Phonetic Variation of Scottish Politicians in Holyrood

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Abstract

The present study looks at the phonetic variation of Members of the Scottish Parliament through the CAT lexical set, then further analysing it by looking at the separate lexical sets of TRAP and BATH. Previous research has concluded that phonetic variation can index political party affiliation (Hall-Lew *et al.* 2010, 2012). With Scotland being in the process of a major political movement headed by the Scottish National Party, Scotland provides an excellent framework to study the role of phonetic variability in the construction of national and political identity. The present study's aim was to determine the extent that the lexical sets of CAT, TRAP and BATH can be attributed to the political identity of the MSPs and what is the social meaning of this variability. Using a modified Watt and Fabricius normalisation method, the tokens for each speaker were examined and run through descriptive and mixed-effects model statistics. Results show that members of the Labour Party are more variable in the production of F1 and when combined with data from Westminster, it gives further evidence that phonetic variation can be an index of political party affiliation.

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Abbreviations

MSP	Member of Scottish Parliament (Holyrood)
MP	Member of Parliament (Westminster)
SNP	Scottish National Party
SSE	Standard Scottish English
RP	Received Pronunciation
F1	Vowel Formant 1
F2	Vowel Formant 2
F3	Vowel Formant 3
mW&F	Modified Watt & Fabricius Normalisation Method
F1/S	Normalised Value of F1 Found by Centroid S in *mW&F*
F2/S	Normalised Value of F2 Found by Centroid S in *mW&F*

1 Introduction

Previous research provides significant evidence that phonetic variation can index a political stance and identity (Hall-Lew *et al.* 2010, 2012; Podesva *et al.* 2012). Scotland is currently undergoing what is probably the most important political movement for the Scottish people in several hundred years, with a proposed referendum for Scottish independence in 2014, headed by the Scottish National Party (SNP). The SNP and the opposing Scottish Labour Party have very strong and opposing politically ideological stances in terms of an independent Scotland. Because of this, the Members of Scottish Parliament (MSPs) in Holyrood provide a perfect framework to examine Scottish national identity and how it is constructed through language use.

The present study aims to supplement current research, which is an examination of ten Scottish Members of Parliament (MPs) in Westminster, to determine the extent that these MPs negotiate and align their political identity through the variability of sociophonetic features, namely the production of the TRAP and BATH lexical sets (Hall-Lew *et al.* in preparation). The TRAP and BATH lexical sets for Standard Scottish English (SSE) do not have the same distinction that one would see in British Received Pronunciation (RP English), and therefore are realized as a singular CAT vowel. However, one aim of the current research is to discover how much of the variation can be explained by the TRAP and BATH vowels. This present study focuses on the variability of these same sociophonetic features in the Scottish MSPs in Holyrood. In doing so, it hopes to fill a gap in the growing body of knowledge on sociolinguistic variation and political

identity. With the Scottish Parliament being relatively young, the amount of linguistic work that has been done regarding the politicians of Holyrood is relatively narrow, and the present study hopes to fill that space.

The SNP manifesto defines them as a Scottish Government working for Scotland "to build a culture of independence" (Scottish National Party 2011: 05). The SNP focus on being a purely Scottish government is in stark contrast to the Scottish Labour Party. The Scottish Labour Party is part of the wider Labour Party of the UK, without a separate constitution. “The SNP has the distinct advantage of not presenting candidates for election within other areas of the UK” whereas the Labour Party needs “to be both British and Scottish at the same time” (Leith and Soule 2011: 40). Because of this difference, the MSPs of the Scottish Labour party may feel a greater need to negotiate between their Scottish identity and their political identity within the rest of the UK.

The current research shows that Scottish Labour MPs at Westminster exhibit a wider range in their production of CAT than the SNP on the F1 and that political party affiliation can be attributed as a main-effect for this. It also shows that party does not, in fact, matter when examining variation on the F2 except when looking at the surrounding phonological environment. The work being done with the Scottish MPs in Westminster shows the potential for similar variation in Labour Party members at Holyrood. In comparing the data from the MPs of Westminster with the MSPs in Holyrood, the present study will quantitatively determine the extent that phonetic variation of CAT and the separate TRAP and BATH vowels is mirrored throughout the party, regardless of location in the UK.

The present study focuses on three main research questions:

1. How can the lexical set CAT, as well as the separate lexical sets of TRAP, and BATH help to explain the phonetic variation of the MSPs in Holyrood?

2. Can this variability be explained by the political identity of the MSPs?

3. What is the social meaning of this variability?

1.1 Brief Overview of Holyrood

The Scottish Parliament at Holyrood was established by the Scotland Act in 1998, with the UK Parliament giving over domestic powers to the Scottish Parliament in July of 1999. Since then the SNP have been slowly rising to power. In 2007 they overtook the Scottish Labour Party as being the largest represented party in Holyrood, forming a minority government. The current Scottish Parliament was elected in 2011 where the SNP won 67 of the total 129 seats, forming a majority government. In the 2011 election, the Scottish Labour Party lost several incumbent representatives but still holds the second highest number of seats with 37. The distribution of elected officials has the majority of the Labour Party's representatives coming from central Scotland, Edinburgh and Glasgow, while the SNP tend to come from less urban areas (Scottish Parliament 2012). In comparison, the UK Parliament at Westminster tends to have a different demographic of Scottish representatives. The largest number of Scottish politicians working in the UK Parliament is the Labour Party with 41 seats, where the SNP currently only hold 6 (BBC News 2010).

2 Theoretical Framework

2.1 Sociolinguistic Variation

Sociolinguistics is the study of the ways that society may influence language use and how linguistic variables and social variables are related. More specifically, contemporary variationist sociolinguistics frequently explores the ways that linguistic variation can construct identity and social meaning through a variable's usage and context. The models set forth by Silverstein (2003) of indexicality and the 'indexical order' allow researchers to examine the relationship between these social meanings and linguistic variability.

According to Silverstein's model, any variable that is considered to be a (socio-) linguistic "fact" is also "necessarily an indexical fact" (2003: 194-195). The indexical value of a linguistic variable is part of the indexical order which has different *n*-th levels. What Silverstein defines as *first-order indexicality* is the first part of the value or order, wherein this first-order index indicates membership of a population (Eckert 2008: 463). First-order indexicality lies on what Eckert calls the *indexical field* of '*n*-th order' indexical usage. Once a variable becomes an index it acquires an $n + 1^{st}$ value. Though in Silverstein's framework, he never prioritizes the levels of indexicality because observations of correlations between any n-th order variable may be viewed 'with a different level of social meaning in terms of an $n + 1^{st}$ order indexical ideologization' (Moore and Podesva 2009: 451). Because the indexical value of any variable is constantly changing with the social evaluation of indices, it is important to recognise the variables in terms of the ever changing qualities of the indexical field because "speakers use

variables not simply to reflect their particular pre-ordained place on the social map but to make ideological moves" (Eckert 2008: 464).

Through an understanding of the indexical field, it becomes possible to look at variability in the terms of the social meaning of variants. The present study follows Eckert (2000, 2005) and Moore and Podesva (2009) in its use of the term 'social meaning'. Social meaning can be described as the way that indices characteristic of a person's speech are deployed through repeated stancetaking. This definition of social meaning is dependent on the view that any linguistic feature is deployed for the purpose of taking a stance (Keisling 2009: 179; Moore and Podesva 2009). Stance is the repeated use of utterances that help to construct social identities. "How often speakers do or do not align or comply with conventional sociolinguistic norms or indexicalities in their acts of stance plays a role in the reproduction of those norms and indexicalities" (Jaffe 2009: 18). The collective production of this can be a driving force in variability, depending on the indexical identities of the speakers. Stance is at the centre of the process of indexicalisation because speakers combine indices with other indices and the context in which they occur to determine and negotiate which stance to take. The argument here is not that sociolinguistic variants have an inherent stance or social meaning, but that a variant has the potential for multiple stances and social meanings (Kiesling 2009: 179).

In order to understand the relevant social meaning of a linguistic variant it is necessary to "understand how it is embedded in the styles that generate recognizable meaning" in at least one social level (Moore and Podesva 2009: 450). Style happens within the variation of an individual speaker occurring outside of contextual constrains, focusing not on what was being said, but rather how it is said (Shilling-Estes 2002; Danescu-Niculescu-Mizil *et al.*2011). In this, style helps sociolinguistic research in studying "the production and reproduction of social

meaning in variation… as long as we can position ourselves in relation to the sources of that material, and attribute meaning to it, we can use it" (Eckert 2001: 123-124).

2.2 *Identity*

This section looks at identity from several different viewpoints: language and identity, construction of political identity, and linguistic and non-linguistic facets of Scottish national identity. This is not to imply that these views of identity are independent of one another. On the contrary, each of these has an active role in the construction of identity as a whole. The construction of identity is an intricate process, where an individual's identity is not bound to a single realisation. "Identities encompass (a) macro-level demographic categories; (b) local, ethnographically specific cultural positions; and (c) temporary and interactionally specific stances and participant roles" (Buckholtz and Hall 2010: 21). Moore and Podesva claim that "identity has become something of a loaded term in sociolinguistics" (2009: 449) and this section hopes to clearly define 'identity' and how these facets of identity work together as opposed to independently of one another in the construction of identity. Because identity is constructed through the discourse of language, it is embedded in the social meaning of the linguistic variability.

2.2.1 *Language and Identity*

Identity is not simply an act of claiming membership to a community or defining oneself in a certain way, because the relationship between language and identity is non-exclusive. Linguistic features are not exclusively used by members of a group associated with it. At the same time members of a group are not bound to those particular features their group is

identified as having. This is because "language plays a significant role in presenting, constructing, and reshaping identity" (Podesva, *et al.* 2012: 65). Constructing identity involves small acts that are based on the "perceptions of individuals or categories" (Eckert 2008: 463) because "identity is the social positioning of self and other" (Buckholtz and Hall 2010: 18).

The construction of identity is a process which occurs in everyday interactional situations and is indexed through language. In early variationist sociolinguistics, Labov's Martha's Vineyard study was one of the first that showed the construction of identity through language and the relationship between identity and ideology (1963). Because the speech of the individuals in Martha's Vineyard indexed their identity as belonging to that group, it shows that there is a known social meaning between all of these individuals sharing the same ideology. There is however a concern with looking at identity through correlations in language variation. This would suggest that identity is static in its social meaning of language. It's important to realise that statistical correlations between variants and group identities are generalisations. "Identity is not something apart from language, something to be correlated with language; rather language and identity are co-constructive" (Moore 2011: 221).

