

# Gemination in Northern Welsh English



**Universiteit Utrecht**



PRIFYSGOL  
**BANGOR**  
UNIVERSITY

Ellen Collée, 4135555, July 2016  
BA Thesis, English Language and Culture  
Utrecht University, supervisor Dr. Koen Sebregts

## **Acknowledgements**

There are 3 people who helped me so much and I'd like to thank them. First of all, my supervisor Koen Sebregts, who never gave up on me, even though my (sometimes) annoying and hopeless emails kept coming, especially when I was working on the analysis in Praat. He was also very kind to do the statistics for me, without which this entire dissertation would not have been possible. Secondly, I'd like to thank the staff at Bangor University, for helping me and agreeing to let me use the language laboratory in Bangor even though they had no obligation to help me, since this dissertation was written for Utrecht University. I am very grateful for the discussions and brainstorm sessions about dissertation topics at the start of the year with Marco Tamburelli. I'd like to thank him for showing interest in my dissertation, and more importantly, for suggesting the topic of gemination. Then, last but certainly not least, a very big thank you to Sarah Cooper, who made sure I could use the lab and who always welcomed me in her office. Most of all, I owe her special thanks for helping me with practical things, especially with designing my target words. Without her I probably would not have been able to come up with 65 words in the chosen environments.

**Abstract**

Bilinguals have been seen as an fascinating subject of research for years. How do two languages exist in one person? Are some features of one language used in the other? This study tries to contribute to research in bilingualism by investigating whether phonological transfer from Welsh to Welsh English occurs in North Wales. The focus lies on consonant lengthening, or gemination. 8 Welsh-English bilinguals in two age groups from North Wales (mean ages: 22 and 54) and 8 monolingual English speakers (mean ages: 20 and 50,5) participated. They were asked to fill in a questionnaire about language use and they were recorded when reading out loud a list of sentences. Acoustic and statistical analyses strongly suggest that gemination occurs in the speech of Welsh-English bilinguals. In addition, results show that the extent to which geminates are used depends on how much Welsh they speak and the linguistic context (vowel length, manner of articulation and voicing).

**Keywords: Welsh-English bilingualism, transfer and gemination.**

## Contents

1. Introduction: The language situation in Wales	5
2. Theoretical Background	
2.1 The Influence of Welsh on Welsh-English	9
2.2 Gemination	10
2.3 Research Questions	12
3. Methodology	
3.1 Participants	13
3.2 Procedure	13
3.3 Equipment	14
3.4 Material	15
3.5 Acoustic Analysis	17
3.6 Statistical Analysis	20
4. Results	21
5. Discussion	25
6. Conclusion	31
References	33
Appendix A: Approval Ethical Committee	37
Appendix B: Consent Form	38
Appendix C: Participant Information	39
Appendix D: Questionnaire	41

## 1. Introduction: The Language Situation in Wales

Wales is a bilingual country; Welsh and English are the official languages and they can be found everywhere. These languages are not related, since English is part of the Germanic language family (König & Van der Auwera, 1994) and Welsh of the Celtic family (Hannah, 2013). Other Celtic languages which are still spoken nowadays are Irish Gaelic, Scottish Gaelic and Breton. Welsh is spoken in Wales and in parts of Patagonia in South America (Hannahs, 2013).

The UK Census (2011) showed that 19% of the Welsh population in Wales over the age of 3 is able to speak Welsh. However, when looking at the combination of the ability to speak, write, and read the language, only 14,6% of the population is able to do so, according to the UK Census (2011). These numbers were higher in 2001; 20,5% and 16,3% respectively. From the 1991 UK Census onwards, 100% of the people who speak Welsh also speak English, so all Welsh speakers are in effect bilinguals. The censuses show that from 1891 onwards, there has been a decline in the populations' ability to speak Welsh. However, since 1991 this number is starting to increase. This is due to a change in education policy (Herrero de Haro, 2013).

The UK Census (2011) showed that more people speak Welsh in the north of Wales compared to the south, as can be seen in Figure 1. Figure 1 shows that Welsh is spoken the most in Anglesey and Gwynedd, which are the darkest counties in the north-west below.

Figure 2 below shows that more young people speak Welsh compared to older people. The highest percentage is found in the age group 5 until 15, which is 40.3%. This could be because Welsh is an important element of education in Wales.

Figure 1

*Percentages of Welsh speakers in the principal areas of Wales according to the UK Census (2011) from Wikipedia.*

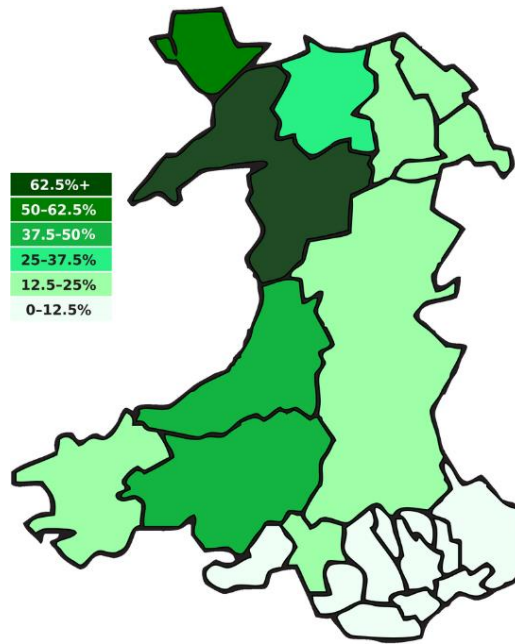
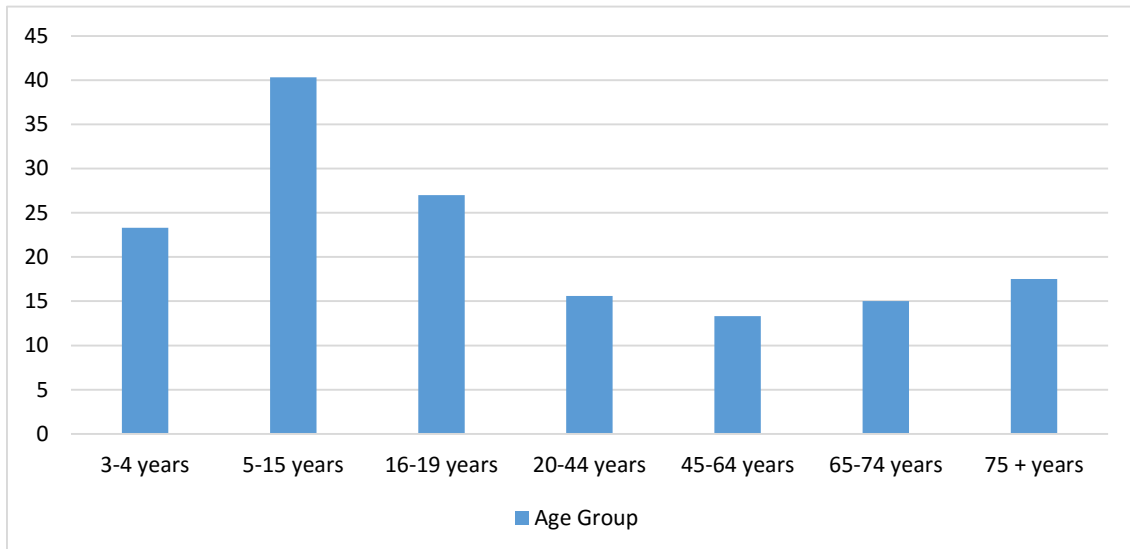


Figure 2

*Percentage of people aged 3 and over who speak Welsh by age based on the UK Census (2011).*

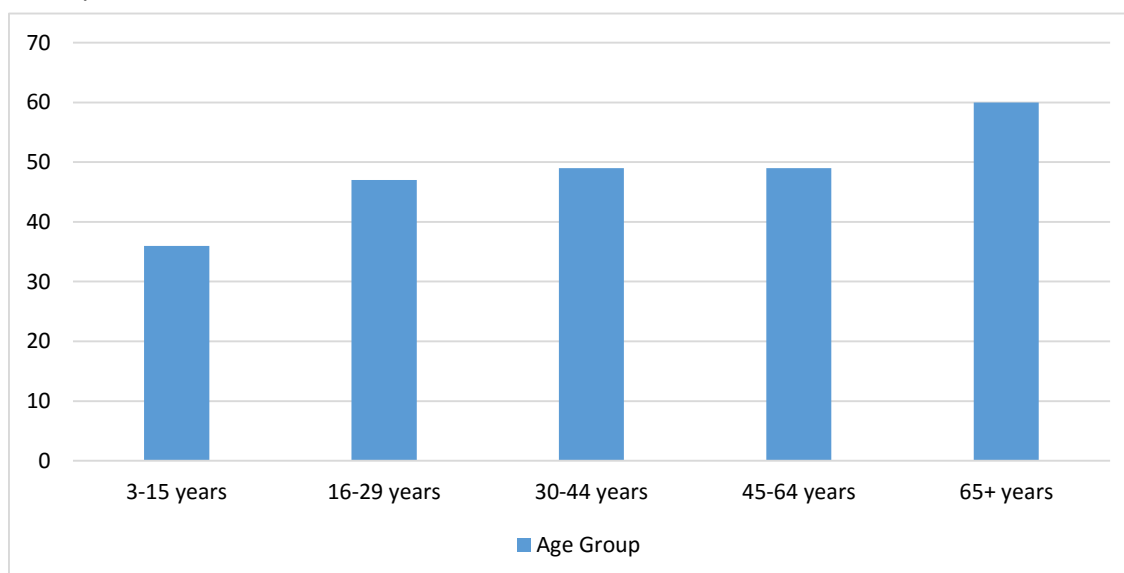


It is mandatory to study Welsh until GCSC (secondary school). More than 25% of the students in primary and secondary school go to schools where classes are taught in Welsh. The other students go to English schools where they learn Welsh as a second language. (Herrero de Haro, 2013). The main language at universities is English. However, all universities in Wales teach some modules in Welsh. Some universities encourage students to take modules in Welsh. For example, at Bangor University students receive 250 pounds per module they do in Welsh.

