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Sound Change and Social Meaning:  
The Perception and Production of Phonetic Change  
in York, Northern England

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Doctor of Philosophy  
The University of Edinburgh  
2017



## **Declaration**

I declare that this thesis was composed by myself, and that the work contained herein is my own except where explicitly stated otherwise in the text, and that this work has not been submitted for any other degree or professional qualification except as specified.

Preliminary results related to this work have been published in the following working papers:

Chapter 4: Lawrence, D. (2017). The Social Perception of a Sound Change. *University of Pennsylvania Working Papers in Linguistics*, 23(1), 111-118.

Chapter 5: Lawrence, D. (2017). The co-fronting of the tense back vowels in York, Northern England. *Proceedings of The 52nd Meeting of The Chicago Linguistic Society*, 36-41.

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## Abstract

This thesis investigates the relationship between social meaning and linguistic change. An important observation regarding spoken languages is that they are constantly changing: the way we speak differs from generation to generation. A second important observation is that spoken utterances convey social as well as denotational meaning: the way we speak communicates something about who we are. How, if at all, are these two characteristics of spoken languages related?

Many sociolinguistic studies have argued that the social meaning of linguistic features is central to explaining the spread of linguistic innovations. A novel form might be heard as more prestigious than the older form, or it may become associated with specific social stereotypes relevant to the community in which the change occurs. It is argued that this association between a linguistic variant and social meaning leads speakers to adopt or reject the innovation, inhibiting or facilitating the spread of the change. In contrast, a number of scholars have argued that social meaning is epiphenomenal to many linguistic changes, which are instead driven by an automatic process of convergence in face-to-face interaction. The issue that such arguments raise is that many studies proposing a role of social meaning in the spread of linguistic innovations rely on production data as their primary source of evidence. Observing the variable adoption of innovations across different groups of speakers (e.g. by gender, ethnicity, or socioeconomic status), a researcher might draw on their knowledge of the social history of the community under study to infer the role of social meaning in that change. In many cases, the observed patterns of could equally be explained by the social structure of the community under study, which constrains who speaks to whom.

Are linguistic changes facilitated and inhibited by social meaning? Or is it rather the case that social meaning arises as a consequence of linguistic change, without necessarily influencing the change itself? This thesis explores these

questions through a study of vocalic change in York, Northern England, focusing on the fronting and diphthongization of the tense back vowels /u/ and /o/. It presents a systematic comparison of the social meanings listeners assign to innovations (captured using perceptual methods), their social attitudes with regard to those meanings (captured through sociolinguistic interviews), and their use of those forms in production (captured through acoustic analysis). It is argued that evidence of a consistent relationship between these factors would support the proposal that social meaning plays a role in linguistic change.

The results of this combined analysis of sociolinguistic perception, social attitudes and speech production provide clear evidence of diachronic /u/ and /o/ fronting in this community, and show that variation in these two vowels is associated with a range of social meanings in perception. These meanings are underpinned by the notion of ‘Broad Yorkshire’ speech, a socially-recognized speech register linked to notions of authentic local identity and social class. Monophthongal /o/, diphthongal /u/, and back variants of both vowels are shown to be associated with this register, implying that a speaker who adopts an innovative form will likely be heard as less ‘Broad’. However, there is no clear evidence that speakers’ attitudes toward regional identity or social class have any influence on their adoption of innovations, nor that their ability to recognise the social meaning of fronting in perception is related to their production behaviour. The fronting of /u/ is spreading in a socially-uniform manner in production, unaffected by any social factor tested except for age. The fronting of /o/ is conditioned by social network structure — speakers with more diverse social networks are more likely to adopt the innovative form, while speakers with closer social ties to York are more likely to retain a back variant.

These findings demonstrate that York speakers hear back forms of /u/ and /o/ as more ‘local’ and ‘working class’ than fronter realizations, and express strong attitudes toward the values and practices associated with regional identity and

social class. However, these factors do not appear to influence their adoption of linguistic innovations in any straightforward manner, contrasting the predictions of an account of linguistic change where social meaning plays a central role in facilitating or inhibiting the propagation of linguistic innovations. Based on these results, the thesis argues that many linguistic changes may spread through the production patterns of a speech community without the direct influence of social meaning, and advocates for the combined analysis of sociolinguistic perception, social attitudes and speech production in future work.





## Lay Summary

All languages change over time, and vary from place to place. These changes could involve differences in the words people use, the grammatical patterns people prefer, or the way they pronounce certain sounds.

What causes one generation to speak differently from the previous one? A large body of research has focused on explaining patterns of change (particularly changes in pronunciation) in terms of factors such as how easy it is to pronounce new language features, or how changes might introduce or remove ambiguity in a language. This work allows us to understand why many patterns of change seem to happen in a similar way across multiple languages. However, it doesn't provide an answer to more fundamental questions: why do these changes start in the first place? What causes new pronunciation patterns to spread? What causes them to stop spreading?

A large body of research has argued that social identity (one's feelings about being from a particular region, for example) is crucial to answering these questions. For example, observing that a new language feature occurs frequently in the speech of one social group but is absent from the speech of another, a researcher might argue that this reflects the innovating group's unconscious desire to sound a particular way — perhaps they have adopted the new pronunciation pattern because it sounds 'trendy' or 'modern'. Alternatively, a researcher might argue that the group which do not use the new feature want to remain 'authentic', and thus avoid the new way of speaking. Central to these arguments is the observation that linguistic innovations become associated with *social meaning*: adopting or avoiding the new feature may communicate something about a talker's social identity, and this may inhibit or facilitate the way the change spreads across groups of speakers.

Arguments such as these allow us to connect our analysis of language change with the social history of the community under study, potentially explaining why a particular change happened in a particular place at a particular time. However, in existing research these arguments are often made primarily on the basis of production data (measurements taken from recordings of people speaking). Because of this, it's difficult to provide conclusive evidence for a particular account — it's possible to document a pattern of change in production and explain it in terms of the social meaning of the new feature, but we can't demonstrate clearly that our account is the correct one. How can we know that people perceive the new feature in the way a researcher proposes? Is it possible to empirically demonstrate that this social meaning (as opposed to some other social meaning, or some other factor entirely) is critical to the spread of the change?

In this thesis I argue that the best way of approaching these questions is to move away from relying primarily on evidence from speech production. I propose that in order to test hypotheses about the influence of social meaning on language change we need to triangulate three types of data: perception data (collected through listening experiments), production data (collected through recordings of people speaking) and attitudinal data (collected through in-depth interviews with members of the community under study). Instead of observing the spread of an innovation in production and inferring its social significance after-the-fact, this allows us to form predictions which are grounded in the perceptual experience of the speakers being studied. In other words, we can use people's reactions when they hear someone using a new language feature to generate hypotheses regarding what kind of person will want to use (or avoid) that feature, then test those hypotheses using production data.

I apply this approach to the study of two sound changes in progress in York, northern England. The first of these changes involves the vowel in 'goose', which is becoming more like the vowel in 'geese' among younger speakers. The

second one affects the vowel in 'goat', where some young people are said to be moving away from the traditional northern 'long' pronunciation, and using a vowel more typical of Standard Southern British English.

The findings of this investigation demonstrate a common pattern of social meaning across the two changes. For both vowels, the older forms tend to be heard as more typical of 'Broad Yorkshire', the term people in York use for 'authentic' local speech, which they associate with stereotypes of local regional identity. Another interesting finding is that younger people are particularly good at noticing the difference between the newer features and the old ones, while older people tend not to notice these differences. Building on these findings, I test the prediction that people who explicitly identify as being 'Yorkshire born 'n' bred' (authentic local people) will be more likely than others to avoid adopting linguistic innovations. However, the results don't clearly support this prediction. For the vowel in 'goose' I find no effect of speakers' stated attitudes to regional identity on their production patterns, and although there are some attitudinal effects for the northern versus southern-like pronunciations of the vowel in 'goat', I don't find clear evidence of change toward the southern-like pattern. In other words, although people hear the older forms of these vowels as 'authentic' and 'local', there isn't clear evidence that people who claim to be 'authentic' and 'local' avoid adopting the new forms, which is what we might expect if regional identity played a role in the spread of the changes. In the conclusion of the thesis, I propose that this mismatch between the way people hear a changing feature and the way they produce it suggests that many linguistic innovations may spread without the direct influence of social meaning, becoming socially significant only in the later stages of the change.



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My primary reason for choosing to study speech in York is closely connected with my family history. York is the city where my mother and father met as trainee teachers in the early 1970s, and I have many fond memories of childhood visits to the city. Conducting research in York gave me a unique opportunity to re-connect with this place, and I'd like to thank my parents for taking me there as a child, as well as for continually supporting my professional and academic endeavours, no matter how obscure they may seem.

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# 1. Introduction

This thesis investigates the relationship between social meaning and linguistic change. An important observation regarding natural languages is that they are constantly changing: the way we speak differs from generation to generation. Although processes of linguistic change are difficult to observe directly, a central method in sociolinguistic work has been to study change in *apparent time* (Bailey et al., 1991), which is the approach adopted in this thesis. By assuming that individuals' linguistic systems change minimally after adolescence, evidence for linguistic change can be assessed by comparing the speech patterns of older and younger speakers at a given point in time.

In addition to ubiquitous change, a second important observation regarding natural languages is that spoken utterances convey social as well as denotational meaning: the way we speak communicates something about who we are. When hearing someone speak, listeners can make inferences about a range of social traits, such as that person's gender, age, physical stature, or social status. Further, speakers routinely alter (intentionally and unintentionally) the way they speak in order to identify with a particular social group or to express a particular stance or emotional state. This thesis will use the term 'social meaning' to refer to any of the associations which might be available for a linguistic form in a given community of speaker-listeners, both in perception and production. These social categories may include broad notions of correctness, regional identity or social status; they may also include specific social stereotypes, attitudes and social stances, discussed further in Chapter 4. The central aim of this thesis is to understand the degree to which these associations might influence linguistic change. It addresses the following question:

*How, if at all, do the social meanings associated with linguistic innovations influence their spread across a speech community?*

A large body of work has focussed on accounting for language change in terms of the requirements of linguistic systems — for example, a bias toward symmetry in sound systems (e.g. Trubetzkoy, 1969; Martinet, 1955), or a pressure to maintain maximal dispersion between linguistic categories (Mielke, 2009). While these accounts are able to explain cross-linguistic similarities in the types of changes which occur in natural languages, they fail to explain how language changes spread through groups of speakers, and why only a small subset of possible changes ever take place. To address these questions, sociolinguists have explored the role of social meaning in linguistic change, proposing that the social values associated with a linguistic innovation may influence its adoption among a community of speakers.

Many sociolinguistic studies have argued that social meaning plays a central role in linguistic change. Under these accounts, patterns of linguistic variation attach to a set of social values, which lead to the spread of innovative forms across the population. These values could be related to regional or group identity: adopting an innovation might make a speaker sound more ‘local’ or ‘working class’. An innovation might also be associated with a specific stereotype, such as ‘Valley Girl’ or ‘Hipster’, or social characteristics such as being ‘tough’ or ‘authentic’. Once the innovation becomes linked to a set of social meanings, speakers may adopt or avoid a novel form to signal their alignment toward or away from the social meanings associated with it, facilitating the spread of the innovation across subgroups of the population.

The proposal that the social meaning of linguistic innovations plays a central role in their propagation has two attractive characteristics: firstly, it provides a reasonable explanation for the fact that language changes tend to exhibit social patterning. Rather than propagating randomly across the population, novel linguistic forms tend to spread at different rates across different social groups. This is exactly what would be expected if social meaning facilitates the

propagation of innovations: the groups who race ahead in adopting the new form are those who wish to align themselves with its social meaning, while those who lag behind or resist the innovation are the speakers who wish to disassociate themselves from that meaning. Additionally, social meaning provides a possible explanation for the sporadic nature of linguistic change: the fact that only some of the possible changes which might happen actually do occur. It can be argued that in order for a change to take place, a pattern of variation needs to be re-analysed as socially-meaningful, such that speakers are motivated to shift toward the novel form. Such a proposal would correctly predict that stability would be the norm for linguistic systems: change would only occur when an innovation becomes associated with a relevant social meaning.

A large body of previous work has drawn on social meaning to account for the spread of linguistic innovations, as well as the inhibition and/or reversal of historical changes. In some studies, the social meaning invoked is very general, involving broad notions of 'correctness' or 'prestige' (e.g. Labov, 1972; Trudgill, 1974). Recently, there has been great interest in the role of stereotypes specific to particular communities. For example, the stereotypical 'classic New Yorker' is argued to influence several changes in New York City (Becker, 2009, 2014a, 2014b), the 'Traditional Sunset Native' (Hall-Lew, 2013) is argued to influence the variable uptake of the low-back merger in San Francisco, and the 'Chav' is argued to influence the fronting of /o/ in Northern varieties of British English (Haddican et al., 2013). In all cases, speakers are claimed to recognize the association of the innovation with these stereotypes (on some level) and 'select' the form most consistent with their social identity, leading some groups to race ahead in adopting the innovation while others lag behind or resist the novel form.

In contrast to the work described above, a number of scholars have argued that social meaning is epiphenomenal to many linguistic changes, which are instead

driven by an automatic process of convergence in face-to-face interaction (Trudgill, 2008; Labov, 2001; Kauhanen, 2017). For these authors, while innovations may become associated with social values as they propagate through a speech community, this association does not influence processes of change. Instead, speakers adopt the variant which they encounter the most, with the differential propagation of innovations across speaker groups emerging from the structure of speakers' social networks. The issue that these accounts raise is that for any claim regarding the influence of social meaning on a linguistic change, there usually exists an equally reasonable 'change-by-accommodation' account, particularly if group-level variation in production is taken as the primary source of data. The broader problem is that the differential propagation of innovations across speakers groups might have a number of possible explanations: social meaning may or may not play a role in a particular change, and even if it does, the specific meanings and mechanisms involved may not be those initially hypothesized by a researcher.

How can a researcher know whether social meaning plays a role in a given pattern of change? Even if social meaning does exert an influence on the spread of an innovation, how can hypotheses regarding the specific meanings involved be evaluated empirically? The present study approaches these issues through a systematic comparison of three aspects of language use and social identity:

- a) The social meanings speaker-listeners assign to changing forms in perception.
- b) Speaker-listeners' attitudes toward the social values associated with those meanings.
- c) Speaker-listeners' production patterns with regard to the changing forms.

Although links between speech perception and production are notoriously difficult to capture (see e.g. Beddor, 2015), it is argued that investigating the

relationship between perception, attitudes and production is essential to understanding the role of social meaning in linguistic change, as existing accounts imply a close connection between these three factors. If linguistic innovations spread due to speakers' recognition of their social meaning and use of the novel form to signal their social identity, it would be reasonable to expect that their production patterns would reflect their social attitudes with regard to the social meanings assigned to the changing forms in perception. In contrast, if innovations spread primarily due to a 'neutral' process of accommodation, the structure of speakers' social networks and the degree of contact they have with the source of the innovation should be the most important factor in determining their production patterns.

This present study applies this perception-attitudes-production approach to the analysis of two sound changes in progress in York, Northern England: the fronting of the tense back vowels /u/ and /o/. As a city which is often described as 'an island of the South in the North', York provides an ideal field site for the study of language change and social identity. The past 50 years have seen a rapid expansion of the service and tourism industries in the city, as well as an influx of students from both the rest of the UK and abroad. At the same time, many of the industries which were traditionally a central part of life in York have declined, bringing tensions around social class and regional identity to the fore. It is reasonable to expect that these tensions might be observable in the speech patterns of York residents, and might play a role in facilitating or inhibiting the spread of linguistic innovations. Haddican et al.'s (2013) recent study of language change in York argues that this is indeed the case. Observing a rapid move toward fronted variants of /u/ (the vowel in GOOSE) and comparatively slow adoption of fronted variants of /o/ (the vowel in GOAT), the authors suggest that the latter change may be inhibited by its association with stereotypes of regional identity and social class. However, as with many studies proposing a role of social meaning in linguistic change, this argument is based primarily on production data. Using Haddican et al.'s (2013) production

analysis as a starting point, the present work develops a thorough account of the social perception of variation in /u/ and /o/ in York, the social attitudes speakers hold toward the possible social meanings of these vowels, and their adoption of or resistance to linguistic innovations.

**Chapter 2** provides an overview of the issues introduced in this introduction, discussing examples of studies where social meaning is claimed to play a central role in linguistic change (social-indexical accounts), as well as accounts which argue against this claim (change-by-accommodation accounts). It moves on to discuss previous approaches to the problem of distinguishing social-indexical versus change-by-accommodation accounts of linguistic change, including experimental approaches and computational studies. The chapter concludes by arguing that existing studies do not provide evidence of the key mechanism underpinning social-indexical accounts of linguistic change: speakers' ability to assign social meanings to forms undergoing change, then to position themselves with regard to those meanings through their production choices. This gap motivates the approach of the present work, which investigates the relationship between sociolinguistic perception, social attitudes, and speech production.

**Chapter 3** introduces the approach of the present work in more detail, outlining the three questions which structure the thesis. The three questions are: '*Do speaker-listeners assign social meaning to the changing forms?*' (addressed in Chapter 4), '*Are speaker-listeners' production patterns related to their attitudes toward the social meaning(s) indexed by the changing forms?*' (addressed in Chapter 5), and '*Are speaker-listeners' production patterns related to their awareness of the social meaning(s) indexed by the changing forms?*' (addressed in Chapter 6). The remainder of Chapter 3 introduces the field site of the present study and the sound changes analysed: the fronting of the tense back vowels /u/ and /o/ in York, Northern England.

**Chapter 4** answers the first guiding question of the thesis: *'Do speaker-listeners assign social meaning to the changing forms?'*. It achieves this through the analysis of two types of sociolinguistic perception data: one group of listeners' open-ended reactions to recordings of York speakers of a range of ages and backgrounds, and a second group of listeners' responses to digitally-manipulated speech stimuli, collected through a controlled sociolinguistic perception experiment. The chapter argues that variation in /u/ and /o/ is associated with a range of social meanings in York, structured around the notion of 'Broad Yorkshire' speech, a socially-recognized register (Agha, 2003) linked to social class and regional identity. 'Broad' speech is linked to a range of social traits, with 'Broad' speakers described as 'authentic' and 'genuine' and 'Yorkshire born and bred', but also 'rough', 'thuggish' and 'uneducated'. Monophthongal /o/, and back variants of /u/ and /o/ are shown to be associated with this register, implying that a speaker who adopts an innovative form will likely be heard as less 'Broad'.

**Chapter 5** addresses the second guiding question of the thesis: *'Are speaker-listeners' production patterns related to their attitudes toward the social meaning(s) indexed by the changing forms?'*. It draws on the findings of the previous chapter to form predictions regarding the relationship between social attitudes and the adoption of fronted variants of /u/ and /o/ in York. Based on the association between back variants of these vowels and regional identity, a social-indexical account of change in these vowels might predict that those speakers who hold strong positive attitudes toward local identity would resist adopting fronted variants. In contrast, a change-by-accommodation account would predict that any differences in the adoption of fronted variants would be related to speakers' opportunities for contact with the innovative forms: speakers with the most exposure to innovations would be the most advanced with regard to the change in production, and those who have the least exposure would lag behind, regardless of their attitudes toward regional identity and social class. The chapter explores these predictions by evaluating the relative



influence of social network diversity, dialect contact, and social attitudes on speakers' production patterns. To do this, it draws on an ethnographically-informed analysis of the sociolinguistic interview data to develop quantitative variables representing each of these factors. The results of Chapter 5 suggest a very limited role for social meaning in explaining the trajectory of the changes under study. The fronting of /u/ is spreading in a socially-uniform manner in production, unaffected by any social factor tested except for age. The fronting of /o/ is conditioned by social network structure — speakers with more diverse social networks are more likely to adopt the innovative form, while speakers with closer social ties to York are more likely to retain a back variant. There is very little evidence that fronting is related to social attitudes, although speakers who express strong positive attitudes toward local regional identity are more likely to produce monophthongal /o/ and diphthongal /u/. These results provide evidence that dynamic variation in /u/ and /o/ may be a stable pattern of sociolinguistic variation related to regional identity in York. However, the fronting of these vowels appears to happen despite the fact that backness is associated with local regional identity in perception.

**Chapter 6** addresses the final guiding question of the thesis: '*Are speaker-listeners' production patterns related to their awareness of the social meaning(s) indexed by the changing forms?*'. Where Chapter 5 tested the relationship between speaker-listeners' social attitudes and the production of forms undergoing change, this chapter approaches the analysis of the role of social meaning in linguistic change from another angle, testing the relationship between speaker-listeners' implicit perceptual awareness of the social meaning of variation in /u/ and /o/ and their production patterns. The chapter argues that the role of social meaning in linguistic change is contingent on speaker-listeners' ability to recognise the social meaning of changing forms in perception. It is suggested that social-indexical accounts allow predictions to be formed regarding which speakers will be especially sensitive to particular meanings of changing forms in perception. The analysis explores this proposal

by testing a specific social-indexical account /o/ fronting in York. Based on the observation of a rapid shift toward fronted, diphthongal /o/ among a subset of younger speakers, it is proposed that those speakers maybe have begun to associate back variants of /o/ with a highly stigmatized stereotype represented in the perceptual stimuli, the 'Chav'. Given the acute stigma surrounding this figure, such an association might lead speakers to avoid back variants in production. If this were the case, it would be reasonable to predict that the leaders of change in /o/ might be more perceptually sensitive to the 'Chav' association of backness than other speakers. This hypothesis is tested in two ways. The first analysis explores the effect of non-linguistic factors on the perception of back /o/ as a 'Chav' feature, testing whether the speakers who adopt fronted variants in production are more sensitive than others to this meaning. The second analysis tests the relationship between individuals' awareness of the relationship between variation in /o/ and their production patterns. The results of Chapter 6 suggest a general bias for younger listeners hear back variants of /u/ and /o/ as 'Chav' features, but no evidence of a relationship between speakers' awareness of this meaning and their production patterns. It is suggested that this may reflect apparent-time evidence of the changing social meaning of back /u/ and /o/; however, the chapter argues that these results provide no evidence of the role of social meaning in facilitating the spread of linguistic innovations.

**Chapter 7** reviews the key findings of the thesis. The general conclusion is that many sound changes may spread without the influence of social meaning, even when the social patterning of the innovation in production might imply that social meaning is involved. The chapter argues that in some cases linguistic innovations may propagate across a speech community *despite* the association of the changing forms with a social meaning. For example, while younger York speakers know on some level that back variants of /u/ would make them sound more authentic and 'Yorkshire born and bred', neither their attitudes toward regional identity nor any other social factor tested (except for age) have any

impact on their production of this vowel. This mismatch between sociolinguistic perception, social attitudes and speech production problematizes explanations of linguistic change which rely on social meaning to explain the propagation of linguistic innovations, particularly if they rely on production patterns as their primary source of evidence. The chapter reviews a number of similar findings involving perception-production mismatches in sociolinguistics, and advocates for the combined analysis of perception, attitudes and production in future work on sound change and social meaning.