In constructing one's identity, it is dependent on not simply the claims that are made by individuals, but also how those claims are validated by others around them. (Bechhofer *et al.* 1999) "Identity is something constructed rather than essential," and simultaneously it is "performed rather than possessed" (Joseph 2010: 14). In one sense, accommodation of linguistic variation can be viewed as a long term process that is sustained by the constructing of identity (Schneider 2008: 264) because "identity is a discursive construct that emerges in interaction" (Buckholtz and Hall 2010: 19). Goodwin and Alim's study of "Valley Girls" and "Ghetto Girls" provides an example of how forms of identity construction can be realised through both style and stance (2010). Schneider summarizes it best when he says that

"language choice is both an expression and a manipulation of social bonds, of relationships of power and solidarity, and identity decisions operate in both directions - either strengthening accommodation as an expression of solidarity or increasing differences caused by socially dissociating decisions" (2008: 264).

2.2.2 *Political Identity*

Political identity is a continuation of the production of a person's identity which occurs in the political sphere and political identities, like all social identities, are constantly in a process of production and negotiation. A person's political self-categorization is guided by group membership and their relationship to that group, so examining political identity in terms of social identity may help to explain why it remains relatively constant through ever changing political conditions (Green, *et al.* 2002). Since political parties are stable at a macro level, individual political identity should endure over time (Green, *et al.* 2002; Abramowitz and Saunders 2006). "Party identification is the most stable political predisposition in the minds of citizens" and their political identity as a member of that party not only influences how individuals perceive the political sphere but "also colours some of their most abstract beliefs about society and public affairs" (Goren 2005: 894).

The importance of political identity in the construction of one's identity is relatively new to sociolinguistics. Party affiliation and political values are at the core of a person's political belief system (Goren 2005: 883), but to what extent does that extend to an index through linguistic variation? Political identity has been shown to be a resource for politicians to index their stance through the use of phonetic variability in the U.S Congress (Hall-Lew*, et al.* 2010, 2012). Here they examine phonetic variation as an index of political party affiliation in the pronunciation of the second vowel of *Iraq*. The studies are focused on whether or not a

person's political identity is indexed based on pronunciation of the second vowel in *Iraq*, and they found a strong correlation. In the context of their political speeches in the U.S. Congress, the pronunciation of the foreign (a) is utilized as a resource to construct, negotiate, and maintain their political identity and membership with their political party (Hall-Lew, *et al.* 2010). The foreign (a) is a foreign word (e.g. *Iraq, café, latte*) that has been nativised into English with the phonological realisation of either /æ/ or /a:/ (Boberg 1999: 49, cited in Hall-Lew *et al.* 2010) Podesva *et al.* also found in a study of Condoleezza Rice, a conservative American politician, that her phonetic variation may be an index of her political party affiliation in congruence with other conservative politicians (2012). By constructing a political identity through language, the linguistic variables may become associated with that identity, adding to the potential social meaning of that variant.

2.2.3 *Scottish National Identity*

The salience of Scottish national identity is an important factor for Scottish politicians. Their view on their Scottish identity versus British identity and the linguistic choices made because of this are what the present study aims to discover. In order to understand the linguistic choices made by Scottish politicians, it is important to look at the national identity of Scotland as part of the greater UK.

A key factor that is frequently brought up in discussions of national identity, as with all potential identities, is the concept of 'out-groups'. As mentioned above, claiming group membership requires the ability to differentiate who is part of the group and who is not. "Individuals identifying with a nation do so in large part by distinguishing themselves from some 'other' or 'others' (Mitchell, *et al*. 2012: 105). By constructing one's national identity, an individual defines themselves by the markers they deploy which act as "characteristics

associated with an individual that they might choose to present to others, in order to support a national identity claim" (Kiely, *et al.,* 2001: 35-36 cited in Mitchell, *et al*. 2010: 102).

"Descriptions of the United Kingdom as a 'nation state,' and British citizenship as a form of 'nationality,' reflects a mode of discourse which is common in England, but which tends to be used less by people living elsewhere in the United Kingdom, who are generally inclined to distinguish their British *citizenship* status from their *national* identity" (Abell, *et al*. 2006: 209, original emphasis). Scotland being part of the multi-national state of the UK makes defining 'Scottishness' difficult, and survey's about national identity reflect this: 51% of people view themselves as Scottish not British, 33% say they are British and Scottish, and 10% are British not Scottish. When asked which national identity they consider best describes them: 78% say Scottish, 14% say British, 2% English and 6% Other (Bond and Rosie 2010: 89-90).

For many Scottish people, their national identity is very important to them but it is also very complex. In a study of individuals who are members of the SNP, national identity was incredibly strong with more than four out of five people ranking national identity first or second in a list of how think and describe themselves. However, only 65% of these ranked it first with the other identity choices (e.g. political allegiance, ethnicity, job, etc.) being relatively evenly dispersed (Mitchel, *et al*. 2012: 103)

When looking at sociolinguistic variation, we cannot ignore that the construction of identities are expressed through linguistic variation. It is a complex process that is not simply *feeling* more Scottish than British. Identity must be examined in the context of what the speakers are indexing about themselves and others, and the environment that variants occur with regard to their social meaning.

2.3 *Lexical Sets and Standard Scottish English*

The concept of a lexical set refers to a large group of words that share the same realization of a specific vowel (Wells 1982). Wells' definition is based off of British RP English and General American where these sets have been selected to be unmistakable in whichever dialect speaks them (1982: xviii) In the present study, focus is placed on the lexical sets of TRAP and BATH. The lexical set of FLEECE has also been included in order to normalise the vowels of the speaker (more on this in section 3.2). In SSE, TRAP and BATH do not have a split between the vowels that one would see in RP or near-RP English and both are realized as the singular lexical set of CAT.

In the context of Scotland, the 'standard' spoken English for educated, middle-class individuals is SSE, which is similar to Standard English English but spoken with a Scottish accent which has little regional variation throughout Scotland (Stuart-Smith 1999: 203; 2008). However, Scobbie *et al.* points out that for native Scottish middle class speakers "a small but significant proportion... ...use phonological and phonetic systems which are near-RP. This is observable in the speech of, for example, some MPs and lawyers" (1999: 242). While some Scottish MP's may use features of near-RP English, it has been pointed out that some politicians seem to resist the any Anglo-influence in their use of SSE, one of these being the Scottish First Minister, Alex Salmond who is part of the SNP (Carr and Brulard 2006: 31)[1].

Standard Scottish English typically has "just a single phoneme /a/ common to PALM and TRAP (as well as BATH and, with following /r/, START); though its realisation may vary both allophonically and socially" (Wells 1982: 403). A small number of Scottish people may have a distinction between /a/ and /ɑ/, however it's "far more common to have just one low vowel

[1] This paper by Carr and Brulard gives an excellent explanation of the many differences between SSE and RP English that is outside the scope of the present study.

/a/ with two allophones, which may have a large phonetic contrast between them" (Scobbie *et al.* 2006: 6).

2.4 *Evolutionary Approaches to Variation*

The social and cultural variables in language variation discussed up to this point may also be impacted by evolutionary factors of indirectly-biased cultural transmission, intragroup verses intergroup selection, and the effect of the free-rider problem[2]. The full extent that these factors will impact any form of linguistic variation cannot fully be determined *a priori,* but they nonetheless do require some consideration in several regards.

Cultural variation is inclined to be adopted at a group level. Cooperation is undeniably a very important factor in human interaction and it may well explain why the societies of human populations are active at a much larger scale than groups defined by kin selection seen in other species (Soltis *et al*. 1995; Boyd and Richerson 2009). A theoretical model provided by Gintis *et al.* (2001) suggests that the cooperative signalling of group membership in a social group may manifest when the signalling of group membership is a result of advantageous allegiances within the group. Because of the levels of cooperation necessary in humans, group identification may have helped to drive "cultural evolution to ever-greater extremes of in-group cooperation" (Boyd and Richerson 2009: 3286)

Variation and change is a natural part of language. The inherent change and drift in culturally transmitted variables such as language would be much better suited in aspects of design if it did not change at all, but unfortunately that is not the case (Labov 2001: 5). In comparison to biological evolution, cultural evolution occurs at a tremendously rapid pace

[2] The free-rider problem is when a defector of a group exploits the benefits that come from the cooperative behaviours of others without paying for it (Roberts 2008).

(Boyd and Richerson 2009: 3286; cf. Worden 1995: 148), and in terms of language this can be seen as something that is beneficial to its speakers because it is capable of quickly adapting to changing environments. Drift must be accounted for in any cultural system, but its effect on language should not be assumed to be equal in all instances (Roberts 2008: 175). How language is used in intragroup vs. intergroup situations will have a significant effect on the variation of language (Wray and Grace 2007).

As Roberts points out, "it is hardly disputed that human beings exploit the variation inherent in language and employ it as a marker" (2008:175). In signalling group membership through language people transmit reliable indexical information about themselves, and humans are genetically predisposed to identify these markers and associate them with their usefulness (Wray and Grace 2007: 575). It's been shown that using only linguistic features, people can decipher which individuals belong to their group and which ones are considered the outsiders. In this, individuals can also distinguish those speakers who act as a 'free-rider', or trying to exploit the variation occurring in language (Roberts 2008).

It should be made clear that the intragroup and intergroup factors associated with speakers in the present study are certainly not overt, but the concept of group selection is clearly an important consideration in this case, especially for the Labour MSPs in question. This is because individual behaviour in relation to linguistics can only be seen when observing the social groups that the individual belongs to (Labov 2010: 7). What becomes the issue is determining which force is stronger; that of their Scottish identity, or their political identity of belonging to the larger Labour Party of the UK, keeping in mind that these two identities only began to conflict in the past few decades and even more since the Scottish devolution in 1999 (cf. McCrone 2012).

3 Methods

3.1 Speaker and Token Selection

The data collection for lexical tokens used in the present study was obtained from General Assembly Meetings of the Scottish Parliament over a five month period, March to July 2012, via Parliament TV on the website of the Scottish Parliament (Scottish Parliament 2012). Again, the politicians used in the present study are Lewis MacDonald, Ken Macintosh, and Hugh Henry from the Labour Party, and Fergus Ewing, Kenny MacAskill and John Swinney from the SNP; all of whom have been in the Scottish Parliament since its establishment in 1999 and are part of their party's front bench team. In determining politicians for the present study they were also controlled for a minimum age gap between the youngest and oldest, all are between the ages of 48 and 60 years old, and all are male. All of the speakers were also educated in Scottish Universities and secondary schools.

The MSP's role in Holyrood was also considered, and they were matched as closely as possible based on meeting the above criteria. John Swinney (SNP) acts as the Cabinet Secretary for Finance, Employment and Sustainable Growth while Ken Macintosh (Labour) is his Shadow Cabinet Secretary. Kenny MacAskill (SNP) is the Cabinet Secretary for Justice, with Lewis MacDonald (Labour) as the Shadow Cabinet Secretary. The two politicians had no equivalent match. Fergus Ewing (SNP) is the Minsiter for Energy, Enterprise and Tourism, while Hugh Henry is the Shadow Cabinet Secretary for Education and Lifelong Learning. Since the present

study's focus is on a possible correlation between phonetic variation in the TRAP/BATH vowel space and political identity, region within Scotland was not a strong factor in determining politicians. Only six speakers were chosen based on the time constraints of this study.

