A phonetic analysis of back vowel raising in Dublin English

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1. ABSTRACT

This study uses acoustic phonetic techniques to verify reports of back vowel raising in Dublin English and re-interpret those changes. Hickey [9] describes the raising of a series of back vowels as characteristic of a new variety of Dublin English. He interprets this raising as a shift away from the open realisations of vernacular forms of Dublin English. This study confirms the presence of a broad pattern of back vowel raising between two generations of Dubliners, observing NORTH raising along with social stratification of THOUGHT that does not appear to be a recent development. The results suggest, however, that inner city Dubliners are participating in NORTH raising, and that the STRUT/FOOT contrast is being lost among middle-class Dubliners. These developments weaken the argument that ongoing change constitutes divergence from vernacular forms of Dublin English, suggesting instead a broader reconfiguration of the vowel systems of Dublin English.

Keywords: Dublin English phonology, Irish English

2. INTRODUCTION

Descriptions of Dublin English phonology have been published by Bertz [3, 4] and Hickey [9], while Wells [15] includes several observations on Dublin English in his description of varieties of English. All three authors describe linguistic differences between men and women, as well as between younger and older subjects. Bertz also describes linguistic differences between different working class areas of Dublin. Both Wells and Bertz describe Dublin English as a continuum between a vernacular variety of Dublin English and an 'educated' variety. Hickey similarly describes 'Local' and 'Mainstream' varieties of Dublin English. Local Dublin English is described as stigmatised, largely confined to the capital city and extremely conservative, probably unchanged in its salient features since the introduction of English before 1200 [9]. Hickey argues that its conservativeness and relative homogeneity are a result of the tightly knit structure of the community in which it is spoken. In contrast, Bertz and Hickey agree that middle class Dubliners speak a variety of Irish English that is widespread around Ireland. Hickey argues that this variety has functioned as an unrecognised national standard.

Bertz similarly argues that it is difficult to identify a middle-class Dubliner's regional origins from their speech alone.

Hickey [9] argues that the back vowels LOT, THOUGHT, NORTH and the onset of CHOICE are raised among Dubliners born after approximately 1970, arguing that these changes are a shift away the open realisations typical of vernacular forms of Dublin English [8][1]. Several of these realisations are, however, noted in earlier work by Wells and Bertz, which may suggest that they are somewhat older than is described by Hickey. Wells [15], for example, describes strongly raised tokens of THOUGHT, LOT and NORTH as an "affectation" of university-educated Dublin women. Similarly, a NORTH/FORCE merger is described by Hickey as a result of New Dublin English NORTH raising, but a NORTH/FORCE merger is also reported by Wells and Bertz. None of the existing research includes a detailed, quantitative description of the variation observed, however. It is therefore impossible to assess the degree to which these authors' descriptions capture the typical realisations found in their data sets. This limitation suggests the need for a more transparent, quantitative analysis of Dublin English phonology.

3. AIMS

This paper uses acoustic phonetic techniques to describe inter-generational change in the vowel systems of residents of three areas of Dublin city. It will discuss the extent to which ongoing change in the back vowels of Dublin English can be viewed as divergence from vernacular varieties of Dublin English

3. METHODS

Participants were recruited in the city's north, southeast and inner city. These areas were chosen based on an assessment of the socioeconomic and historical differences between these three areas, combined with an investigation of Dubliners' folk linguistic perceptions of variation in Dublin English [13, 14]. The southeast and inner city were found to be long-established areas that differ dramatically in socioeconomic class. In contrast, the northern suburbs were found to be more recently established and socioeconomically intermediate. The investigation of Dubliners' folk linguistic

perceptions revealed that Dubliners perceive a clear linguistic difference between residents of the southeast and those resident elsewhere in the city. In contrast, a somewhat less clear linguistic difference is perceived between northside Dubliners and inner city Dubliners

73 participants were interviewed and grouped by sex, area of residence and whether they were younger or older than the median age of 40, as seen in Table 1. The uneven distribution of subjects in the groups is factored into the analysis outlined below. Participants were interviewed in pairs, with most completing a sociolinguistic questionnaire, map drawing tasks, a semi-structured interview and a series of map guiding tasks designed to elicit tokens of each of vowels and consonants under investigation (Details in [13]). This kind of map guiding task has previously been used to produce relatively natural speech, while retaining substantial control over the variables produced [2].

Table 1: List of participants

Area	Age group	Gender & no.
Northside	Older	Male: 5, Female: 7
	Younger	Male: 10, Female: 8
Southside	Older	Male: 7, Female: 6
	Younger	Male: 3, Female: 7
Inner city	Older	Male: 3, Female: 5
	Younger	Male: 6, Female: 6

This paper focuses on an analysis of the back vowels prompted by the map leading tasks. Each target word was separated into an individual sound file. The beginning of each vowel was determined by the onset of voicing (where preceded by a voiceless consonant) or by a sudden change in intensity or formant values. The end of each vowel was determined by the loss of voicing (where the following consonant was voiceless) or by a sudden drop in intensity. The beginning and end of each vowel could be easily identified because almost all cases they were both preceded and followed by a stop or fricative. F1 and F2 values were extracted at 25% and 75% time points within the vowel. The 25% point was taken to be the target for monophthongs while the 25% and 75% points were taken to be the onset and offset for diphthongs. The 75% was also used to measure the degree of offglide present on monophthongs. In all cases the spectrograms were visually inspected. Where necessary the locations of the measurement points were adjusted to obtain a measurement of relatively stable formant values.

In order to accurately track subjects' vowel formants, it was necessary to tailor the number of formants and the frequency range in which they were tracked, as recommended by Wood [16]. Lobanov normalisation [12] was used to remove the effects of physiological differences (such as the longer vocal tracts of men) on these measurements while retaining sociolinguistic differences. The effectiveness of this technique has been demonstrated in several studies [5, 1, 6]. Normalisation was accomplished using the Vowels package [10] for the R statistics and graphics package.

The normality of the distribution of F1 and F2 values for each lexical set in each age/gender/area sampling group was measured using a series of Shapiro-Wilks tests. This analysis determined that the distributions of a minority of lexical sets' F1 and F2 values were non-normal. The variance of F1 and F2 in each lexical set and sampling group was similarly investigated with a series of Levene's tests. Again, a minority of groups showed unequal variances. As the sample sizes are unequal, the assumptions of ANOVA and Tukey's HSD were judged to be seriously violated and the data was instead analysed using the non-parametric Kruskal-Wallis and max-t tests [7]. These tests were used to determine whether significant differences in vowel height, fronting or duration existed between the realisations of lexical sets by different age/gender/area-stratified groups.

4. RESULTS
4.1 THOUGHT and LOT
When THOUGHT and LOT are compared, in Figure 1 it becomes clear that a vowel height contrast exists for southsiders but not inner city Dubliners or northside men. In addition, female northsiders of both age groups have a higher realisation of THOUGHT than LOT. The lack of significant differences in vowel height between younger and older subjects suggests that THOUGHT is a stable sociolinguistic variable[2], and that high variants of the lexical set are not a recent phenomenon. It should be noted, however, that younger southside women are very variable in THOUGHT height, which may suggest that some members of this cohort are leading a trend towards even higher THOUGHT vowels.

Figure 1: Lobanov-normalised F1 values for LOT and THOUGHT in Dublin English speakers.

Height of LOT and THOUGHT
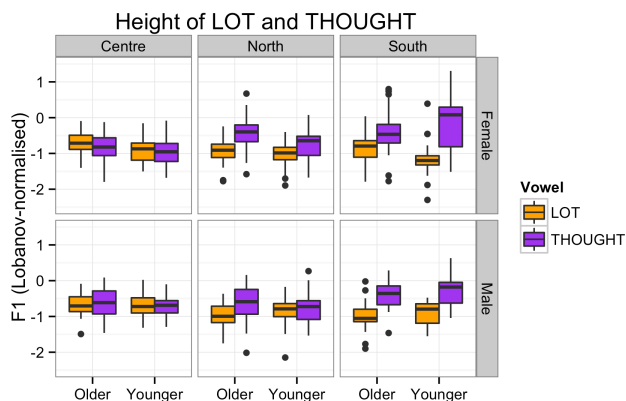
High variants of THOUGHT are also noted by Wells [15] as stereotypically associated with university educated Dublin women. Further research is required to investigate when these realisations developed in Dublin English. It has been widely observed that in the case of stable linguistic variables, women will typically favour the high-status variant [11]. In the case of THOUGHT, an investigation of Dubliners' folk linguistic beliefs has suggested that this variant is strongly associated with the affluent 'Dublin 4' postcode [14]. This is strongly associated with affluent Dubliners. It is therefore unsurprising that northside women would use the variant while northside men do not. Finally, no evidence of ongoing change in LOT was observed in this study.