## 2. Background

### 2.1 Why do languages change?

Change is a universal property of living human languages, yet the fact that languages undergo change seems counterintuitive. Why should language users alter their existing conventions, given that such alterations potentially risk impeding communication? The key to answering this question involves another important property of natural languages: the presence of linguistic variation, or many ways of saying the same thing (Labov, 1972). At any one time in a given community of speakers, there exist a range of competing forms which may express the same meaning. Over time, a range of physiological (Ohala, 1983; Harrington et al., 2011), linguistic (Martinet, 1955; Labov, 1994; Kiparsky, 1995) and social factors (see discussion below) may lead the community to favour one form over the others, resulting in linguistic change.

This thesis is concerned specifically with the role of social factors in processes of linguistic change. One motivation for studying social factors is that they provide a potential explanation for two important properties of language change. The first of these is what Labov (2001:75) refers to as the *sporadic* character of linguistic change: while language change is constantly occurring, the overwhelming trend is stability: most elements of a given language do *not* change from generation to generation. Secondly, linguistic changes are often *socially-structured*: some groups race ahead in adopting a new convention, while others may lag behind or resist adopting a novel form. For example, women are typically reported to adopt innovations at higher rates than men (Labov, 1972; Trudgill, 1974; Haeri, 1994; Maclagan et al., 1999; Conn, 2005). Many changes originate in interior social groups (e.g. the lower-middle or upper-working classes), before spreading outward in the socioeconomic hierarchy (Labov, 1972; Trudgill, 1974; Baranowski, 2010). While much linguistic research has focussed on the physiological and linguistic factors which explain cross-

linguistic similarities in patterns of language change (e.g. Blevins, 2004), these accounts cannot explain the fact that only a limited number of possible changes actually ever take place, nor the fact that innovations tend to spread at different rates across social groups.

What mechanism could lead a population of speakers to sporadically replace existing conventions with new ones, and why should innovations tend to pattern differently across social groups? One possible explanation lies in the potential for linguistic variation to carry social meaning: perhaps language users evaluate competing variants in terms of the social values associated with them, leading to the selection of certain innovations at the expense of others (Labov, 1963; 1972; Hall-Lew, 2009; 2013; Becker, 2014a; 2014b; Labov et al., 2013; Watt, 2000; 2002). In this thesis, accounts of linguistic change based on this social selection mechanism will be referred to as *social-indexical* accounts. A second possible explanation is that language change is primarily driven by the frequency with which speakers encounter innovative versus conservative forms, for example, due to changes in the social network structure of the community under study (Trudgill, 2004; 2008; Kauhanen, 2017). These explanations will be referred to as *change-by-accommodation* accounts. Crucially, social-indexical accounts propose that the social meaning associated with the form undergoing change is central to the spread of innovations across the speech community. For change-by-accommodation accounts, social meaning is epiphenomenal to linguistic change: it may arise as a consequence of language change, but does not influence the trajectory of change itself.

To what extent does the social-semiotic function of linguistic variation impact upon processes of language change? Is social meaning a central motivating factor, or is the spread of linguistic innovations more often a question of who speaks to whom? What do these explanations for language change imply about speakers' perceptual awareness of the social meaning(s) of variable features, and their ability to control that variation in speech production? This chapter

will provide an overview of these issues, describing the theoretical underpinnings of social-indexical and change-by-accommodation accounts, and evaluating their ability to explain the sporadic, socially-structured nature of linguistic change. It will be argued that social-indexical accounts provide a clear explanation for both of these properties, while explanations based on change-by-accommodation struggle to explain the fact that only a subset of the possible changes that might happen ever take place. However, it will also be suggested that existing empirical studies lack the crucial evidence for the role of social meaning in linguistic change: a link between the social meanings speaker-listeners assign to innovations in perception, their social attitudes with regard to those meanings, and their production patterns with regard to the innovations. The search for this link between sociolinguistic perception, social attitudes and speech production will form the basis of the present study.

## **2.2 Social meaning as a motivating factor in linguistic change**

### **2.2.1 Phonetic variation and social meaning**

Spoken utterances may contain a wide range of information about the speaker (Ladefoged & Broadbent, 1957; Abercrombie, 1967). This may include information derived from physiological properties (Lass et al., 1978), as well as learned associations between patterns of variation and social categories (e.g. Foulkes & Docherty, 2006). The fact that linguistic forms may be associated with both social and denotational meanings provides a potential solution to the question of why speakers should move away from established conventions: while such a change may risk impeding communication, there may be a social benefit for speakers in adopting a novel form.

The fact that linguistic variation may carry information about a speaker has long been recognized. For example, Ladefoged and Broadbent (1957) distinguish the 'linguistic' information carried by an utterance from 'socio-linguistic' and 'personal' information (p.98), referring to pronunciation features which may

signal group identity and the identity of a given individual respectively. There is a great deal of perceptual evidence supporting the assertion that speech contains information about the identity of speakers. For example, Remez & Rubin (1997) carried out talker identification experiments using sinewave replicas of natural speech, which eliminate the effects of voice quality and intonation. Despite the absence of these cues, listeners were able to reliably identify individual talkers, suggesting that talker-specific information was available in the phonetic quality of speech segments. In terms of group identity, Clopper & Pisoni (2004) have demonstrated that speakers of American English can use phonetic variation to categorize talkers by regional dialect. Purnell, Isardi & Baugh (1999) show that American English listeners can distinguish the ethnicity (European/Hispanic/African-American) of a talker from a single token of 'hello', with accuracy rates upward of 77%. Listeners may also use speech variation to infer the sexuality of a talker (Munson & Babel, 2007), their socioeconomic status (Labov et al., 2011) and to assign personality traits such as 'dependability' or 'intelligence' (Lambert et al., 1960). These studies demonstrate that sociolinguistic variation can signal, or *index*, a wide range of aspects of social identity, including the identity of specific individuals; their regional background, ethnicity and sexuality; their socioeconomic status and personality traits.

As well as using variation as a cue to social characteristics in perception, there is evidence that speakers deploy linguistic variation to construct their social identities through their production patterns. The idea that speakers strategically deploy linguistic variation to achieve social goals is often associated with LePage & Tabouret-Keller (1985), who make the following proposal:

*The individual creates his [sic] systems of verbal behavior so as to resemble those common to the group or groups with which he [sic] wishes from time to time to be identified.*

LePage & Tabouret-Keller (1985:181)

The implication here is that speaker-listeners have some knowledge of the distribution of sociolinguistic variation across social groups, and use this knowledge to perform 'acts of identity', signaling group affiliation through their production choices. Eckert (2000) provides another example in her study of language use and social practice in a suburban Detroit high school, 'Belten High'. The author found that the social geography of the school was structured around two polarized peer groups: the school-oriented *jocks*, and the staunchly non-conformist *burnouts*. Eckert characterised these groups in terms of the wide range of social practices the adolescents used to position themselves with regard to the jock/burnout opposition: jocks wore straight-leg jeans, while burnouts wore bell-bottom trousers; jocks were likely to be involved in school-sponsored after-school activities, while burnouts were more likely to engage in 'cruising' in urban Detroit. The jock/burnout opposition was also observable in speakers' language use: burnouts were much more likely to use negative concord (e.g. *She didn't say nothing* vs. *She didn't say anything*) than jocks, and led in the adoption of vocalic innovations spreading from the urban center (such as the backing of /ʌ/, meaning that 'bus' would be pronounced closer to [bʊs]). Furthermore, jocks who participated in activities associated with burnout identity, such as 'cruising', showed higher rates of the speech features typical of burnouts than other jocks. Eckert (2000) argued that these patterns reflected speakers' use of linguistic variation as a way of constructing their identities, positioning themselves as more or less affiliated with the jock and burnout groups.

While Le Page & Tabouret-Keller's (1985) 'acts of identity' framework focuses specifically on group membership, recent sociolinguistic work has sought to develop a more sophisticated understanding of the possible social meanings that can attach to linguistic variation. Eckert (2008) argues that the burnouts' use of features associated with urban speech does not necessarily reflect their desire to be identified as 'urban'. Rather, the patterns of usage emerge as a product of speakers' identification with a range of characteristics they



perceived as typical of urban speakers: street-smartness, toughness and independence. Echoing the experimental evidence that phonetic variation can index a wide range of social characteristics, Eckert's (2008) discussion of the Belten High results provide examples of several types of social meaning which may be available for variable forms. Taking the use of negative concord as an example, at the level of *broad demographic categories*, this feature is more common in urban speech than suburban speech. At the level of the high-school, it is associated with a particular *persona style* or *social type*: the burnout. The burnout style, and by extension, the forms which index it, are associated with a set of *personal qualities*: street-smartness, toughness, and independence. Moore & Podesva (2008) suggest that negative concord may also be associated with the rebellious *stance* the burnouts take in opposition to the values of the school.

This brief discussion of the possible types of social meaning articulated by a variable feature reveals an important property of the social-semiotic function of linguistic variation: a single feature may have a range of possible social interpretations which can be activated in the moment of usage. These could include stances ('anti-school', 'rebellious'), more enduring personal qualities ('tough'), locally-meaningful social types ('burnout') or broad demographic categories ('urban'). To account for the range of social meanings potentially available for linguistic features, sociolinguists have turned toward the linguistic-anthropological concept of *indexicality* (Silverstein, 2003). Silverstein's concept of the *indexical order* provides a framework for understanding how linguistic forms may become associated with multiple social meanings. Under this approach, linguistic forms attach to social meanings when speaker-listeners notice (on some level) a correlation between a speech pattern and a social category. At this stage, the form is recognized as an 'n<sup>th</sup>-order' index (p.194), typically understood as reflecting the speaker's membership in a social group. However, since groups themselves are associated with social values, these values also become available as associations for the speech variant, which Silverstein (2003) refers to as the 'n+1<sup>st</sup>-order' meanings of the form. Thus, a

form which is initially associated with a difference across social groups (such as jocks vs. burnouts) may become available as an index of characteristics associated with those groups (e.g. toughness) or stances typical of those groups (e.g. rebellious). Speakers may draw on these meanings when making production choices to construct their social identity in a particular way. Building on Silverstein's (2003) concept of the indexical order, Eckert (2008) refers to the meanings which may become available for a linguistic feature as that feature's *indexical field*: a 'or constellation of ideologically related meanings, any one of which can be activated in the situated use of the variable' (p.454).

A number of studies have documented the social meanings of variable speech patterns in a range of contexts. For example, Campbell-Kibler (2009; 2010) has explored the social perception of variation in *-ing* clusters (e.g. [sɪŋɪm]/[sɪŋən] vs. [sɪŋɪŋ] for *singing*) among US college students. Her findings demonstrate that this alternation may be interpreted as an index of regional origin (with apical variants heard as 'Southern'), and education (with apical variants heard as 'less educated'). The apical variant was also found to be associated with 'relaxed' speech, with the velar realization linked to characteristics such as 'articulate' and 'pretentious'. Zhang (2005) has suggested that the rhotacization of syllable rimes in Beijing Mandarin is associated with a local social type: the 'Beijing Smooth Operator', a smooth-talking, street-smart character who uses their 'gift of the gab' to deal with difficult situations. Podesva (2007) has shown how a young professional interacting with friends uses falsetto to position himself as a 'diva': a style-conscious, critical and flamboyant gay persona.

In addition to the above findings, a related strand of research has focused on socially-recognized ways of speaking, or 'enregistered voices' (Agha, 2005). Agha's (2003) study of the emergence of RP as a prestige register of spoken English demonstrates how the emergence of metadiscursive genres such as prescriptivist pronouncing dictionaries and popular handbooks regarding

speech habits led to the recognition of 'RP' as a distinct way of speaking, linked to 'characterological images of persons' (p.239) and social traits (e.g. 'ambitious', 'intelligent'). There is clear overlap here with the notion of the *social type* discussed above; indeed, Eckert (2008) appears to treat the notions of *enregisterment* and the *indexical field* as aspects of the same general phenomenon. However, in many sociolinguistic studies, the term *enregisterment* or *enregistered variety* has come to refer specifically to socially-recognized varieties of speech, particularly those linked to meanings of place – for example such as 'Pittsburghese' (Johnstone, 2009), 'Geordie' or 'Sheffieldish' (Beal, 2009).

While a range of features may provide information about a speakers' general regional origin, features which are linked to *enregistered varieties* are usually those which people recognize as 'typical' of particular place, and usually emblematic of a 'typically local' social type or characterological figure. Johnstone et al. (2006) have demonstrated how 'Pittsburghese' emerged as an *enregistered variety* during the 20<sup>th</sup> century, as features which were initially related to socioeconomic status in production became available to mark 'authentic' local identity. In addition to the stances, persona styles, characterological figures and demographic categories discussed in e.g. Campbell-Kibler (2010) and Podesva (2007), *enregistered varieties* can be seen as another possible level of social meaning: a linguistic form may identify a talker as 'someone who speaks with a Geordie accent' or as someone who speaks 'Country' (Hall-Lew & Stephens, 2011).

To summarize the discussion so far, this section began by introducing an important property of language: the propensity for spoken utterances to simultaneously convey information about the speaker, as well as the message they are trying to communicate. It was suggested that this property of speech not only allows speaker-listeners to make social judgements about speakers, but also allows them to use language as a resource for identity construction.

Surveying sociolinguistic work on social meaning, it was suggested that variable linguistic forms can be understood to be associated with an *indexical field* of possible meanings.

<b>Type of meaning</b>	<b>Example meanings</b>	<b>Example studies</b>
Macro-level social categories	<i>Working-class, Southern</i>	Labov (1972;2001) Campbell-Kibler (2009;2010)
Enregistered varieties	<i>Pittsburghese Country</i>	Johnstone (2009) Hall-Lew & Stephens (2011)
Social types/ Characterological figures	<i>Valley girl Burnout Smooth operator</i>	D'onofrio (2015) Eckert (2000) Zhang (2005)
Persona styles	<i>Diva</i>	Podesva (2007)
Speaker characteristics	<i>Educated, Articulate</i>	Campbell-Kibler (2009;2010)
Stances	<i>Formal, Careful</i>	Campbell-Kibler (2009;2010)

*Table 2.2.1: Examples of social-indexical meanings*

Table 2.2.1 summarizes the main categories of social meaning referred to in existing research; see Eckert (2016) for further examples. The choice of one form over another may index an interactional stance such as 'formal' or 'careful'; it may index a more enduring characteristic of a speaker, such as 'educated' or 'articulate' (Campbell-Kibler, 2009; 2010). Speakers may use linguistic resources to construct recognizable persona styles in interaction, such as the 'gay diva' persona in Podesva (2007). Linguistic features may also become associated with more stable social types or characterological figures, such as the 'valley girl' (D'onofrio, 2015) or 'burnout' (Eckert, 2000). Forms may also be recognized as typical of enregistered varieties such as 'Pittsburghese' (Johnstone, 2009), or mark a speaker as 'country' (Hall-Lew & Stephens, 2011). Finally, speech variants may be associated with broad demographic or regional categories, such as 'working-class' or 'Southern' (Labov, 1972; 2001).

## 2.2.2 Social meaning as an explanation for linguistic change

The key argument of social-indexical accounts of linguistic change is that the association of a linguistic form (or one of its variants) with a social meaning may facilitate or inhibit a potential change in that feature. In the terminology introduced in section 2.2.1, these accounts argue that the trajectory of linguistic changes can be understood by modeling the *indexical field* of forms undergoing change (Eckert, 2008). If a linguistic innovation is perceived as socially meaningful, then choosing one form over another may have implications for how a speaker is perceived — for example, an innovation might be considered more ‘modern’ or ‘prestigious’ than the older form, facilitating its adoption among speakers who identify with these meanings. Conversely, change might be inhibited in cases where adopting an innovation would lead speakers to sound ‘not from here’ or ‘incorrect’. This would provide an explanation for the observation that linguistic changes happen sporadically: only if a variant becomes associated with an appropriate social meaning would it be expected to spread across the speech community. It would also explain the social patterning of many linguistic changes: speakers use the changing form to signal their orientation toward or away from the social values associated with the competing variants, resulting in the innovations spreading along social lines.

In the sociolinguistic literature, social meaning is invoked as an explanation for patterns of linguistic change in a number of different ways. Speakers may be claimed to adopt an innovative form due to its social meaning, leading to *socially-motivated sound change* (e.g. Labov, 1963; 1972). In another set of accounts, speakers are claimed to resist adopting a potential innovation because of its social meaning, leading to *socially-motivated resistance* to linguistic change (e.g. Hall-Lew, 2009; 2013, Becker, 2014a; 2014b). Additionally, a number of accounts propose that a social meaning attaches to a form moving out of usage, leading to the *socially-motivated reversal* of historical changes, or the *socially-motivated loss* of a stigmatized feature (e.g. Labov et al., 2013; Watt, 2000; 2002). Examples of these accounts are provided below.

### *Socially-motivated sound change*

One of the earliest studies to propose the role of social-indexical meaning in linguistic change was Labov's (1963) study of vocalic change in Martha's Vineyard, an island off the coast of Massachusetts. Labov noted an increase in the degree of centralization in (ay) and (aw)<sup>1</sup> at the vowel onset, particularly among residents who had a positive orientation toward the island. Labov (1963) argued that a subset of younger island residents were using the centralization of these vowels to signal their identity as authentic 'Vineyarders' in contrast to the 'Mainlanders' who visited from the Massachusetts mainland:

*It is apparent that the immediate meaning of this phonetic feature is "Vineyarder". When a man says [rɛɪt] or [hɛʊs], he is unconsciously establishing the fact that he belongs to the island: that he is one of the natives to whom the island really belongs.*

Labov (1963:305)

Labov proposed that the centralization of (ay) and (aw) began as a subgroup of island fisherman began to associate the feature with the 'dramatized island character' of the authentic Vineyarder. Labov (1963) argues that younger islanders associate this figure with a range of personal characteristics — they are 'independent, skilful with many kinds of tools and equipment, quick-spoken, courageous and physically strong.' (p.305). In the terminology introduced in Table 2.2.1, the centralization of (ay) and (aw) became linked to a local characterological figure: the 'Authentic Vineyarder', who was associated with a set of social characteristics such as 'authentic', 'independent' and 'quick-spoken'. This association between a pattern of linguistic variation and a social meaning lead to the rapid adoption of centralization among younger speakers who identified positively with these values, as they used the feature to align themselves with the 'Authentic Vineyarder' figure. Eckert (2016) provides an

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<sup>1</sup> Labov's (1963) notation for the vowels in the PRICE and MOUTH lexical sets (Wells, 1982).

analysis of the Martha's Vineyard findings in terms of Silverstein's (2003) *orders of indexicality*:

*...in Labov's (1963) Martha's Vineyard study, (ay) with a centralized nucleus, originating as a regional ("first" order) index 'Vineyarder,' was appropriated to index a particular stance in the struggle with mainland incursion, yielding a "second" order index – a particular claim about what constitutes an 'Authentic Vineyarder.'*

Eckert (2016:72)

The general mechanism being described here is as follows: a pattern of incipient variation exists (here a pattern of regional variation). As a consequence of social and economic changes in the community (a growing reliance on the tourist industry and decline of the fishing industry), this pattern becomes associated with a new social meaning ('Authentic Vineyarder'), leading to the rapid shift toward one variant among a subgroup of speakers. This mechanism provides a potential explanation for the social patterning of the change: speakers who identify strongly with the social values associated with the 'Authentic Vineyarder' adopt centralized variants to index their alignment with those values. It can also account for the fact the centralization of (ay) and (aw) in particular were found to be undergoing change, as it is those forms (and not other regionally-patterned differences) which had become associated with the 'Authentic Vineyarder' style.

The 'Authentic Vineyarder' meaning described in Labov (1963) was very specific to the social-historical context of the Martha's Vineyard study, relating to a particular characterological figure which emerged as a consequence of social change on the island. In addition to claims regarding local social-indexical meanings such as this, a large body of sociolinguistic work has used broader concepts such as 'prestige' to explain patterns of linguistic change. For example, Labov (1972) attributes the spread of coda /r/ in New York City to the prestige associated with the form. While New York English was traditionally non-rhotic (e.g. Sen, 1979), Labov reported a shift toward rhoticity among New Yorkers,

which he argued was related to a change in the relative prestige of rhotic vs non-rhotic pronunciations. Labov (1994) refers to this process as an example of 'change from above', or the introduction of innovations 'that have higher prestige in the view of the dominant class' (p.78). Upper-class New Yorkers are argued to have recognized coda /r/ as a potential marker of prestige, and adopted it to signal their social position, which led to it being imitated by speakers lower down in the socioeconomic hierarchy. The process implied here is not unlike that described in the Martha's Vineyard study, although the social meaning at stake regards 'prestige' derived from social class, rather than a local identity category such as the 'Authentic Vineyarder'.

### *Socially-motivated resistance*

The two cases from Labov (1963) and Labov (1972) provide examples of socially-motivated linguistic change. In both cases, the social meaning associated with a pattern of variation facilitates its spread across a population of speakers. Another set of social-indexical accounts use the social meaning of a changing form to explain resistance to linguistic change among subgroups of speakers. For example, Hall-Lew (2013) analysed the merger of the low back vowels (the vowels in COT and CAUGHT) among European American and Chinese American residents of San Francisco's Sunset District. Chinese Americans were found to follow the regional Californian pattern of a shift toward merger in apparent-time, while European Americans appeared to resist the move toward merger, maintaining distinct realizations of the vowels in COT and CAUGHT. Hall-Lew (2013) relates this finding to previous reports of merger-in-progress among European Americans in the neighbourhood (Moonwomon, 1991), suggesting that the apparent 'interruption' of this change might be explained by 'the emergence of local value for conservative vowel variants.' (p.384). Hall-Lew (2009) provides more detail about what this 'local value' might involve, proposing that the association of the COT - CAUGHT distinction with the



stereotypically Irish-American 'Traditional Sunset Native' persona may motivate European American speakers to resist the merger.

Becker (2009; 2014a) provides another example of socially-motivated resistance to linguistic change. While many traditionally non-rhotic varieties of North American English have experienced a rapid shift toward rhoticity (Feagin, 1990; Baranowski, 2007), the adoption of coda /r/ in New York City is reported to be comparatively slow (Labov et al., 2006). Becker (2014a) has suggested that this may be due to the association of non-rhotic forms with identities of place in New York city. Analysing the speech of European-Americans in the Lower East-Side, Becker (2009) found that speakers were more likely to use non-rhotic forms when discussing topics related to the neighbourhood, such as narratives situated in the local area or changes in the neighbourhood. The author argues that this represents speakers' use of the form to 'authenticate their status as Lower East Siders' (p.653). Although the author does not claim to demonstrate socially-motivated resistance directly, Becker (2014a) argues that the positive local values attached to non-rhoticity might lead certain speakers to resist the ongoing change toward the rhotic form, leading to the relatively slow rate of change noted by Labov et al. (2006).

#### *Socially-motivated reversal and loss*

Another way in which social meaning has been proposed to influence linguistic change is in the reversal of previously-documented changes, and the loss of existing forms. In these cases, a shift away from a particular variant is explained by a change in its social meaning. Labov et al. (2013) argue that the fronting of the back up-gliding vowels (the vowels in MOUTH and GOAT, or /aw/ and /ow/ in Labov's (2013) notation) has begun to reverse in Philadelphia, and that the usage of locally-stereotyped features such as tense /æh/ and /oh/ (the vowels in MAD and BOUGHT) has declined. The authors relate these features to the patterns of neighboring dialects, arguing that 'features in common with North

and North Midland dialects have accelerated in use while features in common with South Midland and Southern dialects have been reversed in favor of Northern patterns.’ (p.30). The specific social meanings involved in this reversal are not made clear; the authors simply conclude that the changes are ‘driven by social evaluation as features rise in level of salience for members of the speech community’. The implication of this argument is that the changing features became associated with some aspect of regional identity or social status, leading to the reversal of change in the back vowel system and withdrawal from tense /æh/ and /oh/.