The Welsh Language Use Survey (2013-2015) showed that 47% of the Welsh speakers are fluent. Even though more young than older people speak Welsh, Figure 3 shows that within the group of Welsh speakers, older people are more fluent compared to younger people.

Figure 3

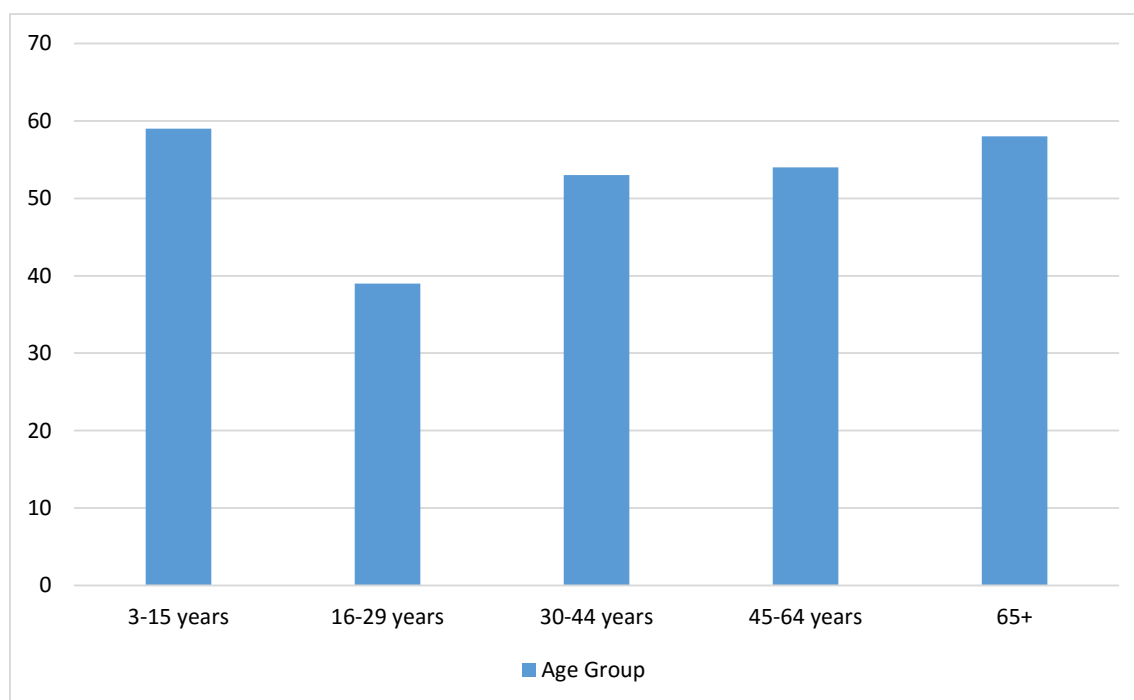
*Percentage of Welsh speakers who are fluent by age based on the Welsh Language Use Survey (2013-2015).*



Regarding the question of how often Welsh speakers speak Welsh, the Welsh Language Use Survey (2013-2015) showed that 53% speaks Welsh daily. Figure 4 below shows which age group speaks Welsh daily. All age groups varied between 53% and 59%, except for 16-29 years which was 39%.

Figure 4

*Percentage of Welsh speakers who speak Welsh daily based on the Welsh Language Use Survey (2013-2015).*



Attitudes towards Welsh culture by Welsh speakers is in most cases very positive (Morris, 2013). Moreover, it is said that language serves as a symbol of the Welsh identity (Bourhis et al., 1973).



## **Theoretical Background**

### 2.1 The Influence of Welsh on Welsh English

Bilingualism entails the possibility of the two languages influencing each other. This process is either called interference or phonological transfer, in which the first is used to describe the influence in terms of language contact (Weinrich, 1953) and the second in terms of second language acquisition and foreign accents (Flege & Darwinian, 1984). It remains unclear which specific properties can influence the other language (Curtin & Pater, 1998).

Welsh and English influence each other in Wales. There are differences between the amount of influence of Welsh on English in the north and south of Wales. A language shift from Welsh to English has occurred in Wales, in which the shift is in a more final stage in the south compared to the north. Fewer people speak Welsh in the south of Wales compared to the north (Thomas, 1984). Features of the original language can leave imprints on the other language. This occurred in North Wales, where a Welsh substrate on English has been found. In addition, convergence between the two languages has also occurred (Morris, 2013). The imprint of the Welsh language seems to be stronger in places where many bilinguals live, as in Caernarfon for example (Morris, 2013). The amount of cross-linguistic influence depends on many variables. Examples of these are age of acquisition of both languages (simultaneously or successively), language used at home/school, amount of input and the main language used in the community (Morris, 2013). The influence of the first language (Welsh) on the second language (English) seems to become stronger with age. However, this is also influenced by other factors, for example language usage (Morris, 2013).

Examples of phonetic transfer from Welsh to English are the use of Welsh prosodic features in English by bilingual speakers (Connolly, 1981), the use of /t/ in northern Welsh English in all positions by bilingual and monolingual speakers (Penhallurick 1991) and the

production of Welsh variants [r] and [r̥] in English in Caernarfon by bilingual speakers (Morris, 2013) and possibly gemination.

## 2.2 Gemination

Gemination is a phonetic process in which consonants are lengthened in speech. This occurs in many languages. Example of these languages are Italian, Finnish, Arabic, Japanese, Icelandic, Bengali, Hindi, and Turkish (Maddieson, 1985). Lengthened consonants, or geminates, are mostly found in word medial position (Picket et al., 1999). The first phonetic cue to distinguish a geminate is increased duration of the closure/constriction interval (Esposito et al., 1997). There is a temporal relation between the preceding vowel and the geminate (Tserdanelis & Arvaniti, 2001). In most cases the preceding vowel is shortened, which can be seen as the second cue. However, this relation differs across languages. For example, this vowel shortening does not happen in languages like Turkish (Lahiri and Hankamer, 1988) and Japanese (Maddieson, 1985). Picket et al. (1999, p. 156) state that “the C/V ratio remains stable across speaking rate and speakers” in Italian. This ratio can be useful when looking at gemination.

Not all geminates are lengthened similarly. Research by Arvaniti & Tserdanelis (2000) on Cypriot Greek compared words with geminates to words with singletons. Results showed that sonorants were 47% longer in geminates compared to the singleton consonants in the control words. In addition, fricatives were 24% longer and stops 36% longer.

Phonological gemination used to occur in the Welsh language. Evidence for this has been found in some orthographic forms (Morris-Jones, 1913). Even though the phonemic contrast no longer exists, there are still phonetic geminates in modern Welsh (Hannahs, 2013). A small study (with 3 participants) showed that gemination occurred in Welsh English in the post stressed penult consonant. However, the paper does not clearly state where the participants were from (north/south Wales) and which words were used (Williams, 1999).

Many agree that gemination occurs in modern Welsh when a stressed vowel is followed by a voiceless stop (Ball & Williams, 2001). A less supported view is that gemination may also occur after a stressed vowel with [m, ŋ, s, t] (Hannahs, 2013).

Even though gemination is not a feature of Standard English, it has been reported that gemination has been found in Southern Welsh English. This might be due to the influence of Welsh on English (Kaye 2005). There has not been any research which focussed on why this (possible) language transfer occurs or which factors influence gemination in Welsh English. In addition, there has been some controversy in the literature concerning in which environments gemination occurs in Southern Welsh English. It has been said that gemination can only occur in fortis consonants (Conolly, 1981; Wells, 1970). In addition, reports state that it occurs in medial position (Thomas, 1984; Hughes, 1979; Crystal 2003). Other reports focus on which vowels precede the potential geminate. Lengthening has been said to occur after short stressed vowels (Thomas, 1984) and when /i:/, u:/ and diphthongs are followed by a fortis consonant (Connolly, 1981). It has also been argued that it occurs when it is orthographically dictated; when two consonants occur in spelling (Crystal, 2003).