The archived footage gathered over the five month period was digitized into *.wav* files at 22,100Hz/16 bit, mono, and all speaking instances of the six politicians were placed into a single file, one per speaker. To ensure there was enough data, each speaker was to have at least thirty minutes of continuous speaking time for analysis, however in the instance of Hugh Henry this was not possible and he was analysed with only twenty-two minutes of continuous speech (though this did not inhibit him from having enough tokens). Each speaker was segmented with each token of TRAP, BATH or FLEECE, where the tokens were selected with regard to phonological environment, duration, and primary syllable stress.

In order to get only optimal vowels for analysis, there were many considerations when determining whether or not to include a token. The goal is to limit the discrepancy between what is the actual realisation of the vowel and how the vowel was perceived. To achieve this tokens of loan words containing a foreign (a) (e.g. *café, Iran*) and proper nouns (e.g. *Glasgow*, *France, Salmond*) were excluded from the segmentation process. It was also necessary to exclude many word initial vowels in cases where the preceding sound altered or could potentially alter the realisation of that vowel. Function words, words with unstressed vowels, and anything that background noise alters the acoustic qualities of the recording have been excluded from the segmentation process; however, words that are stressed main verb or

nominal form of words like *that*, *has, have*, etc. are included in the data. One of the main considerations for including tokens was whether or not the vowel was the primary stress.

Measurements of the tokens were taken of the F1, F2 and F3, favouring midpoints of the vowel where the midpoint is represented by its maximum F1 value, and where the endpoint occurred at least two glottal pulses from the end of the vowels' voicing. These measurements were extracted from separate TextGrid tiers in Praat for the appropriate lexical sets to which they belong (FLEECE, TRAP or BATH) using a script embedded in Akustyk (Plichta 2006; Hall-Lew 2009: 135). No vowels less than 60 milliseconds long were included because "very short vowels are known to centralise, due to the reduced time for the speaker to reach their vowel target" (Hall-Lew 2009: 132-133). By excluding vowels less than 60 milliseconds long it ensures that the script would function as accurately as possible. This script gives an Excel output containing the midpoint and off glide of F1, F2 and F3 including the standard deviation for each token. Here the output was examined for discrepancies. Any token with a standard deviation over 100 on the F2 or over 300 on the F3 was excluded. Tokens with an *undefined* standard deviation were also excluded (though this mostly occurred in vowels less than 60 milliseconds in length).

The ultimate goal was to have at least ten BATH tokens for each speaker after cleaning up the data output, as BATH is the least used of these lexical sets. All speakers exceeded this goal with the fewest number of BATH tokens being exhibited by Lewis MacDonald and Ken Macintosh having fourteen tokens each. The other four politicians had between twenty-two and twenty-nine BATH tokens each.

3.2 Normalization

As stated in section 2.3, FLEECE is used to normalize the speech of the speakers. Plotting the non-normalized formant values of the TRAP/BATH vowel space will show the amount of variation in a single speaker but it does not allow for the direct comparison between speakers needed to examine the variation on a social level (Hall-Lew 2009: 136). Normalizing the data factors out the physical, and consequently acoustic, differences between the speakers being studied, and it allows for a direct and quantitative comparison of the vowels. (Watt *et al.* 2011:111). By factoring out physiological differences between speakers through normalization, it's possible maintain the important sociolinguistic differences in the vowel quality of different speakers (Thomas 2002: 174). The lexical set of FLEECE represents the minimum F1 formant and the maximum F2 formant, and this makes FLEECE ideal for normalization because it remains relatively stable across most speakers (Watt and Fabricius 2002:162-163). In normalizing the vowels the present study uses a modified Watt and Fabricius S-centroid method (referred to as *mW&F*) found on NORM: Vowel Normalization Suite (Fabricius *et al.* 2009; Kendall and Thomas 2010). [3]

The *mW&F* normalization method is vowel extrinsic, speaker intrinsic, formant intrinsic in its normalization process. This means that the vowels of a speaker are dependent on the values of other vowels within the same speaker, but are not dependant on the other speakers within the same data set. The S-centroid method of *mW&F* provide a range of flexibility not

[3] A detailed description of determining the value of 'centroid' *S* in the *W&F* and *mW&F* methods can be found in Watt and Fabricius (2002) and Fabricius *et al.* (2009).

seen in other methods because it does not require the full use of the vowel space in order to work at its optimal level and can adapt to different dialects and languages. However, like all vowel extrinsic methods, with the exclusion of some vowels, it may provide slightly skewed values. Additionally, the Watt and Fabricius method shows distorted values closer to the bottom of the vowel envelope; however, this is lessened with the modified version used in the present study (Watt and Fabricius 2002; Fabricius *et al.* 2009; Thomas and Kendall, 2007).

4 Results

The results of the *mW&F* normalised data have been put through a descriptive statistical analysis as well as a mixed-effects model analysis. The data was first analysed for the descriptive statistics for the overall vowel, CAT. Figures 1 and 2 show the minimum and maximum formant values for all speakers for CAT, including the distance between these minimum and maximum values.

Figure 1. Distances between the minimum and maximum F1/S values for CAT.

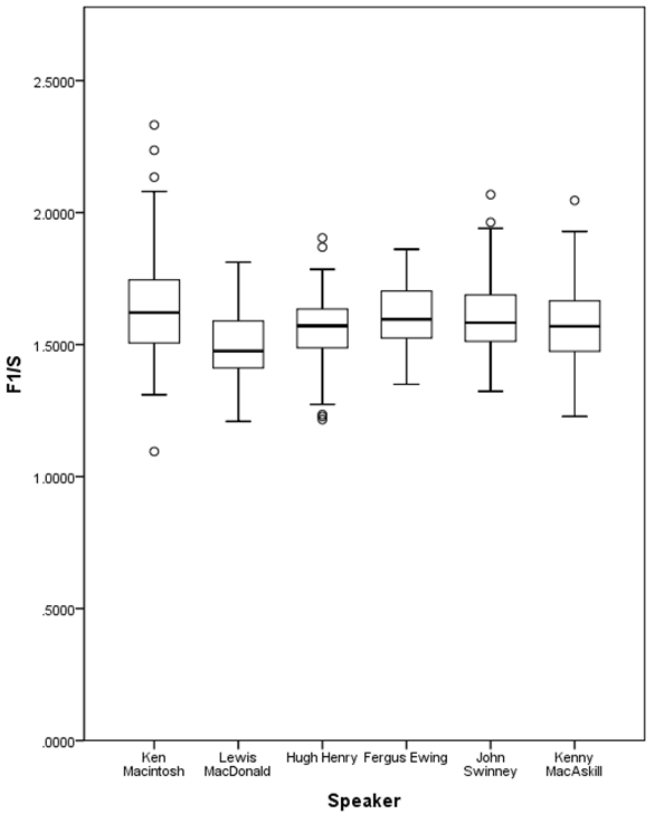
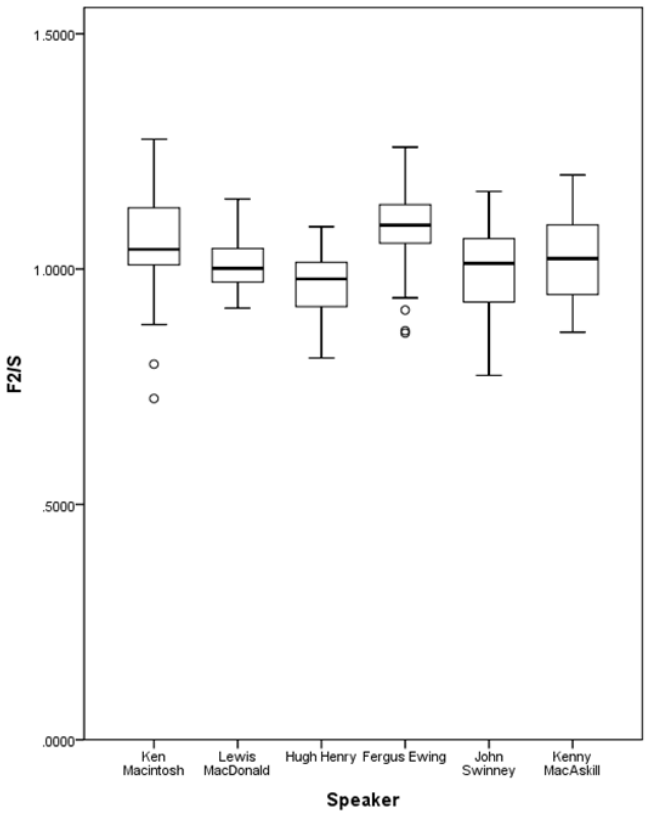


Figure 2. Distances between the minimum and maximum F2/S values for CAT.



By examining the minimum and maximum values it's possible to see who has widest variation in their vowel production; however, analysis of the minimum and maximum values opens the possibility of misinterpretation because there may be outliers on the F1 and F2 by representing an abnormally high or low value. Because of the possible complications from this type of analysis on its own, the minimum and maximum formant values must be viewed along with the mean values and standard deviation. Figures 3 and 4 and Table 1 show this for CAT in all of the speakers as well as the party as a whole. Table 1 also shows the overall token count for each speaker.

Figure 3. Mean values of normalised F1 for CAT.

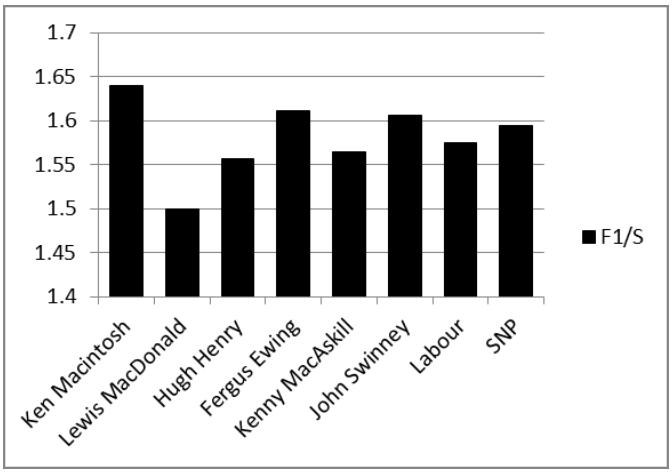


Figure 4. Mean values of normalised F2 for CAT.

