

High back vowel fronting in the north-west of England

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Abstract

This paper discusses an acoustic study of the GOOSE lexical set for 42 speakers of Carlisle English. The results support the view that GOOSE fronting is taking place in this variety. The results also confirm that different preceding allophonic environments influence the degree of fronting. Additionally, the status of the lexical sets FOOT and GOAT in relation to GOOSE is also discussed. However, fronting is not attested for these lexical sets.

1. Introduction and background

Patterns in the rate of fronting of GOOSE and its relationship with FOOT and GOAT in Carlisle English are examined in this paper. Carlisle English a variety spoken in the far north-west of England which has not been studied in depth until now. Only recently have linguists drawn their attention to this urban area. [1] conducted a perceptual study in Carlisle and several other places while [2] studied identity patterns in cities along the Scottish-English border including this urban area. The city has a population of 101,000 and is the largest conurbation in Cumbria. Carlisle is also known as the *Border City*. The title reflects its proximity to the Scottish border which is only 16 km away. The city's surrounding area is dominated by agriculture. The closest urban area is Tyneside some 90 km away. In the south of the city, about 50 km from Carlisle, the Lake District is located. To the east the Pennines, which stretch across the country, flatten and make the north-east more accessible. The Borderlands, as well as the area west of Carlisle which stretches out to the Irish Sea (West Cumbria), are sparsely populated regions. No other urban area can be found in close proximity to the city. Nevertheless, Carlisle is a regional centre where people commute to and from the surrounding areas [3], [4]. The geographical position of the city plays a key role in the linguistic changes which have occurred in the past and which are influencing the present status of the dialect. [5] proves that many salient features such as [u:] in MOUTH and [ɪə] in FACE were once part of the phonetic inventory of Carlisle English but they are not anymore. Three factors that trigger this extreme feature loss have been suggested [5]. First, Carlisle has seen the influx of many people from very different English dialect areas (Scotland, Ireland, Lancashire) from the industrialization onwards, which led to a very drastic levelling process. Second, the speakers of Carlisle English did not and do not have to develop or maintain identity markers (linguistically or non-linguistically) which separate them from immediate urban neighbours. And finally, although the surrounding rural areas (Cumbria, Scotland and Northumbria) have very strong dialect markers, Carlisle English speakers set themselves apart from these groups by avoiding these features.

2. GOOSE-fronting in varieties of English

(Parallel) back vowel fronting of GOOSE and GOAT is a major issue in varieties of American English [6]. It is a salient

feature of Anglo-American speakers but is now also found in the speech of minority communities such as Chicanos in Los Angeles [7] and Asian Americans in San Francisco [8]. The fronting of high back vowels in English is also found in South Africa. [9] conducted a study on GOOSE-fronting in the multicultural South African English context and described the sociolinguistic behaviour of different ethnic groups. His findings suggest that this former identity marker of white South African English speakers is currently adopted by middle class speakers of any ethnicity. Now it is more a marker of age and social status (as it is adopted by young people and by middle class speakers) than of race and is therefore "deracialising" ([9], p. 28). Fronting is also recorded for the other two major southern hemisphere varieties of English. [10] proposed a centralized /ɨ/ as notation for the GOOSE vowel in Australian English. Similar to Australian English, in New Zealand English the GOOSE vowel is generally centralized [11]. GOOSE-fronting is a phenomenon which is also observed in many places in England [12]. As far back as in 1932 Jones reported the fronting of /u:/ in certain environments: "The most important subsidiary long u: is an 'advanced' variety. It is used when j precedes, as in *music* 'mju:zɪk, *tube* 'tju:ɪb, *deluge* 'delju:dʒ. By calling it 'advanced' we mean that the part of the tongue which is highest is the central part – a part more forward than the 'back'" ([13], p. 82). Thus, GOOSE-fronting (at least in the south of England) is a process which has been in progress for at least a century or longer. [14], p. 148, affirms that GOOSE does not have a back quality but is produced in a more central position in English urban speech. In particular, varieties in the south of England show considerable fronting of GOOSE [15]. In many cases, GOOSE and FOOT are both fronted with GOOSE being the more advanced variable [16]. [17] conducted an acoustic cross-dialectal study of British accents. The authors concluded that a fronted quality of GOOSE is found in the majority of accents analysed. Nonetheless, the quality of GOOSE was not uniform, i.e. differences in the realisation between the accents occurred. They also suggested a tripartite system for the distribution of GOOSE in relation to FOOT for Britain:

"(i) neither GOOSE nor FOOT seems to have moved from its back position; (ii) only GOOSE, but not FOOT, has moved to a more front position; (iii) both GOOSE and FOOT are rather front" ([17], p. 29). On this basis, in order to categorise the use of GOOSE in this model, in this paper FOOT will be taken into account as well.

For the north of England, the fronting of the high back vowel has not been reported in detail yet. While Newcastle English seems to resemble a rather traditional realisation of GOOSE, there are some hints that fronting of this variable is underway in Burnley, Lancashire which is situated in the north-west of England [17]. The fronting of GOOSE can be accompanied by the fronting of GOAT in some English varieties in Great Britain. According to [12], p. 67 varieties with monophthongal /o:/ for the GOAT lexical set (e.g. northern England) are not

influenced by this innovatory fronting process. Only speakers of southern English ([12], p. 67) show the tendency for a frontier quality. [18], however, points out the fronting of GOAT in Bradford, a town situated in West Yorkshire, while [19] presents similar findings for Sheffield in South Yorkshire.

3. Methodology and sample

The sample contained interview data taken from 42 speakers (21 male and 21 female speakers, age 22-78) of Carlisle English. Data for a corpus of spoken Carlisle English was mainly collected in February/March 2007 and March 2008. The selection criterion was that the participants were born and bred in Carlisle and had lived in Carlisle longer than in any other place. The recordings lasted for about 25 to 90 minutes. The data were analysed in an apparent time hypothesis framework.

An Edirol R-1 digital recorder with integrated stereo high-quality microphones was used. The sampling rate at the time of recording was 44.1 kHz but it was down sampled to 11 kHz for analysis. After the interview the recordings were transferred to an Acer Aspire 5100 Notebook and also stored on data DVDs and on a hard drive. The acoustic analysis was done by using Praat [20] and a complementary script [21].

Measurements for the first and second formant were taken at the midpoint of the vowel. In various cases the GOOSE vowel was realised with a diphthongised form with a high F2 onset. A total of ten tokens per speaker were collected. Only for one speaker fewer tokens, i.e. nine tokens could be measured. Measurements were only taken from primary stress locations.

Under certain circumstances tokens were omitted from the study. Unclear productions due to overlapping speech or background noise were rejected. *You* as token was dismissed from the sample. Tokens which belong to the FOOT lexical set in the standard variety but were perceived as GOOSE in Carlisle English such as *book* or *cook* were not collected. Because of possible phonological conditioning, several restrictions were made about the allophonic environments surrounding the vowel, i.e. vowels following /w/ and tokens with /ŋ/ and /l/ after the vowel were omitted from the study (cf. [22], [14]).

| Lexical set | Lexical subset | details | examples |
|-------------|----------------|------------------------------|--------------------------|
| GOOSE | TOO | preceding anterior coronal | <i>lose, two, soon</i> |
| | NEW | preceding palatal /j/ | <i>news, Tuesday</i> |
| | COOP | preceding various consonants | <i>goose, boot, shoe</i> |

Table 1: Lexical subsets of GOOSE used in this study.

The number of allophonic distinctions which were analyzed in earlier studies varied to a certain extent. [9] distinguishes between preceding coronal, non-coronal and /j/ preceding environments while [23], p. 172, distinguishes between prevocalic coronals (Tuw), vowel-preceding non-coronals (Kuw) and postvocalic /l/. [8], however, follows Flemming's [24], p. 336, advice when he states that only anterior coronals influence the fronting of vowels.

In this study three environments for GOOSE were analyzed: vowels following anterior coronal consonants (TOO), vowels following palatal /j/ (NEW) and vowels following any other consonantal environment (COOP) (see Table 1). A total of 1316 tokens for GOOSE, 1077 for GOAT and 627 tokens for FOOT were analyzed. The latter two lexical sets were not split up according to different preceding allophonic environments.

4. Normalization and Statistical Modelling

Data were normalized with the *Vowel Normalization Suite* [25] (using the Watt and Fabricius's modified method [26]). Due to the vowel-extrinsic nature of this method, in addition to the lexical sets analysed here, tokens for the following lexical sets were collected and normalized in addition to the experimental ones: FLEECE, NURSE, THOUGHT, LOT, BATH, START, STRUT and PRICE. Table 2 presents the informants' profiles and the normalized average F1 and F2 values for GOOSE separately for male and female speakers.

| Speaker | Mean F1 | Mean F2 | Speaker | Mean F1 | Mean F2 |
|----------|---------|---------|----------|---------|---------|
| 1F22 WC | 0.873 | 1.317 | 1M26 MC | 0.76 | 1.564 |
| 2F23 MC | 0.806 | 1.472 | 2M29 WC | 0.859 | 1.278 |
| 3F24 MC | 0.793 | 1.567 | 3M31 MC | 0.748 | 1.437 |
| 4F25 MC | 0.916 | 1.578 | 4M34 MC | 0.842 | 1.262 |
| 5F25 MC | 0.81 | 1.537 | 5M36 WC | 0.774 | 1.355 |
| 6F27 WC | 0.79 | 1.369 | 6M37 WC | 0.739 | 1.484 |
| 7F36 MC | 0.823 | 1.387 | 7M38 WC | 0.834 | 1.229 |
| 8F42 MC | 0.78 | 1.451 | 8M41 MC | 0.78 | 1.332 |
| 9F47 MC | 0.734 | 1.39 | 9M43 WC | 0.775 | 1.239 |
| 10F49 WC | 0.833 | 1.213 | 10M52 WC | 0.816 | 1.066 |
| 11F49 WC | 0.814 | 1.365 | 11M55 WC | 0.83 | 1.03 |
| 12F53 MC | 0.829 | 1.26 | 12M57 MC | 0.71 | 1.156 |
| 13F56 WC | 0.842 | 1.485 | 13M59 WC | 0.836 | 1.176 |
| 14F57 WC | 0.75 | 1.32 | 14M60 MC | 0.83 | 0.893 |
| 15F59 WC | 0.795 | 1.133 | 15M61 MC | 0.85 | 1.061 |
| 16F60 MC | 0.849 | 1.316 | 16M62 WC | 0.833 | 1.051 |
| 17F61 WC | 0.759 | 1.155 | 17M63 WC | 0.839 | 0.897 |
| 18F63 WC | 0.821 | 1.077 | 18M67 MC | 0.805 | 1.318 |
| 19F67 MC | 0.815 | 1.184 | 19M68 WC | 0.842 | 0.96 |
| 20F68 MC | 0.745 | 1.09 | 20M73 MC | 0.863 | 1.119 |
| 21F71 WC | 0.817 | 0.943 | 21M78 MC | 0.753 | 1.233 |

Table 2: Informants' profiles and normalized mean formant values for GOOSE.

A linear regression model was used to identify predictors of language change. The analyses were based on normalised F2 values. F2 was treated as a dependent variable while the social factors of age, gender and social class which were entered into the statistical model were treated as independent variables. Speaker's age was treated as a continuous variable based on the age of the speakers when the interview took place. Male and female constituted the binary distinction in the social factor gender. Social class was also defined as a binary choice (middle class (MC) vs working class (WC)) on the basis of educational and occupational information.

5. Results

5.1. GOOSE

The overall results for GOOSE are presented in Table 2 and Figure 1. The normalized mean F2 values ranged from 0.893 to 1.578 where higher F2 values indicate greater fronting. In general, the results suggested that fronting of the high back vowel was under way in Carlisle English. According to the apparent time hypothesis, age should be the factor influencing

the fronting of the back vowel. Thus, younger speakers should realize the GOOSE vowel as a front vowel more consistently than older speakers. Indeed, the results in Figure 1 suggested a correlation between the fronting of GOOSE and age for both, male and female speakers with younger females showing the most advanced realizations. The correlation between F2 values and age, and between F2 values and gender was very robust ($p < 0.01$). This result suggested therefore the existence of a change in progress.

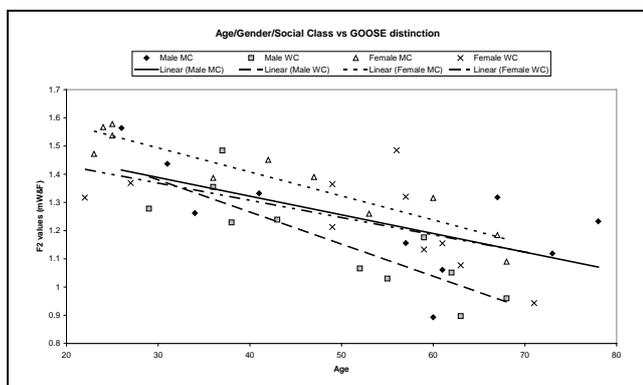


Figure 1: *Fronting in the GOOSE lexical set as a function of speakers' age, gender and social class (modified Watt and Fabricius's vowel normalization method for 42 speakers).*

Figures 2 and 3 present the distribution of the three lexical subsets of GOOSE for males and females. For both sexes the fronting process in the three environments can be noted. As expected, high-back vowel nuclei following palatal /j/ were more fronted in the vowel space than TOO and COOP with the exception that older female speakers had higher average F2 values for TOO. For TOO age and gender correlated with F2 in a significant way ($p < 0.01$). However, compared to these two factors, social class was not such a good predictor of fronting for male speakers ($p = 0.018$), although it was for female speakers ($p < 0.01$). The fronting of NEW correlated significantly with speakers' age for both women and men. For both male ($p = 0.01$) and female speakers ($p < 0.01$) social class correlated strongly with F2 in this environment. However, gender was not a predictor for fronting in this environment ($p = 0.333$). In the COOP environment age ($p < 0.01$), social class ($p < 0.01$) and gender ($p < 0.01$) were all strong predictors for fronting. For females, social class correlated with F2 ($p < 0.01$), but this correlation was not significant for male speakers ($p = 0.888$). In conclusion, in all three subsets of the GOOSE lexical set a strong tendency towards fronting in apparent time could be recognized for the speech of both men and women. Young MC female speakers appeared to take the lead in this change in progress.

5.1. GOAT and FOOT

Even though the correlation between F2 and age was highly significant ($p < 0.01$), we could not assume that GOAT was undergoing fronting. Only the F2 values of WC females were increasing in apparent time, which caused the overall correlation to be significant. Yet the correlation between F2 and MC female speakers did not seem to be significant ($p = 0.56$) because the values were practically constant. The MC females had generally higher F2 values and therefore they produced the vowel more fronted than WC females. For the latter group the F2 values increased in apparent time but in general the values were lower than for the former group. For

men there was no correlation between F2 and age ($p = 0.508$). Vowels of the FOOT lexical set did not undergo fronting. For this lexical set, age and F2 did not correlate ($p = 0.467$) and no fronting could be observed. Figure 4 provides the normalized average F2 values for GOAT, FOOT and GOOSE for all speakers of the sample. The F2 values of GOAT and FOOT seem to run more or less parallel. For older speakers GOOSE is roughly parallel to the other two vowels as well. On the contrary, in the speech of young people the vowel in GOOSE is extremely fronted.

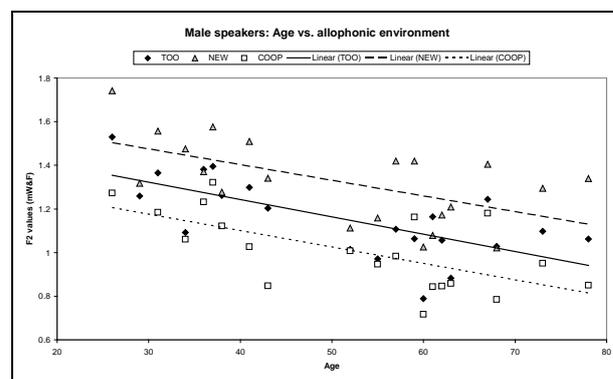


Figure 2: *Allophonic influence on high back vowel fronting as a function of age (male speakers).*

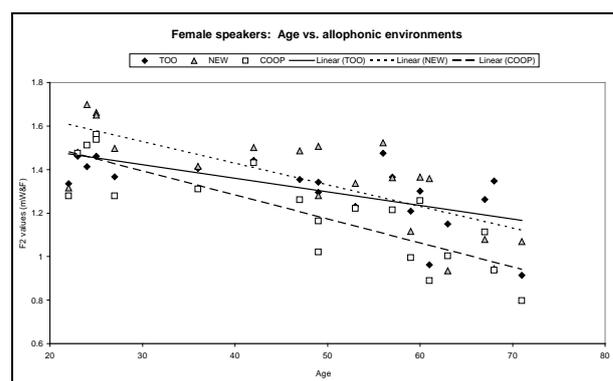


Figure 3: *Allophonic influence on high back vowel fronting as a function of age (female speakers).*

6. Discussion

Overall, GOOSE-fronting has not been reported in earlier studies for this area; however, it is shown in this article that this is a change in progress in Carlisle English. Younger speakers produce more fronted nuclei than older speakers and young MC female speakers are taking the lead in this change. F2 values are significantly correlated with age in all three lexical subsets of GOOSE whilst for FOOT this correlation is not significant. For GOAT we find highly significant results for F2 and age but these results are misleading. Thus, a change in progress has only to be observed for WC females for this lexical set.

The different allophonic environments are influencing the degree of fronting considerably; this reminds us of Mesthrie's findings [9], where NEW tokens had higher F2 values than TOO and COOP (for males). Anterior coronals preceding the vowel are influencing the degree of fronting as well (as predicted by Flemming [24]). Close proximity to Scotland could lead to the

assumption that the fronting of the high back vowel is a result of dialect contact. There are however reasons why this hypothesis has to be rejected. First of all, [2] has proven that contact features of Scottish English are hardly found in Carlisle English. Additionally, dialect contact of Carlisle English with Scottish English could not explain this change, since the former shows phonological length for vowels (including GOOSE and FOOT) whereas the latter does not. GOOSE and FOOT are not distinguished in Scottish English. Therefore, words that resemble the FOOT lexical set in Carlisle English would have to show fronting in comparable measures and be merged with GOOSE. Since this is not the case but rather that FOOT stays in a back position in Carlisle English, the hypothesis of an influence from Scottish English must be discounted. According to Ferragne and Pellegrino's model [17] mentioned above, Carlisle English resembles type (ii) in the tripartite system with fronting for GOOSE but not for FOOT. A similar pattern for GOOSE and FOOT is also found in Burnley, Lancashire [17]. Hence, diffusional change could be a trigger for the high back vowel fronting process.

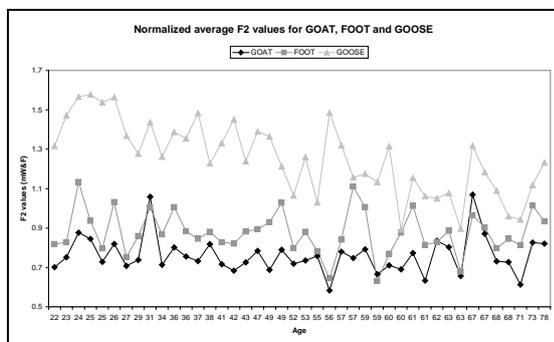


Figure 4: Development of F2 for GOAT, FOOT and GOOSE according to age.

7. Summary and conclusions

The results presented here demonstrate the fronting of the high-back vowel in Carlisle English. This change has not been described for this variety before. There is evidence that this is a change in progress which is determined in no small measure by the allophonic environment in which the vowel occurs, this being responsible for the degree of fronting. This process cannot be seen as a contact feature with Scottish English despite the frequent contact situations. On the contrary, it is possible to hypothesize that this change is diffusing from Lancashire up to Cumbria. For FOOT and GOAT a fronting process is not observable.

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9. References

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