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An Intraspeaker Variation Study of Scottish English /r/ Pharyngealisation

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Abstract

Pharyngealisation—the retraction of the tongue towards the pharynx—of prepausal and preconsonantal /r/ has been recognised as an emergent strategy of derhoticisation in Scotland’s Central Belt (Stuart-Smith 2007). However, previous studies have focused on the incidence of this phenomenon between speakers, with little attention paid to intraspeaker variation. The question remains: How does Scottish English derhoticisation behave in a situation of style-shifting? We explore the intraspeaker variation of comedian Frankie Boyle, a recognisable speaker of Scottish English, comparing his production of apical and pharyngealised /r/ in prepausal and preconsonantal environments in two interview contexts. The acoustic correlates of /r/ pharyngealisation are characterised as a rise in F3 with reduced energy in the formant. This is quite different from the plummeting F3 associated with an apical realisation of /r/, allowing for a binary categorisation of pharyngeal and apical tokens as well as an analysis of F3 frequency as a continuous measure.

We present evidence that Boyle makes significantly more frequent use of pharyngealisation when interviewed by Kevin Bridges, a fellow Glasgow native, than by Richard Osman, a Southern Standard British English (SSBE) speaker. Further, a secondary analysis of phonation quality shows that Boyle uses significantly more creaky voice with Osman than with Bridges, allowing for a fuller understanding of Boyle’s style in each context. Attempts to attribute the observed differences in pharyngealisation rate to factors other than interview context (e.g., linguistic factors or discussion topic) yielded insignificant results, further reinforcing the notion that the style shift is due to interview context. Even within the binary categories of pharyngeal vs. apical, an analysis of formant frequency found that, on average, Boyle produced “more apical” apicals with Osman (lower plummeting F3) and “more pharyngeal” pharyngeals with Bridges (higher rising F3), suggesting that these forms are dynamic and can be strategically produced to varying degrees. This evident style shift between interview contexts is an ideal platform for a discussion of the strengths and weaknesses of various sociolinguistic theories. Ultimately, we conclude that audience design best captures the interactional effects observed, but reference to second order indexicality is required to understand what social meaning Boyle achieves through style-shifting.

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Ruaridh Purse and Euan McGill

1 Introduction

Rhoticity is the phonological specification that postvocalic /r/ be pronounced in prepausal and preconsonantal position, and it has long been considered a feature of Scottish English. However, Scottish English derhoticisation, most often realised as a pharyngealised /r/ by male Glaswegians (Stuart-Smith 2007), has been documented as an emergent feature, particularly in Scotland's Central Belt. Where previous studies of derhoticisation have focused on variation between speakers, this study investigates it as part of a larger style shift in the individual speech of Frankie Boyle, a recognisable speaker of Scottish English. By exploring the realisation of /r/ in the subject's speech with different interviewers, we found significant variation such that far more tokens were pharyngealised when Boyle was interviewed by a fellow Glasgow native than by a Southern Standard British English (SSBE) speaker. In addition, a secondary analysis of voice quality yielded significant variation in use of creaky voice, supporting the notion of a style shift according to interview context.

These findings raise some interesting points of discussion for the application of social theory to sociolinguistic variation, and the strengths and weaknesses of different approaches. Ultimately, we conclude that the results provide support for the notion that such sociolinguistic theories are best used in concert to yield the most comprehensive explanation possible. What Boyle achieves through variation in /r/ realisation and voice quality is best explained with reference to second order indexicality (Silverstein 2003), whilst audience design (Bell 1984) best captures how contextual factors act as forces that drive him to produce them.

2 Background

Much of the inspiration for this study comes from Stuart-Smith's (2007) research on Glaswegian adolescents. In her work, Stuart-Smith characterises derhoticisation in Scotland's Central Belt as a change in progress led by working-class males. This observation is in line with earlier, largely qualitative analyses (MacAfee 1983) that identified the working class as the leaders of change in the production of several consonants in Glaswegian English, including /r/, which has long been recognised as existing in a "state of flux" (Grant 1913:36). More recent studies (Stuart-Smith et al. 2014) have confirmed that derhoticisation, while present throughout the Central Belt, is particularly advanced in and around Glasgow. Middle-class natives of Glasgow and the rest of the Central Belt, however, still largely retain use of apical /r/ as is the norm for Scottish Standard English (Lawson et al. 2013).