The literature shows that gemination is a reported phenomenon in South Wales, although there has not been extensive research on the matter. However, gemination has not been reported in North Wales. North Wales is in a different stage of the language shift, in which there is more influence from Welsh on English. This would predict that gemination will also be found in North Wales. This paper will investigate whether and how gemination occurs in Northern Welsh English.

### 2.3 Research Questions

#### 1. Does gemination occur in Northern Welsh English in different vowel contexts?

Hypothesis 1: I expect that gemination occurs in Northern Welsh English in medial position after stressed vowels. I base this prediction on the fact that gemination occurs in the south of Wales, even though Southern Welsh English is not as influenced by Welsh according to descriptions compared to Northern Welsh English. In addition, fewer Welsh-English bilinguals live in the south in comparison to North Wales. Northern Welsh English has more features that come from Welsh. Therefore, I expect that this process also occurs in North Wales.

#### 2. Are there differences in the use of geminates between older (>39) and younger people (<25)?

Hypothesis 2: I expect that people who speak Welsh and are more exposed to Welsh will be more influenced by the Welsh language and thus use more geminates. Since surveys show that more older people speak Welsh on a daily basis and more people in this group are fluent, I predict older people will use more geminates. Even though more younger people are able to speak Welsh, I predict that fluency and how often the language is used has more influence on their English.

### 3. Methodology

The research described in this thesis was approved by the ethics committee in the School of English Language and Linguistics, Bangor University (Wales).

#### 3.1 Participants

16 subjects participated in this study. Eight were bilingual Welsh-English speakers, of which four were younger participants (mean age: 22) and four older participants (mean age: 54). In each age group there was an even split between male and female participants. All bilingual participants were from the north of Wales. In addition, there were 8 monolingual English speakers. These participants functioned as the control group. This group was divided in the same manner as the bilingual group. There were four younger participants (mean age: 20) and four older ones (mean age: 50.5). There was also a 50/50 division between male and female subjects in this group. All participants were university educated in the past or currently enrolled in higher education.

Table 1  
*Age in years per participant by language and gender.*

	Welsh-English Bilinguals				English Monolinguals			
	Male		Female		Male		Female	
Younger	21	21	25	21	21	19	21	19
Older	62	52	49	53	57	56	50	39

#### 3.2 Procedure

After the participants were briefed about the experiment, they were asked to sign a consent form. After this, the participants were asked to fill in a questionnaire with personal information (Appendix D). In addition to personal details, it asked about language use: native languages, languages when growing up, percentage of each language used in various contexts

and attitude towards each language. The monolingual English speakers were asked only to fill in the first element of the questionnaire, since they could not answer the question about using multiple languages. However, one question was for the monolinguals only, and it focused on whether the participant had any knowledge of the Welsh language. This questionnaire was based on Gullberg and Indefrey (2003).

After the questionnaire, the participants were given a list of sentences. They were given some time to familiarize themselves with the words. After this, they were asked to read the list out loud. This was recorded. After the first recording, the participants had a very short break. Then the participants read the list of sentences again in the same order, and once again this was recorded.

Then the participants were asked to answer one question and the answer was recorded. The question was: *What is the influence of Welsh on your daily life?* This question was included to create the possibility to analyse spontaneous speech. The question was about Welsh to give some insights in what the attitude of the participants was in relation to Welsh, even though this was not the aim of the research. The researcher tried to keep these responses short and the participants were politely cut short after about a minute in most cases. All recordings were between 20 seconds and 58 seconds, except for the longest which was 99 seconds.

### 3.3 Equipment

All experiments took place in a sound-proof room in the language laboratory, in the Linguistics Department of Bangor University on College Road 37-41 (Bangor). All recordings were WAV recordings (48kHz, 16-bit) and they were made with a ZOOM H1 Handy Recorder.

### 3.4 Material

The list of words the participants were asked to read out loud consisted of 65 target words, which were inserted in the phrase “say [target word] again”. A frame sentence was used to control the participants’ intonation pattern (Webb 2011). All target words were disyllabic, with the stress on the first syllable. The structure of the target words was CVCV and where this was not possible CVCVC.

All target words contained /i, u, ɪ or a/ in the first syllable. These were chosen in order to be able to compare long-short, high-low, front-back and rounded-unrounded vowels. This can be seen in Table 2.

Table 2

*The length, height, roundness and place of the vowels /i:, u:, ɪ, a/.*

Vowel	Length	Height	Round	Place
/i:/	Long	High	Unrounded	Front
/u:/	Long	High	Rounded	Back
/ɪ/	Short	High	Unrounded	Front
/a/	Short	Low	Unrounded	Front

These vowels were followed by one of the following consonants: /k, g, t, d, n, m, s, z/, which were the target consonants. These consonants were chosen to be able to compare the place and manner of articulation, voicing and the energy level (lenis/fortis). Nasals were included to see whether these consonants were affected differently from plosives and fricatives. The features of the used consonants can be found in Table 3 below. All target words contained /i, ə, ɪ/ in the second, unstressed, syllable.

Table 3

*The place of articulation, manner of articulation, voicing and energy of /k,g,t,d,n,m,s,z/.*

Consonant	Place	Manner	Voicing	Energy
/k/	Dorsal	Plosive	Voiceless	Fortis
/g/	Dorsal	Plosive	Voiced	Lenis
/t/	Coronal	Plosive	Voiceless	Fortis
/d/	Coronal	Plosive	Voiced	Lenis
/n/	Coronal	Nasal	Voiced	-
/m/	Labial	Nasal	Voiced	-
/s/	Coronal	Fricative	Voiceless	Fortis
/z/	Coronal	Fricative	Voiced	Lenis

The four chosen vowels occurred in combination with all the consonants. This resulted in  $8 \times 4 = 32$  environments. Each environment was tested twice, to be sure the vowel and consonant combination was the same. In most cases the 2 target words in each environment rhymed, since it was not expected that the changing of the initial consonant would influence the consonant in medial position. In this way the combination of the vowel in the first syllable and the consonant in medial position could be measured twice. This resulted in  $32 \times 2 = 64$  words. The total word list was made up of 65 words (since one word ending in /ə/ was added to see whether this ending differed from the other endings). The words were randomized and all participants read the words in the same order. The (used) target words can be found in Table 4 below.

Table 4

*The target words and transcriptions.*

Word	Transcription	Word	Transcription
<i>Beacon</i>	/ˈbi:kən/	<i>Weaken</i>	/ˈwi:kən/
<i>Vegan</i>	/ˈvi:gən/	<i>Meagre</i>	/ˈmi:gə/
<i>Leaning</i>	/ˈli:nɪŋ/	<i>Meaning</i>	/ˈmi:nɪŋ/
<i>Beaming</i>	/ˈbi:mɪŋ/	<i>Seeming</i>	/ˈsi:mɪŋ/
<i>Pieces</i>	/ˈpi:zəs/	<i>Leasing</i>	/ˈli:sɪŋ/
<i>Season</i>	/ˈsi:zən/	<i>Wheezing</i>	/ˈwi:ziŋ/
<i>Puking</i>	/ˈpju:kɪŋ/	<i>Nuking</i>	/ˈnju:kɪŋ/
<i>Boogie</i>	/ˈbu:gi/	<i>Cougar</i>	/ˈku:gə/
<i>Lunar</i>	/ˈlu:nə/	<i>Sooner</i>	/ˈsu:nə/
<i>Rumour</i>	/ˈru:mə/	<i>Humour</i>	/ˈhju:mə/
<i>Lucid</i>	/ˈlu:sɪd/	<i>Loosen</i>	/ˈlu:s(ə)n/
<i>Music</i>	/ˈmju:zɪk/	<i>Cruiser</i>	/ˈkru:sə/



<i>Bicker</i>	/ˈbɪkə/	<i>Chicken</i>	/ˈtʃɪkɪn/
<i>Bigger</i>	/ˈbɪgə/	<i>Digger</i>	/ˈdɪgə/
<i>Dinner</i>	/ˈdɪnə/	<i>Linen</i>	/ˈlɪnən/
<i>Dimmer</i>	/ˈdɪmə/	<i>Limit</i>	/ˈlɪmɪt/
<i>Kissing</i>	/ˈkɪsɪŋ/	<i>Missing</i>	/ˈmɪsɪŋ/
<i>Wizard</i>	/ˈwɪzəd/	<i>Lizard</i>	/ˈlɪzəd/
<i>Racket</i>	/ˈrækɪt/	<i>Packer</i>	/ˈpækə/
<i>Wagon</i>	/ˈwəɡən/	<i>Dagger</i>	/ˈdægə/
<i>Cannon</i>	/ˈkənən/	<i>Banner</i>	/ˈbənə/
<i>Salmon</i>	/ˈsæmən/	<i>Gammon</i>	/ˈɡæmən/
<i>Fasten</i>	/ˈfæsən/	<i>Passing</i>	/ˈpɑsɪŋ/
<i>Hazard</i>	/ˈhæzəd/	<i>Jazzier</i>	/ˈdʒæzə/

