Influence of Liverpool Welsh on Lenition in Liverpool English

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The purpose of this research was to provide evidence for the Welsh language having an influence on the Liverpool accent with a specific focus on the lenition and aspiration of voiceless plosives. Lenition and aspiration of the speech of participants from Liverpool and North Wales were determined using an acoustic software. The data suggested lenition did occur in the speech of the Welsh participants. However, lenition seemed to be trending amongst people in Liverpool as plosives were lenited a stage further than previous research suggests. Conclusions may be drawn to highlight an influence of the Welsh language on lenition in Liverpool.

Keywords: *lenition, Liverpool, sociophonetics, Wales, Welsh language*

1 Introduction

The use of aspirated voiceless plosives is a common feature in British accents of English (Ashby & Maidment 2005). However, the aspiration of voiceless plosives in a word-final position is normally not audible and if it is medial, it takes on the characteristics of other syllables in the word (Roach, 2000).

Some accents of English exaggerate the aspiration of the voiceless plosives /p, t, k/ although this is not generally found in most Northern English accents of English (Wells 1982). There are only two English accents of English that have been found to do this through previous research. These are London and Liverpool English (Trudgill, Hughes & Watt 2005). Due to the influence of London English on Estuary English, this feature can be heard in the South West of England. Most accents of English that do have this feature have some interference from another language that heavily aspirates voiceless plosives such as Irish, Welsh, Singaporean or African-American English (Wells, 1982).

The accent of Liverpool English is also known as 'Scouse'. Some of the phonological features of Scouse are very different from those of the surrounding areas despite the Liverpool accent originally being part of a Lancashire-Cheshire dialect continuum (Honeybone 2004). One of the most prominent differences between Liverpool English and the surrounding areas is the ability for Scousers to lenite the plosives /p, t, d, k/ into several allophonic varieties (Watson 2007). Speakers of Liverpool English may also use [ɾ] in place of [t] word-medially. Some of the most distinct features of Liverpool English have mainly been attributed to the mass influx of Irish migrants into the city from the 18th century onwards (Trudgill et al. 2005) such as the fricativisation of plosives. Liverpool became a major port after the first dock was built in 1715, originally linking the city with the slave trade between Africa, Britain and the Netherlands (Russell 2007). As the dock grew in importance, it became England's second busiest dock with trade links across the world. This meant the city increased in wealth and prosperity and became a popular place for immigrants to travel to and settle, with the aim to find work. Also, as travel links between Britain and America expanded, the port was used as a main immigration and emigration base from Ireland and to

America (Russell 2007). Becoming such a busy port and a newly multicultural city during the 18th century meant the accent started changing from its Lancashire origin to what is heard today (Coslett 2008).

The increase in fortune for Liverpool as a city attracted a high number of Welsh people into the area, amongst people from other nationalities. At least 20,000 Welsh migrants arrived into the city each decade between 1851 and 1911, with immigration peaking in the 1880's. There were two Welsh Anglican churches and over 50 nonconformist chapels, schoolhouses and missions in Liverpool where ministers held services only in Welsh. Most of these were situated in the north of the city around Anfield, Everton, Tuebrook and West Derby (Davies 1994).

A feature of Liverpool English that has recently been of particular interest to linguists is the lenition of the voiceless plosives /p, t, k/. Lenition is used to describe different processes which normally turn plosive phonemes into affricates, fricatives or glottals (Watson, 2007). The range of allophones used by the people of Liverpool instead of the voiceless plosives /p, t, k/ is vast and something which has become a popular topic of research in recent years and discussed below. The type of lenition of the voiceless plosives is a unique aspect of Liverpool English which is probably not found anywhere else in England.

There are many phonetic aspects of the Liverpool (Scouse) accent which also occur in the speech of people living in North Wales. The dental realisation of /t, d/ and the strong aspiration of voiceless plosives in Welsh English have both been attributed to the influence of the Welsh language (Thomas 1984). The aspiration of voiceless plosives becomes stronger in Welsh-speaking areas, especially word-finally (Trudgill & Hannah 2002). These phenomena also occur in Liverpool English. Another similarity between the Welsh and Liverpool accents of English is the use of [x] and [ç] as allophones for /k/ (Marotta 2005). The velar fricative is the representative of orthographic <ch> in Welsh although it may be realised as uvular in the north of Wales. These allophones do not exist in any other English accents of England (Wells, 1982). However, these allophones only occur in Liverpool English due to lenition.

Based on the connections between the two dialects and the distinguishing features of the accent of Liverpool which do not occur in other varieties of English in England, the research question will be:

> To what extent has the Welsh language influenced the lenition of voiceless plosives in the Liverpool English accent?

The data yielded a similar likelihood to lenite between Liverpool and North Wales English although the stages, according to Honeybone (2001), differed in the Liverpool participants' leniting further than the participants from North Wales. These differences have been attributed to social factors and an increase in the social status of Liverpool as a city.

The paper will be set out with a review of previous findings in the field of lenition and Welsh and English phonetics, along with the historical links between the two areas. Following this, there will be a description of the methodology. The results will then be described, analysed and followed by the concluding remarks.

2 Literature Review

The research question above was chosen as it seems to fill a gap in this particular field of research. This section expands on the research question and looks at previous research and theories that will help to explain the data and the motivation behind the research.

2.1 Emigration and Immigration in Wales and Liverpool

In the 1800's, many Welsh people emigrated abroad and set up new colonies in countries such as Canada, Argentina and the United States (Williams 1991). Many more moved to the newly affluent cities in England to find work in factories and mines. An extremely high number of Welsh people emigrated into Liverpool during the 1800's, especially from rural North Wales. In 1813, 10% of the population of Liverpool were Welsh and by the early 20th century, over 120,000 people had migrated to Liverpool making it the city with the highest number of Welsh language speakers in England (Russell 2007). In 2001 there were 5133 people born in Wales and living in Liverpool. Due to the sheer number of Welsh people migrating to Liverpool during the 1800's, Liverpool has previously been referred to as the capital city of North Wales (Russell 2007). The Welsh National Eisteddfod, which is primarily a Welsh-medium festival, has also been held in Liverpool on three occasions during the later 19th, early 20th century. As most of the Welsh immigrants into Liverpool were from rural North Wales, they would have spoken Welsh, probably as a first language (L1) and as monolinguals. This would mean that any features that transferred and contributed to the accent of Liverpool from the Welsh speakers would have been influenced from the Welsh accent they spoke.

During the Industrial Revolution and the coal mining boom, Wales became a popular place for migrants looking for work. Most migrants into Wales came from England and Ireland but smaller numbers came from Europe. However, most of them emigrated into the south of Wales as this was where the mining industry was mainly based.