Stuart-Smith (2007) provides a good description of the acoustic correlates of pharyngealisation. She characterises the pharyngeal variant as exhibiting a slight rise in F3 accompanied by a loss of energy in the formant, which is strikingly different from the plunging F3 associated with apical /r/. This is the result of tongue retraction towards the pharynx, which also reduces the airflow. Other similar strategies of derhoticisation produce a less pronounced rise in F3 but can still easily be distinguished from apical /r/. Recent studies on derhoticisation have also employed ultrasound tongue imaging (Lawson et al. 2013, Stuart-Smith et al. 2014), eliminating much of the doubt surrounding tongue placement, especially in different techniques of derhoticisation. However, it is not possible to implement this in a study based on existing corpora. In place of this, we chose to provide first-pass judgements of /r/ production supplemented by an analysis of acoustic correlates.

Voice quality is also reported to index social class in Scottish English, particularly in Edinburgh and Glasgow (Esling 1978, Stuart-Smith 1999). Creaky voice—produced with relatively slow airflow and tightly compressed vocal folds, resulting in a low F0 and low spectral balance—is typically associated with higher social classes, whilst breathy voice—produced by holding the vocal folds apart to allow greater air flow—is reportedly associated with the working class. More recent literature on the use of voice quality in "cross-situational variation" (Podesva 2007:487) indicates that in drawing upon the indexed meanings associated with it, phonation type can also contribute to the composition of a larger style.

This study analyses variation in both /r/ realisation and voice quality for one speaker, Frankie Boyle. Boyle (born 1972) is a native of Glasgow who lived in different areas of the city during his childhood and adolescence. First, The Gorbals, described as "an aching cement void" (Boyle 2010), and then Pollokshaws in the south of the city, which is substantially less deprived. His fame as a comedian and comedy-writer came at around the age of 25. He spent 3 years of undergraduate study, and some of his comedy career, in London, though he currently resides in Glasgow. His interviewers in the two contexts are: Kevin Bridges, a younger male friend (born 1986, 14 years Boyle's junior) and fellow Glasgow native from the "working class" area of Clydebank; and Richard Osman, a Cambridge-educated man of similar age to Boyle (born 1970), who comes from the Home Counties of

England. The interview with Bridges took place in front of a London studio audience and was broadcasted on BBC Radio 4, which has a largely middle-class English audience. The interview with Osman took place at the Edinburgh Festival, which tends to attract an international audience in addition to Scottish locals.

Boyle and Bridges were born in the same city, grew up in similar socioeconomic circumstances, and are personal friends. As for Osman, though he and Boyle are of a similar age (with Osman born 2 years earlier), Osman's upbringing was "middle class" and in a different country of the UK. Our analysis will explore how this interlocutor difference is reflected in Boyle's use of salient sociophonetic variants. While Boyle's use of creaky voice may mirror that of his interlocutors, his use of derhoticised /r/ is greatly reduced in conversation with Osman, whose speech is never rhotic, in this case indicating the precedence of social meaning over acoustic similarity when performing stylistic convergence.

3 Methods

The data from this study are taken from two interviews in 2014: Kevin Bridges carried out Interview 1 in London for broadcasting on BBC Radio 4, and Richard Osman conducted Interview 2, which was televised at the Edinburgh Festival. In total, the two interviews last 69 minutes and feature 684 analysable tokens of prepausal and preconsonantal /r/. The sound files were sourced from YouTube clips (Edinburgh International Television Festival 2014, Some Decent Videos 2014) and digitised through Soundflower (Ingalls 2012) into the audio recording software Audacity (Mazzoni and Dannenberg 2000) at a rate of 11,100Hz. The recordings were first transcribed to locate all instances of prepausal and preconsonantal /r/, which were segmented in Praat (Boersma and Weenink 2007).

For each token, a binary distinction between non-apical and apical was made using an auditory first-pass analysis and visual examination of the spectrogram (Figures 1 and 2). Figure 1 shows the relevant rhyme for *placards* [plaka's] with a pharyngealised /r/, and Figure 2 shows the apical realisation of /r/ in *start* [staɹʔ], as typical of SSE (Kerswill 2003). As previously shown by Stuart-Smith (2007), F3 in the pharyngealised example rises to around 2700Hz and loses intensity. In the apical example, however, it drops to around 1900Hz before the coda. For the purposes of this study, all strategies of derhoticisation have been condensed into the category of non-apical or "pharyngeal". There were no instances of full rhotic deletion such as occurs in RP, which has been documented in Edinburgh in the past (e.g., Romaine 1980).