### 3.5 Acoustic Analysis

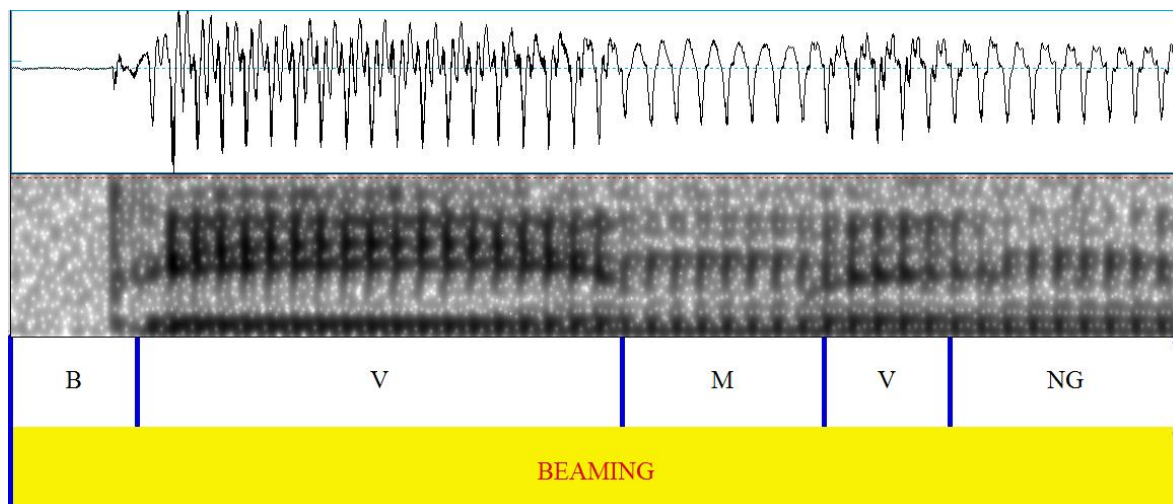
The focus of the acoustic analysis was on the Consonant/Vowel ratio, or C/V ratio. This ratio was chosen to make up for the differences in speech rate across participants. This ratio was used to investigate gemination. More details will be given in this section.

For the purposes of the analysis, the spontaneous speech and words containing /t,d/ were left out of consideration because of time constraints. This means that 48 words out of 65 were analysed (containing /i:, u:, ɪ, a/ and /k, g, t, d, n, m, s, z/). These words can be seen in Table 4.

The recordings were converted to mono sounds without compression or downsampling. After this, all phrases were segmented and exported as a tab delimited file. *FAVE* (Rosenfelder et al., 2001) was used to automatically align the words and phonemes. The boundaries in this text grid were then manually corrected in *Praat* (Boersma & Weenink, 2015). An example can be found in Figure 5 below.

Figure 5

The waveform and spectrogram of a recording, showing the target word 'beaming' with the segmented phonemes, V = Vowel.



The analysis focused on computing the C/V ratio using the first segmented vowel and the consonant in medial position. It was chosen to segment initial /l,r,w,j/ together with the first vowel, since it was unclear where the boundary between these sounds occurred. An example is shown in Figure 6. The medial consonant was segmented similarly to the others in these words.

Some words containing /k/ in medial position showed a different pattern after the first vowel and before the pattern which is normally found in /k/. This deviant pattern was segmented as well and called pre aspiration (PRE in the text grid). Pre-aspiration was seen as part of the /k/. It was only segmented when it was clearly a different pattern and not a weaker continuation of the previous pattern of the vowel. An example is shown in Figure 7.

Figure 6

The sound wave and spectrogram of a recording, showing the word 'say' and the target word 'linen' with the segmented phonemes. The segmentation of /l/ and the vowel are highlighted, V = Vowel.

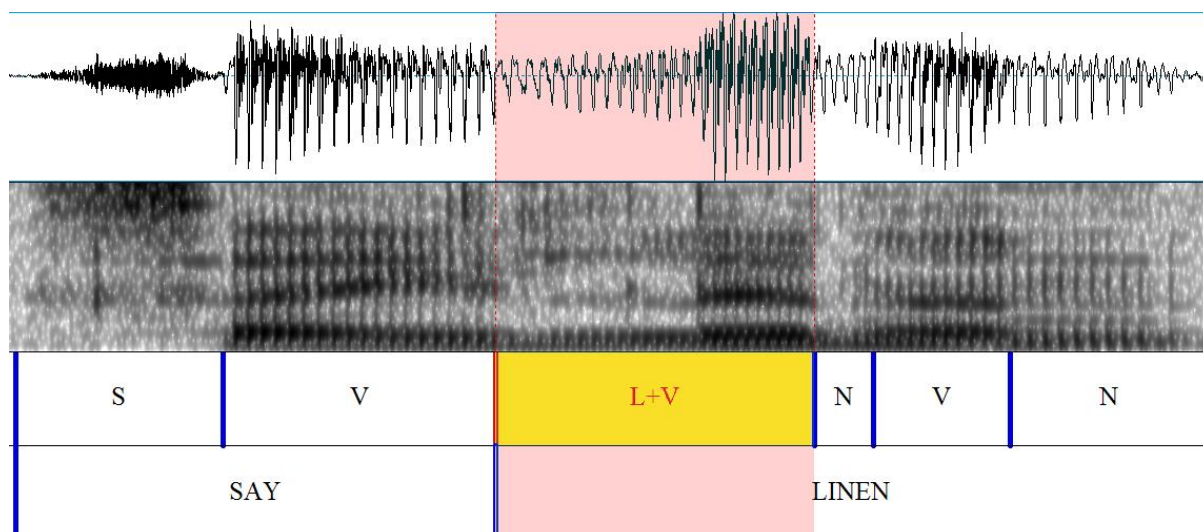
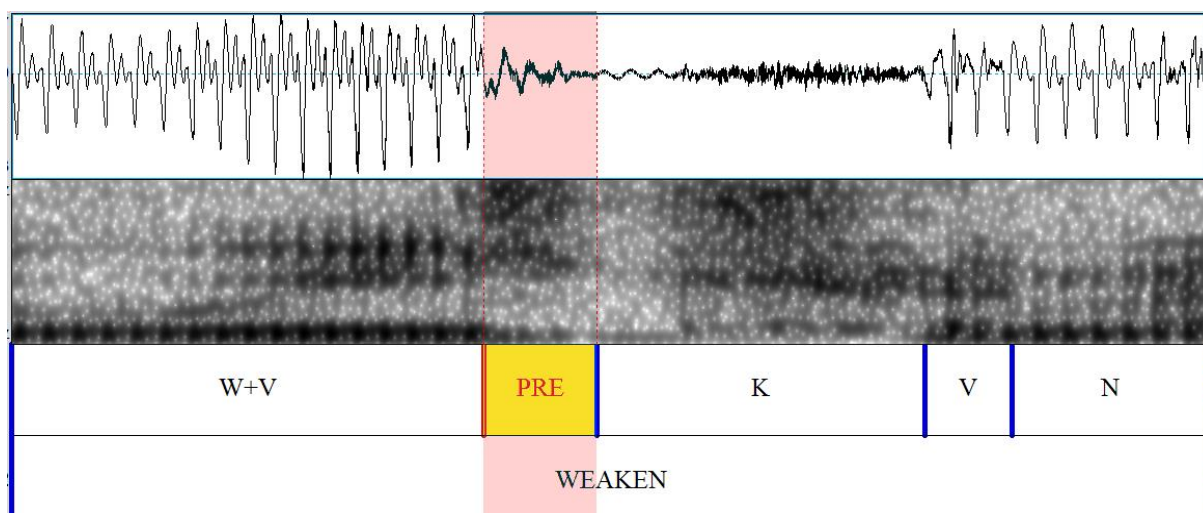


Figure 7

The sound wave and spectrogram of a recording, showing the target word 'weaken' and the segmented phonemes. The segmentation of the pre-aspiration (PRE) is highlighted (V = Vowel).



After the segmentation, the duration of the combination of the initial consonants and first vowels in words with /l,r,w,j/ or the first vowels in all other words were read from the selections and documented in an *Excel* file. This was also done for the consonants in medial position. The consonant to vowel ratio was then calculated by dividing the consonant duration

by the vowel duration. For example, for one participant, the target word *beaming* had a consonant duration for /m/ and vowel duration for /i:/, which were 67 ms and 160 ms respectively. Dividing the consonant duration (67 ms) by the vowel duration (160 ms) then gives a C/V ratio of 0.419.

### 3.6 Statistical Analysis

A series of linear mixed-effect models were computed using the lme4 package (Bates et al., 2015) in R (R Core Team, 2014). The response variable was the C/V ratio, used as the phonetic correlate of possible gemination. Participant and word were included as random effects. Potential fixed effects, taken from the questionnaire and linguistic context, were added if they improved the overall model fit. One of the fixed effects which was eventually included is the percentage of Welsh spoken compared to English. This was a self-reported estimate by the participants in the questionnaire. The other included fixed effects were vowel length, manner of articulation and voicing. The resulting model is presented in Table 3 below.