Becker (2014b) provides another example of a study proposing the socially-motivated reversal of linguistic change. The author shows that the BOUGHT vowel is lowering in apparent-time in New York City English, in contrast to Labov’s (1972) finding of a move toward more raised realizations. Drawing on results from a sociolinguistic perception test, Becker argues that the reversal of the trajectory of change in BOUGHT can be explained by its contemporary social meanings. While raised BOUGHT may have previously been associated with the general meaning of ‘New York City’ at the time of Labov’s (1972) study, Becker provides evidence that the vowel has recently become associated with the ‘classic New Yorker’ figure: an ‘older, white ethnic New Yorker from the outer boroughs who is mean and aloof’ (p. 395). The author argues that the negative connotations of this characterological figure have led speakers to reverse the trajectory of change in BOUGHT, as they distance themselves from the ‘classic New Yorker’ through their production choices. A similar argument can be found in Watt’s (1998, 2000, 2002) work on the English spoken in Newcastle upon Tyne. Watt found that the ingliding realizations of FACE and GOAT ([ɪe] and [ʊə]) were being replaced by ‘pan-northern’ [e:] and [o:]. Watt & Milroy (1999) suggest that this reflects the influence of different social meanings attaching to the variants: the ingliding diphthongs are old-fashioned, associated with industrial working-class life, while monophthongs identify speakers as ‘modern Northerners’ (Watt, 1998:7). Echoing the argument of Becker (2014b), the

general claim here is that linguistic change is motivated by a new social meaning attached to the older variant: a form which may have been the typical way of speaking for a community in the past becomes associated with a new set of indexical meanings, leading to a shift away from that form.

To summarize, this section has discussed examples of studies where the social significance of a variable pattern is argued to explain linguistic change. In all cases, speaker-listeners are argued to attach a social meaning to one or more variants of a linguistic form. This connection between linguistic form and social meaning then leads to a change in speakers' production patterns, as they use the form to position themselves with regard to the social values associated with that meaning. In some cases, the social meanings associated with an innovation are said to drive the change (e.g. Labov, 1963); in other cases, they may lead subsets of speakers to resist a change (e.g. Hall-Lew, 2013). It is also argued that social meaning may lead to the reversal of changes (Becker, 2014b) or the loss of socially-marked forms (Watt, 2000). Table 2.2.2 summarizes these different accounts, alongside the published examples discussed in this section:

<b>Type of account</b>	<b>Study</b>	<b>Social meaning</b>	<b>Effect on change</b>
<b>Socially-motivated change</b>  <i>Social meaning attaches to an innovation, facilitating its adoption.</i>	Labov (1966)	Martha's Vineyard residents associate centralization of (ay) and (aw) with the 'Authentic Vineyarder' persona.	Advanced centralization of (ay) and (aw) among up-island residents.
	Labov (1972)	New Yorkers associate coda /r/ with prestige.	Adoption of coda /r/ among middle-class NYC speakers.
<b>Socially-motivated resistance</b>  <i>Social meaning attaches to an innovation, leading a subgroup of speakers to avoid it.</i>	Hall-Lew (2013;2009)	San Franciscans associate the low-back distinction with the 'Traditional Sunset Native' figure.	Resistance to merger among younger European American residents of the Sunset district.
	Becker (2014a)	New Yorkers associate non-rhoticity with New York identity.	Resistance to the adoption of coda /r/ in New York City.
<b>Socially-motivated reversal/loss</b>  <i>Social meaning attaches to an existing form, leading to the reversal of its trajectory of change or its replacement.</i>	Labov et al. (2013)	Saliency of tense /æh/ and /oh/. and fronted /aw/ and /ow/ among Philadelphians.	Reversal of change in /aw/ and /ow/; loss of tense /æh/ and /oh/ in Philadelphia.
	Becker (2014b)	New Yorkers associate BOUGHT raising with the 'classic New Yorker' figure.	Lowering of BOUGHT among middle-class Lower East-Siders.
	Watt (2000;2002)	Tynesiders associate ingliding FACE and GOAT with 'old fashioned' speech.	Loss of ingliding FACE and GOAT in Tyneside.

*Table 2.2.2: Examples of social-indexical accounts of linguistic change*

In addition to the empirical sociolinguistic studies discussed above, a number of authors have made the theoretical case for the role of social meaning in linguistic change. One of the earliest examples is Sturtevant (1947), who argued that innovative forms become associated with the social group from which they originate, with the spread of the innovation reflecting its changing social prestige. Although they do not use the term *social meaning*, Weinreich et al.

(1968) propose the *Evaluation Problem* — understanding the social evaluation of a changing form — as a central part of the study of language change. More recently, Croft (2000) has argued that the association of a pattern of variation with a social meaning may lead to its propagation:

*'...the innovation passes from an 'error' — that is, a form lacking any social value — to a socially defined variant in the mind of the hearer. The hearer later replicates the innovation in another context, intending it to be understood by his interlocutors as having a social value. If his interlocutors understand his intention in this context, then the propagation of the innovation has begun'.*

Croft (2000:186)

The mechanism described here is similar to that documented in Labov (1963): a pattern of variation becomes associated with a social meaning (here 'social value'), facilitating its spread across the speech community. Although their approach to sound change focuses primarily on physiological and structural factors, Garret & Johnson (2013) have proposed that individuals who wish to identify with a group may be more likely to interpret phonetic variability in the speech of that group as indexing group membership. Similar to the process described by Croft (2000), it is suggested that this may lead to a change in the social meaning of a pattern of variation, facilitating the propagation of the innovative form. Along with the empirical accounts listed in Table 2.2.2, these theoretical proposals share the same central idea: that the social meanings associated with linguistic innovations directly affect their spread through the production patterns of a speech community.

Social-indexical accounts of linguistic change have a number of explanatory benefits. Firstly, they account very easily for the observation that linguistic changes tend to pattern along social lines. Speakers of different ages and social backgrounds may vary in their degree of identification with the social meaning of the innovation; further, the social meaning of the innovation may make the novel form unavailable to certain groups (e.g. if it has a strongly classed,

gendered or ethnic component). The differential propagation of changes across social groups can be seen as a natural consequence of speakers having access to and identifying with the meaning of those changes to differing degrees. Secondly, social-indexical accounts can potentially account for the sporadic character of linguistic change. While many changes may be *linguistically* possible, it may be that not all of those changes are *socially* possible. If we assume that simply speaking differently carries a potential social cost (e.g. sounding 'different' or 'incorrect'), this would introduce a general bias against innovations being adopted. Only when a pattern of variation becomes associated with a relevant social meaning (e.g. 'Authentic Vineyarder') would change be expected.

A potential limitation of social-indexical accounts of linguistic change is that they rely on several assumptions about sociolinguistic competence. Firstly, they require that speaker-listeners have access to some form of (possibly implicit) knowledge of the possible social meanings of changing forms. Secondly, they require that speakers be able to draw on those meanings to inform their production choices. While many aspects of language use are available to index social meaning in perception and production (see section 2.2.1), it is not clear that these assumptions are valid for all speakers or all potential linguistic innovations. There is good evidence that listeners are very skilled at inferring social meaning from variable features (e.g. Campbell-Kibler, 2009, 2010), and that they can use variable forms to index a range of styles and stances in production (e.g. Eckert, 2011; Kiesling, 1998; Moore & Podesva, 2009). However, there is also considerable evidence that listeners' awareness of social meaning and their control of socially-meaningful forms may not always match up. Chapter 6 of this thesis provides a discussion of the concept of 'awareness', and key examples of such mismatches. For example, Johnstone and Kiesling (2008) have shown that speakers who are most perceptually aware of 'Pittsburghese' features are those who do not use them, and vice-versa. Nycz (2016) has argued that Canadian migrants in New York City may retain

Canadian Raising in their speech, despite their high degree of awareness of the social meaning of the feature (a widely-stereotyped regional marker) and apparent desire to avoid being identified as Canadian.

Another example of a mismatch between sociolinguistic perception, social attitudes, and speech production can be found in work contrasting overt attitudes (the explicit attitudes people express when asked about ways of speaking) and covert attitudes (the attitudes inferred from controlled sociolinguistic perception experiments). The LANCHART project (Gregersen, 2009) provides an excellent example of this. Through several longitudinal studies of linguistic variation and change in Denmark, it has been demonstrated that regional varieties of Danish have undergone a rapid process of standardization over the past 100 years (Schøning & Pedersen, 2009; Jensen & Maegaard, 2012; Kammacher et al., 2011). Each of these studies documents the replacement of local dialect features with features of Copenhagen speech, which Maegaard et al. (2013) argue is driven by covert positive attitudes toward Copenhagen Danish among younger people. When asked directly about their attitudes toward Copenhagen speech, adolescents tend to express a strong preference toward their local dialect (Kristiansen, 2009). However, when speakers are unaware that attitudes to dialect differences are the focus of investigation (e.g. when taking part in a *matched-guise test*, see p.83), they tend to downgrade speakers who use local pronunciation patterns, rating them lower than Copenhagen speakers on scales such as 'stupid – intelligent' and 'trustworthy – untrustworthy' (Maegaard et al., 2013:25). These results suggest a limited role for overt social attitudes in constraining the spread of linguistic change, and point to a mismatch between speakers' stated attitudes, the attitudes elicited through covert measures, and their speech behavior.

Evidence of this mismatch between sociolinguistic perception, social attitudes, and speech production is potentially problematic for social-indexical accounts of linguistic change, which imply that the social meanings speaker-listeners attach to changing forms directly influence their production patterns. The

central mechanism underpinning these accounts implies a relatively straightforward link between a) the social meanings speaker-listeners assign to innovations in perception; b) their attitudes toward the social practices and values associated with those meanings and c) their production patterns. However, few studies have provided clear evidence of a relationship between these factors, a task which will form the basis of the present study.

## **2.3 Social meaning as a consequence of linguistic change**

### **2.3.1 Accommodation and alignment**

The possibility that linguistic change may be motivated or inhibited by the social meaning of variable features provides a very reasonable explanation the fact that many changes tend to spread along social lines, and the fact that only some of the set of possible changes take place at any one time in a given language variety. However, a number of scholars have argued that social meaning is epiphenomenal to linguistic change, which is instead driven by automatic accommodation in face-to-face interaction. Rather than evaluating and selecting innovations based on their social meaning, speakers are argued to adopt the form they encounter most frequently, with the differential propagation of innovations arising from their degree of exposure to the innovations, constrained by the structure of speakers' social networks. Social meanings may attach to the changing form as a consequence of the change, but this fact does not influence the spread of innovations.

While the relationship between sociolinguistic perception, social attitudes and speech production which underpins social-indexical accounts of linguistic change is not well supported by empirical data, the processes of linguistic alignment which underpin change-by-accommodation accounts are well documented. A large body of research has documented the tendency for speakers' production patterns to converge over the course of interaction, both in terms of speech rate (Giles et al., 1991), discourse features (Garrod &



Doherty, 1994), syntactic constructions (Branigan et al., 2000) and lexical items (Branigan et al., 2011). In the phonetic domain, Goldinger (1998) has shown that speakers spontaneously imitate the vowel quality of a model talker in a word-shadowing tasks, a finding which has been replicated in a number of studies (Namy et al., 2002; Goldinger & Azuma, 2004; Pardo et al., 2013). Pardo (2006) has extended these findings to conversational interaction, demonstrating a tendency for convergence in voice onset time (VOT) among speakers completing a communicative map task. Solanki (2017) provides a comprehensive overview of further results from the literature on accommodation and alignment (pp.13–28). Together, these findings reflect a robust tendency for speakers to ‘pick up’ the pronunciations of those around them, both in terms of global characteristics such as speech rate, and phonetic characteristics such as VOT and vowel quality. The evidence for phonetic convergence in interaction has led many scholars to propose it as a fundamental mechanism of linguistic change.

### **2.3.2 Change-by-accommodation**

The proposal that many linguistic changes may spread through a general bias toward interactional convergence can be traced as far back as Bloomfield’s (1933) *principle of density*: the observation that people tend to speak like those around them. Bloomfield suggests that the central mechanism of dialect variation is a bias toward linguistic convergence:

*Every speaker is constantly adapting his [sic] speech-habits to those of his interlocutors; he [sic] gives up forms he has been using, adopts new ones, and, perhaps oftenest of all, changes the frequency of speech-forms without entirely abandoning any old ones.*

(Bloomfield, 1933:328)

The principle of density implies that linguistic innovations may spread without the direct influence of social meaning; as Labov (2001:19) puts it, ‘The effect is a mechanical and inevitable one; the implicit assumption is that social evaluation and attitudes play a minor role.’ While Labov does not reject the role of social

meaning in some linguistic changes, he acknowledges the risk of extrapolating his Martha's Vineyard findings:

*The Martha's Vineyard study is frequently cited as a demonstration of the importance of the concept of local identity in the motivation of linguistic change. However, we do not often find correlations between degrees of local identification and the progress of sound change.*

(Labov 2001:191)

Labov's skepticism regarding the role of social meaning in linguistic change is rooted in an empirical concern: since many changes appear to spread without being explicitly noticed by speakers, arguing for a role of social meaning in their adoption would require that we posit 'a covert belief structure' (p.191): a set of implicit attitudes toward linguistic forms which could influence language use without speakers' conscious control. Labov argues that the existence of such covert attitudes is 'not usually supported by material evidence'. In light of this, Labov concedes that 'language change may simply reflect changes in interlocutor frequencies', with the social patterning of linguistic innovations 'a simple product of frequencies of interaction' (2001:192).

One of the most explicit rejections of a role for social meaning in linguistic change comes from Trudgill (2004). Focusing on the role of dialect contact in the development of colonial varieties of European languages, Trudgill argues that identity factors are epiphenomenal to much linguistic change, claiming that automatic accommodation in face-to-face interaction is the central driving force. Trudgill (2004) develops this argument through an account of the development of New Zealand English, using recordings of the three generations of New Zealand speakers, which he argues represent three stages of new-dialect formation. In the first stage, the immigrant groups essentially maintain the 'native' variety of the dialect area they migrated from. The second stage is characterized by a high degree of variation, with children encountering and adopting forms from a range of British dialects. The third stage involves the reduction of this variation and convergence to a single norm, 'as a result of

group accommodation in face-to-face interaction' (Trudgill, 2004:113-114). The central point of Trudgill's argument is that the mechanism by which speakers converge on a single norm is frequency-based. While it could be imagined that this convergence could have been driven by some form of social meaning (such as the prestige associated with south-Eastern varieties of British English), Trudgill claims that this is not the case. Rather, the outcome tends to be that the majority variant (that is, the one shared by most of the dialects in contact) is selected as the norm. This pattern is borne out in the majority of cases described in Trudgill (2004). Trudgill (2008) extends his (2004) New Zealand argument to cover a number of other colonial varieties of European languages, arguing that their formation can largely be explained by a 'deeply automatic' (p.252) process of accommodation.

While Trudgill's (2004) argument originally referred to the specific situation of dialect formation in an isolated community, Trudgill (2014) adopts a similar position with reference to the spread of linguistic innovations more generally, which he describes as 'purely a matter of who interacts most often with whom' (p.215). The implication of Trudgill's claim is that an individual's participation in or resistance to an linguistic change is determined not by the social connotations of the variants involved, but simply by the frequency with which they encounter novel forms in face-to-face interaction. Since these frequencies will be necessarily constrained by the structure of speaker-listeners' social networks, this model can account for the observation that innovations propagate along social lines, without requiring that these patterns be driven by the social meaning of the forms undergoing change.

The issues raised in Trudgill (2008) have provoked a number of interesting responses. Coupland (2008) argues that since accommodation is likely to be socially mediated, Trudgill's outright rejection of the role of identity in linguistic change is unwarranted. The fact that accommodation may be mediated by identity factors has been confirmed experimentally by Babel (2010); see section

2.4.1. Holmes & Kerswill (2008) point out the fact that social factors influence a speakers' choice of interlocutor, as well as the direction of accommodation (who accommodates to whom) in a given interaction. Bauer (2008) criticizes Trudgill's simplistic approach to identity, arguing that more locally-relevant identity categories are likely to play a role.

Despite the above potential criticisms, change-by-accommodation accounts such as that of Trudgill (2008) have a number of useful theoretical qualities. Firstly, they can clearly account for the social patterning of linguistic innovations: since change is driven by frequency of interaction, and frequency of interaction is constrained by social network structure, the fact that linguistic changes spread along social lines falls naturally from the model. A second benefit of such accounts is their parsimony: they require no assumptions about speaker-listeners' ability to recognize and reproduce the social meaning of changing forms, other than a general bias toward convergence, which is well documented in such studies as Namy et al. (2002) and Goldinger (1998). It is important to note that change-by-accommodation accounts do not exclude the possibility for linguistic innovations to become associated with social meanings; they simply propose that social meaning may play no major role in facilitating or inhibiting change itself — Trudgill (2008) claims that identity is 'parasitic upon accommodation, and chronologically subsequent to it' (p.251). Where social-indexical accounts posit the social meaning of an innovation as a driving force of its propagation, the implication of change-by-accommodation accounts is that social meaning may arise as a consequence of linguistic change, without affecting its trajectory.

While change-by-accommodation accounts can clearly explain the social patterning of linguistic innovations, it is less clear how they can account for the sporadic character of language change. If linguistic change is driven purely by accommodation, then why is it that some features get selected by this process, while others don't? A good example of this point are features such as th-

fronting, l-vocalization and t-glottaling. These innovations are believed to have originated in the south east of England, but are now found in the speech of young people across the United Kingdom (Kerswill, 2003; Stuart-Smith et al., 2007). However, it is *not* the case that younger people are adopting south eastern varieties wholesale — rather, many features of regional varieties persist, with only select features being replaced by the novel forms. Change-by-accommodation accounts have no immediate way of explaining the fact that select features show evidence of regional diffusion, while others show no evidence of change.

## **2.4 Previous approaches to the problem**

To summarize the discussion so far, sections 2.2 and 2.3 presented two possible mechanisms for the spread of linguistic innovations. Under social-indexical accounts of linguistic change, language users evaluate competing variants in terms of the social values associated with them, adopting the form which is most consistent with their social identity. Under change-by-accommodation accounts, language change is primarily driven by the frequency with which speakers encounter innovative versus conservative forms, for example, due to changes in the social network structure of a community. Social-indexical accounts provide a clear way of explaining the fact that linguistic innovations spread along social lines, and the fact that only a small set of possible innovations ever take place. However, these accounts assume a close link between the social meanings attached to variable linguistic features, speakers' attitudes toward those meanings, and their production patterns. Change-by-accommodation accounts struggle to explain the sporadicity of linguistic change, but are more parsimonious, with a well-understood underlying mechanism.

The general issue that change-by-accommodation accounts raise is that for any claim regarding the influence of social meaning on linguistic change, there

usually exists an equally reasonable change-by-accommodation account. Despite this, many studies treat the role of social meaning in linguistic change as a given, focusing on identifying the possible social meanings of innovations to confirm this position. In contrast, another body of research effectively treats indexical meaning as an irrelevant by-product of linguistic change. As Eckert, quoting Trudgill (2014, p.220), points out: “It seems that there is a ‘it-must-be-like-that’ school on both sides of the issue, when in fact we are faced with open questions.” (Eckert, 2016, p.12). Given that the role of indexical meaning in sound change is one of the foundational claims of sociolinguistic theory (e.g. Labov, 1963), establishing how social-indexical accounts of linguistic change can be disentangled from explanations based on change-by-accommodation is of the utmost importance.

#### **2.4.1 Experimental studies**

A major reason for the lack of sociolinguistic studies attempting to assess the role of social meaning in linguistic change is the methodological challenges which such a project implies. Traditional sociolinguistic studies are characterized by an overwhelming reliance on production data. Of the six examples of social-indexical accounts provided in Table 2.2.2, only Labov (1972) and Becker (2014b) include perceptual evidence of the social meanings implied to play a role in the change. The issue with this reliance on production data is that both change-by-accommodation and social-indexical accounts of linguistic change make similar predictions for group-level production patterns. The rate of adoption of an innovation is likely to vary across individuals (see e.g. Rogers, 2003; Milroy, 1987; Stuart-Smith et al., 2008), and this is likely to correlate with group membership of some type. Since group membership is also likely to correlate with any number of attitudinal factors and social dispositions, the group level patterns which sociolinguists would typically take as evidence of social meaning could equally be interpreted as the outcomes of a change-by-accommodation model.

In light of these empirical difficulties, one approach to teasing apart the competing accounts has been to investigate properties of short-term accommodation behavior, examining evidence for the 'deeply automatic' process underpinning Trudgill's (2008) account of linguistic change. Babel (2010) explored a range of factors influencing the behavior of speakers of New Zealand English in a task where they shadowed a speaker of Australian English, measuring their convergence toward that speaker before, during and after shadowing. Among the predictors of convergence were a measure of participants' social-psychological orientation toward Australia vs. New Zealand, measured through an Implicit Association Test (Greenwald et al., 1998). Scores on this measure were correlated with speakers' degree of accommodation to the Australian model talker, demonstrating that accommodation is 'simultaneously automatic and social' (p.437). This provides evidence against the complete rejection of identity factors in a change-by-accommodation model of sound change, and echoes the arguments of Coupland (2008) and Holmes & Kerswill (2008).

Another study investigating the properties of accommodation behavior as a possible explanation for linguistic change is Sonderegger et al. (2017), which investigates the medium-term convergence of a group of reality TV participants in the UK over a period of three months, focusing on VOT duration and vowel quality. While a change-by-accommodation account would predict that speakers interacting in a closed system for some period of time would begin to adopt similar pronunciation norms, the authors found very little evidence of such convergence in their data. This echoes the findings of Pardo et al. (2012), who report only modest levels of overall convergence among college roommates, even after 3.5 months of cohabitation. Thus, while there is strong evidence of short-term convergence in interaction, evidence for the medium-term patterns of accommodation which would link this process to community-level sound change is not as clear.

The findings of Babel (2010), Pardo et al. (2012) and Sonderegger et al. (2017) demonstrate that the model of interactional convergence underpinning Trudgill's (2008) change-by-accommodation argument may be flawed, suggesting that interactional convergence may be more complex than Trudgill assumes. Their results call into question the degree to which accommodation in face-to-face interaction occurs independently of identity factors, and imply that the link between interactional convergence and community-level change may be less straightforward than is implied by change-by-accommodation accounts. However, although these findings cast doubt on the nature of the process underpinning change-by-accommodation, they do not necessarily support social-indexical accounts of linguistic change, where the underlying mechanism involves the speakers selecting among the pool of possible variants based on their social-semiotic value. These results speak to properties of the change-by-accommodation account, but do not directly model the role of social meaning in sound change.