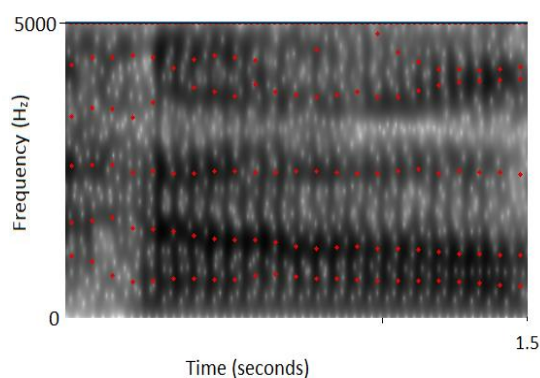


Figure 1: Spectrogram slice for rhyme of *placards* [plaka's].

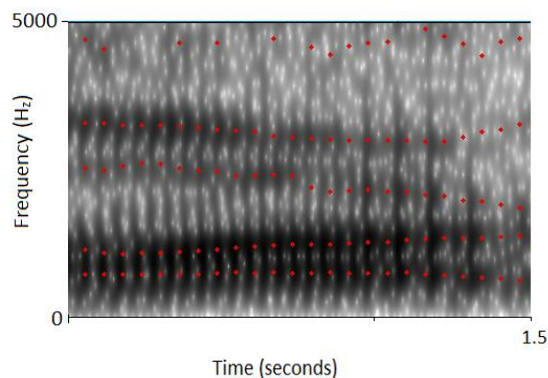


Figure 2: Spectrogram slice for rhyme of *start* [staɹʔ].

In addition to this auditory coding of the dependent variable, a number of acoustic measurements were taken. In line with Plug and Ogden's (2003) assertion that rhoticity is a property of the rhyme as a whole,¹ the whole vowel +/r/ sequence was considered. These measurements were: the duration of each relevant vowel +/r/ sequence; the frequency of F1, F2, and F3 at a stable midpoint; and the frequency of F3 at each of the five final glottal pulses for each token. These formant measurements allowed us to confirm our initial decisions for categorising each token into pharyngeal and non-pharyngeal. We also coded for the surrounding segmental environment, with the preceding contexts including /i/, /a/, /u/, /ʌ/, /e/, /ɛ/, /o/, /ɔ/, and /ə/, and the following contexts including /p/, /b/, /t/, /d/, /k/, /g/, /ʔ/, /m/, /n/, /f/, /v/, /θ/, /ð/, /s/, /z/, /w/, /l/, /j/, and pause. We also noted the location of lexical stress in the word, which was marked "primary" for primary stress on the relevant rhotic syllable or "other" if it fell elsewhere.

In order to provide a full and accurate analysis of Boyle's rhoticity which adheres to the principle of accountability (Labov 1972), all tokens which were expected to contain a rhotic according to Wells's (1982)

¹ Please note that Plug and Ogden (2003) examined derhoticisation in Dutch.

lexical sets were included.² However, words where vowel epenthesis had taken place (e.g., *world* [wʌrəld]) were not considered as valid prepausal or preconsonantal /r/ tokens. To test inter-rater reliability, both authors coded 40 tokens (20 from each interview). For this sample, we were in 100% agreement for the auditory coding, and a comparison of formant measurements yielded a result of 82.5% accuracy within 30Hz of one another.

Boyle's speech in both interviews was also coded for voice quality. All utterances were measured for duration of modal and creaky portions. Boyle's speech across both interviews totalled 2672.3 seconds (931.2s with Bridges, 1741.2s with Osman). To test for inter-rater reliability, both authors analysed the first 500 seconds of each interview and tagged instances of creaky voice in Boyle's speech. We were in agreement for 96% of these tokens. Where we disagreed, it was for stretches of speech less than 0.2 seconds long.

4 Results

Bridges' interview was 28 minutes long and yielded a total of 254 prepausal and preconsonantal /r/ tokens. Osman's interview provided 439 such tokens in 41 minutes. In addition, it was necessary to omit 9 tokens from our analysis: 4 had no clear formants, and 5 were interrupted by the interviewer. This resulted in a total of 684 prepausal and preconsonantal /r/ tokens in 1 hour 9 minutes of interview-based speech.

4.1 Production of /r/ between Interview Contexts

Our main result is that the frequency of Frankie Boyle's /r/ pharyngealisation does vary according to his interlocutor (Table 1). We find a difference of 46% in his rate of production of pharyngealised /r/ between the two interview contexts ($X^2 = 163.8, p < 0.01$).

Figure 3 shows the mean formant tracks for the F3 of the last five glottal pulses as produced by Boyle in each interview, with mean midpoint F3 plotted for reference. The tokens were separated into four groups based on interviewer and auditory coding results; the different coloured tracks in Figure 3 correspond to these different groups (e.g., "Kevin Bridges y" tracks the F3 average of all vowel +/r/ rimes produced in the interview with Bridges and was coded auditorily as pharyngealised).