Table 5

*Summary of a linear mixed-effects regression showing the C/V ratios and predicting the occurrence of gemination. Number of observations = 768.*

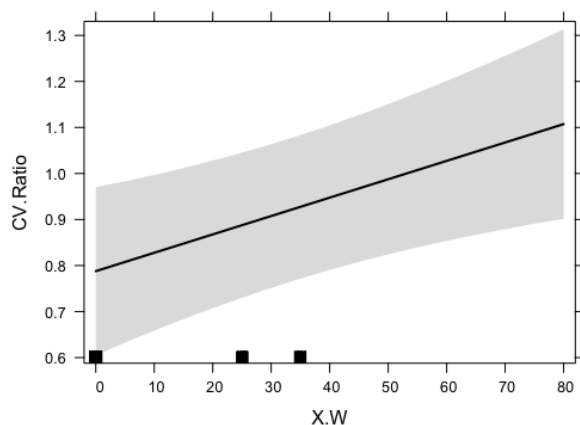
Random effects	Variance	Std deviation	N
Word	0.120	0.35	48
Participant	0.056	0.24	16
Fixed effects	Estimate	Std error	T-value
(Intercept)	0.884	0.13	6.569
% Welsh vs. English	0.004	0.00	2.738
Vowel length, short	0.576	0.11	5.400
Manner of articulation, nasal	0.188	0.16	1.180
Manner of articulation, plosive	0.343	0.13	2.611
Voicing, voiced	-0.928	0.14	-6.851

#### 4. Results

The percentage of Welsh used per day compared to the percentage of English used, as indicated by the participants, is a significant factor in the C/V ratio model (t-value=2.738). The C/V ratio increases when the percentage of Welsh used in the home is higher. This can be seen in the first plot in Figure 8 below. The C/V ratio for Welsh/English speakers is higher compared to monolingual English speakers (represented by '0' on the x-axis). Moreover, the extent to which the C/V ratio is higher depends, among other factors, on the percentage of Welsh used per day. Other factors concerning language use (native language, language used at home growing up, language used when speaking to mother and friends) co-vary with the percentage of Welsh spoken and showed the same trend. Therefore, these are left out of consideration in the linear model.

Figure 8

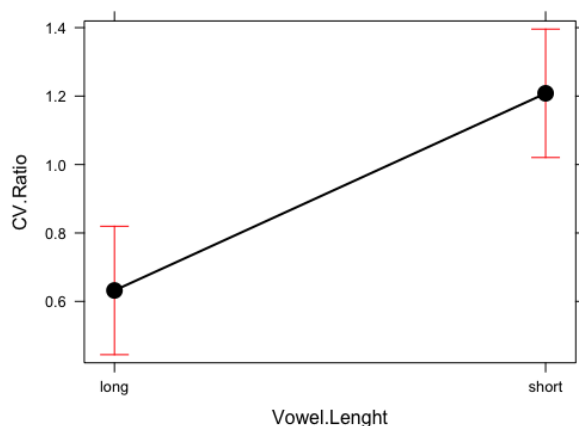
*Plot showing the increase of the C/V ratio when more Welsh is spoken, X.W.=% Welsh spoken.*



Another significant factor which influences the C/V ratio is phonological vowel length (t-value=5.4). Words with short vowels have a higher C/V ratio compared to long vowels. The mean CV ratio for short vowels is 0.576 higher than that for long vowels. The plot can be found in Figure 9.

Figure 9

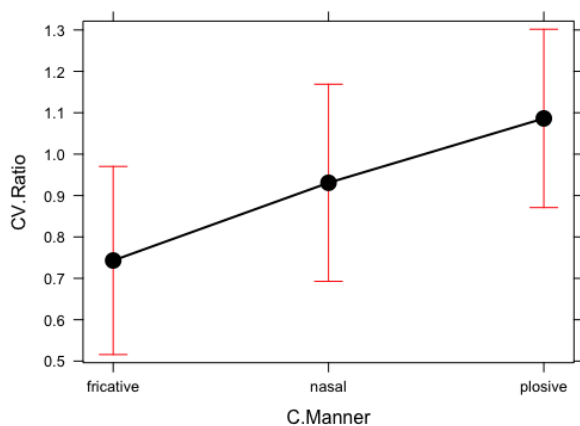
Plot showing the increase of the C/V ratio when short vowels are used.



In terms of the consonantal manner of articulation, the difference between plosives and fricatives is significant ( $t$ -value=2.611). As Figure 10 below shows, the C/V ratio is highest for plosives and smallest for fricatives. Nasals are found in between. The C/V ratio is 0.343 higher for plosives compared to fricatives and 0.188 higher for nasals than that for fricatives.

Figure 10

Plots showing the increase of the C/V ratio when plosives are used, C=Consonant.



The last significant factor is the voicing of the consonant ( $t$ -value= -6.851). Voiced consonants have a lower C/V ratio compared to unvoiced consonants, which can be seen in the last plot of Figure 11 below. The C/V ratio of voiced consonants is 0.928 lower than that of the unvoiced consonants. Overall, the amount of gemination (suggested by a higher C/V

ratio) depends on 3 linguistic features (phonological vowel length, consonantal manner of articulation and voicing) as well as the percentage of Welsh used.

Figure 11

*Plots showing the decrease of the C/V ratio when voiced consonants are used, C=Consonant.*

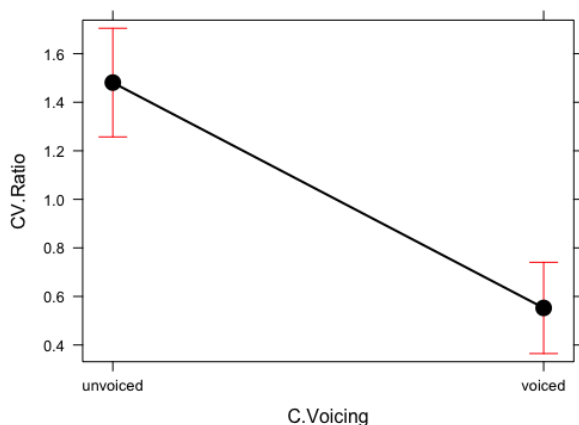


Figure 12 shows the mean C/V ratios for all participants. In general, the Welsh/English participants (1,2,3,7,8,9,10,14) are found more to the right and thus have higher C/V ratios compared to the English speakers (4,5,6,11,12,13,15,16). However, variation can be seen in this pattern. The overall pattern is gradual, which means that the Welsh/English speakers found on the right side of the figure do not geminate all the time. Surprisingly, the mean C/V ratio of participant 2 shows that some Welsh/English participants do not seem to geminate at all. It can be seen that the C/V ratio for participant 7 (Welsh/English bilingual) is the highest and is much higher compared to the mean ratio of the participant below participant 7.

Younger speakers have slightly lower C/V ratios. This is marginally significant and has been left out of consideration since it only improves the model marginally. However, this result shows a trend, which is illustrated in Figure 13, suggesting that older speakers are more likely to use geminate consonants. However, the standard errors overlap considerably, which presumably is the reason that the effect of age on the C/V ratio is not significant (t-value=-1.173).

Figure 12  
*The mean C/V ratio per participant, P=Participant.*

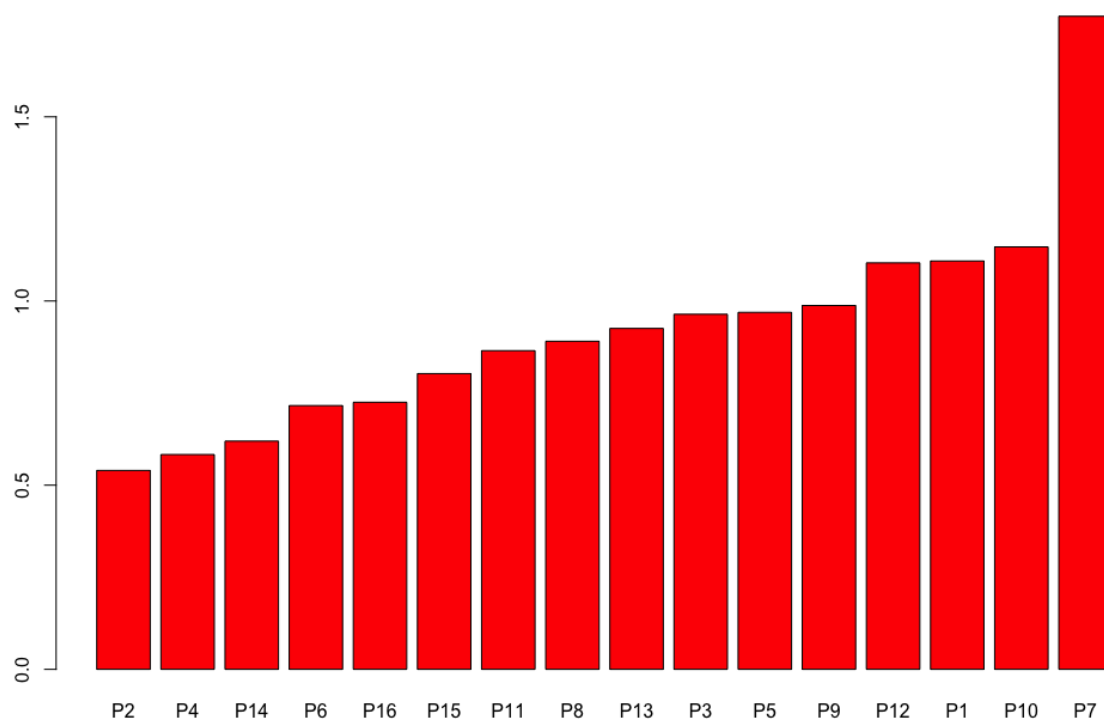
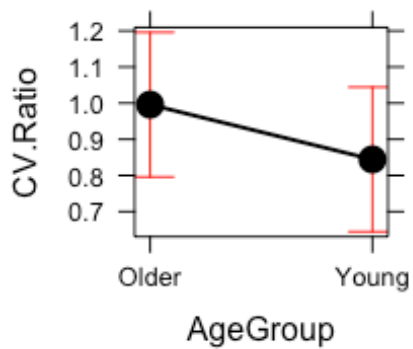