An alternative approach to investigating the role of social identity in the spread of linguistic innovations has been to simulate linguistic change under experimental conditions. Roberts (2010) conducted an experiment in which participants communicated to negotiate anonymously for resources in an artificial 'alien language'. Participants were awarded points for exchanging resources with a member of their own team, but points were deducted for exchanging resources with a member of the opposite team. This manipulation introduced a pressure to signal group identity using the artificial language, which participants achieved in various ways: for example, by introducing innovative forms, or adopting misspelled forms as identity markers. By including conditions where participants communicated only with team-mates (meaning that there was no need to signal their identity) and with both team-mates and competitors (where there was a risk of exchanging resources with competitors, and thus losing points), Roberts (2010) was able to manipulate the degree of pressure to signal group identity. While participants were able to use



variation in the alien language to identify each other in all conditions, only in the most competitive condition did this lead to the development of two conventionalized 'dialects' of the artificial language. These results suggest that the social meaning of linguistic innovations may facilitate their adoption by different groups of users under experimental conditions, consistent with the general predictions of social-indexical accounts of linguistic change. However, it is not clear how well the situation of signalling group identity in a communication game maps on to real-world language use, particularly given the many possible ways in which speech forms may vary in natural languages, and the myriad possible social meanings variable forms may index.

#### **2.4.2 Computational modelling**

Another solution to the empirical challenge of comparing social-indexical and change-by-accommodation accounts has been to approach the problem through computational modeling. By making a number of simplifying assumptions, it is possible to express the different processes contributing to the outcome of linguistic change in a very precise manner, and use simulations to test whether their behavior reasonably reflects the properties of language change.

Baxter et al. (2009) apply such an approach to Trudgill's (2004) account of the formation of New Zealand English by comparing a number of possible mechanisms for the propagation of sound changes. Drawing on the evolutionary approach of Croft (2000), the authors describe these mechanisms as *neutral evolution*, *neutral interactor selection*, *weighted interactor selection*, and *replicator selection*. *Neutral evolution* refers to the strong interpretation of Trudgill's (2004) account, where the propagation of innovations is determined by the frequency of the competing variants alone. *Neutral interactor selection* adds the possibility that social networks constrain interaction patterns across speakers. *Weighted interaction selection* includes the selection of interaction patterns due to the social values associated with different speakers, similar to the arguments of Coupland (2008), Holmes & Kerswill (2008), and Babel

(2010): speakers' choice of interlocutors, and the degree to which they accommodate to the speech of those interlocutors, are influenced by social values. Finally, *replicator selection* is the mechanism implied in social-indexical accounts of linguistic change: speakers socially evaluate the linguistic variants themselves, and this biases their selection of one variant over another. In several simulations of neutral evolution, which the authors argue most closely represents Trudgill's (2004) argument, they demonstrate that even when various parameters are adjusted, a mathematical model of this process fails to account for the data presented in Trudgill (2004). They conclude that:

*'...simple factors of frequency of exposure to language use and social network structure are insufficient in themselves to account for the emergence of a new dialect in an isolated society'*

(Baxter et al., 2009:290)

Blythe and Croft (2012) build on this work by exploring the ability of computational models to simulate the temporal trajectory of linguistic change. They attempt to model observation that most linguistic changes are directional, involving the gradual replacement of one form with another, and that this replacement typically follows an S-shaped curve (e.g. Labov, 1994:65). Using simulations similar to those in Baxter et al. (2009), they conclude that only a mechanism where speakers differentially evaluate competing variants can introduce the type of bias necessary for changes to follow the S-shaped trajectory. They speculate that this bias involves the association of social values with competing forms, following Croft (2000) and Labov (2001:517-18). They further advance a hypothesis regarding the source of this evaluation:

*For whatever reason, a speaker or group of speakers weights the language use of other (groups of) speakers differentially. That speaker/group then observes that a particular variant is probabilistically associated with the relevant speaker/group, and transfers the weighting from the speaker/group to the variant.*

(Blythe & Croft, 2012:292)

Here Blythe & Croft (2012) clearly invoke a model of sociolinguistic competence similar to the 'acts of identity' framework of LePage & Tabouret-Keller (1985); the discussion of a transfer of 'weighting' also echoes Silverstein's (2003) orders of indexicality in proposing that speaker-listeners notice patterns of variation across groups of speakers and assign social meaning to the variants involved. However, the representation of social meaning in the models of Blythe & Croft (2012) is very simplistic; in fact, their models do not require that the differential weighting of variants be social in nature at all (p.273). Their results do not provide evidence of the mechanism implied in the above quotation: speaker-listeners' evaluation of variants in terms of their social meaning, and deployment of those variants to signal that meaning in production.

While the majority of computational work attempting to model social processes in linguistic change has argued that some form of social evaluation is necessary for the propagation of linguistic innovations, recent work by Kauhanen (2017) presents a model exploring the effect of different patterns of clustering between speakers on the propagation of linguistic changes. In contrast to the findings of Blythe & Croft (2012), Kauhanen (2017) finds that the propagation of linguistic innovations may emerge as a consequence of population dynamics: the author argues that a 'non-uniform, but dynamic population structure containing hubs of speakers' is all that is necessary for language changes to spread (p.25), and calls for a 're-evaluation of the role of prestige as a causal factor in at least some cases of prestige'. Kauhanen's (2017) findings suggest that linguistic change can, in principle, emerge as a consequence of changes in the social network structure of a community, without the social meaning of the competing forms being involved. The fact that this is theoretically possible makes the search for empirical evidence for the role of social meaning in linguistic change all the more urgent.

## 2.5 Conclusion

A central proposal of many sociolinguistic accounts of linguistic change is that the social meanings attached to forms undergoing change play a central role in the propagation of linguistic innovations, either inhibiting or facilitating their spread across a population of speakers. Under these accounts, speaker-listeners notice novel variants on some level, associate them with a set of social meanings, and adopt the variant which is most consistent with their social identity. This process is argued to lead to community-level patterns of change, facilitating the adoption of innovations in some cases (e.g. Labov, 1963), inhibiting their adoption in others (Hall-Lew, 2013), and leading to the reversal of trajectories of linguistic change (Becker, 2014b) or loss of stigmatized features (Watt, 2002). These social-indexical accounts of linguistic change offer a potential explanation for two observations: the fact that many linguistic innovations pattern along social lines, and the fact that, despite a large number of phonetic biases favoring particular types of change (Blevins, 2004; Garrett & Johnson, 2013), only a subset of possible changes ever take place.

Despite the potential explanatory power of social-indexical accounts of language change, a number of authors have argued that many linguistic innovations may spread without the influence of social meaning, instead driven by a more general bias for convergence in face-to-face interaction. These change-by-accommodation accounts provide an arguably more parsimonious explanation for the social patterning of many linguistic changes, and are based on a well-documented underlying process: the tendency for speakers to converge to the speech patterns of their interlocutors.

The proposal that the spread of linguistic innovations may be influenced by their social meaning is a fundamental claim of sociolinguistics (e.g. Labov, 1963). However, few sociolinguistic studies have attempted to directly address the issues raised by change-by-accommodation accounts. A number of studies of accommodation behavior have demonstrated issues with the assumptions

Trudgill (2003; 2008) makes regarding interactional convergence and its relationship with community-level change: as well as being socially-mediated (Babel, 2010; Pardo, 2012), there is little evidence that the patterns of convergence observed between speakers in face-to-face interaction lead to community-level convergence in the long term (Sonderegger et al., 2017). While these findings call in to question the mechanism of change-by-accommodation proposed by Trudgill (2008), they do not provide evidence for a relationship between social meaning and the propagation of linguistic change.

Aside from the discussions among sociolinguists on this topic, a number of scholars of cultural evolution have approached the problem through experimental simulations and mathematical modeling. Roberts (2010) has provided evidence that experimental participants may use variation in an artificial language to signal group their identity, leading to group-level divergence given sufficient exposure and pressure to mark group identity. Computational simulations have demonstrated that a change-by-accommodation model is unlikely to produce results which match the S-shaped temporal dynamics of most documented language changes (Baxter et al, 2009; Blythe & Croft. 2012). Furthermore, researchers exploring these models have argued that a process whereby speakers attach social values to competing variants is necessary to capture the sporadicity and temporal dynamics of linguistic change (Stadler et al., 2016), although there is still some debate on this matter (Kauhanen, 2017).

These experimental and computational studies provide valuable insight into the possible mechanisms of propagation in linguistic change; however, one limitation of such approaches is that they may oversimplify their treatment of social identity, which is typically modeled either as group membership (Roberts, 2010) or a loosely-specified 'weighting factor' (Blythe & Croft, 2012). Blythe & Croft (2012) point this out explicitly, admitting that their models suggest that some kind of differential weighting of competing forms is necessary, without specifying what that might correspond to in the real world;

the authors concede that 'only empirical studies of social values and language use can determine which factor(s) determine the weighting' (p.294).

While the role of the social meaning in linguistic change has attracted recent interest in a number of experimental and computational studies, this work has typically treated social meaning in a very simplistic manner. In contrast, sociolinguistic work has made great advances in modeling the types of social meaning which may become associated with linguistic variation, but very few studies have provided clear evidence of the role of these types of meanings in the spread of innovations, with some scholars arguing that social meaning may be entirely epiphenomenal to linguistic change.

What is missing from the existing literature is a thorough empirical account of the social values associated with forms undergoing change, and clear evidence that speakers' orientation toward those values plays a role in the spread of the innovations. It is precisely this gap which the present study aims to fill, by addressing the following question:

*How, if at all, do the social meanings associated with linguistic innovations influence their spread across a speech community?*

As has been argued throughout this chapter, the key mechanism underpinning social-indexical accounts of linguistic change is speakers' ability to assign social meanings to forms undergoing change, then to position themselves with regard to those social meanings through their production choices. However, existing work provides very few examples where this sociolinguistic perception-production relationship has been explored directly. In light of this, the present work will investigate the relationship between sociolinguistic perception, social attitudes, and speech production, in an attempt to find evidence for the role of social meaning in linguistic change. The following chapter will describe this approach in more detail, outline the methodological challenges raised by

addressing this question empirically, and explain how the present work aims to address them.

## 3. The Present Study

### 3.1 Perception, attitudes, production

The previous chapter introduced two ways of characterising the relationship between social meaning and linguistic change. For social-indexical accounts, the social meaning of changing forms is central to explaining the way innovations spread across a speech community: speaker-listeners attach a set of social values to the form undergoing change, and these values influence the spread of the innovation through social space. In contrast, change-by-accommodation accounts propose that social meanings are epiphenomenal to linguistic change: they attach to innovations only after they have begun to propagate, and have no effect on the propagation itself.

The key issue with empirically distinguishing these accounts is that they make very similar predictions in terms of production patterns: although they are underpinned by very different mechanisms, they both predict that innovations will spread along social lines in production. Observing differences in the social distribution of an innovation, it might be inferred that the social meaning of a variant is constraining its propagation, and the researcher might draw on their understanding of the community under study to reason about what that meaning is. This is the approach adopted in many of the social-indexical accounts discussed in section 2.2.2: Labov's (1963) claim that vowel centralization in Martha's Vineyard was socially-motivated was based on patterns related to speaker age, ethnic group, and neighbourhood. Watt's (2002) claim that the loss of ingliding diphthongs in Tyneside was influenced by social meaning was based on patterns related to age, social class and gender. Hall-Lew's (2013) claim that resistance to merger in San Francisco is motivated by social identity is based on patterns related to age and ethnicity. In each of these studies, the variable adoption of an innovation is observed across social groups, and its social meaning is inferred by relating the observed patterns of



linguistic variation to the social history of the community under study. While the findings of such studies are consistent with the proposal that social meaning plays an important role in linguistic change, their results can arguably be accounted for by a change-by-accommodation account: it may be changes in the social structure of the community, rather than the social meaning of the changing forms, which lead to the observed patterns.

How can social-indexical and change-by-accommodation accounts of linguistic change be distinguished, given that they make similar predictions for the adoption of innovations in production? The approach adopted in the present study is to explore the relationship between three aspects of language use and social identity, using data collected from the same individuals:

- a) The social meanings speaker-listeners assign to changing forms in perception.
- b) Speaker-listeners' attitudes toward the social values associated with those meanings.
- c) Speaker-listeners' production patterns with regard to the changing forms.

The central prediction of social-indexical accounts is not only that innovations will spread along social lines, but that the three factors listed above will be related: speakers' production patterns are expected to be influenced by their recognition of the social meaning of changing forms and their attitudes toward those meanings. Change-by-accommodation accounts make no such prediction: rather, the structure of speakers' social networks and the degree of contact they have with the source of the innovation should be the most important factor in determining their production patterns.

The present study applies this approach to the study of a pair of related sound changes in York, Northern England, building on Haddican et al.'s (2013) account of linguistic change in this community. The first step of this analysis will be to

identify the social meanings associated with a pair of sound changes using perceptual methods. The next step will be to operationalize speakers' attitudes toward those meanings through an ethnographically-informed analysis of sociolinguistic interview data. The resulting attitudinal measures will then be used as the independent variables in statistical models of speech production behaviour, alongside measures of speakers' exposure to the innovative forms. In this manner, the present study aims to form testable predictions regarding the role of social meaning in linguistic change, through the analysis of sociolinguistic perception, social attitudes and speech production. Social-indexical accounts predict that speaker-listeners' attitudes toward the social meaning of changing forms should be related to their production patterns above and beyond their exposure to the innovative form. In contrast, change-by-accommodation accounts imply that only exposure should play a role.

One possible criticism of the approach described so far is that speakers' social attitudes are likely to co-vary with their exposure to linguistic innovations. It is likely that the same types of people who interact more with individuals from outside of their social group will also be less likely to define their identity in terms of that group, and either or both of these factors might influence their adoption of linguistic innovations. This means that an observed relationship between social attitudes and speech production could potentially be explained by a change-by-accommodation account, even if the relationship is consistent with the social meaning of the changing form.

To address this issue, the final analysis of the thesis explores the influence of an additional variable on speakers' adoption of innovations: their perceptual awareness of the social meaning of the changing forms. If a subgroup of speakers drive a change forward due to the social meaning they have attached to it, or resist an innovation due to its social meaning, those individuals might be expected to be particularly attuned to that social meaning in perception. Observing a consistent relationship between speaker-listeners' awareness of the social meaning of innovations and their production patterns would place an

explanatory burden on change-by-accommodation accounts, which make no a-priori predictions about sociolinguistic awareness.

Table 3.1.1 summarizes the three questions which structure the present study, and outlines the predictions that change-by-accommodation and social-indexical accounts of linguistic change make for each one.

	<b>Change-by-accommodation</b>	<b>Social-indexical change</b>
Do speaker-listeners assign social meaning to the changing forms?	Possibly	Yes
Are speaker-listeners' production patterns related to their attitudes toward the social meaning(s) indexed by the changing forms?	Possibly	Yes
Are speaker-listeners' production patterns related to their awareness of the social meaning(s) indexed by the changing forms?	Unlikely	Yes

*Table 3.1.1: Distinguishing social-indexical and change-by-accommodation accounts of linguistic change.*

One thing which is immediately clear from Table 3.1.1 is that the two accounts make predictions which are arguably compatible with one another. In particular, the observation of a link between sociolinguistic awareness and speakers' production patterns would not completely exclude a change-by-accommodation account. For example, it could be argued that awareness of a sociolinguistic variable is primarily a function of contact with that feature, although this is not something proposed in any existing change-by-accommodation account. Because it is not possible to completely distinguish the two accounts based on these criteria alone, I will be forced to use the law of parsimony — choosing the theory which accounts for the data whilst making the fewest ancillary assumptions.

### **3.2 York: 'an island of the South in the North'**

Empirically evaluating the competing accounts of linguistic change discussed above requires a field site with specific characteristics. Firstly, it is important that the members of the population have variable degrees of exposure to linguistic innovations: some individuals should be highly mobile and possess diverse social networks, while others should not. Secondly, in order to identify the relevant social meanings which might constrain linguistic change, it would be helpful to find a field site where speakers have something at stake in terms of language and identity: there should be some feature of the location, demographics, and/or social history of the community which makes the question of who people are and how they speak an ideologically-salient issue. Thirdly, an ideal location would be place where there is published evidence of on-going linguistic change, providing a clear starting point for investigating the role of social meaning.

The field site chosen for the present study is York, a small city (population 198,051 in the 2011 census) in the north of England. In terms of the three criteria described above, York is an excellent candidate. Regarding the first point, York benefits from a high degree of contact with London and the South East. Although it is located in the North, York has a direct rail connection to central London. The city's well-preserved Roman and medieval architecture, as well as its relative proximity to the Yorkshire Dales make it an attractive place to live: it is not unheard of for people from the south of England to purchase property in the suburbs of York and commute to London. This is important for the linguistic features studied in the present work, which are often claimed to be diffusing from the south east of England. Since the founding of the University of York in 1963, the city has seen a large influx of students, primarily from the rest of the United Kingdom. Additionally, the growth of the banking and tourism industries over the past 40 years means that an increasing number of professionals from outside of York have moved to the city for employment. This

growing contact with external varieties means that people in York are likely to have some exposure to a range of pronunciation patterns, particularly if they are involved with the tourism, education or the financial industries.

Regarding the second criterion discussed above, York is a particularly interesting field site from the point of view of language and social identity due to its status as a quintessentially 'northern' or 'Yorkshire' place on the one hand, and its perception as a 'posh' city on the other. The 'north-south divide' is a highly salient construct in England, one which encodes a range of economic, social and linguistic differences, both perceived and actual. As the centre of government and monarchy, London and the south of England have historically been far more economically prosperous than the North. This fact is often attributed to the collapse of the northern manufacturing industries in the latter part of the 20<sup>th</sup> century. At the same time as the manufacturing industries of the North began to decline, London and the South East experienced rapid growth, driven by the expansion of the tertiary sector, especially financial services (Martin, 1988). A 2004 census brief paints a bleak image of the outcome of the fall of manufacturing industries in the north of England and Scotland:

*Industrial collapse left a legacy of high worklessness, poverty and declining social conditions. The physical environment of industrial areas was blighted by contaminated land, obsolete infrastructure and the debris of two centuries of rapid growth and exploitation of natural local resources.*

Lupton & Power (2004:14)

While northern industrial towns saw considerable regeneration in the early 21<sup>st</sup> century (see e.g. Tallon, 2013), north-south economic inequality still persists. Wages in the North remain lower on average than those in the South, although the cost of living is considerably lower in northern regions. Rates of unemployment tend to be higher in areas of the North, especially South and West Yorkshire (MacInnes et al., 2013). Life expectancy at birth is on average ~4 years higher in the South than in the North (Equality Trust, 2015). Aside from these differences, the north-south divide is highly salient aspect of public

discourse in England. Wales (2000) provides a critical discussion of media representations of the north-south divide:

*So the cultural images and metonyms of the North and northerners, heavily promoted in the media...are of slag-heaps, flat caps...factory chimneys, brass bands, 'hard', 'poor', 'friendly', 'uncouth'...*

Wales (2000:5)

The 'slag heaps', 'brass bands' and 'factory chimneys' mentioned here clearly evoke images of the North's industrial past, while the personal characteristics 'hard', 'poor', 'friendly' and 'uncouth' are related to stereotypes regarding social class, contrasted with stereotypes of southerners as 'soft', 'civilised', 'intelligent', 'ambitious', and 'well-off' (Wales, 2005:5). Russell (2004:60) describes a similar perception of northerners as 'humorous, hard-working, warm-hearted and friendly, if, especially in Yorkshire, more forthright and outspoken than in the south of England.' This image of 'forthright' and 'outspoken' Northerners will be returned to in Chapter 4, where it will be argued that a similar stereotype of 'Typical Yorkshire' people is important to the social evaluation of speech in York. However, the important point to note at this stage of the discussion is that northern vs. southern regional identity is an ideologically-salient feature of social life for many English people.

Following the above discussion of the relative inequality of northern vs. southern regions of England, an important point about York is that it is comparatively affluent in the context of northern English cities. While nearby regions were reliant on textiles, shipping, steel and coal in the industrial era, York's major employers were the Rowntree's and Terry's chocolate factories, as well as the British Rail Carriageworks. As well as being comparatively equitable employers for their time, these businesses were less strongly affected by changes in government policy than the major industries in nearby regions. Accompanied with the revenue provided by the tourist industry, this means that York has remained relatively well-off in comparison to surrounding areas. The effects of deindustrialization have been much less extreme in York than in the

adjacent cities of Hull and Leeds, leading to the wide-spread perception of the city as ‘posh’, or, as one informant put it, ‘an island of the South in the North’.

York’s status as a geographically northern city with a strong perceived affluence and influence of the South was central to its selection as a field site. Although it is not a physical border town (see e.g. Watt & Llamas, 2014), the ideas that circulate around regional identity in the city mean that it sits on an ideological border between the ‘hard-working’, ‘warm-hearted’ and ‘straight-taking’ North, and the ‘intelligent’, ‘ambitious’ and ‘posh’ South. It is possible to speculate that this tension between identities of place and class might be visible in the speech patterns of the community, and might play a role in the spread of linguistic innovations. In this manner, York’s status as ‘an island of the South in the North’ makes it an excellent context for investigating the role of social meaning in linguistic change.

### **3.3 The fronting of the tense back vowels in York**

Another aim when choosing a field site was to find somewhere where data on language change already exist, providing a reasonable starting point for an investigation into the role of social meaning in linguistic change. A major reason for choosing York was the existence of recent account of sound change in this community: Haddican et al.’s (2013) study of /u/ and /o/ fronting, which provided the impetus for the present work. These vowels make particularly good candidates for investigation because their propensity to undergo fronting is widely documented, but /o/ (as well as /e/<sup>1</sup>) is well-known as a ‘shibboleth’ of Northern-Southern English regional identity (see review on pp.57-58). It is thus reasonable to expect that change in /o/ might interact with identity factors in a northern English locale, particularly given the social context of York as described in section 3.2.

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<sup>1</sup> Although Haddican et al. (2013) cover change in /u/, /o/ and /e/, the present study focuses on /u/ and /o/. This is primarily due to time and space constraints, as well as the fact that a preliminary analysis showed little evidence for change in progress in /e/ for this sample.

Haddican et al. (2013) argue that the fronting of the tense back vowels /u/ and /o/ in York speech can be explained by their social meaning, proposing an account of socially-motivated resistance similar to that of Becker (2014a) and Hall-Lew (2013). The present study builds on Haddican et al.'s (2013) work by presenting a thorough investigation of the relationship between sociolinguistic perception, social attitudes and speech production in this community, as motivated in section 3.1. The following section will provide a brief overview of the literature on back vowel fronting, before discussing Haddican et al.'s (2013) claims and their implications for the present study.

### **3.3.1 Back vowel fronting**

*Fronting* refers to sound changes where a speech segment which was previously articulated with a tongue constriction in the back of the oral cavity is produced further forward. Of particular interest to the present study are the fronting of the tense back vowels: the high back vowel in 'goose' and 'choose', and the mid back vowel in 'goat' and 'toast'. The notation used for these vowels varies across studies, and across groups of researchers by region and research focus. Labov et al. (2006), and many North American sociolinguists use the notation /uw/ and /ow/; researchers working outside of North America (such as Watt, 2002 and Haddican et al., 2013) may refer to the GOOSE and GOAT lexical sets, following the conventions of Wells (1982). Phoneticians working outside of the sociolinguistic tradition may simply use the International Phonetic Alphabet (IPA) symbols /u/ and /o/ (e.g. Harrington et al., 2008). The present study adopts this final convention, in the interests of making the work accessible to as wide an audience as possible.

The fronting of /u/ and /o/ has been documented extensively in varieties of North American English (e.g. Labov et al. 2006; Baranowski 2008; Hall-Lew 2009), Australia (Cox 1999) and New Zealand (Easton & Bauer 2000), as well as in varieties of British English (Jansen 2010; Kerswill & Williams 2005; Watt &



Tillotson 2001). The phonetic implementation of this change may vary. Fronting is very often accompanied by the unrounding of the lips (Harrington et al., 2011), but this is not always the case (Koops, 2010). In US varieties of English, fronting typically occurs primarily at the vowel onset, resulting in a very diphthongal vowel trajectory, although it may also occur at the offglide (Fridland, 2012), resulting in a more monophthongal or front-gliding realization. In the UK, the fronting of /u/ is typically reported to occur across the whole vowel trajectory (Kerswill & Williams, 2005), while /o/ may front at both the onset and offglide. This means that fronting may have several acoustic correlates: the raising of the second formant, reflecting the advanced tongue constriction and/or shortened oral cavity due to unrounding, and differences in the dynamic properties of the vowel trajectory, depending on whether fronting occurs primarily at the onset, midpoint or offglide. This thesis will focus on two of these correlates: the raising of the second formant, following most sociophonetic work on fronting, and the degree of diphthongization of both vowels. In line with recent sociophonetic studies, the term ‘fronting’ will be used to refer to the raising of the second formant throughout this thesis, and ‘diphthongization’ will refer to the degree of spectral change in the first and second formant from the onset to the offglide of the vowel.

There are a number of cross-dialectal similarities in terms of the manner in which /u/ and /o/ are reported to undergo fronting. The first of these is the observation that /o/ fronting occurs only in dialects which also front /u/ (Labov et al., 2006). Secondly, where both vowels undergo fronting, /u/ fronting precedes /o/ fronting temporally, and the nucleus of /u/ tends to remain more advanced in F2 space than that of /o/. These generalizations have led Labov (1994) to propose a general bias for back vowels to undergo fronting, which the author refers to as ‘Principle III’ of chain-shifting. Labov (1994) does not provide a clear explanation of the cognitive or psychological principles which might lead to such a bias: it is implied that a pressure to maintain the symmetry of the vowel system may be at play (Labov, 1994:118; c.f. Martinet, 1955; Stockwell & Minkova, 1997). However, the observation that /u/ and /o/ may

tend to shift in parallel is widely-attested, at least in North American dialects of English (e.g. Baranowski 2008; Fridland, 2008).

Fronting is widely reported in southern varieties of British English, where it appears to follow the generalizations formulated by Labov (1994). The fronting of /u/ and /o/ is reported in London speech by Wells (1984). Williams & Kerswill (1999) provide evidence of fronting in Reading and Milton Keynes. Cheshire et al. (2011) report advanced /u/ fronting among speakers of Multicultural London English, and Altendorf & Watt (2008) describe the fronting of both /u/ and /o/ in London, Colchester and Canterbury. While southern varieties are generally claimed to adhere to Labov's (1994) principles, there is some debate as to whether northern dialects of British English are exceptional with regard to these patterns. For example, it has been claimed that /o/ fronting occurs in the absence of /u/ fronting in Bradford, West Yorkshire (Watt & Tillotson 2001), as well as in Newcastle (Watt 2000).

One complicating factor in studying back vowel fronting in the north of England is the fact that dynamic variation in /o/ is known to be associated with social class and regional identity. The variable diphthongization of the mid vowels /o/ and /e/ is widely cited as a central shibboleth of northern/southern regional identity in Britain (e.g. Watt 2000; Beal, 2009). Lawrence (2015) tested this claim in an online experiment, asking listeners from across the UK to guess the origin of a speaker by placing a pin on a partial map of mainland Britain, in response to single-word stimuli which had been digitally manipulated to include both monophthongal and diphthongal /o/ variants, among other vowels. As can be seen in Figure 3.3.1, listeners strongly associated monophthongal /o/ with northern locations on the map, and diphthongal vowels with southern locations, highlighting the potential for dynamic variation in /o/ to index regional identity.

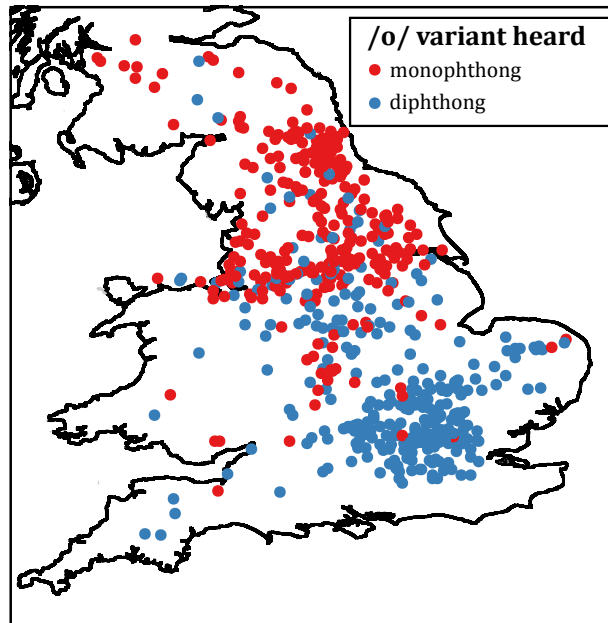


Figure 3.3.1: /o/ diphthongization as a cue to regional identity in mainland Britain. Adapted from Lawrence (2015).

### 3.3.2 Back vowel fronting in York

The social indexing of dynamic properties of /o/ is central to Haddican et al.'s (2013) investigation of York speech, which provides the starting point for the present study. The authors provide a detailed account of change in /u/ and /o/ (as well as /e/), based on an acoustic analysis of data from two sources: a sample of young adults' speech collected by the authors between 2008 and 2011, and a subsample of Tagliamonte's (1996-1998) *Roots of Identity* corpus. The authors present analyses of the speech of three age groups, reflecting change in the vowels over around 70 years, on the apparent-time assumption that variation across these age groups reflects community-level linguistic change (see Bailey et al., 1991). Their key results are schematized in (1).

(1) *Summary of Haddican et al's (2013) findings for /u/ and /o/.*

<b>Year of birth</b>	<b>1920-1940</b>	<b>1967-1981</b>	<b>1986-1990</b>	
/o/	[o:]	[e:]	i. [o:]	ii. [eʊ]
/u/	[u]	[ʊ]	[y]	[y]

Haddican et al's (2013) key findings are as follows:

- i. The second formant of /u/ has raised in a gradual manner across the three generations, which the authors interpret as indicating fronting. /o/ lags slightly behind, following the predictions of Labov's (1994) 'Principle III': that the fronting of /u/ tends to precede the fronting of /o/.
- ii. The youngest cohort show a rapid pattern of divergence into two groups: one group who retain a relatively back, monophthongal /o/, and one group who adopt a fronted, more diphthongal realization.
- iii. While the group born 1967-1981 show evidence of a higher /o/ F2, consistent with fronting, this only occurs among diphthongal speakers in the younger cohort: there is evidence of a higher F2 for monophthongal /o/ among the group born 1967-1981, but not among the youngest group. In other words, a subgroup of younger speakers has adopted a fronted diphthong ([eʊ]), and another subgroup has retained a back monophthong ([o:]), but younger speakers appear to avoid centralized/fronted monophthongs ([e:]).

The authors explain these findings by making a set of claims regarding the social meaning of the changing vowels. The fronting of /u/ is said to spread uniformly due to a 'lack of local social-symbolic anchoring' (p.371), implying that a higher /u/ F2 is not associated with any particular social meaning. In contrast, a subset of speakers are argued to resist diphthongization due to association of monophthongal /o/ with 'identities of place' (p.373). The fronting of /o/ is

claimed to occur due to a systemic pressure for /o/ fronting to follow /u/ fronting, following Labov's (1994) 'Principle III'. However, younger speakers are claimed to resist this pressure due to the association of fronted /o/ monophthongs with a stigmatized working-class stereotype: the 'Chav'.

Haddican et al.'s (2013) explanation for the fronting of /u/ and /o/ in York provides a textbook example of a social-indexical account of linguistic change. Younger York residents are claimed to resist a move toward /o/ diphthongization due to the social values associated with the monophthongal variant. Additionally, the resistance to /o/ fronting is argued to be due to the association of fronted monophthongs with a stigmatized persona (Eckert, 2008) or characterological figure (Agha, 2003). The account also relies on a third claim about the social meaning of the changing forms: /u/ fronting is claimed to be *not* associated with any particular meaning, or to be associated with the general meaning of 'being young' (p.397), facilitating its rapid and socially-uniform spread.

These proposals are not unreasonable in terms of the social context: as discussed in section 3.2, there are good reasons to think that speakers' 'allegiance to the local community' (p.373) might be an important social meaning in York, given its perception as 'an island of the South in the North'. Further, the 'Chav' is a widely-circulated representation of youth identity in Britain. The term is most typically used to refer to stereotypical images of lower-class, disaffected urban youth (Hayward & Yar, 2006), and is tightly related to the demonization of state welfare recipients in the popular press (Valentine & Harris, 2014). The high degree of stigma that the 'Chav' stereotype attracts makes it reasonable to suggest that its association with a linguistic innovation might inhibit change among some younger speakers.

While Haddican et al.'s (2013) explanation for change in /u/ and /o/ is very reasonable given previous findings on these two vowels (see section 3.3.1), the central argument of the present study is that their account (and similar social-indexical accounts) does not present sufficient evidence to fully justify their

claims regarding the role of social meaning in linguistic change. Haddican et al.'s (2013) explanation is based primarily on the observation of group-level variation in production. The argument that the spread of diphthongal /o/ is constrained by social meaning is based on evidence that /o/ monophthongization is associated with positive responses to four questions asked during the interviews: whether speakers liked living in York, whether they planned to settle in York, whether they liked the York accent, and whether they were proud to be from York. The remaining evidence comes from metalinguistic commentary from the study participants — speakers imitate monophthongization when discussing 'Yorkshire accents', and the association between fronted monophthongs and the 'Chav' figure is based on a single performative utterance. The claim that /u/ fronting is not associated with any particular social meaning is based on the absence of any metalinguistic commentary with regard to this feature. All of these claims suffer from their reliance on production: the authors use variation in production, and limited commentary from participants to infer the social meaning of the changing forms, and propose this as evidence for the role of that meaning in linguistic change

Claim	Evidence
<b>(a) /o/ monophthongs are associated with regional identity, leading speakers to resist diphthongization.</b>	i. Metalinguistic commentary (speakers imitate monophthongization when discussing ‘Yorkshire accents’).  ii. Correlation between attitudinal index and monophthongization in production.
<b>(b) Fronted /o/ monophthongs are associated with the ‘Chav’ stereotype.</b>	i. One instance of performative speech during a discussion of social class and speech (p.393).  ii. Lack of evidence of fronted /o/ monophthongs among younger speakers in corpus.
<b>(c) /u/ fronting is not associated with any particular social meaning, or is associated with ‘being young’.</b>	i. Lack of reference to /u/ variation in metalinguistic commentary, in contrast to monophthongization.

*Table 3.3.2: Evidence for Haddican et al.’s (2013) social-indexical account of /u/ and /o/ fronting in York.*

Haddican et al. (2013) are not alone in relying primarily on production data to make claims regarding sound change and social meaning: in fact, most published accounts of linguistic change arguing for a role of social meaning rely primarily on production evidence to support their claims. The problem with this approach is that many possible mechanisms could result in a given distribution of innovations across social groups in production. How do we know that the social meanings inferred from production patterns reflect speaker-listeners’ experience of language use? Furthermore, how can we demonstrate that these

meanings influence their production choices in the manner implied by social-indexical accounts?

Following the proposals of Trudgill (2004) and Kauhanen (2016), it would be completely reasonable to suggest that the patterns of /u/ and /o/ fronting presented in Haddican et al. (2013) are solely due to changes in the social network structure of York residents. Since the opening of the University of York in 1960, York residents have experienced far more opportunities for contact with speakers from outside of York, although these opportunities are likely to be far greater for people who are connected to the education, service or tourist sectors, or for those who travel often outside of York. In this manner, changes in the demographics of York could result in the pattern of divergence observed among the younger speakers described on p.59 through a process of change-by-accommodation.

Taking the findings of Haddican et al. (2013) as a starting point, the present study aims to test the predictions of social-indexical versus change-by-accommodation accounts of linguistic change, focusing on the spread of /u/ and /o/ fronting in York. Nested within this theoretical aim is a methodological question: how can sociolinguists test proposals regarding the role of particular social meanings in particular patterns of change? The proposal of this thesis is that this problem should be approached through the triangulation of several types of information: the social meanings speaker-listeners assign to changing forms in perception, their attitudes toward the identity categories indexed by those forms, and their production patterns.

Haddican et al.'s (2013) account of /u/ and /o/ fronting in York allows preliminary predictions to be made regarding the questions posed in Table 3.1. With regard to the first question: *Do speaker-listeners assign social meaning to the changing forms?*, it would be expected that monophthongal /o/ would be associated with social class and 'local' regional identity, with fronted, monophthongal /o/ associated with the 'Chav' stereotype.



For the second question, *Are speaker-listeners' production patterns related to their attitudes toward the social meaning(s) indexed by the changing form?*, it would be expected that speakers who identify strongly as 'working class' or 'local' would be particularly likely to resist adopting diphthongal variants of /o/. Additionally, speakers who are particularly invested in avoiding being identified as a 'Chav' would be expected to avoid fronted, monophthongal /o/. If fronted /u/ is associated with 'being young', it might be expected that speakers with a stated investment in sounding 'young' or 'modern' might demonstrate an advanced degree of fronting.

With regard to the third question: *Are speaker-listeners' production patterns related to their awareness of the social meaning(s) indexed by the changing form?*, a reasonable prediction based on Haddican et al.'s (2013) account is that younger listeners would be particularly sensitive to the 'Chav' meaning of fronted monophthongs in perception. This prediction reflects the fact that this association is a relatively new addition to the indexical field of fronted /o/, and that it is a category which applies specifically to stereotypes of youth language. Further, it might be expected that those individuals who are particularly perceptually aware of the 'Chav' meaning of fronted, monophthongal /o/ would be particularly likely to avoid the form in production, reflecting the role of this meaning in shaping speakers' production choices. The lack of a specific claim regarding the social meaning of /u/ variation in Haddican et al. (2013) makes it difficult to form predictions regarding /u/ fronting; however, extending the logic of the above argument, it might be speculated that speakers who are most aware of the potential for fronted /u/ to index 'young' or 'modern' would show the most advanced fronting of /u/ in production.

Table 3.3.3 summarizes the predictions for the relationship between sociolinguistic perception, social attitudes and speech production based on Haddican et al. (2013). These predictions will form a starting point for the present study, although the findings at each stage will lead them to be revised in light of new evidence.

	/u/	/o/
<b>Do speaker-listeners assign social meaning to the changing form?</b>	<b>Possibly:</b> /u/ fronting is associated with 'being young', or with no particular social meaning.	<b>Yes:</b> Monophthongal /o/ is associated with being 'working-class' or 'local'. Fronted /o/monophthongs are associated with the 'Chav' figure.
<b>Are speaker-listeners' production patterns related to their attitudes toward the social meaning(s) indexed by the changing form?</b>	<b>Possibly:</b> Speakers who wish to sound 'young' or 'modern' may adopt more fronted /u/ variants.	<b>Yes:</b> Speakers who identify strongly as 'working class' or 'local' will avoid diphthongal /o/. Speakers who wish to avoid being perceived as a 'Chav' will avoid fronted, monophthongal /o/.
<b>Are speaker-listeners' production patterns related to their awareness of the social meaning(s) indexed by the changing form?</b>	<b>Possibly:</b> Speakers who are most perceptually aware of the 'young' or 'modern' meaning of fronted /u/ may show more advanced fronting in production.	<b>Yes:</b> Younger listeners are expected to be particularly aware of the 'Chav' meaning of fronted, monophthongal /o/. Those who are most perceptually aware of this meaning will be more likely to retain a back, monophthongal variant in production than other speakers.

*Table 3.3.3 Predictions for perception, production and attitudes based on Haddican et al.'s (2013) account of /u/ and /o/ fronting in York.*

While a change-by-accommodation account could easily account for the evidence presented by Haddican et al. (2013), confirming the predictions outlined in Table 3.3.3 would pose a challenge to such an account. A particularly strong case for the role of social meaning in linguistic change could be made if

the relationship between social attitudes, sociolinguistic awareness, and the adoption of innovations was found to hold even when controlling for measures of exposure to the innovative forms. On this basis, the present work aimed to extend the work of Haddican et al. (2013) on /u/ and /o/ fronting in York, collecting a dataset which combined data on sociolinguistic perception, social attitudes, and speech production from the same sample of speakers.

Collecting data on sociolinguistic perception, social attitudes and speech production raises several interesting methodological challenges. For example, how can a social meaning such as 'local' be operationalized, and how can its association with a speech pattern be modelled quantitatively? How can the different ways in which speakers orient toward those meanings be captured? How can the influence of these factors on speech production patterns be evaluated? The approach to each of these specific problems will be described in each of the substantive chapters which follow this one, allowing the reader to easily refer to the methods when evaluating the results at each stage. The remainder of this chapter will provide a general description of the data collection process, as well as issues of ethics and the position of the researcher.

### **3.4 Sampling and data collection**

Following the above discussion, the guiding principle of the research design was to collect data which would allow the triangulation of evidence from sociolinguistic perception, speech production, and social attitudes, as well as information about speakers' potential exposure to linguistic innovations. Data were collected during a 6-month period of fieldwork in York carried out between January and June 2015. Data collection proceeded in two stages. Firstly, a set of group interviews were conducted among a diverse sample of 11 York speakers. These were structured around an open-ended sociolinguistic perception task, where participants listened to recordings of a range of speakers from York, and were asked to comment on those speakers' social identity and speech patterns. Section 4.3 describes these interviews in more

detail. The primary aim of the group interviews was to identify a set of social distinctions relevant to language and social identity in York, informing the design of the main data collection phase.

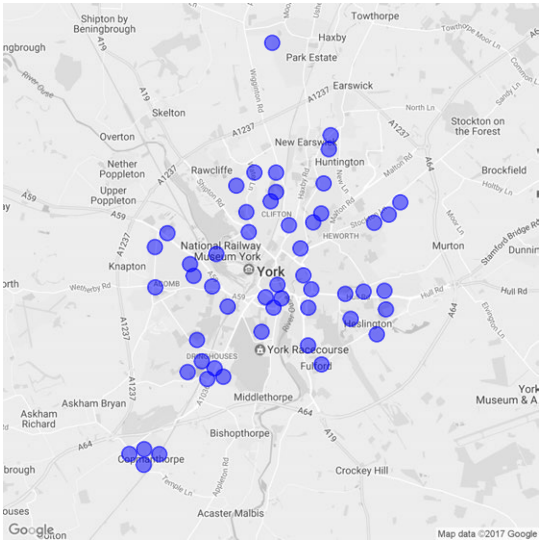
The second stage of fieldwork involved the collection of production data (from a reading task and a communicative map task), sociolinguistic perception data (from a perceptual experiment) and attitudinal data (from an extended interview). Participants were a sample of 52 York residents of a range of ages and backgrounds. These participants took part in an interview of around 1 hour, then completed a communicative map task and read a word list, before completing the perception experiment. Section 4.2 provides details of the specifics of the experimental design for the perception experiment, and details of the production methods are provided in Section 5.2. The materials for the second stage were developed during the fieldwork period, informed by the findings of the group interviews of the first stage.

The motivation for including this two-stage approach was to ground the experimental design in York speakers' experience of language use as far as possible. Rather than deciding on the social meanings of interest in advance, or inferring them from production patterns, including two stages of data collection allowed the experimental materials to include representations of social meaning designed to make sense from the perspective of the community under study. In this manner, the present work follows Dodsworth (2005) and Hall-Lew (2009) in adopting a 'quasi-ethnographic' approach, drawing on an understanding of social reality from the perspective of the social actors under study to inform the research design and analysis.

Recruitment for both stages of the study was conducted through convenience sampling, following the methods of Milroy (1987). Several different methods were used to enter the community, with a view to capturing a diverse range of ages and social backgrounds. One method was through advertising in strategic locations across the city, including cafes and newsagents, as well as around the

university. A second important source of participants was the social media website *Facebook*, where adverts were placed in two popular local groups: *York Past & Present*, a local interest and photography group, and *Stuff for Sale or Swap in York*, a page for exchanging household goods. Finally, while resident in York I was a member of a local martial arts group, which provided a further source of participants.

The sample was restricted to participants who were born and went to primary and secondary school in York, had at least one parent from York, and who were resident in York at the time of sampling. This sampling strategy is very close to that adopted in previous studies of York English (Tagliamonte, 1998, 2009; Haddican et al., 2013), meaning that the data collected for the present study can be added existing corpora for use in future projects. For sampling purposes, 'York' was defined as the York Unitary Authority area, which includes several villages on the outskirts of the city. This definition was motivated by the fact that most residents identified these areas as part of York, and they have been officially considered part of York since 1996 (Office for National Statistics, 2016). However, the vast majority of respondents were residents of areas within the major ring-road which separates York from the rest of North Yorkshire.



*Figure 3.4.1: Approximate sampling locations, with jitter added to preserve anonymity.*

No formal quotas for age, gender, or socioeconomic status were imposed upon the sample, although the sampling procedure described above resulted in a diverse range of ages, and occupation levels being represented. Table 3.4.1 provides the basic demographic characteristics of the sample from the second stage of data collection, which was used for the main quantitative analysis presented in the thesis. The sample comprises of 52 speakers who were aged between 80 and 15 years at the time of data collection. The sample contains representatives of most combinations of gender, age cohort and education level, although there is notable lack of lower-educated men in the middle age cohort.

<b>Level of education</b>	<b>Upper (University education)</b>		<b>Lower (No university education)</b>	
	<b>Female</b>	<b>Male</b>	<b>Female</b>	<b>Male</b>
<b>1935-1960</b>	6	5	2	2
<b>1961-1980</b>	2	4	4	0
<b>1981-2000</b>	8	11	3	5

*Table 3.4.1: Characteristics of the sample from the second stage of data collection.*

Overall, this sample provides a broad representation of York speakers from a range of ages and social backgrounds, and is comparable to the samples collected in previous work on this community, including the data used in Haddican et al. (2013). Given the range of ages and social backgrounds represented in the sample, it is reasonable to expect that these speakers will exhibit considerable variation in terms of the diversity of their social networks, contact with speakers from outside of York, and their social attitudes, which are the key variables of interest for the present study. However, there are two important limitations of this sample. Firstly, there is a bias toward younger, middle-class participants, and corresponding lack of working-class participants, especially in the middle and older age cohort. This means that some aspects of

variation in this community (linguistic, social or attitudinal) may not be captured in this study. A second limitation is the wide range of ages captured in this sample – while this will be useful in evaluating the apparent-time evidence for the changes under study, it introduces a potential source of collinearity, as it is highly likely that social attitudes and sociolinguistic awareness will be related to age (see sections 5.5.2 and 6.5 for further discussion).

### **3.4.2 Position of the researcher**

An important issue in sociolinguistic research involves the potential influence of the researcher on the speech behaviour being studied, both in terms of perception and production. Labov (1972) refers to this as the ‘observers paradox’: sociolinguists want to understand how people speak in their day-to-day lives, but the only way to do this is to observe, and potentially influence, their speech. There is considerable evidence that language behaviour can be affected by variables introduced inadvertently by the researcher. For example, Rickford & McNair-Knox (1994) showed that Foxy Boston, a young African American woman, used higher rates of African American Vernacular English (AAVE) features when interviewed by an African American interviewer than by a European American interviewer. The identity of a researcher has also been shown to influence the results of sociolinguistic perception tasks: Hay et al. (2006) found that New Zealanders’ ability to perceive the distinction between /ɪə/ and /eə/ was influenced by participants’ observing whether the experimenter was a speaker of US English or New Zealand English. These results mean that it is essential to consider the position of the researcher with regard to the community under study, and the possible influence this might have on the results. This is even more important for a study where social identity is central, as the identity of the researcher may constrain their access to more covert or controversial attitudes when interviewing informants.

As in many sociolinguistic studies (e.g. Labov, 1972; Becker, 2010; Hall-Lew, 2009), my status in York lies somewhere between that of an insider and an

outsider. The fact that I approached participants as an academic researcher means that many participants were likely to read me as an outsider: one of the many incomers associated with the university, perhaps. This means that some participants may have avoided expressing opinions on issues related to local identity which they would have been more willing to express with someone who they perceived to be from the local area. The fact that I speak a relatively standard variety of English might also contribute to this perception: while I possess some features typical of Northern speech (such as a variable FOOT-STRUT and TRAP-BATH split), my centralized, diphthongal /o/ would likely mark me as an outsider for some participants; it might also have some influence on their behaviour in the production or perception tasks. Despite my potential perception as an outsider, I have strong historical ties to Yorkshire — I was born in Beverley, East Yorkshire; raised in Doncaster, South Yorkshire and studied in Leeds, West Yorkshire. My hometown is around 40 miles south of York, and my family has strong connections to the city: my parents trained as teachers, met and married in York and my uncle and sister both studied in York. This means that I was able to draw on my knowledge of York and Yorkshire to build rapport with informants. My status as someone with some ties to the area seeking expert knowledge from local residents is consistent with the researcher-community relationships reported in the vast majority of sociolinguistic studies of urban communities (e.g. Labov, 1963, 1972; Milroy, 1980; Hall-Lew, 2009; Becker, 2010).

### **3.4.3 Ethical considerations**

As with any research which involves human subjects, it is important to consider the potential ethical implications of sociolinguistic projects. One of the basic ethical practices of human subjects research is to attain informed consent from participants: participants should fully understand the objectives of the research, and should fully and voluntarily agree to take part. In the present study,



participants first received information about the general aims of the study and the tasks involved in participation in the recruitment material.

**Participants wanted for research into the York dialect**

I'm conducting research into changes in the way people from York speak, and I'm looking for participants to take part in interviews about their experience living in York. I need people from a range of ages and backgrounds – as long as you were brought up and went to school in York, you should qualify.

During the interview we will have a relaxed chat about your experience living and growing up York. I will also ask you to take part in a few short tasks, including describing a path around a simple map and reading a list of words.

At the end of the interview, you will take part in a short perception experiment where you will listen to some words pronounced in different ways and match them to a set of characters.

We can conduct the interview in any quiet place which is convenient for you.

**The interview will last around an hour, and I will pay you £7.50 for your participation.**

*Figure 3.4.2: Recruitment text.*

The aims of the study were clarified orally at the start of each meeting, and participants were given an opportunity to ask questions about the interview tasks. The aims of the study were reiterated through a consent form (Appendix A), which also clarified participants' right to anonymity and right to withdraw participation at any time. The consent form also allowed participants to opt in or out of their data being used in publications, presentations, or as experimental stimuli, and their willingness to be contacted for future work. All of these rights were explained orally at the start of the interview. Following the BAAL recommendations for good practice (BAAL, 2016), parental consent was obtained for the one participant who was aged 15 at the time of data collection. Subjects were compensated £7.50 for their participation, which typically took around one hour. Very few subjects accepted this money, and many requested that the money be donated to a charity, which was done on their behalf. At the end of each session, participants were given an information sheet which

clarified the research objectives and invited them to contact the researcher and/or project supervisor with any questions or concerns.

### **Thank you for taking part in this study**

This experiment tested your ability to recognise small pronunciation differences and associate them with different speaker groups. We think that the way in which different pronunciations become associated with different groups of speakers might affect the way that dialects change over time.

The voices that you heard included examples of sounds which are said to be changing in York speech:

- The vowel in words like 'face', 'late' and 'pay'
- The vowel in words like 'goat', 'home' and 'road'
- The vowel in words like 'goose', 'pool' and 'suit'

By analysing lots of recordings of York speakers of different ages, we can see that these sounds are changing; in many cases, it seems that young people from York are starting to speak more like people from Southern England.

However, the rate at which people are adopting these new sounds is different: people seem more willing to change their pronunciation of the vowel in 'goose' than they are of 'face' or 'goat'. One reason for this might be that they feel that the traditional way of saying 'face' and 'goat' is more attractive, or more accurately reflects their social identity, while the older form of 'goose' isn't so important.

My project tries to explain the way these sounds are changing by comparing the way people speak with the way they perceive and socially evaluate these changing pronunciations.

By studying the way English pronunciation is changing, we are better able to understand language from a scientific perspective, as well as documenting this important part of our cultural heritage for generations to come.

If you are interested in finding out more about the project, or if you know someone else who might be interested in participating, please contact me at [daniel.lawrence@york.ac.uk](mailto:daniel.lawrence@york.ac.uk). If you have any questions or concerns about the use of your data, please contact the project supervisor at [Lauren.Hall-Lew@ed.ac.uk](mailto:Lauren.Hall-Lew@ed.ac.uk)

*Figure 3.4.3 Information sheet text.*

In order to protect informants' right to anonymity and control over the sharing of their data, the speech recordings, experimental data, biographical information and contact details were uploaded to password-protected network share at the University of Edinburgh within 48 hours of each meeting, and

erased from the recorder and laptop computer used for data collection. Speech data, biographical information and contact details were stored in separate password-protected folders, linked using a unique identifier for each participant. All references to individuals in the present work use pseudonyms to preserve anonymity.

### 3.5 A look ahead

Having motivated the general approach of this study, and described previous claims regarding the role of social meaning in /u/ and /o/ fronting in York, the remainder of the thesis will draw on the dataset described above to explore the social meanings associated with variation in /u/ and /o/, speakers' attitudes toward those meanings, and their production patterns. By relating these three aspects of language use and social identity, the thesis aims to test the predictions of social-indexical versus change-by-accommodation accounts of linguistic change.

**Chapter 4** investigates the social meanings associated with variation in /u/ and /o/ in York, asking *"What does it mean, socially, for a York speaker to adopt a more fronted variant of these vowels?"*. In doing so, it addresses the basic prediction of a social-indexical account of linguistic change: that listeners assign social meaning to the variable form in perception. Through a combined analysis of listeners' open-ended social evaluations of extracts of natural speech and their behaviour in the sociolinguistic perception experiment, the chapter demonstrates that a range of possible social meanings are available for the fronting and diphthongization of /u/ and /o/, at least when produced by male speakers. In particular, the back-front dimension of these vowels is associated with a socially-recognized register (Agha, 2003), which participants refer to as 'Broad Yorkshire' speech. This register is linked to two characterological figures with contrasting social characteristics: the 'Old Farmer', who is 'authentic', 'genuine', and 'Yorkshire born and bred', and the 'Chav', who is 'rough',

'thuggish' and 'uneducated'. The findings of this chapter confirm the basic precondition for a social-indexical account of change in /u/ and /o/, and allow predictions to be formed about the relationship between social attitudes and the adoption of innovations, which are explored in the following chapter.

**Chapter 5** investigates the relationship between the social meanings available for /u/ and /o/ and speakers' adoption of innovative forms. It asks "*To what extent is a speaker's adoption of a linguistic innovation influenced by the social meaning of that innovation?*" Drawing on an ethnographically-informed analysis of interviews with each speaker, the analysis evaluates the relative influence of social network diversity, dialect contact, and social attitudes on speakers' production patterns, drawing on the findings of Chapter 4 to form predictions regarding the influence of social identity on the adoption of linguistic innovations. Since back variants of the two vowels are heard as 'Broad Yorkshire', and associated with a positive stance toward local identity, a social-indexical account of these changes might predict that speakers who identify strongly as 'Yorkshire' people would be likely to resist change in these vowels. However, the additional association of 'Broad' speech with the 'Chav' stereotype means that speakers who want to distance themselves from this potential meaning might avoid these features. Under a change-by-accommodation account of /u/ and /o/ fronting, neither of these social meanings will necessarily matter. Rather, it would be expected that any differences in the adoption of fronted variants across speakers would be explained in terms of speakers' opportunities for contact with innovative forms: speakers who have the most exposure to the innovative variants will be the most advanced with regard to the change. The findings of Chapter 5 suggest a very limited role for social attitudes in the spread of /u/ and /o/ fronting in this community, although there is evidence that the diphthongization of both vowels is related to speakers' attitudes to local regional identity. Overall, the results provide no strong evidence of the role of social meaning in linguistic change: while back variants of /u/ and /o/ are perceptually associated with stereotypes of regional

identity and social class, speakers' attitudes toward these social categories have no consistent impact on their degree of fronting in production.

**Chapter 6** explores the influence of speakers' perceptual awareness of the social meaning of changing forms on their adoption of linguistic innovations. It argues that social-indexical accounts of linguistic change make predictions not only about the relationship between speech production and social attitudes, but also regarding speaker-listeners' ability to notice the social meaning of changing forms. The chapter explores this proposal by testing a specific hypothesis regarding /o/ fronting in York, where a subset of younger speakers demonstrate a rapid move toward very fronted, diphthongal variants. It is proposed that this pattern may reflect the social re-analysis of back variants of /o/ as 'Chav' features, leading to an avoidance of these forms in production. If this were the case, it would be reasonable to predict that the leaders of change in /o/ might be more perceptually sensitive to the 'Chav' association of backness than other speakers. This hypothesis is evaluated by exploring the effect of non-linguistic factors on listeners' social selections, before testing the relationship between individuals' awareness of relationship between variation in /o/ and their production patterns. The results provide strong evidence of a general bias for younger listeners to associate backness in both /u/ and /o/ with the 'Chav' character much more strongly than older listeners, but no clear evidence of a relationship between this perceptual association and speakers' degree of fronting. It is argued that these findings are inconsistent with the predictions of a social-indexical account of linguistic change. Rather, they suggest that many changes may spread without the direct influence of social meaning, and that social meanings may attach to linguistic innovations without affecting the trajectory of change.

**Chapter 7** reviews the key findings of the dissertation and links them to the central research question of the thesis: *How, if at all, do the social meanings associated with linguistic innovations influence their spread across a speech community?*. The general conclusion is that many linguistic innovations may

spread without the direct influence of social meaning, at least in terms of the persona-based meanings such as ‘Typical Yorkshireman’ and ‘Chav’ which have formed the focus of many recent sociolinguistic studies of sound change. The work provides strong evidence that changing linguistic features may attach to social meanings as they spread through a speech community, and evidence of a general bias for younger speakers to notice the older forms of sound changes as socially-marked. However, there is no clear evidence that the meanings associated with changing features directly impact upon speakers’ production patterns, as would be expected under a social-indexical account. The chapter closes by discussing other ways in which social meaning may play a role in sound change, and advocates for the triangulation of data from sociolinguistic perception, social attitudes and speech production in future work.



## 4. The Social Meaning of a Sound Change

### 4.1 Overview

This chapter investigates the social meaning of phonetic variation in /u/ and /o/ from the perspective of York listeners. It asks: *what does it mean, socially, for a York speaker to adopt a more fronted variant of these vowels?*

The general hypothesis to be tested in this chapter is that variation in /u/ and /o/ is perceived as socially meaningful by York listeners. If change in these vowels is occurring primarily through a ‘neutral’ process of accommodation (Trudgill, 2008; Kauhanen, 2016), there is no prediction regarding the social significance of the changing vowels. However, if change in these vowels is motivated and/or inhibited by their social meaning, as in social-indexical accounts of linguistic change (e.g. Haddican et al., 2014; Becker, 2014a) it would be expected that listeners would be able to perceptually distinguish innovative and conservative variants and assign them a social interpretation.

Assuming that listeners do assign a social interpretation to these vowels, a second aim of this chapter is to understand *which* social meanings are associated with variation in /u/ and /o/; in other words, to provide an analysis of the indexical field of these vowels. The term *indexical field* is used in recent sociolinguistic work to describe the range of potential social meanings which may be associated with a sociolinguistic variable, accounting for the fact that a speakers’ use of a linguistic feature can carry different social meanings depending on the speaking context, the content of the utterance, and other sociolinguistic cues that might co-occur with that feature (Eckert, 2008; Campbell-Kibler, 2009). While the social meanings associated with a particular form are flexible and context-dependent, they tend to be ideologically related. Understanding the indexical field of /u/ and /o/ is essential to the present study, as a social-indexical account of language change would predict that the



meanings associated with the two vowels will explain which speakers are likely to adopt or resist innovative forms.

In order to address the aims of this chapter, two sources of evidence are presented: one group of listeners' reactions to natural speech samples containing different pronunciations of the target vowels, and a second group of listeners' responses to digitally-manipulated speech stimuli in a controlled sociolinguistic perception task. The first of these datasets allowed a candidate set of social meanings to be identified, narrowing down the potentially very large set of social distinctions which could be relevant to language use. The second dataset allowed quantitative predictions to be tested regarding York listeners' association between those social meanings and fine-grained variation in /u/ and /o/.

The analysis of the social meaning of /u/ and /o/ will begin by testing listeners' ability to map variation in the two vowels to the broad social categories discussed in previous work on York speech: social class, age, and urban/rural identity. Drawing primarily on the experimental data with supporting evidence from the open-ended responses, the chapter will present evidence that, at least for male speakers, York listeners can use phonetic detail in the target vowels to identify whether a speaker sounds older or younger, whether they are likely to have a middle-class or working-class occupation, and whether they are likely to come from an urban or rural locale. These results support the general hypothesis that variation in the target vowels is socially meaningful in this community.

In order to understand the indexical field of /u/ and /o/ in more detail, the second stage of the analysis investigates listeners' selections of individual characters represented in the social stimuli, exploring how variation in these vowels might be associated not only with broad social categories such as 'rural' or 'working class', but with specific stereotypes such as the 'Chav', which has

been argued to be important to the social perception of speech in this community. The key finding of this section is that not all types of working-class, old, or rural identity are equally associated with variation in the vowels under study. For example, while back, monophthongal /o/ and back /u/ are consistently mapped to characters with a working-class occupation, this effect is driven by specific social stimuli, representing the 'Chav' and 'Old Farmer' characters. These characters correspond to stereotypical figures consistently mentioned in the open-ended evaluation data. This implies that listeners do not hear /o/ and /u/ variants only in terms of the broad social categories initially tested, but as typical of specific *characterological figures* (Agha, 2003), reflecting the beliefs and ideologies which circulate regarding language and social identity in this community.

Based on similarities between the linguistic stimuli which cue their selection, it will be argued that the 'Chav' and 'Old Farmer' characters are associated with a socially recognized register of linguistic forms (Agha, 2003), which includes back variants of /u/ and /o/. Informants refer to this way of speaking as "Broad Yorkshire" speech. While both characters are linked to 'Broad Yorkshire' speech, the social attitudes associated with each character are very different: the 'Old Farmer' is described as 'authentic', 'genuine' and 'Yorkshire born and bred', whereas the 'Chav' is 'rough' and 'thuggish' and 'uneducated'. This implies that 'Broad Yorkshire' features may take on different social meanings depending on who is speaking, consistent with previous work on indexical meaning (Campbell-Kibler, 2009; Walker et al., 2014).

The findings of this chapter have clear implications for understanding the social meaning of back vowel fronting in this community. Speakers maintaining a back variant of /u/ or /o/ (resisting the change) may be heard as 'authentic', and perceived as adopting a positive stance towards local identity. However, in doing so, younger speakers may risk being associated with the negative traits of the stigmatized 'Chav' character. Under an account of linguistic change where

social-indexical meaning plays a direct role, it would thus be expected that speakers who orient strongly toward the social attitudes and practices associated with being 'authentically local' might resist fronting these vowels; however, speakers who are invested in avoiding sounding like a 'Chav' might be motivated to adopt the innovative forms. This prediction will be explored in detail in Chapter 5.

#### **4.1.1 Existing claims regarding the social meaning of /u/ and /o/**

The fronting of /u/ and /o/ is reported to be spreading rapidly across geographically diverse varieties of English, including those spoken in North America (Hall-Lew, 2010), Australia (Cox, 1999), South Africa (Mesthrie, 2010) and New Zealand (Maclagan et al., 2009), as well as in the United Kingdom (Harrington et al., 2008). The fact that fronting has spread in a rapid and uniform manner across these varieties has led to the claim that these changes tend *not* to become associated with local social meanings, unlike many vowel shifts. For example, Milroy (2007) describes back vowel fronting as a 'global' phenomenon which 'does not appear to be sensitive to local social indexicalities' (p.165).

While /u/ and /o/ fronting are typically reported to spread without attracting a strong social evaluation, the situation in Northern varieties of British English is less clear, particularly with regard to /o/. The fronting of /o/ is reported in a number of Northern dialects, including Newcastle (Watt & Milroy, 1999), Manchester (Hughes et al., 2012) and Bradford (Watt & Tillotson, 2001). Understanding the social meaning of /o/ fronting in these communities is complicated by the variable diphthongization of this vowel. Monophthongal vs diphthongal /o/ is widely regarded as a 'shibboleth' of Northern/Southern regional identity, and has been demonstrated to be subject to social stratification in Northern varieties (e.g. Watt, 2000). It is thus reasonable to expect that /o/ diphthongization might be perceived as a marker of region or

class in Northern communities, although it is not clear how fronting might affect this evaluation.

Haddican et al's (2013) recent work in York provides a detailed analysis of the fronting of /u/ and /o/ in production, and provides a basis for forming predictions regarding the social meanings associated with these vowels. While /u/ is fronting in a rapid and socially-uniform manner in York, the fronting of /o/ is proceeding more slowly, and there is evidence that younger speakers avoid fronted, monophthongal /o/ variants. The authors interpret these findings as reflecting differences in the social meaning of /o/ and /u/ variation in this community. /u/ fronting is claimed to 'lack any consistent social meaning', although it is possibly associated with 'being young' (p. 397). In contrast, the monophthongization of /o/ may be associated with the general meanings of 'working class' and 'local' (p.384). Fronted, monophthongal /o/ is associated with a stigmatized stereotype: the 'Chav', a lower-class young person who engages in antisocial activity (p.384). These claims provide a useful starting point for the present investigation, providing a simple model of the indexical field of /u/ and /o/ variation (see Section 4.2, Figure 4.2.4), which will be updated as the analysis of this chapter progresses.

## **4.2 Methods**

### **4.2.1 Issues in researching sociolinguistic perception**

Researching the social meaning of a linguistic feature raises a number of methodological challenges. A major one relates to the fact that the perception of speech is a private event, which can never be observed directly. Rather, all that can be observed are the behavioural reflexes of perception. For the purposes of linguistic research, this means that it is typically necessary to develop some form of experiment which allows listeners' reactions to language features to be captured empirically.

Work in sociolinguistic perception provides a number of examples of experiments which elicit social reactions to speech, typically involving variations on the ‘matched guise’ technique of Lambert et al. (1967). This technique involves exposing listeners to multiple recordings of the same speaker, which differ only in terms of the language variety being spoken. For example, a bilingual speaker might be recorded reading the same passage in French and English, or in a standard and non-standard accent. Listeners then rate these recordings of apparently different speakers on a range of social scales, such as how friendly, educated, or trustworthy they are. Because listeners are expected to be unaware that they are listening to the same speaker, any differences in ratings across pairs of recordings can be tentatively attributed to the different language varieties included in the experiment. While the technique was originally used to study attitudes toward French and English among bilingual Canadians, it has been widely applied in other contexts, including regional accents in England (Giles, 1970), English and Scottish varieties in Scotland (Abrams & Hogg, 1987), and to investigate L2 learners’ attitudes toward varieties of English (Rindal, 2010). The benefit of such an approach is that it allows evaluative reactions to speech to be captured empirically, and is typically argued to provide access to social attitudes which would be difficult to elicit through direct questioning.

One important limitation of the original matched-guise methodology is that it does not provide any insight into which linguistic features of the varieties tested are important in evoking the observed social response. For the purposes of the present study this is crucial — the central hypothesis to be tested in this chapter is that specific phonetic properties of /u/ and /o/ are perceived as socially meaningful by York listeners. The need for sociolinguists to understand the social meaning of individual linguistic features has led researchers to build on Lambert et al.’s (1967) original design. For example, Campbell-Kibler (2009) presented listeners with digitally-manipulated extracts of natural speech which differed only in terms of the realization of -ing clusters (e.g. [sɪŋɪn]/[sɪŋən] vs

[sɪŋɪŋ] for *singing*). Similar to previous matched-guise studies, the author elicited judgments of a wide range of social characteristics and evaluative criteria, allowing the effect of the manipulation on social responses to be measured. A similar approach has also been adopted by Levon (2014) when investigating perception of sexuality from speech. The author presented London listeners with recordings of a reading passage in four separate guises: the original, and three manipulated versions — one with th-fronting, one with increased /s/ sibilance and one with increased pitch range. Listeners were asked to evaluate the speakers on six-point Likert scales representing competence and likeability, as well as traits related to gender and sexuality. Fridland, Barlett & Kreuz (2005) employed a similar methodology in the context of the US Southern Vowel Shift, rating resynthesized vowels on scales for ‘pleasantness’ and ‘education’. These studies demonstrate how experimental approaches can be used to evaluate the impact of a variable linguistic feature on the social perception of a speaker. For the purposes of the present study, adopting a similar experimental approach will allow the claim that the fronting and diphthongization of /u/ and /o/ are socially meaningful in York to be evaluated empirically.

In designing the perceptual component of the present study, three guiding principles were kept in mind. Firstly, it was desirable to design an experiment which would be meaningful to participants: rather than using generic rating scales such as those used in Lambert et al. (1967), the stimuli were designed to represent social categories relevant to the community under study. The second guiding principle was that the stimuli and task design would be reasonably ecologically valid — the task was designed to represent a reasonable real-world activity where the social meaning of speech performance would be in focus. Thirdly, it was desirable that the task and stimuli be non-threatening to participants. Many social meanings may be highly contentious or even offensive. For example, the ‘Chav’ meaning proposed by Haddican et al. (2013) is known to attract acute stigma, which might lead participants to be reluctant to assign

this label in a perception task. The contentious nature of such meanings also carries an ethical concern, in that it would not be appropriate to ask participants to make judgments that they may not be comfortable with. As such, it was desirable to design a task which is as non-threatening as possible, and does not involve encouraging participants to explicitly engage with potentially face-threatening forms of social categorization.

#### **4.2.2 Gathering listener intuitions**

The first step in understanding the social meaning of variation in /u/ and /o/ in York was to identify a set of social distinctions relevant to these vowels in this community, as well as the social practices associated with those distinctions. To do this, a set of open-ended evaluation tasks were conducted with groups of York residents. These involved group interviews in which informants responded to extracts of conversational York speech, which were selected to contain examples of the vowels under study. The choice to include the open-ended evaluation stage was motivated by the first design principle discussed in the previous section. Rather than create a task where the relevant social dimensions and their representation had been decided prior to commencing fieldwork, the open-ended evaluation data allowed the creation of an experiment and stimuli which were grounded as far as possible in the participants' experience of socially meaningful language use.

##### *Stimuli*

Speech stimuli for the open-ended evaluation task were extracted from an existing corpus of York speech comprised of recordings from two previous projects: Tagliamonte's (1998) *Roots of Identity* and Haddican's (2014) *A Comparative Study of Language Change in Northern Englishes*. 10 extracts were selected from this corpus. These were chosen to provide examples of the changing vowels, spoken by speakers of a range of ages and genders. Extracts were selected by

identifying the most frequent lexical items containing each variable, then selecting excerpts containing those words. The words were *road* (/o/) and *food* (/u/). Keeping the target lexical item constant across samples facilitated discussion in open-ended evaluation task — it was possible to draw participants' attention to the pronunciation of lexical items and elicit their reactions directly. Having identified a clearly-audible instance of these items in the corpus, preceding and following material was extracted in order to situate the token in a clear conversational context. The length of the extracts ranged from 8.9s to 33s, with a mean length of 21.6s. Transcripts are included in Appendix A.

### *Sampling*

The open-ended evaluation task was conducted among eleven individuals of a broad range of ages and occupations. All participants were born and went to school in York, and were resident in York at the time of interview. Seven interviews were conducted in total, mainly in pairs and groups of three. One participant was interviewed individually, as she could not find an appropriate partner, but was enthusiastic to participate. Information regarding participants' self-reported age, gender and occupation can be found in Appendix A.

### *Procedure*

Participants were given the following instructions:

*I'm now going to play you some recordings of different people. After each recording, I'd like you to talk together and try to form an impression of the speaker. You should try to come up with as much information as possible, but please don't feel you have to make up an answer if you have nothing to say.*

The recordings were played in pairs, providing contrasting examples of each



vowel. After the first recording of each pair had been played, participants were prompted to discuss their impression of the speaker. Once the participants had agreed on their impression of the speaker, they were encouraged to discuss the social practices associated with that type of person, asking questions such as:

- *Where would I go to meet a person like this?*
- *What style of dress or clothing brands would you associate with this kind of person?*
- *Which shops do you think that kind of person goes to?*
- *What kind of social activities do you associate with this kind of person?*

After the informants appeared to have run out of suggestions, the second recording in the pair was played, and the process outlined above was repeated. After participants had discussed each recording thoroughly, their attention was drawn to the vowel of interest through questions relating to the pronunciation of the target word:

- *In both of those recordings, the speakers used the word 'road'/'food'. Did you notice anything about the way that they said it?*
- *Would you say that's a typical way that York people speak?*
- *Do you think people are changing the way they pronounce the vowel in 'road'/'food'?*

#### **4.2.3 Testing listener intuitions**

Generally, the open-ended evaluation data were consistent with Haddican et al.'s (2013) claims: when evaluating the speech of other York speakers, informants regularly referred to age (in the sense of 'older' ways of speaking), social class (primarily in terms of education and occupation), and local 'Yorkshire' identity, which was linked to traditional local industries and stereotypes of rural life. At this stage, it was decided that rurality (i.e. whether

someone comes from an urban or rural locale) was a reasonable starting point for investigating Haddican et al.'s (2013) claim that /o/ variation is associated with 'local' identity. Having identified the categories of age, social class and rurality as potentially relevant dimensions of social meaning, the sociolinguistic perception experiment aimed to quantify listeners' association between phonetic variation in /u/ and /o/ and these categories. This allowed the hypothesis that York listeners would perceive variation in the target vowels as socially meaningful to be tested, and permitted an initial model of the indexical field of these vowels to be developed. During the experiment, listeners matched speech stimuli representing a range of variation in the target vowels to visual stimuli representing the social dimensions being tested, allowing an assessment of their ability to perceptually associate phonetic detail in the target vowels with the relevant aspects of social identity.

#### *Visual stimuli*

Following the findings of the open-ended evaluation tasks, the social perception experiment was designed to represent the social dimensions of age, social class and rurality. An interesting question which arises when designing a sociolinguistic perception experiment is exactly how social reactions to a linguistic feature should be operationalized. A lot of experimental work in linguistics benefits from a clearly-defined response variable — work involving word recognition, for example, is facilitated by the fact that the mental representations being elicited are well-defined and possess conventional orthographic representations, which can be assumed to be available to all literate participants. This is not the case for social responses: while many studies make use of rating scales to capture social evaluations, these do not necessarily represent the mental operation which takes place when listeners form social interpretations from speech. It seems unlikely that listeners access social meaning in interaction by adjusting a set of mental sliding scales

representing social traits, although these are the typical tools used to elicit social meanings in existing work.

An alternative approach to representing social meanings in experiments has been to use images reflecting the social practices associated with different social stereotypes. For example, D'onofrio (2015) represented stereotypes such as 'Nerd' and 'Valley Girl' using images of thick-rimmed glasses (for 'Nerd') and a pink purse and shopping bag (for 'Valley Girl') in an experiment exploring the impact of social stereotypes on phoneme categorization. MacFarlane & Stuart-Smith (2012) and Robertson (2016) have used brand logos (e.g. 'Greggs' vs 'Marks & Spencer') to represent stereotypes related to social class. The benefit of these approaches is that they draw on knowledge of the communities under study to create stimuli which are grounded in local social practices, and are thus more likely to represent listeners' experience of the social meanings under study than generic rating scales.

In addition to using abstract representations of social stereotypes, a number of published studies have successfully used facial images as stimuli in sociolinguistic perception experiments. For example, Hay et al. (2006) used images of people of a range of ages and social backgrounds to investigate the effect of perceived age and social status on speech perception. Squires (2013) adopted a similar approach in understanding the effect of variable subject-verb agreement (e.g. 'he don't like football' vs. 'he doesn't like football') on the perceived social status of a speaker. In both cases, the stimuli consisted of images of people, with social status reflected in the dress style (e.g. casual vs. formal attire) and location of the photograph (e.g. with a housing estate vs. a large detached house in the background). These approaches demonstrate that listeners can use phonetic variation as a social cue not only when dealing with adjectival rating scales or abstract representations of social stereotypes, but also when evaluating images of real people, which is arguably closer to how they experience sociolinguistic variation in real-world interactions.

Drawing on the work such as MacFarlane and Stuart-Smith (2012) and Hay et al. (2006), the social stimuli were structured around the social practices informants referred to during the open-ended evaluation task. Each stimulus image contained three components – an image of a face (providing information about the character’s age), an image of a place of work/study (providing information about the character’s social status) and an image of an urban or rural location (providing information about the regional background of the character). Thus, the intersection of older, middle-class, and rural is represented by a doctor in a rural Yorkshire village (Fig. 4.2.1a), while the corresponding middle-class character is represented as a middle-aged ‘Businessman’ associated with a well-known insurance company (Fig. 4.2.1e).

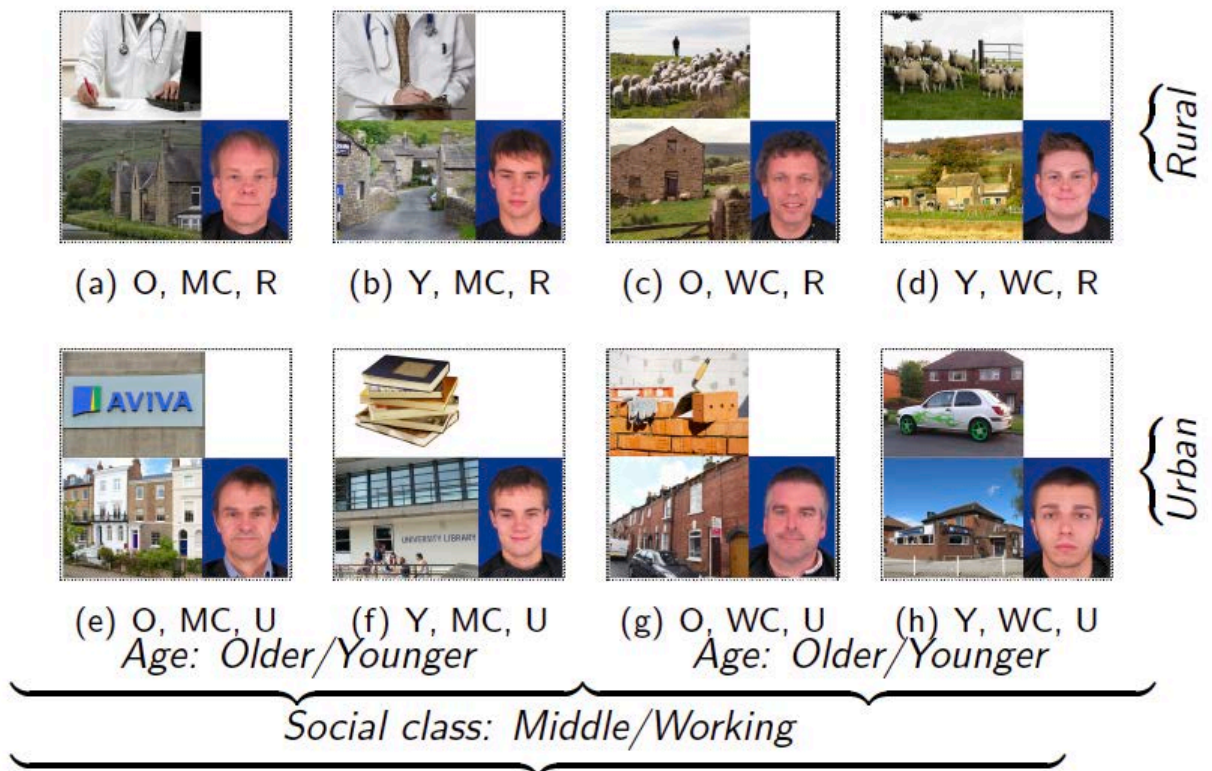


Figure 4.2.1: Visual stimuli.

The facial images were selected from the Stirling ESRC facial database (<http://pics.stir.ac.uk/ESRC/>). Including the facial images had two purposes:

firstly, to provide information about each character's age (allowing the possible age-related meanings of /u/ and /o/ fronting proposed by Haddican et al. (2013) to be evaluated), and secondly, to add realism to the visual stimuli, linking the set of images to form a believable character type.

Since faces are a potentially rich source of social information, including the facial images raised the challenge of finding faces which were believable representatives of the social categories being represented. Because people might have intuitions regarding which faces were more likely to belong to an urban/rural, older/younger, or middle-class/working-class character, it was necessary to choose faces which would be consistent with the other information provided for each character through the non-facial images. To this end, the facial images were selected from a larger sample rated by 10 students at the University of York. The students were asked to rate the faces on a number of scales including age (18-25, 26-35, 36-45, 46-55, 56-65), level of education (primary, secondary, vocational training, undergraduate, postgraduate) attractiveness (a sliding scale valued 0-100), and whether or not they looked like 'a typical person from Yorkshire' (a sliding scale valued 0-100). The selection of faces was informed by these ratings, but based primarily on the author's intuition, with the aim of selecting the most appropriate images for each social category, excluding those who were rated as extremely attractive or unattractive. A summary of the pre-task ratings for the selected facial images is provided in Appendix B. Although care was taken to ensure that the faces were appropriate for the characters represented in the visual stimuli, it should be noted that the faces themselves were not intended to be the primary source of social information in the stimuli. The facial images were intended to portray each character's age and add realism to the task, but the primary social information was communicated through the non-facial images presented alongside each face.

The non-facial images were taken from public domain collections. In all cases, the choice of component images reflects comments made by participants during the open-ended evaluations, meaning that the stimuli represent identifiable constellations of places and social practices known to be relevant to social identity in York. For example, while the tenement buildings shown in the older/middle-class/urban image (Fig. 4.2.1e) may not be particularly meaningful to someone from outside of York, a local person will be able to identify them as The Mount, one of the iconically middle-class areas of York discussed by informants in the open-ended evaluation tasks.

In addition to the broad social categories of older/younger, middle-class/working-class and urban/rural, informants often made reference to specific local stereotypes such as the 'Typical Yorkshireman' and 'Chav' in their open-ended evaluations. These were also represented in the visual stimuli. For example, the 'Chav' is the character at the intersection of younger, working-class and urban, represented through the image of Tang Hall Working Men's Club and an audaciously-modified small car; both aspects of the 'Chav' stereotype which regularly surfaced in the open-ended evaluations. Including these characters was intended to make the experiment more closely represent participants' real-world experience of language and social identity, as well as allowing Haddican et al.'s (2013) claim regarding the relationship between /o/ fronting and the 'Chav' stereotype to be tested. Including these multiple levels of social meaning (with characters representing specific local stereotypes, in addition to being examples of broad social categories) also facilitated the analysis of section 4.3.2., allowing inferences to be made regarding the indexical field of /u/ and /o/ variation.

An important limitation of the stimuli used in the perception experiment is the fact that the images are exclusively male. A preliminary version of the experiment also included female stimuli, but including all possible combinations of the target social categories and both male and female characters led to the

experiment containing a very large number of trials, which would potentially have caused participants to lose interest in the task. In light of this, the decision was made to focus on male characters for the present study, particularly given the fact that the 'Chav' is often represented as male (e.g. Nayak, 2006). This means that any conclusions regarding the social meaning of /u/ and /o/ fronting discussed in this chapter come with the caveat that the findings only provide evidence for meanings associated with male speakers. Further implications of this limitation are discussed in section 4.5.2.

### *Auditory stimuli*

Auditory stimuli consisted of resynthesized natural tokens of four lexical items: *food* and *too* for /u/, and *toast* and *so* for /o/. The lexical items used in the experiment were chosen due their lack of any known social connotations. Using single-word items as opposed to full sentences aimed to isolate the effect of the target vowels, controlling for any other socially-meaningful cues which would have been available in a longer stretch of speech. While this approach has a number of limitations (see section 4.5.2), it represented the most efficient and direct way of testing the general hypothesis of the chapter: that variation in /u/ and /o/ is perceived as socially meaningful by York listeners.

The words were read by a 24-year-old middle-class speaker from York as part of a larger word list which included monosyllabic tokens representing the entire vowel inventory. The speaker was recorded in a soundproof recording booth using a Shure condenser microphone. Recordings were digitized at 48000Hz and mixed down to mono. The stimuli were then resynthesized using a custom Praat script based on Alku et al. (1999), estimating the glottal wave from the natural samples and using it as the excitation source for a set of digital filters. It should be admitted that the use of a middle-class speaker may have led to incongruities between voice quality and vowel quality in the experiment. Future work could attempt a similar design with stimuli generated from several

speakers of a range of social backgrounds.

The auditory stimuli were designed to include a range of patterns of fronting and diphthongization in each vowel, representing the wide range of variation these vowels exhibit in natural speech. The complete set of /o/ stimuli included three steps of fronting of monophthongal variants and three steps of fronting across diphthongal tokens, including examples of fronting at the onset and off-glide of the vowel. The /u/ stimuli included three levels of fronting, from a back realization to very fronted, as well as three identical tokens with lowered onsets, resulting in more diphthongal formant trajectories. The spectral parameters of these stimuli were generated by stylizing formant contours using Praat's *FormantGrid* object class, based on the data provided in Haddican et al. (2013). Where measurements were not available in the published data, contours were based on examples extracted from the corpus introduced in section 4.2.2.

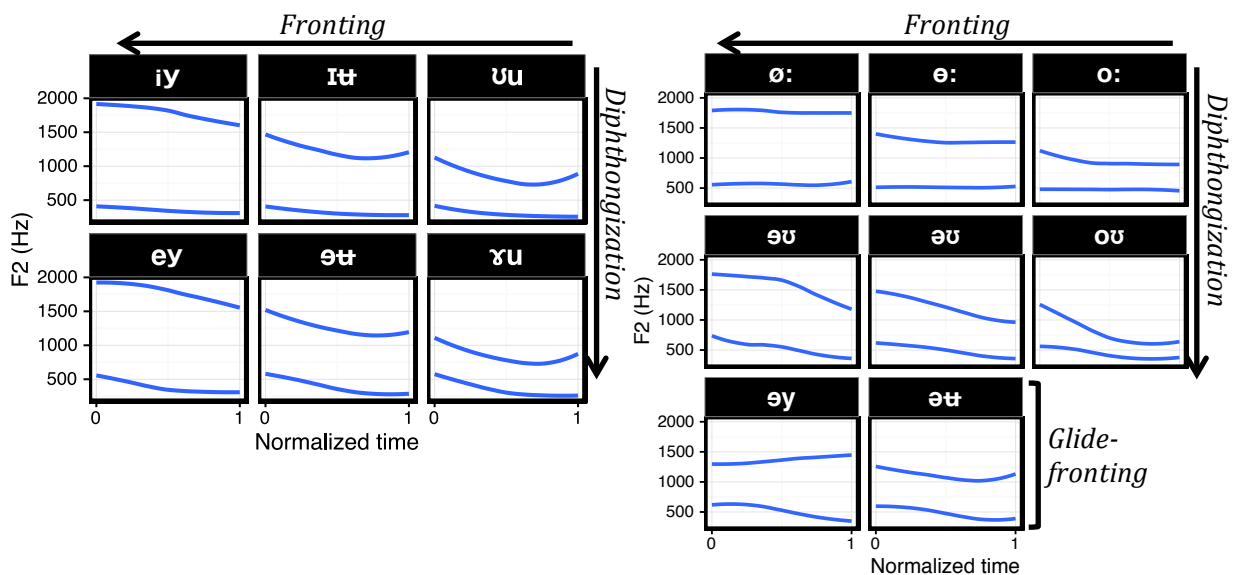


Figure 4.2.2: Resynthesized formant contours for /u/ (left) and /o/ (right). The top row of the /o/ stimuli are the variants typical described as monophthongs in previous work ([o] [ø] [œ]). All /u/ variants have a somewhat diphthongal quality. The variants on the bottom row of the left-hand panel have more diphthongal trajectories due to the raising of the first formant at the vowel onset.



As shown in Figure 4.2.2, the auditory stimuli included examples of diphthongal and monophthongal /o/, with three degrees of fronting (including tokens with fronting primarily at the onset and those with fronting primarily at the offglide). While the tokens of /u/ all have some degree of diphthongization, the tokens include more monophthongal tokens (top row, left-hand panel) and more diphthongal tokens with lowered onsets (bottom row, left-hand panel). Including these tokens in the experiment allowed the relative effect of the fronting and diphthongization of the two vowels on listeners' judgements of speaker identity to be estimated.

### *Sampling*

Participants in the perception experiment were 52 individuals who were born and went to primary and secondary school in York and had at least one parent from York. Recruitment was conducted through convenience sampling; individuals were approached primarily through personal contacts in York and adverts on social networking sites. Participants' ages, genders, and parents' levels of education (collected from a post-experiment questionnaire) are detailed in Table 3.4.1, section 3.4.

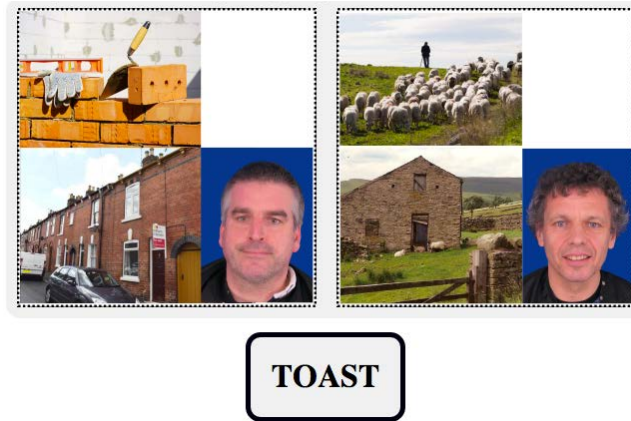
### *Procedure*

The task was framed as an imaginary scenario involving an actor preparing for an audition. The aim of this framing was to provide participants with a believable scenario where they might socially evaluate someone's speech. Participants were told that they were listening to the actor preparing to play one of eight possible roles in a sitcom based in York. After being introduced to the experimental scenario, participants took part in a training phase which aimed to familiarize participants with the visual stimuli and their intended interpretation. Participants saw two images per trial and were asked to categorize them in response to the following prompts:

- Which of these characters is middle-aged?
- Which of these characters is in their twenties?
- Which of these characters is a doctor/farmer/construction worker/NOT a 'Student'?
- Which of these characters is from rural Yorkshire?
- Which of these characters is NOT from rural Yorkshire?

The training results are reported in Appendix B, demonstrating that participants were extremely good at categorizing the stimuli according to these prompts, achieving around 95.3% accuracy on average. In other words, despite the many potential limitations of the visual stimuli, including any noise contributed by the facial images, there is good evidence that participants interpreted the stimuli as intended. Following the training phase, participants were given the following instructions before starting the main experiment:

*In the next part of the experiment, you will listen to the actor say a word and see two of the characters. Your task is to try and guess who the actor is pretending to be, by selecting one of the characters. Listen carefully to the way each word is pronounced, and choose the character who you think is the best match. To select the character, place your fingers on the 'e' and 'i' keys. These represent the two images which you will see on the screen. To select the right-hand box, press the 'i' key. To select the left-hand box, press the 'e' key. Your responses will be timed, so please choose as quickly as possible. Sometimes you might feel that none of the speakers really match the sound you hear. If that's the case, just give your best guess*



*Figure 4.2.3: Example experimental trial testing the association between variation in /o/ and rurality.*

During the experiment, participants saw two images per trial and heard a speech token. The lexical item was displayed below the images, ensuring that listeners identified the target vowel as the appropriate linguistic category. The two images on each trial differed in terms of one of the three social dimensions tested, with the remaining two kept constant between each image pair. For example, participants would see older and younger rural, working-class characters in a single trial, but an older working class and younger middle-class character would never appear together. Participants were given two breaks at one-third and two-thirds of the experiment, where they were encouraged to take a brief rest and re-start when ready. At the end of the experiment, participants were given the opportunity to type open-ended comments for each of the stimulus images and to complete a demographic questionnaire.

#### **4.2.4 Statistical Analysis**

Evidence that listeners can use variation in one or both of the target vowels to distinguish one or more of the social dimensions presented in the visual stimuli would support the general hypothesis that variation in /u/ and /o/ is perceived as socially meaningful in this community. Beyond this general hypothesis, Haddican et al.'s (2013) account can be used to form specific predictions regarding listeners' social selections in this task: monophthongal /o/ is claimed

to be associated with social class and 'local' identity (here represented as rurality). Fronted, monophthongal /o/ is claimed to be associated with the 'Chav' stereotype, and /u/ fronting is claimed to *not* be related to social class or regional identity, but possibly to age.