As expected, Figure 3 shows a rise in F3 for pharyngealised tokens ("y") and a drop for apical tokens ("n"). It also appears that F3 is consistently lower in the interview with Osman. This could be taken as evidence for an increased *degree* of apical rhoticity and reduced degree of derhoticisation, alongside the increased absolute incidence of rhoticity (and decreased absolute incidence of derhoticisation) shown in Table 1. Considering that various phonological contexts are combined in Figure 3 (in particular, vowels of different backness), and given that these contexts may have differing effects on F3, this could be refined further. However, all four contexts contain a similar number of examples of front, mid, and back vowels. Consequently, the figure is likely to be a fair representation of the relationship between interlocutor and F3 frequency within categories. This does not, however, preclude an interaction between vowel backness and interlocutor. In any case, rhoticity as a dynamic sociophonetic variable is an interesting notion which will be addressed later in this paper.

Table 1: Boyle's production of /r/ by interlocutor, syllable stress, and word frequency

	Pharyngeal	Apical	Totals
Kevin Bridges	145 (58%)*	105 (42%)*	250
Richard Osman	52 (12%)*	382 (88%)*	434
Primary Stress	73 (34%)	144 (66%)	217
Other Stress	124 (27%)	323 (73%)	467
Frequent Words	54 (25%)	163 (75%)	217
Infrequent Words	143 (31%)	324 (69%)	467
Totals	197	487	684

² The lexical sets which should be considered rhotic in Scottish English are START, NORTH, FORCE, NURSE, LETTER, NEAR, SQUARE, and CURE.

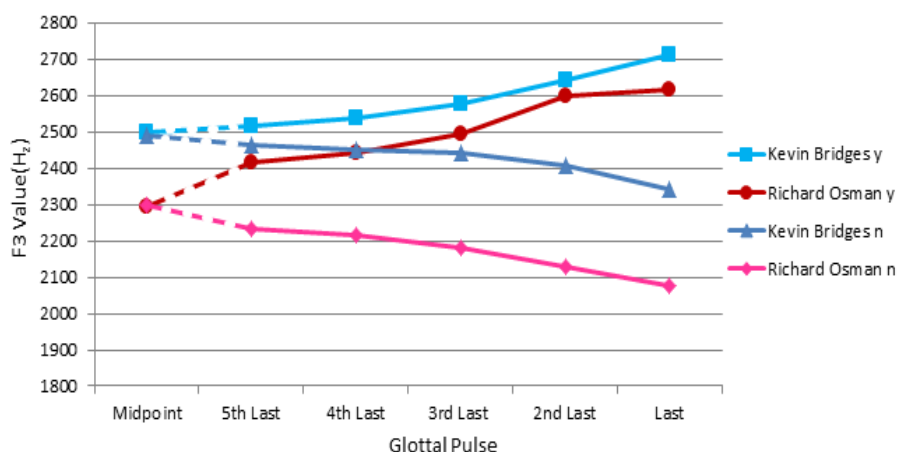


Figure 3: F3 tracks of Boyle's production of /r/ by interlocutor and pharyngealisation (yes/no).

4.2 Production of /r/ and Topic

We further analysed topic as an independent variable, focusing only on the interview with Kevin Bridges, roughly one third of which was on the topic of Scotland as a nation. The topic of Scotland and Scottish independence from the UK is touched upon in the interview with Richard Osman, but there are not enough data to properly examine the effects of topic there, or to investigate an interaction between topic and interlocutor.

Both variants of /r/ under investigation are found in Scottish English. On the one hand, apical /r/ is an enregistered feature of Scottish English, and the variety is sometimes even portrayed with a trilled /r/ despite its very limited use within Scotland (Lodge 2009). On the other hand, the use of pharyngealised /r/ is restricted to a particular group from a particular area of Scotland and is little known outside its borders. However, investigating the rates at which Boyle employs these variants presents an unusual opportunity to explore his perspective on the classist undertones of the Scottish independence debate. Such an exploration is not without motivation as in the interview with Bridges, Boyle himself states, “the thing about the Scottish middle class is they hate Scottish people” (Some Decent Videos 2014:1400s). In light of the Scottish referendum on independence that was imminent at the time of the interview, analysis of variation by topic could therefore shed light on how Frankie Boyle—a proponent of Scottish independence—uses /r/ pharyngealisation to essentially index “Scottishness”.

The variation found between conversation topics was not statistically significant, with Boyle producing 59% of prepausal and preconsonantal /r/ tokens as pharyngealised during the portion of the interview dedicated to discussing Scotland as a nation, compared with 58% in the rest of the interview. Therefore, we cannot reject the null hypothesis that the topic of Scotland as a nation has no effect on Boyle's rate of /r/ pharyngealisation. However, future research into this topic in a context where /r/ pharyngealisation is not already so prevalent would perhaps yield a different result.