Figure 13  
*Plot showing the decrease of the C/V ratio in younger participants compared to older participants.*



Finally, inspection of the pre-aspiration data showed no explicit consistent patterns.

Therefore, this element was not taken into account further.



## 5. Discussion

The C/V ratio was used to investigate possible gemination. Results shows that the C/V ratio is higher for Welsh/English bilinguals, which strongly suggests that gemination occurs in their speech. Moreover, the extent to which they use geminates depends on the percentage Welsh spoken at home on a given day, as well as on vowel length, voicing and consonantal manner of articulation.

The C/V ratio is higher, which suggests that more gemination occurs, in words with short vowels and in words with voiceless consonants. This is phonetically predictable. Cross linguistically, voiceless obstruents are longer than voiced ones (Devine & Stephens, 1994), and phonologically short vowels have a shorter phonetic duration. Dividing the same consonant by a shorter vowel, and dividing a longer consonant by the same vowel, both result in a higher C/V ratio.

Consonantal manner of articulation also influences the C/V ratio, and thus the amount of gemination. The highest C/V ratio is found in plosives, than in nasals and then in fricatives. This is not in line with Arvaniti & Tserdanelis's research (2000), which showed that the lengthening in sonorants was the longest and that in stops the shortest. However, this difference might be caused by the fact that this research only took nasals in account, not other sonorants, such as liquids. Results might be different if further research on gemination in Welsh would focus on other sonorants as well.

Previous studies suggest that there is a connection between fortis/lenis consonants and gemination. It predicted that fortis consonants would be affected. This study found a significant effect of voicing; unvoiced consonants have longer C/V ratios. In this study, fortis and lenis were defined in terms of voicing, which means that the voicing results can suggest that fortis consonants are more effected by gemination. However, Jansen (2004) argues that the fortis/lenis distinction is based on more factors than voicing only. One of these

factors is the duration of a segment. If further studies would take an approach closer to Jansen's (2004), this might give more insight in the relation between fortis/lenis consonants and gemination.

This study did not find a significant influence of the fortis/lenis contrast since the voicing effect was stronger. Even though the voicing results suggest that fortis consonants are effected by gemination, this clashes with the results of the manner of articulation. In the manner groups (plosives and fricatives) the unvoiced phoneme has a higher C/V ratio compared to the voiced one. However, plosives (as a group) are the longest when comparing manners even though there are also voiceless phonemes in the fricative group. This means that even though there is an effect of voicing, the effect of manner is stronger. This may be different if more phonemes (voiced and voiceless pairs) are included.

The main finding of this study is that gemination is influenced by the amount of Welsh spoken on a day, as indicated by the participants. This is in line with the predictions about how often the language is used. If a language is used more often the chance of it influencing the other language is higher. Even though most language factors correlate, there is not a significant influence of language factors concerning the past, like native language or language growing up. The statistical model should only include factors which are independent. Since many language factors were strongly correlated, only the strongest was used, which was the percentage of Welsh used. This can be seen as a limitation of the study. However, if the questions would not correlate this much, other language factors may turn out to be significant.

The results of this study show that age does not significantly influence gemination, even though this was expected. It was expected that older people used more geminates, since surveys showed that more of them are fluent and speak Welsh on a daily basis. Apparently, in this data set age does not correlate with how much Welsh is spoken on a day. The reason for this might be that compared to most surveys, this data is obtained from Northern Welsh-

English bilinguals only. Since Welsh is spoken more in the north than south, it could be that more people who speak Welsh in the north speak it on a daily basis, regardless of age. Even though no significant influence of age on gemination was found, a trend can still be seen in which older people seem to use more geminates. If future research would include more participants (perhaps with different social backgrounds) it may turn out that age has a significant influence on gemination.

The acoustic data show a pattern before the release in the plosive /k/ in the speech of many of the participants. This pattern was seen as part of the consonant in this study. This pattern is most likely pre-aspiration. Hejná (2015) describes this process as “a period of voiceless (primarily) glottal friction occurring in the sequences of sonorants and phonetically voiceless obstruents” (p. 15). Inspecting the data suggests that this process occurs in speakers of both languages, even though this process is not found in Standard English. In addition, inspection also suggests that there is a difference between Welsh and English speakers in pre-aspiration. The patterns seen as pre-aspiration seem to be different in bilinguals and monolinguals. The pattern in most bilinguals was clearly distinct from the adjacent patterns of the vowel and rest of the /k/. However, the pattern in most monolinguals differed from the preceding vowel, but in most cases this was not a very clear distinction. The fact that it seems that pre-aspiration occurs in Welsh and English speakers could be an error of segmentation. Another possibility is that the English speakers could be influenced by Welsh speakers. In this study, every pattern after the vowel which looked different was seen as the consonant, including the pre-aspiration. An attempt was made to be consistent about this in the segmentation. However, it may be the case in English participants that what was seen as pre-aspiration was actually a weakened continuation of the vowel, even though this possible continuation looked somewhat different from the clear pattern of the vowel. In many cases the pre-aspiration segment sounded like the preceding vowel, but because the decision was made

to see everything after the clear pattern of the vowel as pre-aspiration (to be consistent), this might have influenced what was seen as pre-aspiration. Another interesting element is that /g/ seems to behave in almost the same way as /k/ in some Welsh-English bilinguals. Sometimes both soundwaves seemed to look similar, in terms of amplitude, voicing and release. Pre-aspiration can be found in these instances as well, even though this is not usually found in voiced consonants. However, in these cases /g/ seems to be produced almost similar to /k/ and both sound almost identical, in which case /g/ would be mostly voiceless. This study did not conduct any statistical analysis on pre-aspiration, since there seemed to be no pattern whatsoever. However, further research could find out whether the patterns observed by inspection of this data, actually occur in speakers.

Previous studies show that there is a connection between pre-aspiration and gemination, or rather degemination. Degemination is the opposite process of gemination, in which consonants have shorter durations. Stevens & Reubold (2014) analysed Italian pre-aspiration data and they did not find shorter consonants in production. However, “the authors found that perceptually preaspirated plosives were still perceived as shorter than plosives without preaspiration” (Hejrná, 2015, p. 239), which is why Stevens & Reubold (2014) suggest that it is possible that pre-aspiration leads to degemination, in which pre-aspiration can be seen as the first step towards degemination (Clayton, 2010). However, research by Hejrná (2015) on Welsh English is not in line with that hypothesis. Her data showed no shortening of consonants. This finding might be because the focus was on production rather than how sounds were perceived and because the data was collected in Aberystwyth only. It is possible that this process occurs in other places in Wales. However, the finding of this study, conducted in North Wales, is that gemination and pre-aspiration occur simultaneously. It may be possible that the process in which pre-aspiration leads to degemination, as proposed by Stevens & Reubold (2014), either (1) does not occur in Wales or (2) is not completed yet and

is still in the gemination phase rather than the degemination one, or (3) has completed the degemination phase and is now in the last gemination phase. Further research could focus on perceptual data instead of production only and the relation between pre-aspiration and (de)gemination in Wales.

The responses from the questionnaire and short conversations with the participants showed interesting elements. For example, it turned out that in all but one case Welsh-English bilinguals did not learn English at school. Participants who spoke Welsh only at home said that when they went to school some classes were taught in English and that they had English as a subject, but they never had formal lessons which taught them the language when they were young. Participants explained that this was not necessary; they picked up the language from television, radio etc. This might be interesting for further research in sociolinguistics and bilingual language acquisition.