Many of the immigrants in Liverpool during the 18th century came from Ireland, rural Wales and northern Scotland although there were also high numbers from England itself. Despite there being immigration into Liverpool from many different places, it is easy to conclude that Liverpool English has had its main influences from the Irish migration into the city during the 19th century. This is because of the strong familial ties to Ireland along with the strong links in the features of both accents which have been recognised in several pieces of research. In 1841, about 25% of Liverpool's inhabitants were born in Ireland and in the most recent census of 2001, about 60% of all Scousers had an Irish origin (Marotta & Barth, 2005). However, not all of the phonetic features of the Liverpool accent are borne from Irish English.

2.2 Irish Influence on Liverpool English

The Liverpool accent was originally similar to the surrounding areas in Lancashire (Coslett 2008). The unique realisations of phonemes in Liverpool English compared to English English has mainly been attributed to the sheer number of Irish immigrants that visited, and often stayed, during the potato famine (Watson 2007). The many ways in which /t/ can be lenited in Liverpool English is strongly linked to the allophones of /t/ in Irish English (Kallen 1997). Wells (1982) also relates plosive frication in Scouse English to that of Irish English.

Kallen (1997) looked at the link between lenition in Irish English and Liverpool English. It was concluded that the lenition of /t/ in Liverpool English is related to Irish, however, not word-initially. The lenition of /p, k/ and word-initial /t/ have developed from other influences.

Another feature that occurs in Liverpool English but not in Irish is that of the velar nasal plus (Honeybone 2004). This is the realisation of /g/ in the suffix /ing/ so it is pronounced as [ɪŋg]. Lastly, the alveolar tap [ɾ] is used in place of /t/ in Liverpool but not in Irish English. Even though there are several features that are similar to Irish English, not all features in the two accents are the same. The influence of the Welsh language, and the similarities between the two, has only recently been looked at.

2.3 Influence of English in Wales

English phonology has had the greatest effect on Welsh English in the places where Anglicisation has been around the longest. So areas along the English-Welsh border such as Monmouthshire (Figure one, below) have a more English accent of Welsh English than Gwynedd, where the Welsh-speaking population is larger, (Jones 1998) i.e. an accent with fewer features taken from Welsh and more from Standard English. This is why most of the research into the Anglicisation of Welsh English focuses on South Wales as this is the area that has mostly been exposed to sustained Anglicisation. The south east of Wales is highlighted as having an accent that has little influence from the Welsh language and a high proportion of English phonetic influence (Coupland & Thomas 1998).

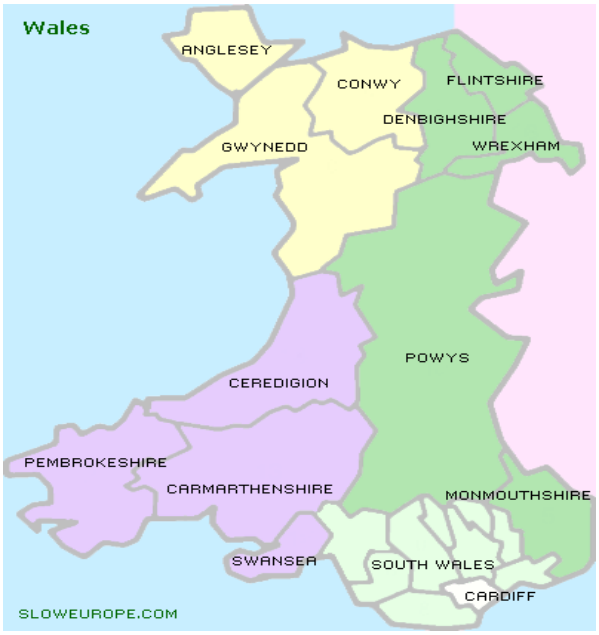

Figure 1: Counties of Wales post 1996 (Wales.gov.uk, 2012)

Despite the lack of research into the influence of English on northern Welsh varieties, there have been some studies that assess the influence that Liverpool English has had on its surrounding area, including North Wales as far down as the Menai Strait (river that separates Anglesey from Gwynedd). Trudgill et al. (2005) state that the influence of Liverpool English can be found in the neighbouring areas such as the Wirral

and Cheshire and as far as North Wales. From as far back as the 1970's Liverpool English has been perceived as having its influence across Chester and over the border through Wrexham and North Wales (Knowles 1978). The development of the A55 as a main coastal route linking Chester to Holyhead (Anglesey) means there has been increased geographical mobility from the North West of England, especially to coastal towns such as Llandudno and Rhyl (Coupland & Thomas 1990).

Cremer (2006) conducted a study in which he looked at the influence of the Liverpool accent in North Wales. The participants lived within 20 miles of Bangor, in Gwynedd and were either first or second language Welsh speakers. Cremer assessed the level of affricated /t/ in the participants' free speech. Cremer hypothesised that the higher the level of affrication in a person's speech, the more Welsh their accent was deemed to be. He then followed up the results with a questionnaire about the opinions of the Welsh and Liverpool accents of English to see if positive opinion of an accent correlated with the features used. Cremer found there was a positive correlation between having a favourable opinion of the Welsh accent and the use of affricates which agreed with his hypothesis. The level of affricated /t/ was the only phonological variable in this study as it was mainly focussed around accent attitudes and labelling the accent the participants spoke with. Despite researching the influence of the Liverpool accent in North Wales, Cremer (2006) maintains that affrication of voiceless plosives originated from the Welsh language. This does mean that there were no 'Scouse' variables to test the influence of Liverpool English in and around Bangor. However, it shows support for the lenition of /t/ in North Wales English.

The main differences between standard Welsh English and standard English English appear at the level of localised dialects (Trudgill & Hannah 2002). This means that the influence of English in Wales or Welsh on Welsh English would be dependent on the level of Welsh used both by the individual and within the individual's community.

2.4 Phonetic Interference from L1 or L2

De Leeuw, Schmid & Mennen (2010) found that an L2 (second language) can influence the accent of native L1 speakers that have moved to a country that speaks the L2 language. The extent of influence is dependent on the level of code-switching and the amount of time spent speaking the L1. The higher the immersion into an L2, the higher the phonological effect on the L1 (De Leeuw et al. 2010). Verhoeven (2007) assessed the phonological awareness of early Turkish-Dutch bilinguals and found evidence for phonological transfer from Turkish (L1) to Dutch (L2). Despite the L1 influence, the participants who were more proficient in both languages had an increased phonological awareness in comparison to those who were L1-dominant. These findings can be used to explain the potential transfer of Welsh phonetic and phonological features into the English speech of the Liverpool Welsh.