4.3 Production of /r/ and Linguistic Variables

Table 1 shows the rate of pharyngealised /r/ by lexical stress, which we found did not significantly correlate with pharyngealisation ($X^2 = 3.63$, $p > 0.05$). However, we coded monosyllabic function words as carrying primary lexical stress even when they might not have been prosodically prominent. To try to account for this, we conducted a Wilcoxon rank sum test comparing duration of vowel +/r/ sequence and rate of pharyngealisation, given that duration is a strong acoustic correlate of both stress and prominence. This test showed that duration was also not significant ($p > 0.05$). These findings are not entirely in line with the findings of Stuart-Smith et al. (2014), who assert that while derhoticisation occurs most frequently in stressed syllables after vowel breaking (e.g., here [hi \wedge (r)]), unstressed syllables are more likely to undergo derhoticisation than other stressed syllables. However, Stuart-Smith et al. (2014) identify the utterance-final position as preferential for derhoticisation in both stressed and unstressed syllables, and we did not have enough utterance-final tokens, nor did we find enough examples of vowel breaking, to properly test this theory here.

We tested for the possible effect of lexical frequency by modelling frequency on Hay et al.'s (1999) corpus-specific strategy. Here, all lexical items produced 10 or more times by Boyle across the whole dataset were characterised as “frequent” and the rest of the data as “infrequent”. The results in Table 1 show that the effect of lexical frequency is not significant ($X^2 = 2.377$, $p > 0.05$).

4.4 Voice Quality

So far, all three of the linguistic variables tested (lexical stress, duration of vowel +/r/ sequence, and lexical frequency) have been statistically insignificant in accounting for the striking variation between the two interviews. We therefore conclude that Boyle likely exhibits socially motivated style-shifting between the two interview contexts, producing pharyngealised /r/ at a significantly higher rate during the interview with Kevin Bridges than during the interview with Richard Osman. This conclusion would be further supported by the differing rate of use of another variable between the two interviews. Impressionistically, this is the case for voice quality. Table 2 shows Frankie Boyle's duration of use of creaky voice versus modal voice in each interview.

Table 2: Boyle's variation in voice quality, in duration (seconds) by interlocutor

	Creaky	Modal	Total
Kevin Bridges	47.7s (5.1%)	883.6s (94.9%)	931.2s
Richard Osman	199.3 (11.4%)	1541.9 (88.6%)	1741.2s
Total	247.0s	2425.5s	2672.5s

Our results show that Boyle uses creaky voice significantly more frequently with Richard Osman than with Kevin Bridges ($X^2 = 24.13$, $p < 0.01$). The average duration of an instance of creaky voice was fairly similar between interview contexts (0.52s for both). However, there were far more instances of creaky voice with Richard Osman than with Kevin Bridges (387 compared to 113). While the interview running time with Osman is greater than with Bridges, there are more than three times as many instances of creaky voice (in less than double the total speaking time in the interview with Osman). The fact that Boyle produces more creaky voice in interview with Richard Osman than with Kevin Bridges (in terms of proportion of speaking time and instances of creaky voice) further demonstrates that Boyle's realisation of /r/ is part of a larger style shift employed between interview contexts.

5 Discussion

5.1 Accommodation Theory

Given Trudgill's (1986) proposition regarding salient variables being more susceptible to accommodation effects, Boyle's /r/ production is a prime candidate for an accommodation theoretic analysis (see Giles and Powesland 1997). Rhoticity on the whole is a highly enregistered feature of Scottish English, and while pharyngealisation may not be widely recognised, Stuart-Smith et al. (2014:89) maintain that the variable is "always a certain kind of socially-embedded /r/" for the communities where its production is widespread. This has long been the case, with Macauley (1977) suggesting that Glasgow's "stagnant economy" for five decades has resulted in the sharp definition of Glaswegian social class markers, of which /r/ production is undoubtedly a good example. This notion of salience *as particular to the relevant speech community* is key to explaining the variation we observe in this study.

In his interview with Kevin Bridges, Boyle's speech does seem to exhibit classic convergence in line with accommodation theory (Giles and Powesland 1997). Bridges himself is highly pharyngeal in his prepausal and preconsonantal /r/ production (66% pharyngeal in his first 42 tokens, higher than Boyle in either interview), and Boyle perhaps increases his production of the pharyngeal variant in response. Impressionistically, Boyle may also converge with his interlocutor in terms of voice quality. That is, Osman seems to produce much more creaky voice than Bridges, and Boyle produces significantly more creaky voice in this interview, perhaps in response. It quickly becomes apparent, however, that convergence under accommodation theory is insufficient to explain all the data, as it does not cast any light on the extremely frequent use of apical /r/ with Richard Osman, whose speech is firmly non-rhotic. Further, from the current data there is no reason to suggest that apical /r/ acts as a "default" variant for Boyle. Perhaps this is an example of divergence, which could be attributed to the fact that Boyle spends a portion of this interview defending his comedic style and career choices up to that point. On the other hand, the notion that Boyle might be exhibiting divergence is a very complex one, and it is especially difficult to substantiate. This is compounded by the fact that Osman and Boyle

have quite different ethnolinguistic repertoires owing to their respective national identities.³ Divergence is therefore not necessary to explain the difference between the two speakers, whose language varieties are already in stark contrast.

5.2 Attention Paid to Speech

Labov's (1972) attention paid to speech model, which attributes different levels of formality in speech to the amount of attention a speaker gives to the language they are using, would seem to fit the data well. More careful speech is proposed to result in a more formal or standard style, as associated with apical /r/ for Scottish speakers, largely due to stylistic variation being derivative of social class variation (Bell 1984), while casual speech should be elicited by less attention paid to speech. Five paralinguistic channel cues were identified by Labov (1972) which seemed to correlate with casual speech: changes in tempo, pitch, volume, breathing rate, and the use of laughter. The cue of laughter, which Labov suggests indicates less attention, might be particularly relevant in this case as Boyle seems to produce laughter in both interviews, and seemingly more frequently with Bridges. Gumperz's (1982) broader concept of "contextualisation cues" builds on this, recognising various linguistic strategies employed by speakers to contextualise an interaction in terms of style. Indeed, the use of the forms under discussion here could be interpreted as contextualisation cues which set the tone of each interview with regard to formality. In other words, the use of pharyngeal /r/ creates and reinforces an informal context for Boyle's interview with Kevin Bridges. On the other hand, the consistently apical /r/ and prevalent use of creaky voice might create a more formal context for the interview with Richard Osman.

However, it is difficult to justify describing Boyle's interview with Osman as "formal", and it is well accepted that attention and formality alone are not sufficient to explain linguistic variation. Furthermore, the attention paid to speech model, which was only intended to create a spectrum of carefulness in speech between data collection techniques, and not within them (Labov 1966), has fallen out of favour among sociolinguists. A particularly strong criticism of the attention paid to speech model is that it is quite possible to consciously shift into non-standard vernacular (Coupland 1980). This could well be the case in the interview with Kevin Bridges. Moreover, not all speech is easily placed on the careful/casual continuum, and the interviews we chose to study further seem to be quite similar in terms of formality, making them hard to separate on a spectrum of expected attention paid to speech. In addition, the paralinguistic channel cues identified by Labov (1972) are an unreliable diagnostic (Wolfram 1969). Laughter, a cue for casual speech, can equally indicate increased self-consciousness and nervousness. Further, Labov's model, which was intended to identify a speaker's least self-conscious and most natural speech, does not account for variation by interlocutor. This is supported by Schilling's (2013) assertion that the model is particularly flawed for explaining style shifts within the sociolinguistic interview. She attributes this, in part, to its lack of multiple dimensions, which are required to address the various kinds of speech produced in casual settings.

5.3 Audience Design

Bell's (2001) audience design model might be more applicable to the data since Boyle's use of style appears to be more nuanced than an act of "copying", or convergence, upon acoustic targets. Under this model, the various members of a speaker's audience influence his or her speech, some more than others, but there is more scope for agentive decisions on the part of the speaker to design speech with the audience in mind. The model also includes categorisation of the various members of the audience in terms of their supposed relative influence on the speaker.

In the interview with Osman, Boyle draws on his own sociolinguistic knowledge to conform to a standard (which appears to be Scottish Standard English). This standard is not the same one used by the interviewer, but both varieties carry the social meaning of using a standard. This analysis allows for Boyle's convergence with Kevin Bridges, but also leaves room for a characterisation of his speech with Osman as non-divergent. Rather, Boyle selects the most suitable form from within his repertoire (which does not contain the same SSBE standard as Richard Osman's), arriving at the apical /r/ associated with SSE.

This initiative style could alternatively be explained through the aspect of audience design known as "referee design" (Bell 1984). In this approach, Boyle would indeed be understood to diverge from his addressee, Richard Osman, and converge with a reference group among whom apical /r/ prevails. This might well be the case for the auditors watching the interview live, many of whom are likely to be Scottish or from outside the UK. However, this study is particularly well placed to discuss the shortcomings of a definition of referee design which requires divergence from an addressee and convergence with another potentially absent party. If reference is made to Boyle's own linguistic repertoire, it becomes clear that the only strategy of derhoticisation available to him (pharyngealisation) has no parallel in Osman's speech. Further, with the understood social

³ The notion of "ethnicity" is not here meant in terms of race, since both Boyle and Osman are Caucasian.

meaning of the groups associated with /r/ pharyngealisation, frequent use of the variant in this context would have to be interpreted as socially divergent. Thus, while acoustically apical /r/ provides a starker contrast from Osman's own realisation of prepausal and preconsonantal /r/, we would argue that the use of this variant remains convergent in terms of social purpose.

If an audience design model is to be applied to the data, Boyle's profound convergence with Kevin Bridges (his addressee) can still be explained. This is despite the influence of the London studio audience (auditors) and the largely middle-class English audience of BBC Radio 4 (which could perhaps be characterised as overhearers), for most of whom pharyngealised /r/ is unfamiliar. Bell's (1984) model does suggest that the effect of the addressee is greater than that of the other parties present, and it could be that convergence would be even more pronounced in the absence of this audience. Further, Boyle is close friends with Bridges, for whom he has acted as something of a mentor in the past. This could contribute to the strong addressee influence on Boyle's speech, since it is unlikely that he would have reason to resist linguistic convergence.

The results for F3 frequency across the analysed tokens' final five glottal pulses allow for an interpretation of the social meaning of "more apical" or "more pharyngeal" forms. This notion of dynamic rhoticity is supported by Love and Walker's (2013) findings investigating postvocalic /r/ among sports fans. In their study, degree of rhoticity varied by topic such that discussing American football elicited an F3 significantly lower in frequency than the topic of soccer. The authors attribute this finding to referee design in that the topic of American football is associated with rhotic varieties of American English, whilst the topic of soccer is associated with non-rhotic varieties of British English. Although topic was not found to be a significant influencing factor in the present study, some support is provided for the validity of a two-layer analysis of Scottish English /r/. Rate of production of particular forms and the degree to which these forms are produced (as suggested by F3 frequency) both reveal ways in which Boyle converges with a particular reference group.

Even so, there are shortcomings with the audience design model for fully explaining the data in this study. One is that while the audience clearly has an influence, it is not clear what it is about the audience that inspires the shift (Schilling 2013). In the case of the interview with Kevin Bridges, the shift could feasibly be attributed to Bridges' own speech (which is highly derhoticised) or some demographic or personal characteristics that he has (such as working class or fellow Glaswegian), or a combination of both. All of these are reasonable suggestions for what might instigate the shift, but which cannot be teased apart. In addition, Frankie Boyle's speech with Richard Osman could perhaps be characterised as an initiative shift (in contrast to responsive), where Boyle is given agency to use language creatively and design the situation. However, since we must maintain that "initiative shifts get their meanings through established connections between linguistic forms and social meanings" (Schilling-Estes 2013:337), this approach is really just responsive after all. A "speaker design" approach might overcome this but would be lacking as a descriptive and restrictive model. Contextual factors should be the core influences for style-shifting, so as to limit the scope of what can be expected. In addition, it is reasonable to assume that style-shifting must be at least partly responsive. Either way, these frameworks are designed to capture what influences a speaker to favour a particular style in a given context. Further analysis is still required to better understand what social meanings are achieved through its use.

5.4 Second Order Indexicality

Silverstein (2003) describes the distinction between first (or n^{th}) order and second (or $n+1^{\text{st}}$) order indexicality as a matter of ideological intensity. A first order indexical meaning of a feature refers to the normative use of that feature, e.g., typical correlations between variants and socio-demographic contexts, whereas a second order indexical meaning refers to competing and co-occurring ideological associations for that same feature. These meaning relations allow native speakers to use indexical relationships to do social work (Johnstone and Kiesling 2008). In other words, use of a particular form can index membership of the group normally associated with that form or stereotypical characteristics of the given group (Eckert 2008), as relevant to the current situation.