Another interesting factor that came forward during the experiments is that some Welsh-English bilinguals, especially the older ones, were very passionate about Welsh culture and language. Many Welsh-English bilinguals believed that English people who live in the Welsh communities should learn to speak Welsh and if they do not, this shows no respect towards the community. Many Welsh-English bilinguals also indicated on the questionnaire that they liked speaking Welsh more than English. The strong feelings about the language shows in statements like “Welsh is not just a language; it is who we are”. Encountering these kind of statements during data collection suggested that attitude would turn out to have a significant influence on the C/V ratio and thus on gemination. However, this was not the case. This might be because the strong attitude about the Welsh language mostly came forward when recording the participants for the spontaneous speech part of the experiment, not from the answers given in the questionnaire. There was a question included about attitude but it does not seem to reflect the strong feelings which were encountered. This can be seen as a

limitation of the study. If gemination is a salient marker of the Welsh attitude towards Welsh culture and language, it may be useful to include more questions about this attitude in the questionnaire. This may prove to be a significant factor in predicting gemination.

Another limitation is that only 16 participants were used in this study. With a higher number of participants, the study would be more representative. More factors might have been significant if other statistical analyses were used. However, it was chosen to use linear mixed effect models since this analysis underestimates (showing trends) rather than overestimates effects (showing false positives). The trends found in this study were in the expected direction. These trends may become significant if more participants would be included.

Some of the chosen target words can be described as a limitation as well, since some words were difficult to segment. For example, it was hard to decide where the boundary had to be between initial /l,r,w,j/ and the following vowel. This problem occurred early in the analysis in *Praat* (Boersma & Weenink, 2016). Therefore, it was decided to measure the first vowel together with the initial /l,r,w,j/ to make segmentation easier. However, this did not turn out to be easier since the participants said all the target words in the phrase “Say [word] again”, which means that there was still a vowel in front of the initial consonants of which it needed to be separated. Segmentation in general proved to be difficult. Considering it is important to look at consonant gemination as broadly as possible and that sonorants are important in this as well, further research could focus on finding a way to segment sonorants more systematically by making the guidelines on which the segmentation is based more clear and extensive for example. In addition, this research could be improved if above mentioned limitations would be eliminated in further research.

## 6. Conclusion

The main aim of this study was to find out whether gemination occurs in Northern Welsh English. The results show higher C/V ratios, which suggests that geminates are indeed used in speech by Welsh-English bilinguals in North Wales, as predicted. The extent to which geminates are used depends on the percentage Welsh spoken per day at home and the linguistic context (vowel length, voicing and consonantal manner of articulation).

The second aim was to find out what the influence of age on gemination is. Results show that age does not significantly correlate with gemination. However, there is a trend in the expected direction. It was expected that older people geminate more since surveys showed that this group is more fluent and speaks more Welsh daily, compared to younger people. However, this study shows that people who speak more Welsh on a given day at home, use more geminates, regardless of age.

This study shows that a feature of the Welsh language has transferred to the English language in the language use of Welsh-English bilinguals. Transfer is more likely to occur when features are involved which are rare, or marked (Eckman, 1977). Geminates are more marked than singletons (Kouwenberg, 1997), which is why it is not surprising that this feature transferred. Another form of phonological transfer concerned with duration is Voice Onset Time (VOT), in which one VOT is used in both languages (Kehoe et al., 2004). Other forms of phonological transfer are usually not about duration.

The question now is whether gemination is a feature of Welsh English or not. One possibility is that it is not, and that the Welsh/English speakers behave as L2 speakers of English. This would then mean that the use of gemination is a foreign accent, comparable to French speakers who use the prosody pattern of their first language when speaking English (as a second language). One of the participants, participant 7, had the highest mean C/V ratio. This mean ratio was much higher than the others, so she could be seen as an anomaly in the

data. However, perceptually, she had a strong Welsh accent when speaking English. Why this accent is perceived as Welsh is not clear, but it might be due to the use of geminates. In addition, not all Welsh speakers used geminates, which is why it can be seen as a foreign accent.

On the other hand, gemination can also be seen as a feature of Welsh English. Participant 10 did not sound very Welsh when speaking English, but she had the second highest C/V ratio. The Welsh speakers were fluent in Welsh and in Welsh English and they did not struggle with English. Moreover, it was reported that speakers in South Wales geminate, even though often they do not speak Welsh. This then suggests that it is not just a foreign accent, but part of the Welsh English accent.

This study brings us one step closer in understanding which features of language can be transferred to another language. When eventually all steps are taken in bilingualism research, hopefully some light will be shed on why and how this happens.



## Reference List

- Arvaniti, A. & Tserdanelis, G. (2001). The acoustic characteristics of geminate consonants in Cypriot Greek. *Proceedings of the Fourth International Conference on Greek Linguistics*, 29-36.
- Ball, M. J., Williams, B. (2001). *Welsh phonetics*. Lampeter: Edwin Mellen Press.
- Bates, D., Maechler, M., Bolker, Ben., Walker, S. (2015). Fitting linear mixed-effects models using lme4. *Journal of Statistical Software*, 67(1), 1-48.
- Boersma, P. & Weenink, D. (2015). Praat: doing phonetics by computer [Computer program]. Version 5.4.08, retrieved from <http://www.praat.org/>
- Clayton, I. D. (2010) On the Natural History of Preaspirated Stops. (Doctoral Thesis, University of Nevada, Reno, United States). Retrieved from [https://works.bepress.com/ian\\_clayton/1/](https://works.bepress.com/ian_clayton/1/)
- Connolly, J. H. (1981). On the segmental phonology of a South Welsh accent of English. *Journal of the International Phonetic Association*, 11, 51-61.
- Crystal, David (2003). *The Cambridge encyclopaedia of the English language*. Cambridge: Cambridge University Press.
- Curtin, S., Goad, H., & Pater, J. V. (1998). Phonological transfer and levels of representation: the perceptual acquisition of Thai voice and aspiration by English and French speakers. *Second Language Research*, 14(4), 389-405.
- Devine, A.M. & Stephens, L.D. (1994). *The prosody of Greek speech*. New York: Oxford University Press.

- Eckman, F. (1977). Markedness and the contrastive analysis hypothesis. *Language Learning* 27(2), 315–330.
- Flege, J. E. & Davidian, R.D. (1984). Transfer and developmental processes in adult foreign language speech production. *Applied Psycholinguistics* 5, 323–347.
- Gullberg, M., Indefrey, P. (2003). Language Background Questionnaire [Questionnaire]. Retrieved from <http://www.mpi.nl/departments/other-research/research-projects/the-dynamics-of-multilingual-processing/tools/Lang-Hist-Quest-Engl.pdf>
- Hannahs, S. J. (2013). *The phonology of Welsh*. Oxford: Oxford University Press.
- Hejná, M. (2015). *Pre-aspiration in Welsh English: A case study of Aberystwyth* (Doctoral thesis, University of Manchester, United Kingdom). Retrieved from <https://www.escholar.manchester.ac.uk/uk-ac-man-scw:277156>
- Herrero de Haro, Alfredo. (2016). The acquisition of Spanish pronunciation by Welsh learners: transfer from a regional variety of English into Spanish. *Círculo de Lingüística Aplicada a la Comunicación* 65, 169-198.
- Hughes, A., & Trudgill, P. (1979). *English accents and dialects: an introduction to social and regional varieties of British English*. London: Arnold.
- Jansen, W. (2004). *Laryngeal contrast and phonetic voicing: A laboratory phonology approach to English, Hungarian, and Dutch* (Doctoral thesis, Rijksuniversiteit Groningen, The Netherlands). Retrieved from <http://www.rug.nl/research/portal/files/14633321/thesis.pdf>
- Kaye, A.S. (2005). Gemination in English. *English Today*, 21(2), 43-55.
- König, E., Van der Auwera, J. (1994). *The Germanic languages*. Abingdon: Routledge.

- Kouwenberg, N. J. C. (1997). *Gemination in the Akkadian verb*. Assen: Uitgeverij van Gorcum.
- Lahiri, A., & Hankamer, J. (1988). The timing of geminate consonants. *Journal of Phonetics* 16, 327–338.
- Maddieson, I. (1985). Phonetic cues to syllabification. In V. Fromkin (ed), *Phonetic Linguistics: Essays in Honor of Peter Ladefoged* (pp. 203-21.). New York: Academic Press.
- Morris, Jonathan. (2013). Sociolinguistic variation and regional minority language bilingualism: An investigation of Welsh-English bilinguals in North Wales (Doctoral thesis, University of Manchester, United Kingdom). Retrieved from <https://www.escholar.manchester.ac.uk/uk-ac-man-scw:205563>
- Morris-Jones, J. (1913). *A Welsh grammar, historical and comparative*. Oxford: Clarendon Press.
- Office for National Statistics. (2011). *UK Census* [data file]. Retrieved from <http://gov.wales/docs/statistics/2012/121211sb1182012en.pdf>
- Penhallurick, R. (1991). *The Anglo–Welsh Dialects of North Wales: A Survey of Conservative Rural Spoken English in the Counties of Gwynedd and Clwyd*. Frankfurt am Main: Lang.
- Pickett, E. R., Blumstein, S. E. & Burton, M. W. (1999). Effects of speaking rate on the singleton/geminate consonant contrast in Italian. *Phonetica* 56, 135–157.
- R Core Team (2014). R: A language and environment for statistical computing. *R Foundation for Statistical Computing*, Vienna, Austria.

