongly disagree, 7 = strongly agree):

Welsh is a modern language.

Strongly disagree						Strongly agree
1	2	3	4	5	6	7

Welsh is a useful language.

Strongly disagree						Strongly agree
1	2	3	4	5	6	7

Welsh is a beautiful language.

Strongly disagree						Strongly agree
1	2	3	4	5	6	7

Welsh is a friendly language.

Strongly disagree						Strongly agree
1	2	3	4	5	6	7

English is a modern language.

Strongly disagree						Strongly agree
1	2	3	4	5	6	7

English is a useful language.

Strongly disagree						Strongly agree
1	2	3	4	5	6	7

English is a beautiful language.

Strongly disagree						Strongly agree
1	2	3	4	5	6	7

English is a friendly language.

Strongly disagree						Strongly agree
1	2	3	4	5	6	7

Appendix G: Cronbach's Alpha and Pearson's r correlations for attitudinal data.

Cronbach's Alpha calculations for the reliability of the questionnaire data:

Factor	Cronbach's Alpha
Welsh in the area (WIA)	0.850
Promotion of Welsh (PROM)	0.657
Opinion of Welsh (OW) ⁴⁶	0.834
Opinion of English (OE)	0.541
Self-reported ability in Welsh (ABIL)	0.906
Use of Welsh	0.809

The Cronbach's Alpha of the speakers' opinions of their English falls below the threshold considered to be reliable in most studies (0.6; Dörnyei 2003: 112), and therefore was not included as a factor. The Pearson R correlation was then calculated in order to ascertain the correlation between the factors, and the level of significance of this correlation was sought:

⁴⁶ The data for the statement 'Welsh/English is a modern language' was omitted as the term 'modern' is could be seen as both positive and negative.

	WIA	PROM	OW	OE	ABIL	USE
WIA						*
r	1.00	-0.10	0.004	-0.104	0.223	0.415
Sig. (2 tailed)	N/A	0.620	0.984	0.606	0.264	0.03
N	27	27	27	27	27	27
PROMO			***		**	
r	-0.10	1.00	0.583	-0.236	0.368	0.329
Sig. (2 tailed)	0.619	N/A	0.001	0.236	0.006	0.09
N	27	27	27	27	27	27
OW		***			**	*
r	0.004	0.583	1.00	-0.219	0.511	0.384
Sig. (2 tailed)	0.984	0.001	N/A	0.272	0.006	0.048
N	27	27	27	27	27	27
OE					**	***
r	-0.104	-0.236	-0.219	1.00	-0.536	-0.562
Sig. (2 tailed)	0.607	0.236	0.272	N/A	0.003	0.002
N	27	27	27	27	27	27
ABIL		**	**	**		***
r	0.223	0.368	0.511	-0.536	1.00	0.620
Sig. (2 tailed)	0.264	0.006	0.006	0.004	N/A	0.0006
N	27	27	27	27	27	27

* Correlation is significant at the 0.05 level

** Correlation is significant at the 0.01 level

*** Correlation is significant at the 0.001 level