Hickey (1996) explained how lenition in Irish English has derived from a morphological device used in Celtic language mutation. However, as Irish and English have different morphological rules, lenition cannot be transferred to English to be used in the same way. This means that the lenition transfer appears erratic at first. Once speakers become bilingual in Irish and English, lenition can either be dropped completely or regularised by the speakers (Hickey, 1996). If it was to be regularised, then lenition in English would develop and appear in its own phonological environments, seemingly without the influence of the original Celtic language.

The main research into the effect of the Welsh language on English seems to focus on the Anglicisation of the Welsh accent in the South of the country which is considered above (2.3). There has been little research that specifically assesses the impact of the Welsh language on Welsh English. The most prominent piece of research that looks at the impact of Welsh on English is the Survey of Anglo-Welsh Dialects (SAWD). Penhallurick (1991) researched the North Wales volume which looked at Gwynedd and Clwyd English (the current counties of Wrexham, Denbighshire and Flintshire). The purpose of the SAWD was to replicate the Survey of English Dialects (SED), headed by Orton between 1950 and 1961 (Orton, Sanderson & Widdowson 1978) by focussing on traditionally Welsh-speaking villages with participants selected to adhere to Orton's NORM criteria. This meant that the participants had to be native of the village, male and aged over 60 years old, resident in the village without any significant interruption, not formally educated beyond 15 years old. Participants also had to be free from speech impediments. 44 participants were chosen from 17 villages in the counties of Gwynedd and Clwyd which were a maximum of 20 miles apart from each other. The villages had between 3,000 and 10,000 inhabitants. All participants had Welsh as their L1 and English as their L2.

Participants' details were taken from a questionnaire and included place of birth, use of Welsh language, education and then the same information taken for their parents and spouse. The questionnaire used in SED was adapted to fit Welsh life and used in the interviews.

The results showed aspiration for /p/ both word-initially and finally with [p:] medially. /k/ was aspirated throughout, although there were no instances of lenition. /t/ was the most varied phoneme with [t̪][t̪ʰ][t̪ˢ][tʰ] being found initially, [t̪ˢ][t̪ʰ][t̪ː][tː] medially and [t̪][t̪ˢː] [t̪ˢ][t̪ʰː][tʰ] word-final. This coincides with other literature (below) that states that /p, t, k/ are aspirated in most places and /t/ is dental. There was also a form of spirantisation word-finally with [tˢ] which is also found in Liverpool English although this was only affricated and lenition to a fricative was not found.

Despite these findings, no additional technology was used to determine what sounds were being uttered by the participants. The allophones transcribed are only based on what Penhallurick could hear from tape recordings of his data. This means these results may be flawed and inaccurate as fricativisation seemed to be overlooked when analysing /p, t, k/ and only aspiration and affrication were considered.

Thomas (1984) discusses several features of Northern Welsh English that derive from features of the Welsh language. In this, he states that voiceless plosives are more strongly aspirated in North Wales English. This includes voiced plosives such as /b, d, g/ becoming devoiced during the release stage. There is also a dental realisation of the alveolar phonemes /t, d, n/ and of inter-vocalic plosives following a short, stressed vowel. Wells (1982) also highlights the strong aspiration of voiceless plosives. However, he states that this is only in Welsh-speaking areas. Wells (1982) explains that there are some consonantal sounds which are used in Welsh and appear in Welsh English through the use of proper nouns such as the names of people and place names. Welsh speakers would pronounce the village name 'Llanfechell' as [ɬanvɛxɛɬ] regardless of whether the person was speaking English or Welsh even though [ɬ] and [x] do not appear in the English English phonological system. It is noted again that speakers of North Wales English heavily aspirate voiceless plosives but, in addition to this, they do not glottalise word-final voiceless plosives, which now occurs in several accents of English (Trudgill & Hannah 2002). North Wales English generally has no glottalisation of its consonants

although they do undergo the same process of lenition as in Liverpool English (Cremer 2006). This is because the final voiceless plosive is strongly pronounced which creates a good environment for aspiration and fricativisation. Penhallurick (2004) describes the phonological features of Welsh English although he does not specify which features are typical of North or South Wales English. Again, the strong aspiration of the voiceless plosives and the dental realisation of alveolar phonemes are cited.

The dentalisation of /t/ and /d/ is not generally a feature that is found in South Wales and is attributed to the influence of the Welsh language as an L1 on L2 speakers of English. This is because it is mainly found in areas of high Welsh L1 speakers (Wells 1982). This is also the case for the strong aspiration of voiceless plosives. The more 'Welsh' an area is, the stronger the aspiration is (Coupland & Thomas 1990). So areas in the north of Wales such as Gwynedd and the Llŷn Peninsula which have historically had the highest numbers of Welsh speakers have the strongest aspiration levels. This is potentially related to the rules of mutation in Welsh.

2.5 Mutation

It was proposed by Hickey that lenition is in fact a Celtic phenomenon as it has been transferred over as a result of mutation in Celtic languages (Hickey, 1996). The rules for mutation are prominent in Welsh and can be heard in the everyday speech of Welsh speakers. Mutation in Welsh holds many complex rules and environments and so the discussion here will be limited to those that are related to the lenition of voiceless plosives to either affricates, fricatives, glottal /h/ (debuccalisation) or complete deletion.

There are three types of mutation in Welsh: soft, aspirate and nasal (see figure 2, below). As nasal refers to the nasalisation of initial plosives, it will not be considered here (highlighted grey in figure 2).

Initial		Soft		Nasal		Aspirate	
c	[k]	g	[g]	ngh	[ŋ̊ɦ]	ch	[x]
p	[p]	b	[b]	mh	[m̥ʍ]	ph	[f]
t	[t]	d	[d]	nh	[n̥ɹ̥]	th	[θ]
g	[g]	(disappears)		ng	[ŋ]		
b	[b]	f	[v]	m	[m]		
d	[d]	dd	[ð]	n	[n]		
ll	[ɬ]	l	[l]				
m	[m]	f	[v]				
rh	[r̥]	r	[r]				

Figure 2: Mutation in Welsh

The most relevant mutation rule in Welsh is the aspirate mutation (the right hand column, above). This mutates initial /p, t, k/ to /f, θ, x/ under certain conditions, such as when following <a> e.g. *te a thost* 'tea and toast'. Other mutation rules that are relevant to the phenomenon of lenition are the soft mutation of /d/ to /ð/ and /t/ to /d/ which are both prominent features in Liverpool English. Hickey states that when monolingual speakers who are used to this process in their language, such as Liverpool Welsh, begin speaking a second language, i.e. English, mutation transfers. However, as English does not have any rule-based form of mutation, it will either be completely removed by the speaker or retained and regularised through inter-generational transmission and

community regularisation. These small communities of Welsh speakers, located in different parts of Liverpool, could then transfer this feature along with others to the speech of native Liverpool English speakers through the process of 'koinéisation'.

2.6 Koinéisation

Koinéisation refers to the process of levelling, mixing or simplification. Accents, dialects and languages can all be influenced when coming into contact with a different variety. An example is the pidgin languages, mainly developed as part of the slave trade. When slaves that spoke different languages had to communicate, one language was not adopted by all but a mixture of two or more languages. This is the same for accents and dialects too and can occur in areas of high immigration from different nationalities. Milton Keynes is a city that was developed during the 20th century in order to accommodate a population boom in England. The people that moved there came from different backgrounds and different areas of the South East. Williams & Kerswill (1999) looked at the dialect-levelling of children in this area. They interviewed children of four, eight and twelve years of age and analysed their accent and dialect. They found that the youngest children had retained the accent of their parents' whereas the eight and twelve year olds had developed a new accent that was unlike any of the surrounding areas. In-migration has also had an effect on Norwich English which, like Liverpool, has developed an accent with many phonological features unlike the rest of East Anglia (Trudgill 1986). Again, this variability within the accent is accounted for in terms of dialect mixture.

There is evidence that koinéisation has also occurred in Liverpool. Immigrants mainly came from the British Isles, China and the British Empire (2.1) and because of this the dialect was not replaced by one single accent. There was not a single, overwhelming force that replaced the local people but a mixing of many cultures, languages and dialects. This means that the new accent and dialect of Liverpool has a mixture of features from different accents. The aim of this research is to assess whether the lenition of voiceless plosives in Liverpool English is a feature brought over from the Welsh language through the in-migrations of the Liverpool Welsh.

2.7 Aspiration in English

An average plosive sound has complete closure in the vocal tract for about 120 milliseconds (Ashby & Maidment 2005) and after this, the articulators part to allow the air to pass through and the sound is produced. As they are voiceless sounds, the vocal folds are far apart so air passes through normally which causes no vibration. Aspiration of a plosive occurs when the voice onset time (VOT) of the next sound is increased. This is produced by a slower parting of the articulators which creates fricativisation of the preceding voiceless plosive (Ashby & Maidment, 2005).

The average length of aspiration is dependent on the phonological environment it is found in. Plosives can be found word-initially, post-vocalically or word-finally in English. When it is found word-finally it can also be pre-pausal which means the phoneme is at the end of a phrase (Watson 2002). Other factors that can affect the length of aspiration are the plosive, the vowel that precedes or follows it and the stress placement. Due to this, no exact aspiration lengths can be given for English consonants. However, averages can be taken and compared with the results in order to assess the validity of the results for conclusions.

The average voice onset time for an unaspirated plosive is around 10ms with aspiration becoming audible after around 30ms (Ashby & Maidment 2005). Aspiration is shorter with a bilabial, intermediate with an alveolar and longest with a velar. The average lengths of VOT given by Cho & Ladefoged (1999) show [p^h] as 58ms, [t^h] as 70ms and [k^h] as 80ms in English. However, these only represent word-initial plosives.

Aspiration is found in English accents of English. Wells (1982) describes how most accents have aspiration before a stressed vowel. However, some accents of English exaggerate the length of aspiration such as the Scouse and Cockney accents. In addition to aspiration, these accents can also allow for affrication and voicing of /p, t, k/ depending on the phonetic environment. Jones & Llamas (2003) found word-final pre-aspiration in Middlesbrough and Newcastle English but this was only with the phoneme /t/. It was concluded that the final aspiration was due to incomplete deletion i.e. the articulators did not make contact to create the plosive burst. If /t/ was found post-vocalically, it was glottalised.

Despite this, non-aspiration is mainly associated with Lancashire and the Pennine valleys north of Manchester (Wells 1982). Aspiration of voiceless plosives tends to be associated with the south of England although it is not an audible friction (Jones & Llamas 2008), so below 30ms. Trudgill & Hannah (2002) stated that Singaporean English has aspirated voiceless plosives but only in a final position. Accents that have been influenced by Celtic languages have strong aspiration of the voiceless plosives and final plosives are also pre-aspirated (Kallen 1997). Due to this, a lot of research on the lenition and aspiration of voiceless plosives has focussed on Irish English.

2.8 Lenition

Lenition involves the 'weakening' of a plosive to an affricate or a fricative. The term 'lenition' came from the word 'lenis' which means 'weak', which is how a fricative is produced (Bauer 1988). As the fricative is weakened, the energy in the vocal tract becomes more intense and the articulators move close together instead of creating the block and so create frication. Honeybone (2001) proposes several stages of lenition before complete deletion of the plosive (Figure 3, below).

Phoneme	Stage One Affrication	Stage Two Fricativisation	Stage Three Debuccalisation	Stage Four Deletion
/p/	-	[ɸ]	/h/	Ø
/t/	[t^s]	[s]	/h/	Ø
/k/	[k^x]	[x]	/h/	Ø

Figure 3: Stages of Lenition (Honeybone, 2001)

The stages of lenition progress from affrication where the plosive burst is still audible to the final stage where the lips are furthest apart and there is no sound.

In the case of voiceless plosives, this would involve the voiceless plosive being weakened to the voiceless affricates [t^s, k^x] which could then further be weakened to a voiceless fricative such as [ɸ, s, x] then a glottal fricative [h] and ending as a deletion (Honeybone, 2001). Whether a plosive is lenited or not is dependent on the phonological environment. Articulatory undershoot can be a factor that promotes lenition in some of these environments. It is described as the process in which a coronal plosive is converted

to an affricate or fricative before a high vowel (Hall, Hamann & Zygis 2006). Articulatory undershoot will only provide a phonological environment for lenition if fortition is also a phonological feature of the accent. Fortition is the opposite of lenition and involves a strengthening of the phoneme to create an allophone (Hall et al. 2006).

Trudgill et al. (2005) observe that /p, t, k/ can be affricated to [ɸ, s, x] respectively. Wells (1982) differs slightly in his analysis of the affricates found in Liverpool English, giving [ɸ, ts, x] as the allophones of /p, t, k/. This is due to the fact that the stops lack complete closure. Wells (1982) states that the frication of the alveolar stops is due to Irish influence; however, the extension to other consonants such as /p, k/ is a phenomenon only in Liverpool English.

Watson (2007) explains how much of the consonantal system of Liverpool English is the same as other varieties of English. It is the allophonic variety of these consonants which makes the accent stand out from others around it. The voiceless plosives /p, t, k/ can be aspirated in word and utterance-final positions (Watson 2007). One of the most common lenition features of Liverpool English is spirantisation, a feature which is the realisation of /t/ as [s] or an allophone of the two sounds. This normally occurs post-vocalically or word-finally and can even result in debuccalisation. The affrication of /t/ is most common word-initially. Also, /k/ can either be fricativised or affricated although this is dependent on the preceding vowel (a low vowel such as [a] would create a fricative and a high vowel such as [ɪ] would create an affricate. /p/ is the least likely to be lenited in Liverpool English but can be fricativised in certain phonological environments (Watson 2007).

Marotta & Barth (2005) and Honeybone (2001) agree that the voiceless plosives are not only lenited to affricates but also that Liverpool English is one of the very few varieties of English in England that do this. Another variety is Middlesborough English who also had an Irish majority emigration there during the 1800's (Jones & Llamas 2008). Marotta & Barth (2005) expand this further by offering the range of allophones found in their study with [x, ç] being allophones of /k/, [θ, s] allophones of /t/ and [ɸ, f] allophones of /p/.

As noted above, there has been an increased interest in the lenition of voiceless plosives in Liverpool English in recent years. Despite this, there is still little research on lenition in Liverpool English (Marotta & Barth 2005) and none on Welsh English.

2.9 Hypothesis

Based on current research found and cited above, my experimental hypothesis would be as follows:

> If lenition and aspiration of voiceless plosives are related to language contact, then Scouse voiceless plosives will show similar lenition or aspiration to Welsh voiceless plosives.

The implication of this would be that the voiceless plosives in the two accents are articulated very differently giving rise to no similarity between the two. If the data were to show this, then it would falsify the experimental hypothesis.

3 Methodology

The independent variable in the study was the accent of the speaker. To make the results quantifiable, the amount of participants for each accent was kept at four each. This was further broken down into two males and two females for each accent. The differences between the two sexes were not analysed as this was not a focus of the study but it was felt necessary to have an equal measure of the two. Previous studies such as Trudgill's study of Norwich in 1972 (Trudgill, 1986) and Wolfram's study in Detroit in 1969 (Eckert, 1999) showed that women are more likely to use Standard English than men. Ensuring an equal number of men and women gave the results more credibility as possible gender differences would not affect the data. Age was not a variable in the study, however, participants of similar ages were sought in order to give better reliability and comparison in the results.

All participants had to be free from speech impediments as this could potentially affect the results. The only other criterion for the Scouse participants is that they needed to have lived in Liverpool all of their life. The Welsh participants had to speak Welsh as a first language and have grown up in the counties of Gwynedd or Anglesey. These counties were chosen due to the high proportion of speakers of Welsh as a first language (Jones, 1998). This would keep the influence of the English language to a minimum as the participants would use Welsh most of the time. Participants who had grown up in the city of Bangor were excluded due to the high student population and influence of the English language in that area.

The participants' age, sex, place where they grew up and whether they were Welsh/Scouse was firstly recorded. Names and contact details were not taken from the participants to ensure complete anonymity. Some unrecorded conversation took place before taking the participant's supporting information and the recording in an attempt to make the participants feel more comfortable. Topics included local news, compliments on the area they lived in and an attempt to converge the participant's accent and views.

For the free-speech part of the recording, participants were asked: "what makes you proud to be Welsh/a Scouser?" Participants were requested to begin their reply with "I'm participant/number… and I'm proud to be Welsh/Scouse because…" The number aspect was inserted so it was easier to keep track of the credentials of each participant. This question was asked first as people are more likely to use their usual accent when they are talking about a topic that has some emotional significance (Labov 2003). This topic was expected to influence their native accent as participants were discussing how proud they were of their hometown. One participant did introduce the recording with his first name instead of a given number but as this was the only personal data given, the recording was kept.

Once the participant had finished the free-speech part of the recording, they were prompted to read through a set of statements twice. These were a set of six nonsense sentences typed onto a sheet of A4 with instructions at the top[1]. Some participants read out the instructions as well as the sentences but this was not included in the data. They were instructed to read the six sentences out loud then read them again once they reached the end, so that the participant could get used to reading them, which would ensure more naturalistic data was recorded. Both sets of sentences were recorded but only the second set was analysed. This part of the recording was necessary because free speech would not necessarily have provided all the data needed. Reading a passage gives

[1] A copy of the sentences is given in the Appendix.

the study the same elicited data from all of the participants that free speech would not. Each participant was given a slip of paper stating that they could remove themselves from the study at any point by emailing the researcher.

The voiceless plosives /p, t, k/ were each represented six times in the passage. Each sound was produced word initially, post-vocalically and word-finally and preceded by either the open front unrounded vowel [a] or the front close unrounded vowel [ɪ] with the exception of word-initial analyses, that were followed by [a] and [ɪ]. Monitoring the preceding vowel prevented any fricative-bias in the results due to articulatory undershoot. Each of the key words containing the sounds was included twice so any anomalies could be highlighted. A total of 278 sound files were analysed as some of the key words were not elicited correctly. The data was recorded and analysed using the softwares Audacity and Praat.

Once all data had been collected the individual sound files were extracted from the full recordings and compared across all variables. Particular attention was paid to the length of aspiration, if any, and whether any lenition occurred as these factors would best answer the research question.

4 Results

The results are grouped by the independent variable of place of birth and comparisons between the different groups are discussed in the next section. The length of aspiration, if any, is reported for the voiceless plosives in each place along with any forms of lenition found.

4.1 Welsh Participants

4.1.1 /p/

Affrication to [ɸ] occurred word-initially along with [p^h]. Affrication was only found preceding the open vowel [a] on two occasions. The remainder were aspirated plosives. The mean length of aspiration was 40ms with a range of 29ms. Post-vocalic /p/ was also either lenited or aspirated with a mean aspiration length of 46ms. In most cases, [p] was realised then followed by [ɸ] after a short silence. Word-finally, /p/ was affricated or was followed by aspiration with a mean aspiration of 63ms. There were two occasions of debuccalisation when following the closed vowel [ɪ].

4.1.2 /t/

When /t/ occurred word-initially, it was weakened to [t^s]. There were also cases of pre-spirantisation where the plosive was preceded by frication but no silent period. This also occurred post-vocalically and word-finally. There was one instance of aspiration at 70ms and one of lenition to the glottal fricative [h].

4.1.3 /k/

Aspiration was average word-initially in comparison to the totals given by Cho & Ladefoged (1999) with a mean length of 55ms and a range of 40ms. Aspiration was found both preceding [a] and [ɪ]. Lenition to affrication and fricativisation was also found in this position. Lenition to [x] or [ç] was found in most of the post-vocalic data for /k/. There were also some instances of [k^x]. When occurring word-finally, /k/ was most likely

to be aspirated with eight occurrences of [kʰ]. The mean length of aspiration was 54ms with a range of 27ms. There was also one instance of debuccalisation following [a]. There were three fricatives and one affricate replacing /k/.

4.2 Liverpool Participants

4.2.1 /p/

Lenition to [ɸ] and aspiration of /p/ was found word-initially. Lenition was found preceding both the front and back vowels but aspiration was more frequent. The mean length of aspiration was 33ms with a range of 31ms. Again, the voiceless bilabial fricative [ɸ] was found in place of post-vocalic /p/ along with [pʰ]. Aspiration was generally longer here with a mean of 64ms and a range of 70ms. The aspiration was slightly longer when /p/ occurred finally with a mean of 67ms. /p/ was more likely to be lenited when following [ɪ] but there were still cases following [a]. Debuccalisation almost occurred in one instance where the sound wave showed no plosive burst but fricative energy was slightly higher than expected for the glottal fricative. One occasion of [ɸ] sounded more like an alveolar tap with frication.

4.2.2 /t/

Word-initially, /t/ was spirantised. Some of these consisted of just the fricative [s] but some behaved differently. Some lenited forms of /t/ consisted of pre-spirantisation with an audible release. Despite this, it had no period of silence before the release. Post-vocalically, /t/ was lenited to [tˢ], [s] or [h]. Two occasions of [s] were of a low frequency so not far away from debuccalisation. Word-finally, debuccalisation was more likely to occur when following a low vowel and spirantisation occurred more when it was preceded by a high vowel.

4.2.3 /k/

/k/ was lenited to [x] or [kˣ] in all but two occasions word-initially. This was realised as [kʰ] with an aspiration length of 20ms when preceding [ɪ] and 60ms when preceding [a]. Post-vocalic /k/was very similar with the majority of examples showing fricativisation. There were three occurrences of the plosive with frication showing as [kˣ]. When /k/ appeared finally, it was lenited in all but one sample of the data which was aspirated with 72ms of aspiration. There was one case of debuccalisation when following [a], five instances of affrication and five of fricativisation. The preceding vowel did not affect the type of lenition.

This chart shows the mean time (ms) of aspiration in Liverpool and Welsh English in comparison to the averages given by Cho & Ladefoged (1999). The lengths of aspiration were run through the SPSS statistical software 14.0. Values were calculated for the standard deviation and an independent samples t-test. The majority of aspiration lengths were found to be significant at <0.05 with only two being statistically insignificant at >0.05.

Aspiration generally seems to be similar for both accents, even when the mean times diverge from the averages for English accents of English. The main difference is the absence of aspiration for /t/ in Liverpool English and the single case of it in Welsh English. Also, despite the two accents being more similar in comparison with the average for English English, the lengths of aspiration are not the same and there can sometimes be up to 20ms difference.

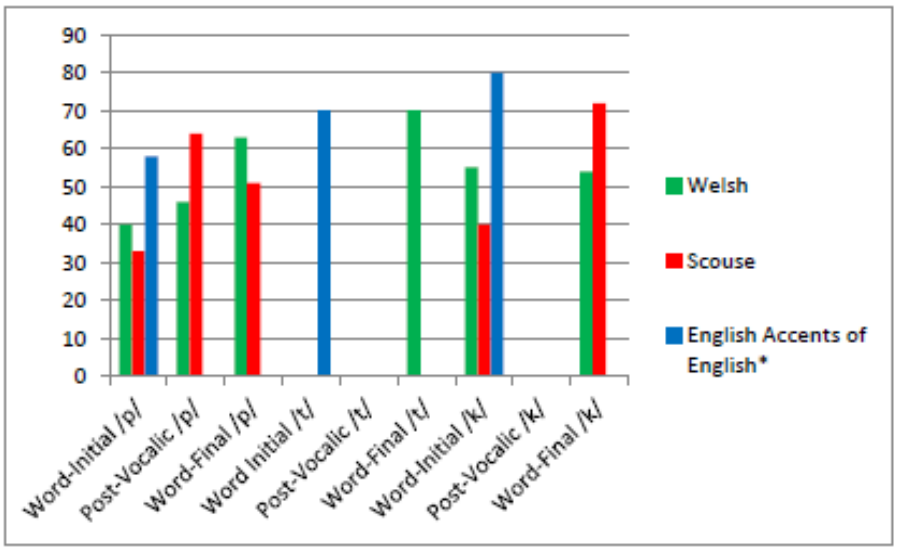

Figure 4: Lengths of aspiration in Liverpool, North Wales and English English[2]

5 Discussion

The results show some support for research previously undertaken which have been highlighted in our review of the literature (Section 2). They also represent new areas for discussion which have not previously been found and published. The main focus of the research was on the similarity of the voiceless plosives /p, t, k/ from North Wales English and Liverpool English and these will be analysed and discussed, along with any in- and cross-group phonetic variation.

5.1 /p/

/p/ can lenite to [ɸ] in Liverpool English through a weakening of the plosive burst to a fricative. Previous research has found /p/ to be the least lenited out of the three voiceless plosives being analysed as part of this research. Despite this, one instance of debuccalisation was found word-finally when preceded by the closed vowel [ɪ] from a Welsh participant and one instance of near-debuccalisation from a Scouse participant. The near-debuccalisation has been labelled as so due to its low-energy frication. Debuccalisation of /p/ has not been recorded in published studies of Welsh and Liverpool English so this could be a new phenomenon that is occurring. As it is normally found only in post-vocalic and final /t/, debuccalisation may be becoming overextended and being applied to other phonemes that are phonetically similar. However, as it only occurred twice and following two different vowels, it could either be in the earliest stages of extension to more phonemes and its usage is erratic, as was lenition in Irish English (Hickey 1998) or could be due to individual differences.

[2] This is an average and does not consider articulatory restraints such as stress placement, vowel conditions or manner and places of articulation. English lengths of aspiration are taken from Cho & Ladefoged (1999).

Word-initial lenition was more likely to occur with the participants from Liverpool than North Wales, with participants in Liverpool almost three times more likely to lenite than those from North Wales (32% compared with 12%, respectively). Despite this, the likelihood to lenite was much lower than that for /t, k/. The low numbers of lenited /p/ word-initially could be explained from previous research by Watson (2007). This states that lenited /p/ only occurs post-vocalically and word-final. This could show a move towards standardising lenition across all three places in the two accents. Despite this, the Welsh participants only lenited /p/ when it preceded the open vowel [a]. As articulatory undershoot would occur more likely with [ɪ], it can be discounted here for that reason. There were slightly more instances of lenition when /p/ was post-vocalic than word-initial. However, affrication to [ɸ] was more likely to occur with the Welsh participants although this difference was small. Lenition was just as likely to occur when following an open vowel [a] or a close vowel [ɪ] but this may be because the following phoneme was [ɪ] for both target words. The sound waves seemed to show a burst of sound after the preceding vowel followed by a short period of silence before either another burst and aspiration or just frication. This is probably a final release of energy before the articulators close for the plosive sound release.

There were no anomalous results when analysing post-vocalic /p/.

When occurring word-finally, /p/ was realised as [p^{h}], [ɸ] or [h]. Taking the total amount of sound files for analysis for each accent (16 each), /p/ was affricated or aspirated a similar number of times. However, whereas the Welsh speakers were more likely to lenite the plosive when following [a], the Scouse speakers were more likely to lenite when following [ɪ]. The occurrence of lenition following [ɪ] from the participants from Liverpool could be due to articulatory undershoot. As /p/ is bilabial and articulated at the front of the mouth, the articulators do not need to move as quickly to create the close, unrounded vowel. This could provide some extension of the plosive as a fricative as the articulators move towards making the next sound. As discussed above, there were two occurrences of debuccalisation, one classed as near-debuccalisation.

Despite this, one participant from Liverpool articulated an affricate of /p/ that was similar to the voiced alveolar tap [ɾ] with frication over it. The voiced alveolar tap is a distinct feature of Liverpool English although it is normally found in place of post-vocalic /t/. No previous research could be found on this specific sound occurring. As there was only one occurrence of it in the recordings and due to the similarity of the phonetic environment with /t/ where it normally occurs, this has been treated as a mispronunciation.

5.2 /t/

/t/ has generally been found to be lenited more than /p, k/. This can be affricated to [t^{s}], further fricativised to [s], debuccalised to [h] or dropped completely. Lenition was found in all but one case of /t/ across the three word positions where aspirated /t/ was found. /t/ was lenited across all three stages but there were some positional restraints.

The Welsh participants were more likely to affricate /t/ to [t^{s}] word-initially with only one case of stage two lenition of fricativising the /t/ to [s]. Half of the Scouse participants affricated /t/ and the other half fricativised it. The appearance of stage two lenition in word-initial /t/ does not corroborate with previous research into lenition in Liverpool English, which states that fricativisation only appears post-vocalically and word-finally (Watson 2007). However, this could be a case for fortition, as found in the

speech of people from the South East of England (Buiza & Plug, 2012). As fortition is not of concern here, this finding would be benefitial for further research. Affrication of /t/ occurs word-initially. Again, this could show a lenition process in which the voiceless plosives in Liverpool English are gradually becoming more lenited. Lenition has never been discussed in Welsh English although the similarities in lenition between the data and research into lenition in Liverpool could highlight a possible transfer effect from the immersion of Welsh language in Liverpool from the 18th century.

The only individual difference was an instance of creaky voice in one affricate articulated by a participant from Liverpool. Despite the creaky voice, the plosive and affrication was still audible and visible in the sound wave.

When uttered post-vocalically, /t/ was spirantised in all but two cases by the Welsh participants. In the two anomalies, /t/ was affricated. Spirantisation also occurred in the Liverpool English recordings. However, there were also cases of debuccalisation including one of near-debuccalisation. This highlights a difference in the articulation of Welsh and Liverpool English post-vocalic /t/. Debuccalisation did not occur in any of the Welsh participants but was present with a high number of participants from Liverpool. Lenition seems to go to a further stage in the data from the Scouse participants than the Welsh although this could be due to a number of different factors. As the Liverpool accent is different from the accents in the surrounding area, the accent could be diverged further by exaggerating the features that are unique to the Liverpool accent, such as lenition. It could be that lenition is an older feature in Scouse than in Welsh English, so has progressed further than it has in Welsh where it is a relatively new feature in comparison.

Word-final /t/ was more likely to be fricativised by the Welsh participants although there were also cases of debuccalisation, affrication and aspiration. The Scouse participants either fricativised or debuccalised word-final /t/. Debuccalisation occurred when following both a back and front vowel, although it was more likely to occur following [a], with spirantisation more frequent when following [ɪ]. The single case of debuccalisation with the Welsh participants followed [ɪ]. These findings are consistent with Watson (2007) who found debuccalisation of /t/ occurred word-finally. Most word-final /t/ with the Welsh participants was fricativised to [s] with two phonemes affricated to [t^{s}]. This is in line with the data from the Liverpudlian participants who were also more likely to fricativise word-final /t/ to [s].

5.3 /k/

According to previous research, /k/ is more likely than /p/ but less likely than /t/ to be lenited. It can either be affricated to [k^{x}] or fricativised to [x]. Watson (2007) found this depended on the vowel that followed it. If /k/ followed [a] it was more likely to be a fricative and if it followed [ɪ] then it would be realised as an affricate.

Debuccalisation was not found word-initially , but this was expected as previous research has found it does not occur in this position. There were four instances of [k^{h}] in the recordings. Two instances occurred for each target word, one from each accent group. However, the length of aspiration did not provide a pattern in the two groups. Affricates were more likely to appear in both groups with half of the phonemes being lenited to [k^{x}]. There was no preference for the position of the following vowel, with lenition evenly assigned to both the high and low vowels. Lenition levels were similar for both the Welsh and Liverpudlian participants.

Lenition to affrication and fricativisation occurred post-vocalically. There were no instances of debuccalisation but this was expected as there has been no previous research showing this. Fricativisation to [x] was more common, especially when following [ɪ]. The main difference between the Scouse and Welsh recordings were that Scousers were more likely to lenite further to fricativisation than the Welsh participants. This seems to be a pattern in Liverpool English, especially when compared with previous research into lenition. However, as lenition does not seem to have been previously researched or found in Welsh English, patterns of lenition could show cross-linguistic influence of the Welsh language on Liverpool English or of Liverpudlian on Welsh due to the close proximity to each other.

/k/ was either aspirated or lenited to an affricate or fricative. There was one case of debuccalisation for each accent group, both following [a]. Lenition was more likely to occur in the Liverpool participants' speech than with the Welsh speakers who were more likely to aspirate /k/. Lenition generally occurred when the plosive was following [ɪ] although there were some cases following [a]. Despite this, the only difference between the speech of the Welsh and Liverpool participants was the aspiration of /k/ by the Welsh and the lenition shown with the participants from Liverpool. Previous research into Welsh voiceless plosives shows that /k/ is aspirated in all positions and this data is consistent with that. Only three instances of fricativisation were found word-finally although the lack of lenition agrees with Welsh phonological rules that the final plosive is pronounced (Wells 1982).