- Rosenfelder, I., Fruehwald, J., Evanini, K., Jiahong, Y. (2011). FAVE (Forced Alignment and Vowel Extraction) Program Suite. Retrieved from <http://fave.ling.upenn.edu>.
- Stevens, M., & Reubold, U. (2014). Pre-aspiration, quantity, and sound change. *Laboratory Phonology* 5(4), 455-88.
- Thomas, A. R. (1984). Welsh English. In P. Trudgill (ed), *Language in the British Isles* (pp. 178-194). Cambridge: Cambridge University Press.
- Weinrich, U. (1953). *Languages in contact*. Oxford: Blackwell.
- Wells, J. C. (1970). Local accents in England and Wales. *Journal of Linguistics*, 6(2), 231-252.
- Welsh Government. (2013-2015). *The Welsh language use survey* [data file]. Retrieved from <http://gov.wales/docs/statistics/2016/160301-welsh-language-use-in-wales-2013-15-en.pdf>
- Williams, B. (1999). *A Welsh speech database: preliminary results*. Unpublished manuscript, CSTR, University of Edinburgh, Edinburgh.
- Wikipedia (n.d.). Welsh speakers in Wales 2011 [image]. Retrieved from [https://en.wikipedia.org/wiki/List\\_of\\_Welsh\\_areas\\_by\\_percentage\\_of\\_Welsh-speakers#/media/File:Welsh2011w.png](https://en.wikipedia.org/wiki/List_of_Welsh_areas_by_percentage_of_Welsh-speakers#/media/File:Welsh2011w.png)

## Appendix A: Approval Ethical Committee



PRIFYSGOL  
**BANGOR**  
UNIVERSITY

**Ysgol Ieithyddiaeth ac Iaith Saesneg  
Prifysgol Bangor**

*School of Linguistics and English Language  
Bangor University*

**Myfyriwr/Student: Ellen Collee - Dissertation (LX-1529), April 2016**

Mae'r astudiaeth hon wedi cael ei chadarnhau o ran agweddau moesegol, yn dilyn ymgynghoriad gyda'r arolygwr (os perthnasol) a gyda'r swyddog Moeseg yr Ysgol. Mae rhyddid i'r fyfyrwr a enwir uchod barhau gyda chasglu'r data a gweithio ar yr astudiaeth.

*This study has been approved with regards to ethical concerns, following consultation with the supervisor and the School Ethics officer. The student named above is now free to continue with collecting the data and working on the study.*

**Dr Thora Tenbrink**

Swyddog Moeseg yr Ysgol / Darlennydd mewn Ieithyddiaeth Wybyddol  
*School Ethics officer / Reader in Cognitive Linguistics*

## Appendix B: Consent Form



PRIFYSGOL  
**BANGOR**  
UNIVERSITY

Bangor University's 'Code of Practice for the Assurance of Academic Quality and Standards of Research Programmes' (Code 03)  
<https://www.bangor.ac.uk/ar/main/regulations/home.htm>

COLLEGE OF ARTS & HUMANITIES

## Participant Consent Form

**Researcher's name: Kim Ellen Collée**

The researcher named above has briefed me to my satisfaction on the research for which I have volunteered. I understand that I have the right to withdraw from the research at any point. I also understand that my rights to anonymity and confidentiality will be respected.

I agree that the data will be used in the researcher's dissertation. If it is decided later that the results will be published somewhere else (article, journal, conference), I agree with this as well.

I agree to having the tasks recorded.

Signature of participant .....

Date .....

This form will be produced in duplicate. One copy should be retained by the participant and the other by the researcher.

## Appendix C: Participant Information

# Participant Information Form 1

### Researcher's name: Kim Ellen Collée

Thank you for participating in this study. The collected data will be used for an undergraduate dissertation. However, in the case that the results are very surprising it could be possible that they will also be published in an article or journal. Please note, all data will be anonymous and untraceable to individual participants. This study focusses on the pronunciation of Welsh English.

This session consists of 3 elements. First you will be asked to fill in a **questionnaire**. This will ask for personal information. For example, your age, place of birth, first language(s) etc.

After this, you will be asked **to read out loud** a list of sentences. This will be recorded.

Finally, you will be asked **one question** about your relation with the Welsh language. Your answer will also be recorded.

Please keep in mind that you can withdraw from this study at any time. If you feel uncomfortable at any point, please let the researcher know. Please tell the researcher if you would like to withdraw. It is also possible to withdraw after the completion of the data collection process if you wish to do so.

If you have any questions before or during or the tasks please ask the researcher.

If you have any questions or concerns regarding this project after you have participated, please do not hesitate to contact the researcher or her supervisor:

Kim Ellen Collée  
[elu781@bangor.ac.uk](mailto:elu781@bangor.ac.uk)  
0044 7497495010

Dr. Koen Sebregts  
[k.sebregts@uu.nl](mailto:k.sebregts@uu.nl)  
0031 030 253 6232

## Participant Information Form 2

### **Researcher's name: Kim Ellen Collée**

Thank you for participating in this study. This study focusses on the pronunciation of Welsh English. The main focus lies on gemination.

There used to be gemination in the Welsh language. This means that consonants were lengthened in some words. These contrasts (with a long/short consonant) had different meanings. Nowadays, this is not the case anymore in Welsh. However, some Welsh speakers still lengthen consonants sometimes. It has been reported that some Welsh-English bilinguals in South Wales also lengthen consonants in English, even though this is not a feature of the English language. This study focuses on gemination in North Wales in Welsh English. Important questions which are asked focus on whether gemination occurs in Welsh English in North Wales and if it does, how it works.

If you have any questions or concerns regarding this project, please do not hesitate to contact the researcher or her supervisor:

Kim Ellen Collée  
[elu781@bangor.ac.uk](mailto:elu781@bangor.ac.uk)  
0044 7497495010

Dr. Koen Sebregts  
[k.sebregts@uu.nl](mailto:k.sebregts@uu.nl)  
0031 030 253 6232



## Appendix D: Questionnaire

# Questionnaire

(taken and modified from Marianne Gullberg and Peter Indefrey (2003), Language Background Questionnaire. Developed in The Dynamics of Multilingual Processing. Nijmegen, Max Planck Institute for Psycholinguistics)

Sbj:

Date:

Below are questions about your education, profession, and language use. Please answer these questions as completely as possible.

### Background:

Age:

Sex:

What is your level of education (high school, university degree):

What is your profession (e.g., student, lawyer):

Are you dyslectic? Yes No

Were you born in Wales? Yes No

If yes:

Have you lived in Wales since birth? Yes No

If no, where else have you lived?

How old were you when you moved there?

If no:

Where were you born?

Where else have you lived?

How old were you when you came to Wales?

How long have you been living in Wales?

### Language History:

What is/are your native language(s)?

Which language(s) does your mother speak?

Which language(s) does your father speak?

Which language(s) was/were spoken to you when growing up at home?

If you answered more than one language in the previous question, could you indicate what percentage of the time was spoken in each language and in which environment (home, school etc)?

Please list your native language(s) and any other languages that you know well below. For each, rate how well you can use the language on the following scale:

Poor 1 2 3 4 5 Excellent

Language	Speaking	Listening	Writing	Reading	Grammar	Pronunciation
1						
2						
3						
4						

Please answer this question if English is your only first language. Do you have any knowledge of Welsh? Please explain.

**Please continue this questionnaire if you filled in more than one language in the previous section.**

For the languages you listed, please indicate below the place and age at which you learned them, and if applicable, whether you learned them by formal lessons (e.g., at school or a course), or by informal learning (e.g., at home, at work, from friends).

Language	Country	Age	Lessons (yes/no)	Duration of lessons	Informal (yes/no)	Duration of informal learning
1						
2						
3						
4						

Did you have English as a subject in school?

How often do you use the languages you listed?

Language	Every day	Every week	Every month
1			
2			
3			
4			

For the languages you listed, rate how well you agree with the following statements using the scale:

Completely Disagree 1 2 3 4 5 Completely Agree

Language	I like to speak this language	I feel confident using this language	I think it is important to be good at this language
1			
2			
3			
4			

How many percent of the time do you speak each language? Please specify in which environment (work, home etc.):

For the languages you listed, which do you use with the following people, for how many hours per day, on what kind of topic and in which place (home, work, etc):

	Language	Hours per day	Topic	Place
Mother				
Father				
Older sibling				
Younger sibling				
Children				
Grandparents				
Other family members				
Housemates				
Partner				
Friends				
Colleagues				

For the languages you listed, which do you use for the following activities and for how many hours per day? If you use more than one language for one activity please write this down with the hours a day for both languages.

Activity	Language	Hours a day
Reading		
Watching TV		
Listening to the radio		
Email, internet		

**Education**

Which language(s) was/were spoken at your nursery school?

Which language(s) was/were spoken at your elementary school?

Which language(s) was/were spoken at your secondary school?

Which language(s) was/were spoken at your university?

If you have any other remarks about your language history that you think may be important for your ability to use these languages, please feel free to write them here: