DRESS down: /ɛ/-lowering in apparent time in a rural Scottish community

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ABSTRACT

This paper presents a sociophonetic investigation of /ɛ/-lowering in apparent time. The data come from 24 speakers, across three generations from Buckie, northeast Scotland (12 males, 12 females). Acoustic analysis of the DRESS-vowel reveals that it is lowering in apparent time. Inspection of the constraints reveals an interaction of internal and external constraints. Analysis of the phonetic context revealed that following-l promoted DRESS lowering. However, this conditioning was only significant for the young females who were shown to be leading the change. The results presented here are related to broader phonological characteristics of the Buckie dialect as well as ongoing changes in a number of different English varieties.

Keywords: language change, sociophonetics, apparent time, dialectology, DRESS-lowering

1. BACKGROUND

Recent studies into a number of distinct and unrelated dialects have demonstrated parallel shifts in the lowering of the short-front vowels. One element of this shift involves the lowering of /ɛ/ (which corresponds to the DRESS lexical set [13]). DRESS-lowering has been reported for Irish English [4]; London English [11], as well as northern varieties of North American English [6], including Canadian varieties [1, 3].

Although the varieties are unrelated, the development of these changes share a number of features. For instance, DRESS-lowering tends to exhibit a degree of phonetic conditioning [4]. Further, the majority of studies report that young females are leading the change [1, 3, 4, 11]. Taken together, these findings may suggest that these shifts qualify as 'changes from below' in a Labovian sense [7].

Initial observation of a dialect spoken in a small community in north east Scotland demonstrates that DRESS may be lowering here too. In this paper we investigate this observation further. We frame this investigation in terms of the following research questions:

- Is DRESS-lowering a change in progress in Buckie? In other words, is DRESS lowering significantly in apparent time?
- How is this change conditioned by external and internal factors?
- How does this change relate to more global vocalic shifts ongoing in Buckie, and other dialects exhibiting DRESS-lowering?

2. METHODOLOGY

Sample

The data come from a set of digital recordings of sociolinguistic interviews [8] conducted by a community insider during 2013-14 [10]. The sample of 24 speakers is evenly stratified across age and gender.

	Old	Middle	Young
Male	4	4	4
Female	4	4	4

Table 1: sample of speakers by age and gender

Transcription, automatic forced-alignment and extraction

Data were orthographically transcribed using Transcriber [2]. Following this, the recordings were automatically aligned using the University of Pennsylvania's Forced-alignment and Vowel-Extraction suite (FAVE-align, [9]). The automation of alignment enables an extremely large increase in the volume of tokens measured; 9,000 tokens per 50 minute interview compared to the 300-350 tokens typical of manual alignment and extraction, with the added benefit of no loss in precision [8]. Using a pronunciation dictionary, the forced-alignment produces a phonemically aligned Praat .textgrid. A series of acoustic measures (F1, F2, F3) are then extracted from every vowel encountered. The forced-alignment was hand-checked and any misaligned elements were manually corrected.

Analysis

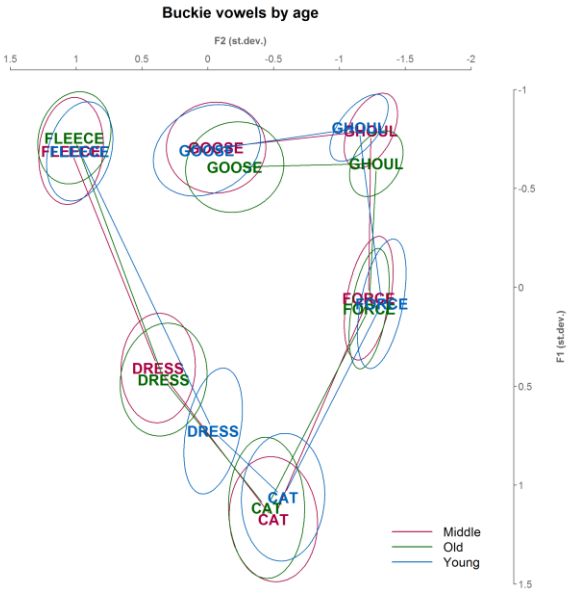
DRESS-vowel height was analysed using scaled (mel) measures of F1 taken one-third into vowel

duration. Just over 1,000 tokens were analysed. As all the speakers were adults and the statistical analysis was concerned with within group comparisons, scaling as opposed to normalisation was judged appropriate. Observed differences were tested for statistical significance through ANOVAs with post-hoc pairwise comparisons performed where significant differences were found.

3. RESULTS

Figure 1 shows the distribution of normalised (Lobanov) mean F1 and F2 across the three age cohorts for six different vowels.

Figure 1: Buckie vowel space by age (n=12,039)



This initial view of the data shows that, compared to the older and middle cohorts, the young cohort has a markedly lower DRESS vowel. We now investigate this difference further.

Apparent time

We turn first to the view of the data in apparent time. Figure 2 displays mean F1 for each age cohort with Older speakers on the left in dark grey, followed by the Middle cohort and the Young cohort in the lightest bar.

Figure 2: DRESS F1 (mel) by age (n=1,087)

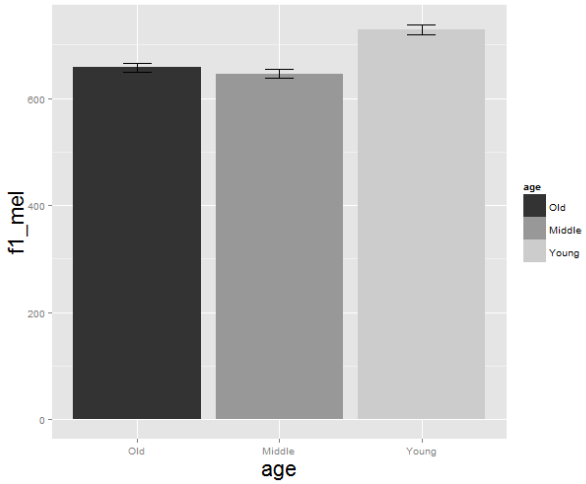


Figure 2 supports the initial observation that DRESS is lowering in apparent time. Statistical analysis confirms there is a significant difference in mean F1 measures over time ($p<.001$); second, pairwise comparisons revealed that this trend is only statistically significant for the young speakers. In other words, young speakers represent the first significant incrementation of this change. We turn now to the phonetic and social conditioning.

Analysis of constraints

Our initial pass of the data revealed that the variation was conditioned by following phonetic environment. This factor initially received detailed coding which accounted for all phonemic distinctions. Based on the patterning of the data and phonetic similarity of items, the fully articulated coding scheme was collapsed into a two-way split: following /l/ referred to as 'TWELVE' and all other following phonetic contexts referred to as 'DRESS'.

Figure 3 presents a view of the data by age, gender and following phonetic environment.

Figure 3: DRESS F1 (mel) by age, gender (females top, males bottom) and following environment category (DRESS and TWELVE)

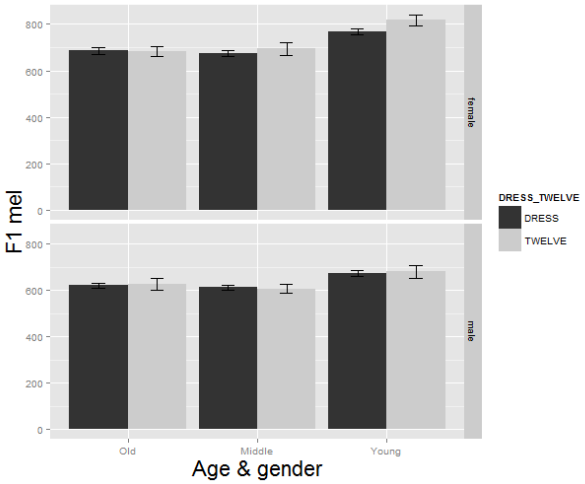
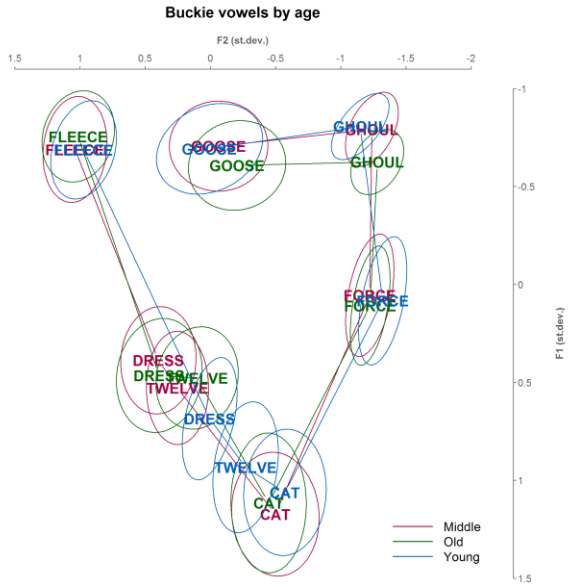


Figure 3 indicates an interaction between age, gender and following phonetic environment. Specifically, following phonetic environment was only significant young females ($p<.001$). For all other speaker groups DRESS height was not significantly conditioned by following phonetic environment.