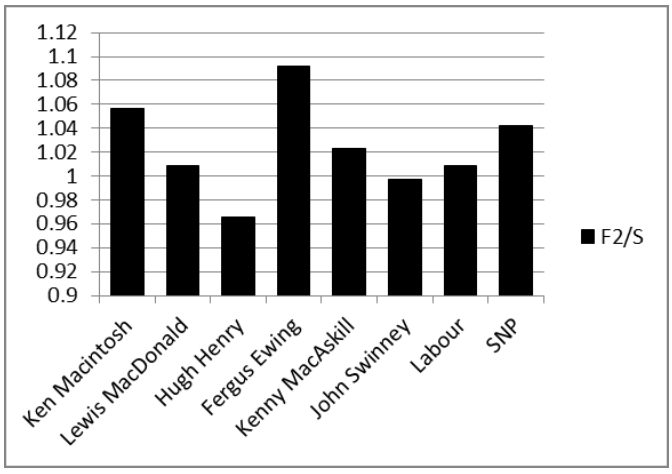


Table 1. Standard Deviation of normalised F1 and F2 for CAT.

StDev CAT	Tokens	F1/S	F2/S
Ken Macintosh	81	0.205898	0.095199
Lewis MacDonald	48	0.129902	0.063281
Hugh Henry	91	0.137779	0.063562
John Swinney	122	0.137188	0.08425
Fergus Ewing	106	0.105293	0.065876
Kenny MacAskill	90	0.142945	0.087465
Labour	**220**	**0.172291**	**0.086026**
SNP	**318**	**0.129316**	**0.088584**

The mean values of F1 and F2 provide a more generalised view of where the vowel production occurs, with a high F1 indicating a vowel produced lower in the vowel space, and a high F2 indicating a more fronted vowel.

The standard deviations of the speakers show who is the most variable in their production of the vowels, without the same possible complications that arise from just looking at the minimum and maximum formant values. Because the present study is concerned with the variance in the TRAP/BATH vowel space, Figures 5 through 8 show these same descriptive statistics to represent the values for TRAP and BATH separately. Tables 2 and 3 compare the standard deviation of the TRAP and BATH vowels for the normalised F1 and F2, as well as the token count for each of the vowels.

Figure 5. Distances between minimum and maximum F1/S values for BATH and TRAP.

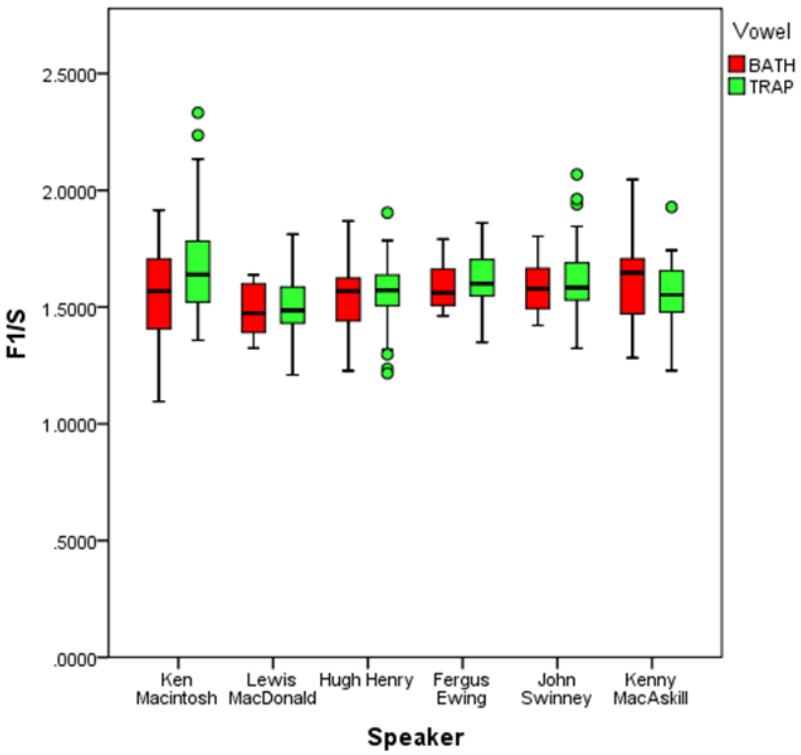


Figure 6. Distances between minimum and maximum F2/S values for BATH and TRAP.

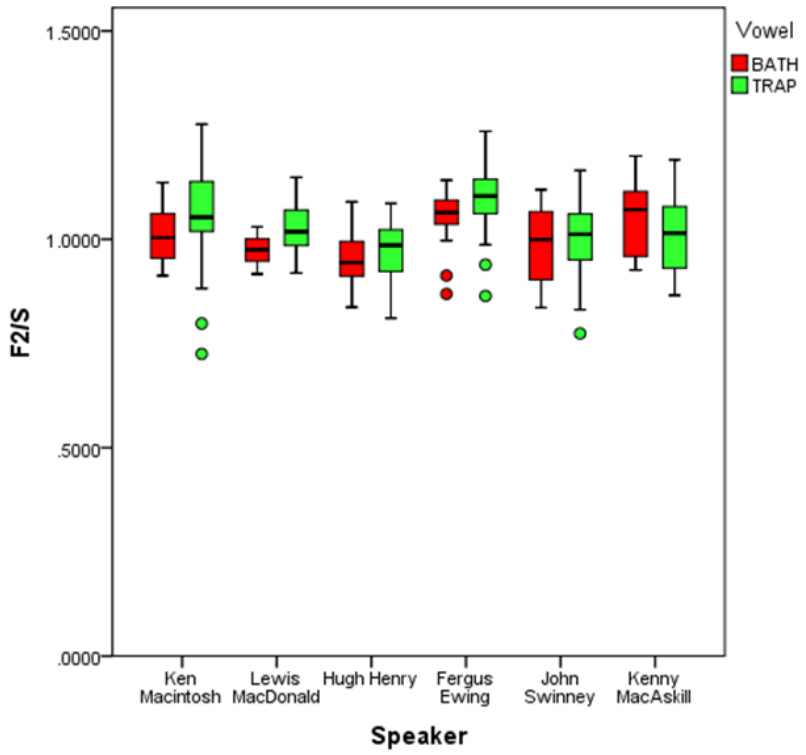


Figure 7. Normalised mean values of F1 for TRAP and BATH.

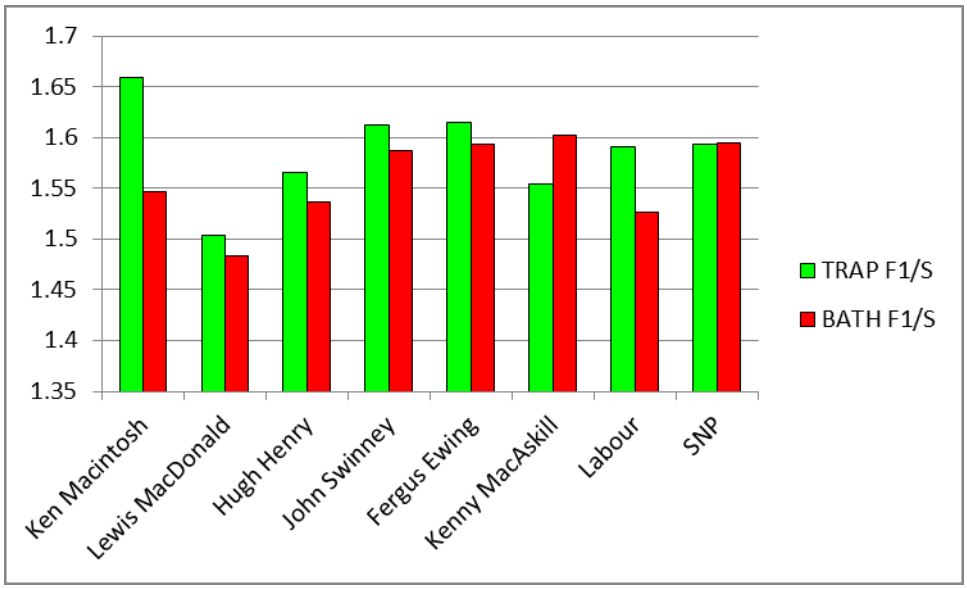


Figure 8. Normalised mean values of F2 for TRAP and BATH.

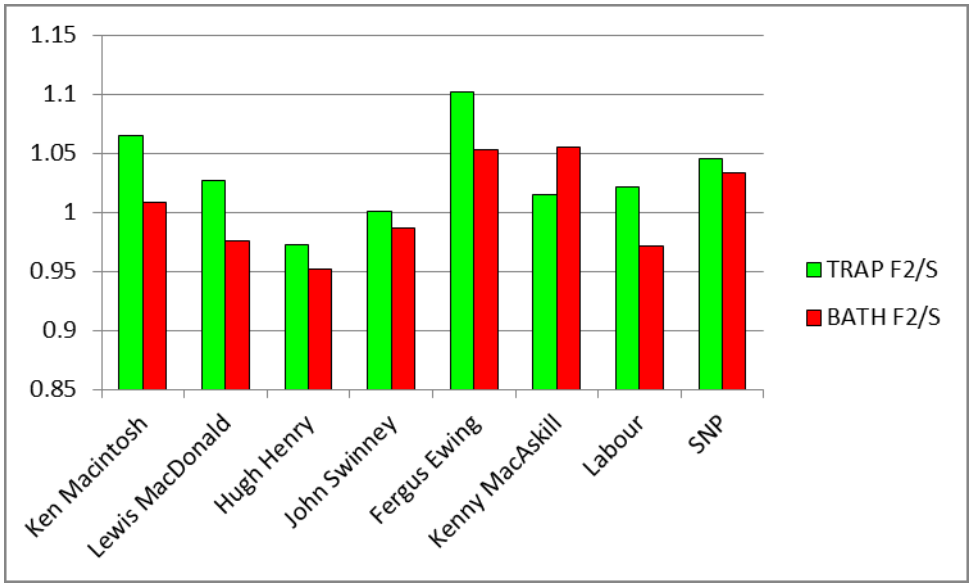


Table 2. Standard Deviation of normalised F1 and F2 for TRAP.

StDev TRAP	Tokens	F1/S	F2/S
Ken Macintosh	67	0.197728	0.098932
Lewis MacDonald	34	0.139119	0.064653
Hugh Henry	62	0.130559	0.066169
John Swinney	68	0.14448	0.081824
Fergus Ewing	97	0.105601	0.062933
Kenny MacAskill	83	0.12718	0.086502
Labour	**163**	**0.173529**	**0.090492**
SNP	**248**	**0.127162**	**0.089393**

Table 3. Standard Deviation of normalised F1 and F2 for BATH.

StDev BATH	Tokens	F1/S	F2/S
Ken Macintosh	14	0.218529	0.066695
Lewis MacDonald	14	0.101634	0.030869
Hugh Henry	29	0.152665	0.056189
John Swinney	22	0.112645	0.092627
Fergus Ewing	25	0.104445	0.063646
Kenny MacAskill	23	0.18781	0.085411
Labour	**57**	**0.16052**	**0.057993**
SNP	**70**	**0.13763**	**0.085624**

Going beyond the descriptive statistics, the present study analyses the data using mixed-effects modelling. Normal regression analysis frequently assumes that the variables making up the data are independent of one another, but this assumption falls short when tokens are grouped according to the speaker. By not including the speaker in the analysis, the results may overestimate external social factors of each speaker. On the reverse side, the inclusion of the speakers during analysis may underestimate the effect that those same speaker-external factors may have on variability (Johnson 2009:363). Mixed-effects modelling

is an excellent way to get around this issue because it is 'a flexible and powerful tool for the analysis of grouped data' (Pinheiro and Bates 2000: vii, cited in Johnson 2009).