Indexicality is particularly useful to explain the sociolinguistic choices made in the interview with Richard Osman. The apical /r/ that Boyle uses most in this context is associated with Scottish Standard English, which is a more supralocal and overtly prestigious variety than derhoticised Glaswegian, as the former is associated with the Scottish middle class. Our results suggest that Boyle's use of voice quality, and style more broadly, also seems to index middle-class identity. Voice quality is known to demarcate social subgroups in Scottish English: specifically, a high incidence of creaky voice is associated with the middle class of Edinburgh and Glasgow (Esling 1978, Stuart-Smith 1999). Education tends to appear in an indexical field alongside the higher social classes, perhaps because of the opportunities for education that are afforded to these groups. Thus, Boyle's use of both apical /r/ and creaky voice indexes well-educatedness. This is a useful social meaning given the tone of the interview, in which Boyle offers rational explanations and counterarguments to Osman's points about his career, television, and the media at large. One example of the indexed characteristic of being well educated at work is when Boyle says the racist slur, "nigger" (Edinburgh International Television Festival 2014:2068.5s), in reference to its use by Jeremy Clarkson, which Boyle characterises as a slur with "no content", that is, no depth

or meaning. This example is particularly pertinent as it also features a strikingly apical prepausal /r/. Boyle's voice quality and /r/ production in saying the word, and his subsequent analysis of its original use, contribute to a style that listeners may interpret as "academic" or "cerebral" due to second order indexical properties. Thus, Boyle distances himself from the reprehensible original use of the word and, in turn, from culpability.

The aforementioned example also raises an interesting question about the interplay of several socially important linguistic forms and how they together contribute to perform a desired persona as part of a larger style. In this instance, it could be argued that the notion of well-educatedness, perhaps afforded by the higher social class, is indexed by both apical /r/ and the use of creaky voice. Thus, where indexical fields overlap, perhaps our understanding of the social meanings of each form can be enhanced. What is indexed by particular voice qualities could help inform the realisations of /r/ that appear alongside them, and vice versa. However, when the social meanings indexed by linguistic forms used simultaneously are at odds, e.g., creaky voice indexing maleness in Glasgow (Stuart-Smith 1999) and overtly prestigious forms being avoided by men (Trudgill 1972), another important point of discussion concerns how they interact with one another and what our interpretation of such indexically loaded forms is.

Given the idea that intraspeaker variation is informed by interspeaker variation, previous studies on the latter (Stuart-Smith et al. 2007, 2014) regarding /r/ pharyngealisation are quite illuminating when this variant is prevalent. Stuart-Smith (2007) confirms that, at the time of her study, the group associated with derhoticisation in Scottish English was that of primarily young, male, working-class Glaswegians, a fairly accurate description of Kevin Bridges's own background at the time. Whilst Bridges's pharyngealisation is likely to influence the rate of that same variant in Boyle's speech, indexicality could support the notion that Boyle also responds to the demographic characteristics of his addressee. Perhaps Boyle's use of this form indexes his own membership of the working class. Pharyngealised /r/ in this context can therefore be interpreted as a local form with the second order property of covert prestige. More specifically, Boyle draws upon the indexed qualities of "trustworthiness" and "friendliness" to project a relatable persona and enhance the casual tone of the interview. Coupled with his comedic prowess, this style also enables Boyle to light-heartedly navigate more serious topics like nationalism and a global-warming-induced apocalypse.

Whilst indexicality is useful for explaining the social meanings behind the strategies used, the approach does not intimately incorporate the influence of the interlocutor and other audience members. Where in audience design predictions are made as to the relative importance of different audience members when designing a style, reference to indexicality alone does not specifically account for what looks to be a crucial factor in the variation observed in this study. We therefore maintain that indexicality alone is not satisfactory to completely explain the shift, given the very robust finding of contextual influence on Boyle's style shift. That being the case, an examination of the data with regard to more than one sociolinguistic model is required to fully understand the findings.

6 Conclusions

It is evident that Frankie Boyle employs some sociolinguistic strategy in the contexts studied. He realises many more prepausal and preconsonantal /r/ tokens as pharyngeal in the interview with Kevin Bridges compared to the interview with Richard Osman. The rates of /r/-pharyngealisation and creaky voice quality significantly correlate with interview context. This implies that Boyle's addressee is a strong influencing factor in the usage of these variants. In contrast, the statistical tests performed on linguistic variables consistently yielded non-significant results.

The sociolinguistic theory best applied to explain this variation is not entirely clear; indeed, the data provide a foundation for an examination of some of the weaknesses of current theories. It makes sense, then, to conclude that none of the models discussed are sufficient by themselves. Instead, more than one must be taken in concert to fully understand the data. In this instance, we would argue that indexicality theory is best suited to explain the sociolinguistic choices Boyle makes in designing his speech, and audience design is effective in that it is clear that his interlocutor (as well as his own linguistic repertoire) further directs and perhaps limits Boyle's variation.

Future intraspeaker variationist research into derhoticisation in Scottish English should investigate its role as part of a larger style, taking multiple variables into account in equal measure and looking to understand how they interact in the construction of a persona. A deeper exploration of the relationship between derhoticisation and voice quality, measuring duration, spectral balance, and frequency of relevant syllables, and perhaps expanding the scope to include use of breathy voice, would be a good place to begin.

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