Figure 4 demonstrates the effect of this phonetic conditioning as it appears within the entire vowel space.

Figure 4: Buckie vowel space by age, including DRESS and TWELVE categories (n=12,039)



4. DISCUSSION

Following the presentation of the analysis, we now return to the research questions:

- Is DRESS-lowering a change in progress in Buckie? In other words, is DRESS lowering significantly in apparent time?

Statistical analysis of the data confirmed that DRESS-lowering was indeed a change in apparent time. However, the post hoc pairwise comparisons revealed that only the youngest cohort exhibited a significantly higher mean F1 than the middle and older cohorts. This would indicate that the change is fairly recent and that the younger speakers represent the first stage of its development. The conditioning of this feature in the speech of the youngest cohort will therefore provide the greatest insight to the nature of its progression.

- How is this change conditioned by external and internal factors?

In line with a number of previous accounts of DRESS-lowering [1, 3, 4, 11], young females were shown to be leading the change, with following laterals promoting the greatest degree of lowering.

In his study of Dublin English, Hickey [4] reports a similar finding for phonetic environment. He suggests that this tendency may be related to the dark or velarised [ɬ] characteristic of Dublin English; i.e. that this segment is preceded by a low-back onglide which may influence the preceding vowel. A similar process may be at work in the Buckie data. Further exploration of the relationship between /l/-quality and DRESS-lowering could prove a fruitful avenue for future work.

In sum, the presence of phonetic conditioning, the gradual nature of the shift and the finding that the change is being led by young females would suggest that DRESS-lowering in Buckie mirrors previous findings and is typical of a ‘change from below’ [7].

- How does this change relate to more global vocalic shifts ongoing in Buckie, and other dialects exhibiting DRESS-lowering?

A number of different accounts of the mechanism underlying DRESS-lowering have been put forward. Several authors have suggested that it is part of a larger chain-shift where the TRAP vowel first backs and DRESS moves down to fill the space [3, 6, 11]. Alternative theories argue that the mechanism is not

a chain-shift but rather that TRAP backs and then DRESS lowers and backs in an analogous fashion [1]. In either account, the common observation is a backed quality for the TRAP vowel which may suggest that TRAP-backing triggers this change, or at the very least, is a necessary prerequisite which enables the change. Returning to the Buckie dialect, Figure 1 shows that the TRAP (CAT) vowel occupies a relatively back/central position overall, but between the age groups there is little change. Further, inspection of differences between the vowel spaces of different age cohorts reveals that DRESS tokens which are followed by a lateral show overlapping positions with the CAT vowel. This may suggest that in the Buckie dialect, while a backer CAT vowel may have enabled the initial change in the DRESS vowel it did not serve as a triggering mechanism. Indeed, the overlap between these categories suggests no clear relationship between them. More broadly, Figure 1 suggests that is it only the DRESS vowel which demonstrates a marked change over time. All other vowels appear stable across the generations. Evidence from the phonetic conditioning, and parallel observations from other dialects [4], suggest that changes in /l/ quality over time may provide a better explanatory mechanism.

5. CONCLUSION

This paper contributes an analysis of DRESS-lowering in the Buckie dialect. In line with previous analyses, the findings presented here show that this change demonstrates phonetic conditioning and is being led by young females. These results were situated within the broader context of findings from other, unrelated dialects which show parallel developments.

Inspection of the vowel space shown in Figure 1 and Figure 4 indicates that there may be no direct link between DRESS quality and other short front vowels, namely the CAT vowel. However, the analysis of constraints revealed that one possibly related systemic change concerned the phonetic conditioning of DRESS-lowering. Here we found that following laterals (the TWELVE set) promoted the lowest realisations. This tendency could be related to changes in /l/-quality, in other words, DRESS-lowering could be a consequence of l-vocalisation. Further work is needed in order to explore the relationship between DRESS-lowering and other potential changes within the surrounding phonology. However, these lines of enquiry suggest promising leads for future research.

Our findings – that the change is promoted by young females and shows phonetic conditioning – indicate the social and linguistic character of a change from below. The question remains however as to why this change, at this point in time, in this dialect? This is a question, not only for the current data, but for all varieties which exhibit this change. Indeed, this question lies at *"the very heart of the matter"* [12] in the investigation of language change more generally, encapsulated in the longstanding 'actuation' problem: *Why do changes in a structural feature take place in a particular language at a given time, but not in other languages with the same feature, or in the same language at other times?* [12]. Currently, we cannot provide a full answer to these questions. However, in contributing to the body of research on DRESS-lowering we can hope to uncover the commonalities which may elucidate the reasons for this change

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