5.4 Aspiration

The aspiration of the plosives was dependent on the phonological environment it was found in. /p/ was aspirated by both accent groups word-initially, finally and post-vocalically. The features of the vowel that followed did not significantly affect the rate of occurrence of [p^h] or length of aspiration. Word-initial /p/ had the shortest length of aspiration with the median occurring post-vocalically and the longest aspiration being found word-finally. Overall, /p/ was aspirated the highest number of times by both accent groups. Aspiration rates were similar for both the Welsh and Scouse participants and the findings were in line with previous descriptions of the voiceless plosives by Wells (1982) and Trudgill et al (2005) that state /p/ is heavily aspirated by both accent groups. All lengths of aspiration for [p^h] were determined to be statistically significant with all of the data showing as <0.05%. This would infer that generalisations from this data could be extended from just the participants to wider society. Standard deviation tests showed a greater difference from post-vocalic /p/ than word-initial or word-final for both Welsh and Scouse participants. This shows a trend in the statistical data as well as the actual quantitative data which could further highlight a similarity in the aspiration lengths of the participants.

[t^h] did not occur in Liverpool English in any of the recordings and only once word-finally with the Welsh participants. Aspiration was realised following [a] with a length of 70ms. As this did not occur in any other instance, this has been labelled as an individual difference. /t/ has a wide allophonic variety in comparison with /p/ and /k/. Previous research has highlighted this along with the ability to aspirate /t/ in the speech of Welsh speakers' of English and people from Liverpool. However, only one case of [t^h] was found in the recordings which could be an evidence for a change in the realisation of /t/. Fricativisation to *s+ or debuccalisation was not recorded in Penhallurick's findings

(1991) but there are clear cases of this occurring in the English of the Welsh participants. This could be an evidence for the influence of the accent of Liverpool in North Wales. However, as Penhallurick (1991) only transcribed what he could hear; fricativisation may have been present but not recognised or overlooked and considered an affricate. As aspiration only occurred once, no statistical tests were conducted.

[k^h] was not found post-vocalically and only on four occasions word-initially. The following vowel did not affect the length of aspiration in this position. Individual results were mixed, with the Scouse participants realising a longer length of aspiration with [a] and an extremely short burst of aspiration when preceding [ɪ]. Comparably, the Welsh participants realised a longer aspiration length with [ɪ] and a shorter burst of aspiration with [a]. Again, this could be associated with the data found for /p/ highlighted above. Further research is needed to explain why this occurs. When /k/ appeared word-finally, aspiration was generally longer for both accent groups. The Welsh participants were more likely to utter [k^h] in comparison with just one Scouse participant realising the aspiration on one occasion. These results are not consistent with previous research conducted by Penhallurick (1991) who found that Welsh speakers heavily aspirate /k/ in all places. In addition to this, speakers from Liverpool are also considered to heavily aspirate voiceless plosives (Trudgill, Hughes & Watt 2005) which was not the case with /k/. Using the independent samples t-test highlighted statistical insignificance from both data sets for word-initial /k/. Standard deviation was also high at 28.28 for both the Scouse and Welsh participants. Due to the statistical insignificance, generalisations outside of the participant groups cannot be made.

6 Conclusion

The focus of the present research was to assess the extent of the similarity between the voiceless plosives /p, t, k/ in northern Welsh English and Liverpool English. This was achieved through analysing and comparing the length of aspiration, if any, and the stage of lenition. There were three places of analysis for each plosive: word-initial, post-vocalic and word-final. This research has filled a gap in the field of phonetics and variation as research into lenition in Welsh has not been previously published.

In comparison with previous research, lenition seems to occur more often in Liverpool English. The voiceless plosives are being lenited in more phonological environments and to a further stage. This could represent a growing trend in the lenition of plosives. As the accent of Liverpool is quite different from those surrounding it, there may be a form of divergence occurring as the influence of the accent spreads over the borders to Halton and the Wirral. As lenition is a distinguishable feature, the people of Liverpool may be unconsciously diverging their accent to keep their identity unique. The city of Liverpool was previously stigmatised, with people from that area stereotyped as being thieves and unfashionable. In 2008, it became the European Capital of Culture and many events were arranged that displayed the vitality and celebrated the passion of the city. Along with this, celebrities who are from the city are displayed in popular media as beautiful and well-dressed which is now being attributed to Liverpool itself. In addition to this, the phrase "Scouse not English" is appearing on football banners and accessories which gives the people of Liverpool their own individual identity. It may well be that the people of Liverpool are highlighting features specific to their accent such as the lenition of voiceless plosives and exaggerating these features.

Similarly, the Welsh participants were just as likely to lenite the voiceless plosives with the exception of word-final /k/. Lenition occurred in all other phonological environments although did tend to be a stage behind the plosive lenition in Liverpool. However, as there is no previous research on lenition in Welsh, there cannot be any diachronic comparison as there is for Liverpool English. Despite this, the similarity in levels of lenition between the two accents cannot be ignored as previous research has shown there is no other occurrence of this in English accents of English.

The lenition of /t/ in Liverpool English has been attributed to the migration of Irish into the city from the 18th century onwards. However, lenited /p/ and /k/ are not found in Irish English. From the data, it was shown that this did occur in the speech of the Welsh and Scouse participants and at an extremely similar rate. Due to the similarity of the extent of lenition between the two accents and the fact that this phenomenon does not occur in any other accent of English it can be fair to say that Welsh has had some influence on the lenition of /p/ and /k/ in Liverpool English.

The most distinguishing difference between the two accents was the aspiration of word-final /k/ by the Welsh participants. As [k^h] was realised by the majority of the Welsh participants and [x, ç] by the majority of the Scouse participants, this was a notable difference. Despite this, it was found that the lenition of /p, t, k/ progressed further than what previous research had found. This could mean that what would have previously been a phonological environment for aspiration has now become part of an overextension of lenition, as discussed above.

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Appendix

Read all of the sentences out loud.
Repeat them a second time once you reach the end.

- The **bat** was **sitting** by the lake **sipping** a **can** of coke and licking a lolly ice. He liked to **sit** in this spot as he could get a **tan** while listening to the ducks **quacking**. Apart from the ducks, you could hear a **pin** drop.

- The **pan** was made of **tin** and needed a **lick** of paint. The little boy used it for **batting** balls and to **sip** water out of. After he had finished playing, he would leave it **sitting** in the porch.

- The **wrapping** paper made a noise that sounded like a duck **quacking**! As the girl tried to **wrap** the **tin** of sweets she had bought for her friend, the dog kept **licking** her face and giving her a **kiss**. It sounded very strange having **wrapping** paper that went "**quack quack**"!

- A **bat** will **sit sipping** a **can** of coke for hours on end but cannot **lick** a lollipop for more than 10 seconds.

- He will eat the chicken **wrap** and **sip** the glass of coke. Then he will try to get a **tan** while **licking** the sauce off his fingers which makes a noise like a **kiss**.

- The girl used the **pan** when she was **batting** the ball but the **pin** fell out.