Fixed effects are usually the object of interest in mixed effects models, can generally be replicated in other studies, and are often represented by a relatively small number of levels, e.g. SNP/Labour and TRAP/BATH. The random effects in a mixed-effects model are drawn from the wider population (in this case, the individual politicians are drawn from the wider population of their political party), because in repeated studies the individual speakers would likely not be the same. 'For random effects, accounting for the variation in the population is more important than knowing the exact values of individual effects' (Johnson 2009: 365).

The mixed-effects model for the present study was run in R using the *lme4* package found in the *languageR* package (Baayen 2008; Bates 2007; Bates and Sarkar 2007; R core team 2012). The mixed-effects model was performed with the speakers as random effects comparing the fixed effects of political party affiliation and vowel classification of TRAP and BATH in both the F1 and F2. The model was also run adding an interaction effect between political party and vowel classification on the F1 and F2 dimensions. There were no significant results to report from these statistics.

5 Analysis

5.1 Sociophonetic Analysis of MSPs

The analysis of the MSPs beings with a look at the descriptive statistics for the singular CAT vowel for each speaker and party. Following that, each speaker and party will be examined in terms of the separate TRAP and BATH vowels. Given that the inferential statistics gave no significant results, there will be no analysis of those mixed-models for the MSPs.

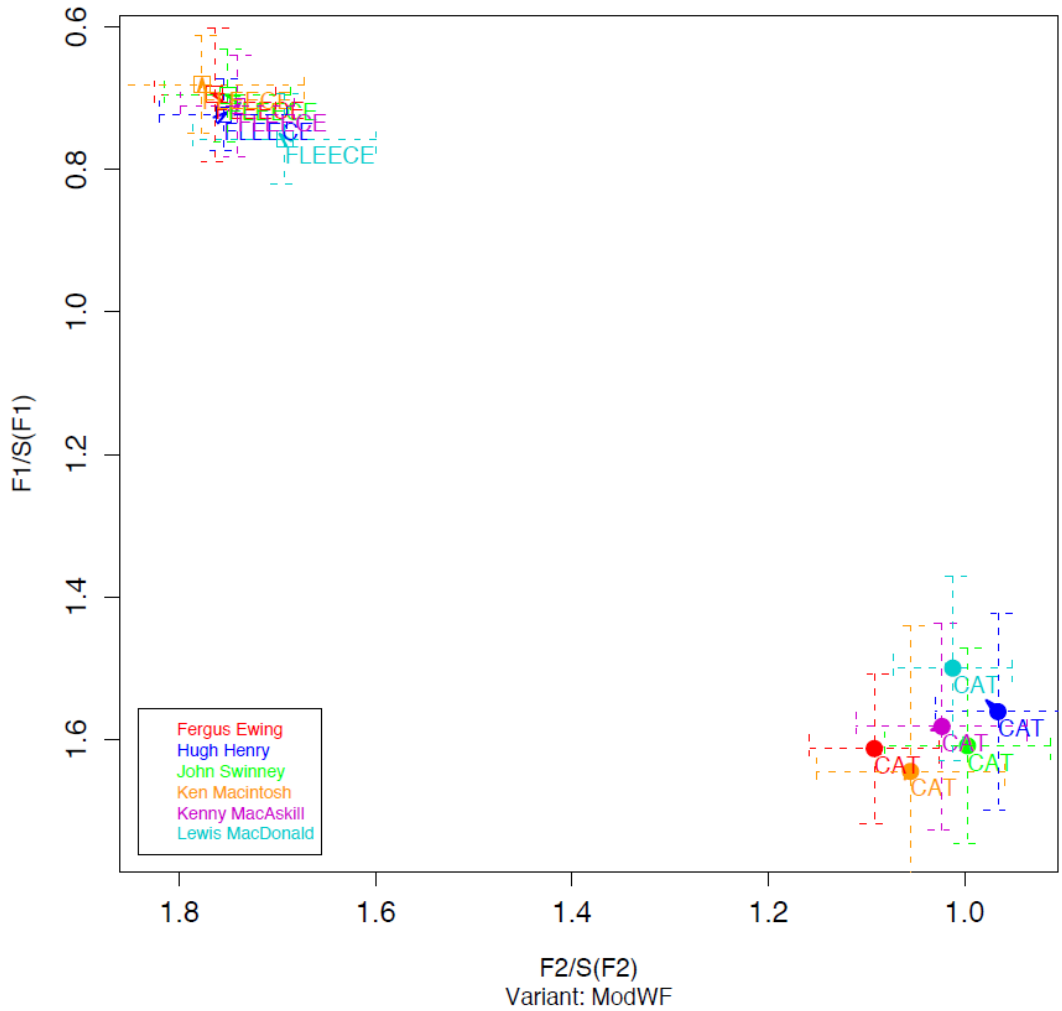
5.1.1 CAT

Briefly mentioned in Section 4 were vowel height and the frontedness/backness of a vowel. In looking at the production of their vowels, frontedness and backness can be seen in normalised F2 values for each speaker where a higher F2 value indicates a more fronted vowel.

Vowel height is based on the normalised F1 value for each speaker, where a low F1 value shows the production of a vowel higher in the vowel space. As seen in Figures 3 and 4, the overall means for CAT show that the vowel is produced slightly higher and backed by the speakers from the Labour Party than the SNP on based on the F1 and F2. However, there does not appear to be any specific patterns based on party affiliation in the mean values of either the F1 or the F2 that would correlate with this occurrence. This lack of pattern can be seen in the highest and lowest mean values of all six politicians. The highest and lowest mean values for F1 both produced by members of the Labour Party. The lowest mean value of is exhibited by Lewis Macdonald (F1/S = 1.499) with the highest being Ken Macintosh (F1/S = 1.64). The highest mean value for F2 is exhibited by Fergus Ewing in the SNP (F2/S = 1.092) and the lowest

is Hugh Henry in the Labour (F2/S = 0.966). Figure 9 plots the normalised mean F1 against the normalised mean F2 values for CAT. But in order to get a better idea of how these MSPs are using their vowel space, it becomes necessary to view each speaker in terms of both the TRAP and BATH vowels separately, which will be done in detail in the following sub-section.

Figure 9. Mean Normalized Formant Values for CAT by Speaker



To best see what the CAT vowel says about each speaker and the party as a whole, we need to look at the values of the standard deviation and the range of the vowel space. The range between the minimum and maximum F1 and F2 is larger for the Labour Party than for the SNP, though for the most part, this can be attributed to the wide vowel range of Ken Macintosh (Figures 1 and 2). The range for the other two Labour politicians is approximately half the size of Ken Macintosh in comparison. For the values of F2, both Lewis MacDonald and

Hugh Henry have the smallest distance between the minimum and maximum out of all six speakers. For the F1 they also possess two of the three smallest ranges; the only person with a smaller F1 range is Fergus Ewing from the SNP. The distance between the minimum and maximum values for the SNP speakers' is very similar on the F2 dimention, each within a few hundredths of a point from each other, but their F1 is slightly more dispersed showing greater variability.

The Standard Deviation for F1 is also slightly larger for the Labour Party than it is for the SNP with a value of 0.1723 compared to the SNP's 0.1293 (Table 1). Ken Macintosh of the Labour Party has the highest standard deviation out of all of the speakers, with the second highest being Kenny MacAskill from the SNP. The standard deviation for F2 does not differ greatly difference between the two parties where the Labour Party has an F2 standard deviation of 0.086 and the SNP has an F2 standard deviation of 0.0886. Again Ken Macintosh and Kenny MacAskill have the largest two values, for the standard deviation of the F2.

This tells us that both Ken Macintosh and Kenny MacAskill are more variable than their party counterparts. Ken Macintosh is by far the most variable member of his party in the production of his CAT vowel. The separation between Ken Macintosh and his other two party members is what makes Mr. Macintosh interesting. Both Lewis MacDonald and Hugh Henry have the smallest F2 range and standard deviation out of all six speakers, meaning that they are the least variable with their vowel production on the F2 dimension. Their F1 standard deviation falls in the mid-range of the six speakers, but is still substantially less than Ken Macintosh. These results show that these two Labour members are less variable in their overall vowel production and more consistent from token to token. For the SNP, Kenny MacAskill is not nearly as variable in his F1 production as the Labours Party’s Ken Macintosh, and though

Kenny MacAskill's F1 and F2 standard deviations may be larger, they do not seem as striking in comparison to the rest of his party.

When examining the results of the CAT vowel, it's easy to see that Ken Macintosh is the most variable of the six politicians studied. While, generally speaking, the politicians from the SNP are all very similar to each other. The two other Scottish Labour MSPs, Lewis MacDonald and Hugh Henry, have a much smaller amount of variation in their vowel production than Ken Macintosh and the SNP. So, what makes Ken Macintosh different? In order to find this out, we turn to the separate values of TRAP and BATH.