4.2 NORTH and FORCE
Almost all older subject groups have a higher realisation of FORCE than NORTH (p<0.01), although older southside men's realisations only near a significant difference (p=0.0785). However, for almost all younger Dubliners this contrast has been lost[3]. These results provide substantial evidence in support of the ongoing merger of NORTH and FORCE described by Hickey [9]. Hickey describes this shift as a move away from vernacular varieties of Dublin English, however, which makes the participation of inner city Dubliners in this shift highly surprising. This participation is particularly striking given the fact that inner city Dubliners are affected by few of the vowel changes observed in northsiders and southsiders [13].

4.3 FOOT and STRUT
Previous accounts of Dublin English describe the lack of a FOOT/STRUT contrast as a characteristic of vernacular varieties of Dublin English. This contrast is seen in older southside and northside participants in Figure 2 but not their inner city counterparts, as would be expected based on the existing literature. What is surprising, however, is that the contrast is much diminished in the younger generation. Older southsiders' and northsiders' STRUT and FOOT were confirmed to differ significantly (p=1x10^{-5}) in height. In contrast, there is no significant difference between the FOOT and STRUT realisations of younger northside[4] or southside women, but younger northside and southside men appear to retain a relatively clear difference between the two (p<0.01).

Figure 2: Lobanov-normalised F1 values for FOOT and STRUT in Dublin English speakers.

Height of FOOT and STRUT
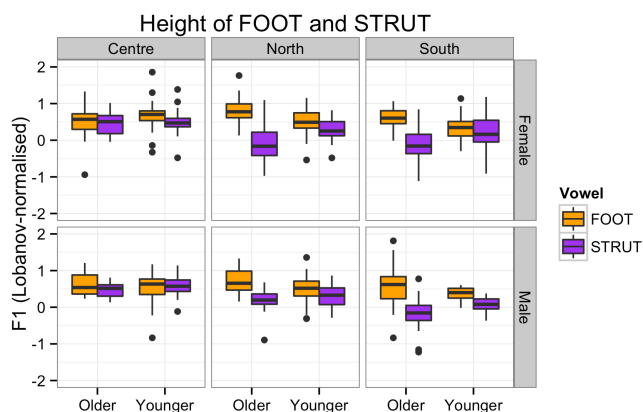
5. DISCUSSION
This paper has found substantial evidence of back vowel raising in Dublin English. This provides substantial support for Hickey's [9] description of Dublin English, although this study differs substantially in its description of several lexical sets. Hickey characterises back vowel raising in Dublin English as a shift away from the realisations of Local Dublin English (and Irish English more broadly). Relatively little of the observed variation can be unambiguously interpreted as maximising this linguistic distance, however. This paper has found reasonably clear evidence of NORTH raising, but inner city Dubliners appear to be participating in this shift. This weakens the argument that these shifts serve to increase the linguistic distance from Local Dublin English and appears to be suggestive of a broader shift in the back vowels of Dublin English across the social spectrum. This study also observes the ongoing raising of STRUT, substantially reducing the FOOT/STRUT contrast that was a clear difference between vernacular and non-vernacular varieties of Dublin English. This further weakens the argument that ongoing change is a simple case of divergence from vernacular varieties of Dublin English. This vowel raising appears to be part of a broader pattern of back vowel raising and front vowel lowering in Dublin English [13].

7. REFERENCES

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[1] He also describes GOAT and MOUTH onset fronting, but these are not addressed in this paper. See Lonergan (2013) for a detailed discussion, as well as analysis of CHOICE raising.

[2] All southside groups have a substantially higher realisation of THOUGHT than LOT ($p<0.001$). Younger ($p<0.01$) and older ($p<0.001$) northside women are the only other groups to have a significantly higher THOUGHT than LOT.

[3] Only younger northsiders have a higher realisation of FORCE than NORTH, and these differences are barely significant ($p=0.0451$ for men and $p=0.04974$ for women

[4] Younger northside women's realisations of FOOT and nearly significantly higher than their realisations of STRUT ($p=0.084$)