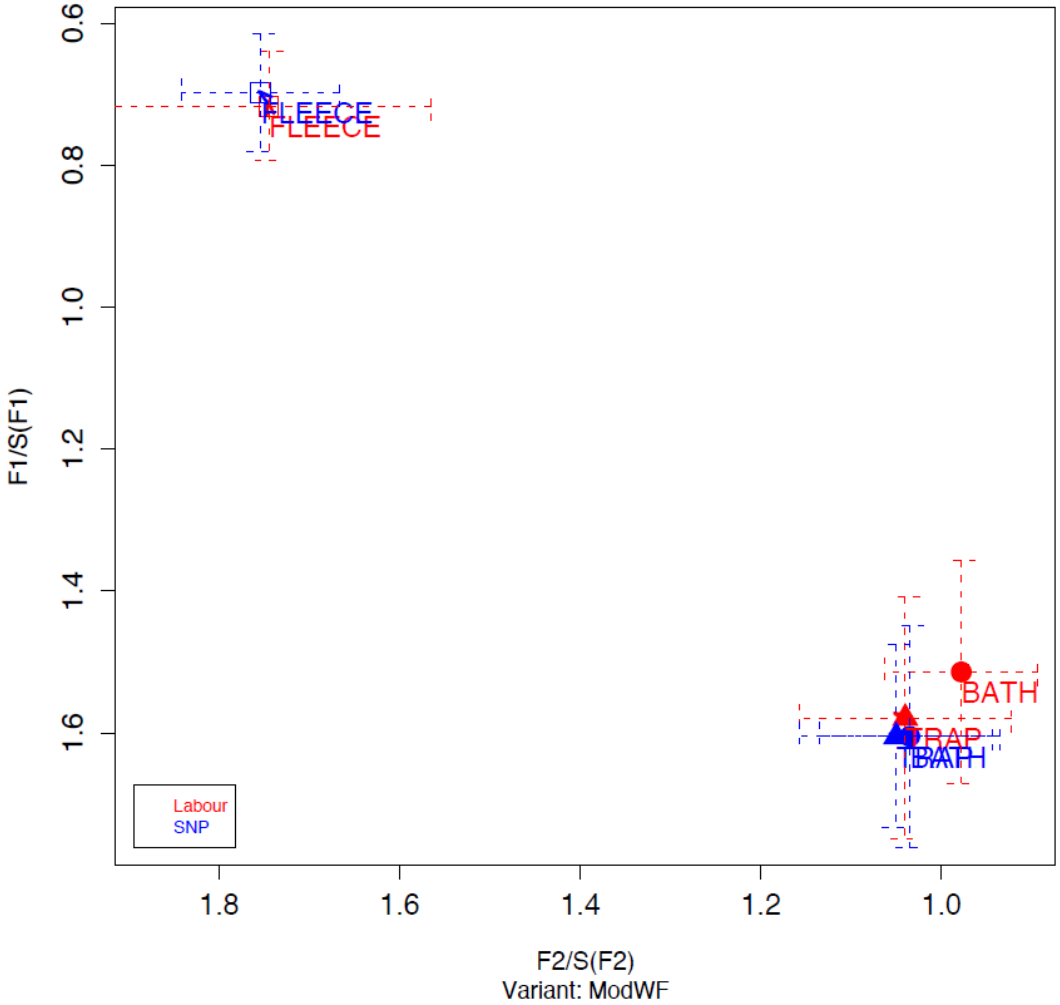
5.1.2 TRAP and BATH

By the application of the TRAP/BATH differentiation to speakers of SSE, we can potentially see how much impact the rest of the UK has on their variability of CAT and whether or not this difference can account for that variance. Again, we begin by looking at the mean values for TRAP and BATH. However, unlike with the CAT vowel, the separation of TRAP and BATH gives a more accurate view of how each speaker is using the overall vowel space. Figure 10 shows a vowel normalised plot for all speakers of TRAP and BATH in both parties.

Though the inferential statistics from the mixed model analysis did not show any significant for this interaction between 'party' and 'vowel', but as Figure 10 shows, there is a visible difference in how the two interact. The mean values for TRAP and BATH for the SNP as well as TRAP for the Labour Party are very close together, but it is apparent that the Labour Party's production of BATH varies in relation to the SNP. To better understand this interaction, it's necessary to look at how the individual speakers are using their vowel space.

The most fronted vowel production of TRAP for all speakers according to the *mW&F* mean values are exhibited by Fergus Ewing (SNP, F2/S = 1.102), Ken Macintosh (Labour, F2/S =

Figure 10. Mean Normalised Formant Values for TRAP/BATH by Party.



1.065), and Lewis MacDonald (Labour, F2/S = 1.027). The more backed vowel production of TRAP occurs with the furthest backed being Hugh Henry (Labour, F2/S = 0.972) followed by John Swinney (SNP, F2/S = 1) and then Kenny MacAskill (SNP, F2/S = 1.014). The vowel production of BATH vowel according to the *mW&F* mean values shows the most fronted speaker to be Kenny MacAskill (SNP, F2/S = 1.055) followed by Fergus Ewing (SNP,F2/S = 1.053), Ken Macintosh (Labour, F2/S = 1.008), John Swinney (SNP, F2/S = 0.987), Lewis MacDonald (Labour, F2/S = 0.976), and finally with the most backed production, again, being Hugh Henry (Labour,

F2/S = 0.952). From these results there is still no pattern that can be seen based on party affiliation. However, looking at vowel height is where it becomes interesting.

For the TRAP vowel, it is much of what has been seen before with no correlation between the vowel height and political party. The highest production of the TRAP vowel happens with Lewis MacDonald (Labour, F1/S = 1.503) followed by Kenny MacAskill (SNP, F1/S = 1.554), Hugh Henry (Labour, F1/S = 1.565), John Swinney (SNP, F1/S = 1.612), Fergus Ewing (SNP, F1/S = 1.615), and the lowest is produced by Ken Macintosh (Labour, F1/S = 1.66). Looking at the vowel height of BATH shows some unexpected results. The highest BATH vowels are all produced by members of the Labour Party starting with Lewis MacDonald (F1/S = 1.482), followed by Hugh Henry (F1/S = 1.537) and Ken Macintosh (F1/S = 1.547). The SNP have the three lowest productions of the BATH vowel. The lowest being Kenny MacAskill (F1/S = 1.603) followed by Fergus Ewing (F1/S = 1.594), and then John Swinney (F1/S = 1.587). Here there is a clear split in the production of the height of BATH based on party affiliation. Given that there is a visible difference between TRAP and BATH for the Labour Party (Figure 10) and the height of BATH appears to be affiliated with party, one may expect to see a correlation between vowel and party. However, these instances are not statistically significant. Figures 11 and 12 show how the TRAP and BATH vowels are realised in the vowel space.

Figure 11 shows the normalised mean values of the TRAP and BATH vowel production for the Labour Party. Based on these values, Ken Macintosh's production of TRAP occurs, on average, lower in the vowel space than the other's in his party (and for all six politicians). His production of BATH also appears to occur in an area where we see the production of TRAP for many of the other politicians. Among the Labour politicians there is greater variation in vowel height than can be seen in the vowel production of the SNP members. Though, admittedly, much of that again has to do with Ken Macintosh.

Figure 11. Mean Normalised Formant Values of TRAP/BATH by Speaker (Labour Party).

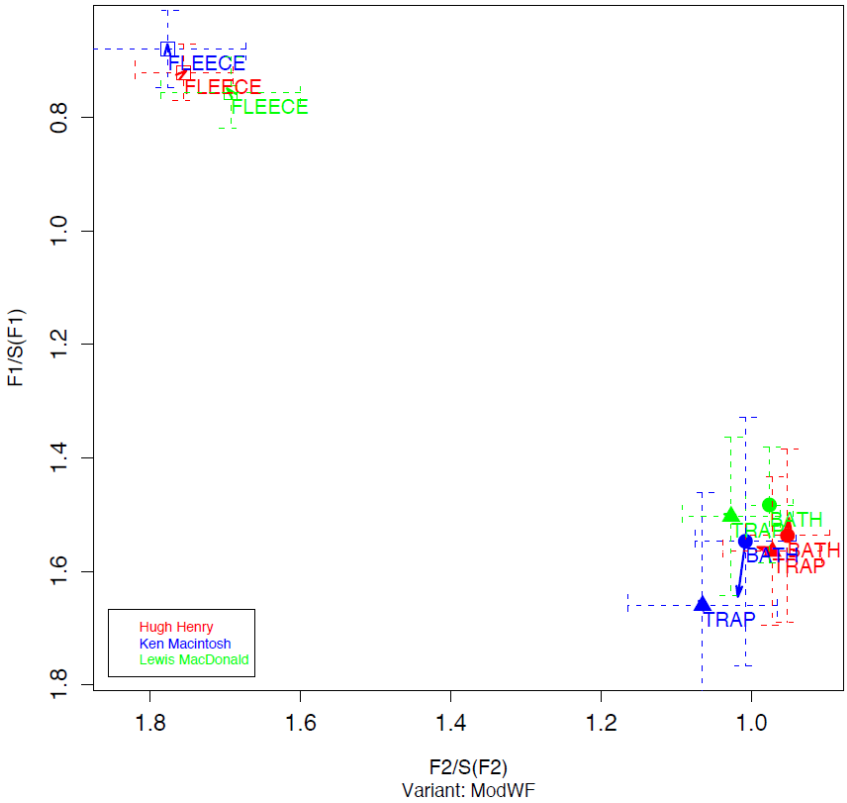


Figure 12. Mean Normalised Formant Values of TRAP/BATH by Speaker (SNP).

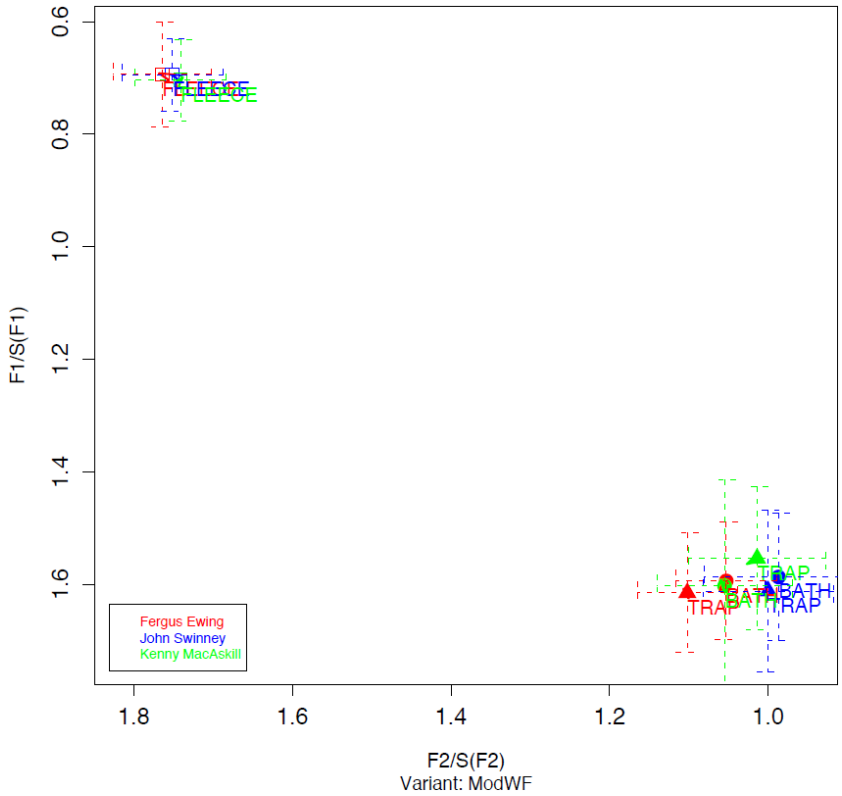
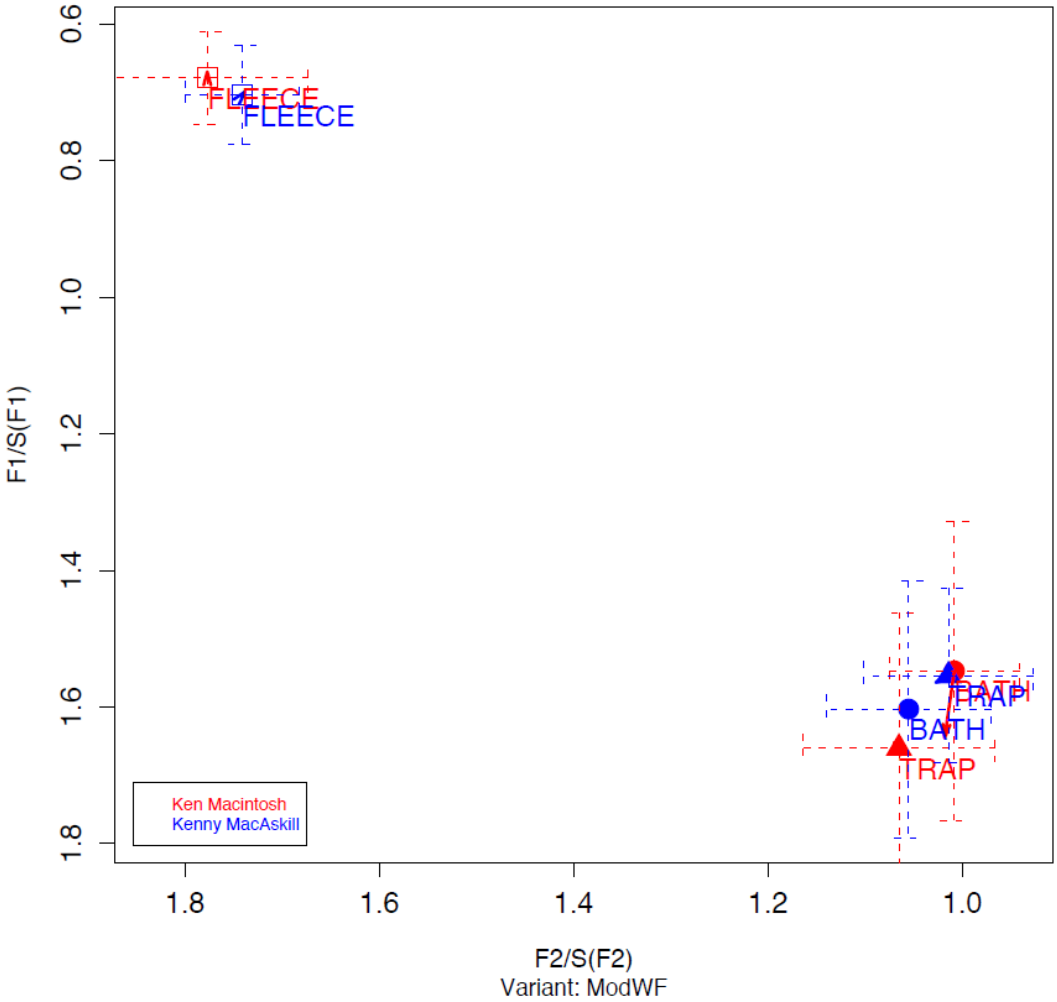


Figure 12 shows the same vowel plot for the SNP politicians. Perhaps the most interesting aspect in the use of the vowel space comes from Kenny MacAskill. His vowel production of TRAP and BATH is opposite from what one would normally see for those two vowels. His production of TRAP is higher and more back in comparison to his production of BATH which is more fronted and a bit lower in the vowel space. Figure 13 shows both Ken Macintosh and Kenny MacAskill's use of the vowel space. In this view it's easier to see where they each produce both the TRAP and BATH vowels.

Figure 13. Mean Normalised Formant Values of TRAP/BATH for Ken Macintosh and Kenny MacAskill.



The standard deviations for the TRAP vowel show the Labour Party to be more variable than the SNP (Table 2). Once again, Ken Macintosh is likely the reason for this as he has the highest standard deviations for both the F1 and F2 for all politicians. This is expected based on the above analysis and is consistent with his production of TRAP in the use of his vowel space. John Swinney (SNP) has the second highest standard deviations on the F1 dimension. The third highest standard deviation is, surprisingly, Lewis MacDonald (Labour) which is interesting because, generally speaking, Lewis MacDonald has some of the lowest standard deviations across the F1 and F2 for CAT as well as TRAP/BATH.

The standard deviations of F2 for TRAP show that Fergus Ewing, Lewis MacDonald, and Hugh Henry are the least variable speakers. Ken Macintosh is the most variable speaker for the F2 of TRAP followed by Kenny MacAskill and John Swinney. The F2 standard deviations for BATH however, are a bit different (Table 3). The F2 of BATH is more variable in the SNP speakers (StDev. F2/S = 0.086) than if it is for the Labour Party (StDev. F2/S = 0.058). The F2 of BATH is the first and only instance where Ken Macintosh is not the most variable of the six MSPs. John Swinney has the highest standard deviation in this instance followed by Kenny MacAskill, but again, Lewis Macdonald and High Henry are the least variable.

The overall analysis of the variability of CAT through the TRAP/BATH distinction in the vowel space of the MSPs revealed several key findings. First is that Ken Macintosh has a wider range of the F1 and F2, and has a higher standard deviation than the rest of the MSPs. The Labour Party's wider F1 and F2 range can also be explained by Ken Macintosh, because Lewis MacDonald and Hugh Henry were generally and consistently the least variable of the six politicians. Next is that Kenny MacAskill's production of the TRAP/BATH vowels is quite odd in that they are inversely switched in their positions in the vowel space. Lastly, the vowel production of BATH is higher for all of the Labour Party MSPs than for the SNP, yet there is no

statistical significance between 'vowel' and 'party' for this instance. The potential reasoning for this will be examined in Section 6.

5.2 Analysis of MSPs and MPs

5.2.1 Brief Overview of Westminster Findings

The Scottish MPs at Westminster were shown to have more statistically significant results than that of the MSPs at Holyrood. Before looking at the combined data we briefly examine the results found at Westminster. The token selection, vowel normalisation method, descriptive statistics and mixed-effects inferential statistic methods are the same as described in Sections 3 and 4. The *mW&F* normalised mean data and token count for the MPs which can be seen in Table 4 is from Hall-Lew *et al*. (in preparation).

The results from Westminster are based on ten Scottish MPs; five from the SNP and five from the Labour Party. The MPs in question are Stewart Hosie, Angus MacNeil, Angus Robertson, Michael Weir, and Peter Wishart representing the SNP, and the MPs for the Labour Party are Douglas Alexander, Gordon Banks, Tom Harris, Jim McGovern and Jim Murphy. The descriptive statistics for the CAT vowel found the MPs from the Labour Party to have a slightly larger standard deviation than the SNP for both the F1 and the F2. Here, Jim Murphy (Labour) and Angus Robertson (SNP) have the highest values for the standard deviation of F1. Douglas Alexander (Labour) and Angus Robertson (SNP) have the highest values for the standard deviation of F2. Even though the Labour has an overall higher standard deviation, there is no party specific pattern that can account for this.

Table 4. Token Count and Normalised Mean Values of Westminster Speakers.

Party	Name	Vowel	Tokens	Mean F1/S	Mean F2/S
Labour	Alexander	CAT	102	1.573	1.0465
Labour	Banks	CAT	46	1.58	1.0435
Labour	Harris	CAT	53	1.567	1.0625
Labour	McGovern	CAT	30	1.598	0.9325
Labour	Murphy	CAT	77	1.6145	1.1925
SNP	Hosie	CAT	81	1.5825	1.077
SNP	MacNeil	CAT	70	1.6025	1.0045
SNP	Robertson	CAT	52	1.604	1.086
SNP	Weir	CAT	68	1.6685	1.086
SNP	Wishart	CAT	51	1.716	1.05
Labour	Alexander	TRAP	73	1.609	1.09
Labour	Banks	TRAP	36	1.548	1.095
Labour	Harris	TRAP	38	1.607	1.075
Labour	McGovern	TRAP	16	1.582	0.939
Labour	Murphy	TRAP	60	1.597	1.195
SNP	Hosie	TRAP	55	1.645	1.084
SNP	MacNeil	TRAP	60	1.623	1.017
SNP	Robertson	TRAP	34	1.628	1.134
SNP	Weir	TRAP	49	1.666	1.099
SNP	Wishart	TRAP	41	1.66	1.049
Labour	Alexander	BATH	29	1.537	1.003
Labour	Banks	BATH	10	1.612	0.992
Labour	Harris	BATH	15	1.527	1.05
Labour	McGovern	BATH	14	1.614	0.926
Labour	Murphy	BATH	17	1.632	1.19
SNP	Hosie	BATH	26	1.52	1.07
SNP	MacNeil	BATH	10	1.582	0.992
SNP	Robertson	BATH	18	1.58	1.038
SNP	Weir	BATH	19	1.671	1.073
SNP	Wishart	BATH	10	1.772	1.051

The mean values for the Labour Party are slightly more fronted than those for the SNP on the F2. However, there is a pattern seen based on party affiliation for the F1 as all five Labour Party speakers have smaller a smaller F1 mean value than the five SNP speakers. The range (not shown in table) for F1 and F2 is larger for the Labour Party than for the SNP, and Douglas Alexander (Labour) has the largest range out of the ten MPs.

When examining the results of the inferential statistics the SNP have significantly lower vowel production than that of the Labour Party on the F1 ($p < 0.008$). However, political party affiliation is only a predictor for the singular CAT vowel, as adding the TRAP/BATH distinction as a main effect or an interaction effect does not improve its significance level. The results also show that TRAP is slightly lower than BATH, but does not reach a level of significance.

The variance found on the F2 dimension among the Scottish MPs found that the TRAP is significantly more fronted than BATH ($p < 0.0027$) correlating with the distinction between TRAP and BATH, though no party has adopted a full TRAP/BATH split. As an interactional effect political party does account for some of the variation when considering the following phonological environment as an interaction effect ($p < 0.0036$). However, like the MSPs political party is not significant as a main effect. A main effect of party on F2 would be mean that one party has fronted CAT vowels than the other. An interaction effect between political party and the phonological environment of the word on F2 means that one party has a variable production of CAT that can be accounted for by the following consonant, while the other party does not. In other words, one party (Labour) exhibits allophonically regular variation in the CAT vowel, the other (SNP) does not. Since Labour have a wider F2 range than SNP, this seems to suggest that SNP are just not all that variable in F2.

5.2.2 Westminster and Holyrood - CAT

The comparative analysis between Holyrood MSPs and Westminster MPs is based on the descriptive statistics from both parliaments. The mean values for CAT show that the overall F2 values are slightly more fronted for the corresponding parties in Westminster than they are in Holyrood. The F1 values also show that Westminster MPs produces lower vowels than their Holyrood counterparts, but there is a greater difference between the corresponding SNP speakers than there is for the Labour Party. Based on the highest mean values of the F2 for CAT, an consequently the most fronted overall vowel production, the top five speakers are, Jim Murphy (Westminster, Labour), Fergus Ewing (Holyrood, SNP), Angus Robertson (Westminster SNP), Michael Weir (Westminster, SNP), and Stewart Hosie (Westminster, SNP). The five speakers with the lowest F2 for CAT, and thus more backed vowel production are Jim McGovern

(Westminster, Labour), Hugh Henry (Holyrood, Labour) John Swinney (Holyrood, SNP) and Angus MacNeil (Westminster, SNP), and Lewis MacDonald (Holyrood, Labour).

For the F1 for CAT the people who produce, on average, the highest vowels in the vowel space are Peter Wishart (Westminster, SNP), Michael Weir, (Westminster, SNP), Ken Macintosh (Holyrood, Labour), Jim Murphy (Westminster, Labour), and Fergus Ewing (Holyrood, SNP). The lowest vowel production is seen in Lewis MacDonald (Holyrood, Labour), Hugh Henry (Holyrood, Labour) Kenny MacAskill (Holyrood, SNP), Tom Harris (Westminster, Labour), and Douglas Alexander (Westminster, Labour). While there are no patterns that can be seen from these values it helps to illustrate that overall, the speakers of Westminster tend to produce their vowels slightly more fronted than those of Holyrood and are also slightly lower in the vowel space than their party counterparts. This finding is odd because RP speakers generally have fronter and higher vowels, whereas Scottish speakers generally produce their vowels backer but lower. This is a crossing of cues which is difficult to interpret from a sociolinguistic perspective.

The vowel range for each party for CAT shows both the SNP and Labour Party from Holyrood with a greater overall range for both the F1 and F2. Looking at the standard deviations shows that MPs from the Labour party has more variation on the F2 than the MSPs. On the F1 dimention, however Scottish Labour MSPs exhibit more variation here with a higher standard deviation than the Scottish Labour MPs. The inverse is true of the SNP with MSPs showing more variation in F2, and less variation in F1 than the SNP MPs.

5.2.2 Westminster and Holyrood – TRAP/BATH

The results of TRAP and BATH tend to get a bit more complicated when looking at both political party affiliation and parliament. In terms of the TRAP and BATH vowel, the key factor is

the distance in F1 and F2 for each of the four subsets (Holyrood Labour Party, Holyrood SNP, Westminster Labour Party, Westminster SNP). On the F2, the distance between TRAP and BATH is similar for both Labour Parties, as well as the two corresponding SNP groups. Though the distance between TRAP and BATH for both Labour Parties is greater than it is for the SNP. For the F1 the distances between TRAP and BATH are much more mixed.

Overall, the Scottish MPs tend to produce a more fronted TRAP vowel than that of the MSPs for both parties Labour and SNP, with the mean values of Westminster being larger than the MSPs of both the SNP and the Labour Party. The same can be seen for BATH as in TRAP with the overall mean values. Westminster MPs tend to front the BATH vowel more than the MSPs. In terms of vowel height, for BATH we see the MSPs of Holyrood produce higher vowels than their Westminster counterparts.

Though the most interesting, and unexpected, results can be seen on the F1 in the production of TRAP. The people who produce the highest TRAP vowels are Lewis MacDonald (Holyrood, Labour), Gordon Banks (Westminster, Labour), Kenny MacAskill (Holyrood, SNP), Hugh Henry (Holyrood, Labour), and Jim McGovern (Westminster, Labour). The lowest productions of TRAP based on the mean F1 are Michael Weir (Westminster, SNP), Peter Wishart (Westminster, SNP), Ken Macintosh (Holyrood, Labour), Stewart Hosie (Westminster, SNP), and Angus Robertson (Westminster, SNP). For the F1 of the TRAP vowel there is a very clear party split in the mean values for each speaker, with the Labour Party for both Westminster and Holyrood producing TRAP vowels that are higher in the vowel space than all of the SNP MPs and MSPs - with two exceptions. As mentioned above, Ken Macintosh and Kenny MacAskill are the two most variable speakers from the MSPs. They are also the only two speakers who do not follow the same pattern as the other MPs and MSPs.

The data from the Westminster MPs and the Holyrood MSPs was also examined using a mixed-effects model in a combined dataset containing all ten MPs and the six MSPs. These inferential statistics did not show any significant results when testing for the variation on F2. However, when testing for the variance of F1, they did reveal some interesting results. Testings to see if political party affiliation would predict the variance in F1 by itself with speaker as a random effect accounts for variance in F1 at $t = 2.6$. Similarly, testing to see if the TRAP/BATH differentiation would account for the variance with speaker as a random effect shows that is accounts for some of the variability at $t = 2.28$. When testing for party and vowel class as fixed effects, by adding 'vowel' to 'party' main effect it improves the fit of F1 ($p < 0.02264$). While adding the 'party' to the 'vowel' main effect for F1 with speaker as a random effect improved the result ($p < 0.0096$). However, testing F1 with 'vowel' and 'party' while adding an interaction effect between 'vowel' and 'party' does not improve the results beyond the vowel and party main effects. Not surprising is that testing to determine if the differences between Holyrood and Westminster could account for the F1 variance returned no signicant results. Though, adding parliament to 'vowel' and 'party' effects does approach significance ($p <0.0866$).

6 Discussion

The social meaning associated with this variability is anything but certain. “Meanings will shift and adapt dependent upon the wider style in which social and linguistic resources are used” (Moore 2012: 222). The following section analyses the social meanings of the variability of CAT and TRAP/BATH, keeping this in mind.

Based on the data in this present study we have to assume that if variability in the production of the Scottish CAT vowel indexes identity factors or social meanings, those factors and meanings have more to do with national identity than they do for political identity. This can be seen in the lack of any significant results for the F2 in the mixed-effects model statistics when looking at just the MSPs. The exception to this is when looking at the combined Westminster and Holyrood dataset which shows a correlation between F1 variance and political party in the Westminster and Holyrood combined dataset.

The statistically significant results of the combined Westminster and Holyrood dataset show that the Scottish politicians are utilising their vowel space in a predictable manner based on political party affiliation. Even though the politicians lack a TRAP/BATH split, the variance on F1 for CAT may feature elements that enable them to index this variability, and align themselves and their political identity how they see fit. If this variability of F1 is indexed in the minds of the politicians, it would provide further evidence of phonetic variability indexing political party affiliation.

The MSPs by themselves however, lack of any significant results, which is not necessarily surprising. The MSPs were born, raised, and work in Scotland, so the influence of

SSE surrounds their everyday lives. Being in the Scottish Parliament, they would have less motivation to adopt the differentiation of TRAP and BATH than the Westminster MPs who have a much greater need to negotiate between their Scottish identity and their political identities; this is especially true of Labour Party politicians. The results of this are seen in the analysis of the Westminster study, where political party affiliation accounts for the strongest predictor of variance amongst the MPs (Hall-Lew *et al.* in preparation).

The two most interesting speakers from Holyrood were obviously Ken Macintosh from the Labour Party and Kenny MacAskill from the SNP. What is interesting is what makes these two unique. Ken Macintosh is the only one of the six MSPs to have worked outside of Scotland before he began his political career. From 1987 to 1999 he worked as a television producer for the BBC. The BBC in the mid-1980's had a policy of employing speakers with an RP accent or a *modified* regional accent (Collins and Mees 1984: 5). Though, since the 1990's there has been a "noticeable increase in the use of local accents at the national level" (Crystal 2010, 32). Ken Macintosh's time at the BBC likely would not have been long enough to drastically alter his speech, especially considering he has been back in Scotland since his election in 1999. Though it may have possibly made him more aware of the salient distinction between TRAP and BATH. Because of this, it is possible that he is attempting to vary his vowel production according to the wider range seen in RP speakers. This, however, is by no means certain because of the multitude variables that need to be taken into account when looking at the construction of identity.

Kenny MacAskill's realisation of the TRAP and BATH vowels differs from what one would normally expect to see. While this is interesting, the explanation for this is not self-evident as not all variation is obviously explainable. Being a member of the Scottish Parliament he is very much in the public sphere, and therefore needs to accommodate to more audiences; add to

that the fact that the UK standard for national English patterns is to have a TRAP/BATH split, especially for politicians, since those norms come from Southern Standard English. Since language variation is a resource for the construction and negotiation of identity, people who have a greater need to negotiate between a large number of contexts and audiences will, theoretically, be more predictable.

The SNP members show very little variation in the production of CAT as seen in their standard deviations. The SNP as a party have a very clear stance on their political aims in Scotland; least of which is Scottish independence. But more than that, the SNP are defined by their national identity. The SNP's view as being "'Scottish not British' - is associated with more uncompromising views on party strategy" (Mitchell et at. 2012: 136). Because these SNP MSPs need to represent both their national identity and political identity - both of which are, in many ways, bound to each other - the lack of variance between them may suggest that their identities are being maintained at the party level. The SNP's variation in the production of CAT could be a possible index of 'Scottishness,' however further research of a wider range of SNP MSPs in Holyrood is needed before that claim can be made.

7 Conclusion

This study has looked at the phonetic variance of Scottish MPs in Holyrood based on their use of the vowel space for the lexical set of CAT, while further applying the lexical sets of TRAP and BATH to further examine the extent that the TRAP/BATH distinction can account for the variance of CAT. Findings reveal that members of the Labour Party are more variable in their production of F1. The data also reveals that for the lexical set of BATH there is a clear pattern between the two parties with the Labour Party producing vowels that are higher and more backed in the vowel space than the SNP. The SNP have very little distinction between the TRAP and BATH. It has been argued that this is due to their stance as a political party, and could potentially be an index of their political and national identities. The results from the MSPs in Holyrood have also been examined in combination with the data from MPs at Westminster. These results suggest that there is a correlation between political party affiliation and variance in F1, which adds to the conclusions drawn in previous studies of phonetic variation acting as an index of political party affiliation. Though it's important to acknowledge that these results only occurred when the two separate parliaments were analysed together, and did not occur when looking solely at the MSPs.

Like many studies, the scope of this research has been limited by time, leaving many possibilities for future research. The study of the Westminster politicians revealed a significant interaction between political party affiliation and the phonological environment in which the tokens occurred. The data from the MSPs did not take this into account due to time constraints, but it may reveal further evidence of the correlation between political identity and phonetic variation. It is also possible that taking other variables into account could produce

meaningful results, such as the duration of the vowels according to the Scottish Vowel Length Rule (Scobbie *et al*.1999, 2006) or rhoticity.

The SNP's political stance as a Scottish government for Scotland and their ideology regarding the future of Scotland may help explain the lack of variability by the SNP MPs in the highly constrained format of parliamentary speaking. At the same time the amount of variability exhibited by the Labour Party MSPs may be due to their greater need to negotiate their identity as being both Scottish and part of the larger UK party. However, any correlations gathered from these possibilities must also be viewed with some scepticism. There are numerous linguistic and social variables that the present study cannot account for, and as such these claims are by no means the definitive answer. The linguistic construction of identity is ultimately a very complex process, and the MSPs are actively engaged in this process while attempting to maintain their political and national identities.

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