These hypotheses are evaluated by estimating the conditional probabilities associated with each social selection and auditory stimulus item. When hearing each speech token, participants were asked to make a social judgment about that item on one of the target social dimensions — either choosing between an older and younger character, a middle-class and working class-character, or an urban and rural character. Since the listeners made a binary judgment on each trial, if a speech variant was uninformative with regard to a particular social dimension, it would be expected that participants would behave at chance level — there would be no reason that they would consistently select one type of character over another. However, if participants associate that variant with the social dimension in question, it would be expected that that variant would cause a consistent bias toward a particular social selection.

Following this approach, any non-zero effects of the auditory stimuli on social selections would constitute evidence that some aspect of variation in /u/ and /o/ can be assigned a conventional social meaning by these listeners. The predictions based on Haddican et al. (2013) are visualized in Figure 4.2.4, representing a set of social categories distributed in phonetic space.

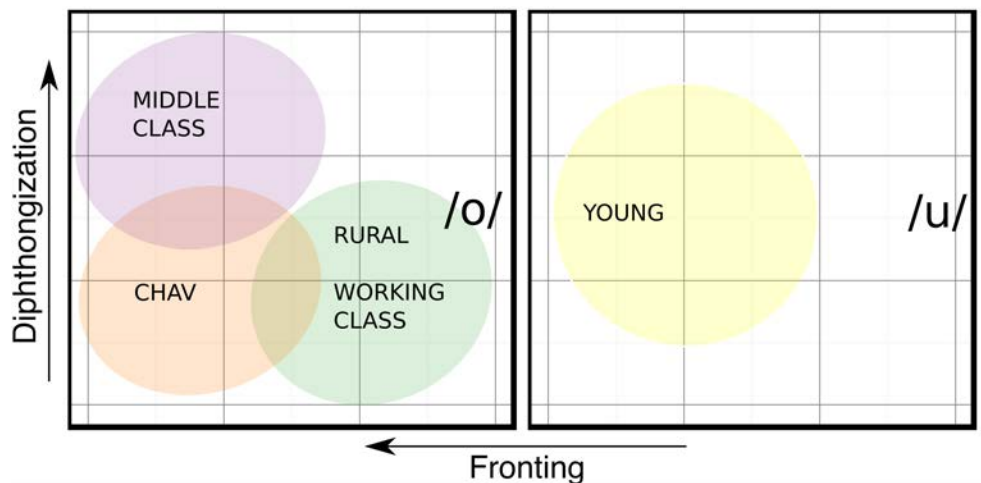


Figure 4.2.4: A visual representation of the hypothesized indexical field of /o/ and /u/ variation based on Haddican et al., (2013).

Following Figure 4.2.4, hearing a monophthongal variant of /o/ should result in listeners' being biased toward the selection of a working-class or rural image, while diphthongal /o/ should bias listeners toward the selection of a middle-class image. Fronted, monophthongal variants should cue a 'Chav' selection, and fronted /u/ variants will increase the probability of a younger selection.

The following analyses test these predictions by fitting mixed-effects logistic regression models to the data for each vowel, estimating the probability of a given social category being selected conditional on the identity of the speech stimulus heard. Random intercepts are included for each participant, each auditory and visual stimulus item, and the face set used in the experiment (see section 4.2.3); random slopes are included for participant:variant, reflecting the fact that listeners may vary in the degree to which their selections are affected by the auditory stimuli. In all cases, the *Speech stimulus* term was sum coded, with the most back, monophthongal variant used as the reference level. This means that the intercept of each model represents listeners' general bias toward selections of the social category being modeled (the mean estimated log-odds of that category being selected), and the coefficients for each auditory stimulus item represent the effect of that stimulus above and beyond the effect

of the intercept.

Statistical significance will be evaluated in two ways in the following analyses: first, models including *Speech stimulus* term are compared to models with random terms only, using a likelihood ratio test. This test is performed by comparing the deviance of two models (calculated as two times the negative log-likelihood of each model), and computing the probability of observing a difference of that magnitude or greater according to the  $\chi^2$  distribution. This amounts to comparing a 'null' model where participants' responses are entirely idiosyncratic (captured by the random coefficients alone), to one with a population-level effect of the auditory stimulus on selections, and performing a hypothesis test on the difference in explained variance. In other words, if the model with a main effect of speech stimulus significantly improves the model with random terms only, there is evidence of a population-level effect of variation in the vowel tested on listener responses, above and beyond the individual-level variation captured by the random effects. Following this test of model significance, the significance of individual coefficients will be calculated using the Wald z statistic, allowing statements to be made about exactly which variants of /u/ and /o/ are associated with which social categories. Where relevant, post-hoc comparisons will be made between auditory stimuli using Tukey's Honest Significant Difference test.

The analysis will proceed in three stages. Section 4.3.1 will test the social meanings proposed by Haddican et al. (2013) separately, with each statistical model representing trials where the visual stimuli contrasted in terms of age, social class, or rurality. This will allow the analysis of the indexical field of these vowels shown in Figure 4.2.4 to be updated. Section 4.3.2 will present results for the individual characters represented in the stimuli, allowing another level of social meaning to be added to the description of the indexical field of /u/ and /o/. It achieves this by fitting a further set of mixed-effects logistic regression models, this time modeling the selection of each visual stimulus versus all

others. This section will use a comparison of goodness-of-fit statistics across these models (McFadden's (1974) pseudo- $R^2$ ) to argue that four characters in particular are strongly associated with variation in /u/ and /o/: the 'Chav', the 'Old Farmer', the 'Student' and the 'Businessman'.

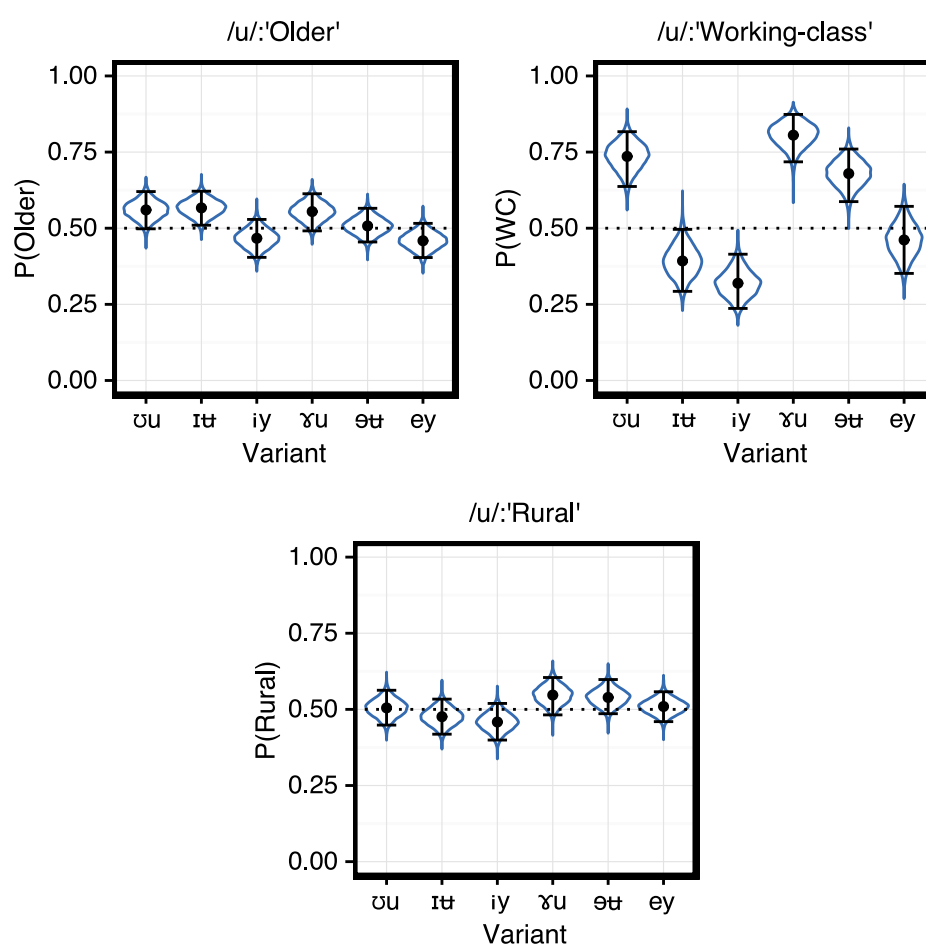
Section 4.3.3 will explore similarities and differences between these characters in terms of the linguistic forms associated with them. To interpret these results, the analysis will draw on the open-ended evaluation data to introduce the notion of 'Broad Yorkshire' speech, an enregistered speech variety (Agha, 2003) which represents listeners' conception of 'local' ways of speaking. It will be argued that listeners' evaluation of certain variants as 'Broad' underpins their understanding of the social meaning of /u/ and /o/ variation, providing a unifying explanation for their perceptual responses. Effects of listener characteristics on social evaluation will be considered in Chapter 6.

## 4.3 Results

### 4.3.1 Age, social class and rurality

#### *Results for /u/*

Variation in /u/ had a significant effect on social class selections only ( $\chi^2(5)=28.35$ ,  $p < 0.001$ ). No significant effects were found for the effect of /u/ variation on the selection of older versus younger ( $\chi^2(5)=9.91$ ,  $p=0.08$ ) or urban versus rural characters ( $\chi^2(5)=5.44$ ,  $p=0.37$ ). Figure 4.3.1 plots the effect of each variant of /u/ on the selection of older, working-class and rural characters in the social perception experiment.



*Figure 4.3.1: Effect of /u/ variation on perceptions of age, social class and rurality. /u/ variants are, from left to right: more monophthongal tokens (three levels of fronting) followed by more diphthongal tokens (three levels of fronting). Each point represents the probability a typical York listener would select an older/working-class/rural character when hearing each vowel variant.*



The results for working class selections are very clear: back variants of /u/ are consistently assigned to working-class characters (back, more monophthongal:  $\beta=0.723$ ,  $SE=0.21$ ,  $z=4.5$ ,  $p < 0.001$ ; back, more diphthongal:  $\beta=1.13$ ,  $SE=0.23$ ,  $z=4.99$ ,  $p < 0.001$ ), while fronted variants are assigned to middle-class characters (fronted, more monophthongal:  $\beta=-1.075$ ,  $SE=0.19$ ,  $z=-4.79$ ,  $p < 0.001$ ; fronted, more diphthongal:  $\beta=-0.47$ ,  $SE=0.20$ ,  $z=-2.28$ ,  $p < 0.001$ ). This effect is mediated by diphthongization: while listeners consistently hear centralized, more monophthongal tokens as middle class ( $\beta=-0.76$ ,  $SE=0.19$ ,  $z=-4.78$ ,  $p < 0.001$ ), this is not the case for the centralized, more diphthongal token, which cues a working-class selection ( $\beta=0.45$ ,  $SE=0.17$ ,  $z=2.56$ ,  $p=0.01$ ). The results on the urban/rural dimension suggest a trend for diphthongal variants to cue the selection of a rural character, and there is a trend for back variants to cue the selection of an older character than centralized or fronted variants; however, only models of working-class selections were significantly affected by the speech stimulus heard according to the likelihood ratio tests.

Further evidence that listeners notice and socially evaluate variation in /u/ can be found in the open-ended evaluation data. In the following extract, Jane and Christine compare recordings of an older and younger speaker, focusing on /u/, and linking it to ‘old York’ speech:

(1) *Interview 4, 58:45 - 59:30, response to recordings 7 and 10*

- Jane:*<sup>1</sup> *Hers is a definite [uɒ] and that sounded more ['i: ju:], [fi: 'ju:d].  
But not [fju:d] as in a battle, it had that edge to it that was lifted.*
- Christine:* *Yeah she said it...it was almost elongated when the older woman said it.*
- Jane:* *Yeah, and a really different mouth shape.*
- Christine:* *Would you associate that with York speech?*

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<sup>1</sup> All names provided are pseudonyms.

Jane:            *Yeah. But with **old York speech**. Now I don't think many people do speak like that.*

Similarly, in the following extract Daniel and Eric imitate back /u/ in the speech of an older speaker:

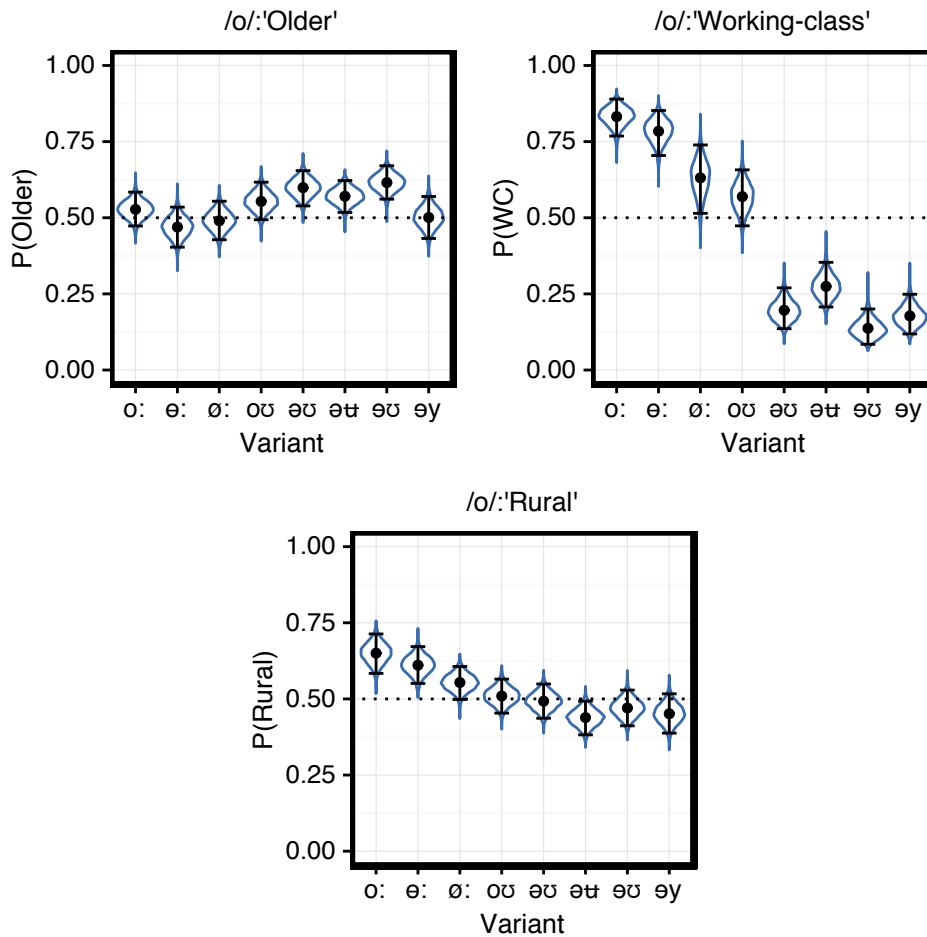
(2)    *Interview 2, 1:06:53 – 1:07:11, response to recording 10*

Daniel:        *She said [fuɔd].*  
Eric:            *[fuɔd]*  
Mark:         *and she's like [so:]*  
Eric:            *[so:], [fuɔd]*  
Interviewer: *Tell me more about that.*  
Eric:            *I think it's the [o:] innit.*

One surprising observation is the fact that the extract (1) contains references to back /u/ as 'old', despite the fact that no significant effects were found in the experimental data for age selections. One possibility is that the meaning the informants in (1) drawing on is not 'old' in terms of the empirical age of speakers, but rather a more general notion of 'old York speech', which is perceived as characteristic of certain types of older York speakers. This idea will be developed further in sections 4.3.2 and 4.3.3. Together, these findings provide evidence that York listeners perceive variation in /u/ as socially meaningful, consistently mapping back variants to working-class characters, and fronted variants to middle-class characters. This effect is mediated by diphthongization, which weakens the effect of fronting on working-class selections. The results provide support for the general hypothesis of this chapter: that variation in the target vowels is perceived as socially-meaningful by York listeners. However, it provides this support in a slightly surprising manner, given Haddican et al.'s (2013) claims regarding the social meaning of /u/ fronting in York (that it would either be heard as *young*, or associated with no particular social meaning).

*Results for /o/*

Variation in /o/ had a significant effect on selections for age ( $\chi^2(7)=18.59$ ,  $p < 0.01$ ), social class ( $\chi^2(7)=51.56$ ,  $p < 0.001$ ) and rurality ( $\chi^2(7)=15.90$ ,  $p < 0.03$ ), suggesting that listeners can consistently map variation in this vowel to all three social dimensions tested.



*Figure 4.3.2: Effect of /o/ variation on perceptions of age, social class and rurality. /o/ variants are, from left to right: monophthongal tokens (three levels of fronting), followed by diphthongal tokens (three levels of fronting), alternating at the onset and offglide.*

For age selections, the effect is carried by the tokens with fronted onsets, which cue the selection of an older character ( $\beta=0.30$ ,  $SE=0.11$ ,  $z=2.87$ ,  $p < 0.01$ ), while centralized monophthongs cue the selection of a younger character ( $\beta=-0.29$ ,  $SE=0.13$ ,  $z=2.25$ ,  $p < 0.01$ ). For selections on the social class dimension, all

variants result in a statistically significant bias. With the exception of the most back variant, diphthongs cue a middle-class selection. This effect is strongest for the most fronted diphthongs (fronted onset:  $\beta=-1.78$ ,  $SE=0.28$ ,  $z=-6.47$ ,  $p < 0.001$ ; fronted offglide:  $\beta=-1.82$ ,  $SE=0.28$ ,  $z=-6.60$ ), and weakest for centralized diphthongs (fronted onset:  $\beta=-1.78$ ,  $SE=0.28$ ,  $z=-6.47$ ,  $p < 0.001$ ; fronted offglide:  $\beta=-1.82$ ,  $SE=0.28$ ,  $z=-6.60$ ). The back diphthong cues a working-class selection ( $\beta=0.79$ ,  $SE=0.22$ ,  $z=4.56$ ,  $p < 0.001$ ), suggesting that the effect of diphthongization is mediated by fronting: diphthongal /o/ sounds middle class, unless it is very back. Monophthongal /o/ cues a working-class selection, and this effect is mediated by fronting: the most fronted variants showing the weakest bias toward working class images (back monophthong:  $\beta=2.28$ ,  $SE=0.26$ ,  $z=8.62$ ,  $p < 0.001$ , central monophthong:  $\beta=1.77$ ,  $SE=0.24$ ,  $z=7.46$ ,  $p < 0.001$ ; front monophthong:  $\beta=0.87$ ,  $SE=0.25$ ,  $z=4.49$ ,  $p < 0.001$ ). This pattern suggests that fronting and diphthongization are associated with middle-class selections, while backness and monophthongization are associated with working-class selections.

Turning to the urban/rural dimension, the strongest effects are found for the back, monophthongal variant, which causes a bias toward rural selections ( $\beta=0.53$ ,  $SE=0.15$ ,  $z=4.67$ ,  $p < 0.001$ ). The bias for monophthongs to cue a rural selection is reduced by fronting: centralized monophthongs have a smaller effect than back monophthongs ( $\beta=0.36$ ,  $SE=0.13$ ,  $z=2.87$ ,  $p < 0.01$ ), and fronted monophthongs are not significantly different from the baseline: ( $\beta=0.13$ ,  $SE=0.11$ ,  $z=1.14$ ,  $p = 0.25$ ). Diphthongs with centralized offglides cue an urban selection ( $\beta=-0.34$ ,  $SE=0.11$ ,  $z=-4.16$ ,  $p < 0.01$ ), as do those with fronted offglides ( $\beta=-0.39$ ,  $SE=0.13$ ,  $z=-2.27$ ,  $p < 0.05$ ). Overall, these results imply an association between monophthongization and rurality, particularly for very back variants of /o/, and an association between diphthongization and urban identities, especially for fronted variants.

The experimental findings for /o/ are generally consistent with informants' responses to the open-ended evaluation task. Variation in /o/ was particularly likely to be mentioned in the open-ended evaluation data, with monophthongal variants described as 'typical Yorkshire' and 'stretched out':

(3) *Interview 2, 32:04-32:40, response to recording 2*

*Mark: It's a **typical Yorkshire** – you just sort of **stretch it out**. Yorkshire people like to spread things out. It's like buffer time to think.*

As well as linking monophthongization (and possibly duration) to local identity as in this extract, many informants referred to social class or 'Posh' speech with regard to /o/ diphthongization:

(4) *Interview 2, 41:12-42:37, response to recordings 6 and 8*

*Grant: Yeah she says [rəʊd], she pronounces the [əʊ]. Whereas the other guy [ro:d].*

*Interviewer: And what does that... what kind of impression do you get about her?*

*Grant: She's **posher**. Yeah that's what I get from it. She pronounces it more Queen's English.*

Together, the results for /o/ provide further support for the claim that variation in /u/ and /o/ is perceived as socially meaningful by York listeners, satisfying the minimal conditions of a social-indexical account of change in these vowels. It is also now possible to update the indexical field of /u/ and /o/ previously visualized based on Haddican et al. (2013). Figure 4.3.3 demonstrates this by visualizing the social categories tested (old/young, middle class/working class and urban/rural) in phonetic space. A category is included if and only if variants with the phonetic properties of interest showed statistically-significant effects for that category at the  $p < 0.05$  level.

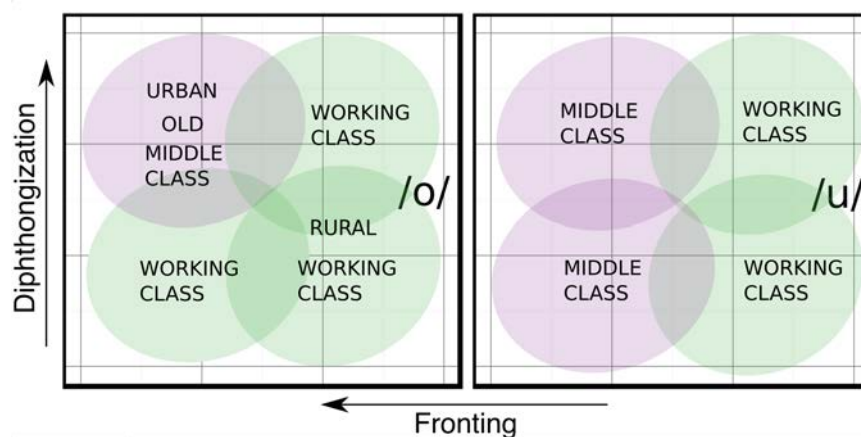


Figure 4.3.3: Indexical field for /o/ and /u/ based on the results of section 4.3.1, visualizing the effect of fronting and diphthongization on selections of older/younger, urban/rural and working-class/middle-class characters.

Many of these results are consistent with the predictions made in Figure 4.2.4 Monophthongal vs diphthongal /o/ is strongly associated with social class, and monophthongal /o/ is associated with rurality. However, other findings are quite surprising, both in terms of Haddican et al.'s (2013) claims, and also in terms of what is known about productive variation in these forms. The most striking result is that listeners can use /u/ fronting as a cue to social class. This is quite unexpected given the prediction that it would show effects only in terms of age selections, and the fact that it is *not* associated with social class in production. Furthermore, despite the fact that both /u/ and /o/ fronting are strongly related to age in production, listeners' perceptual association between fronting and age is relatively weak: there is no statistically-significant effect of /u/ fronting on age selections, and while fronted /o/ monophthongs weakly cue a younger selection, listeners appear to assign diphthongal /o/ to older characters, despite the fact that diphthongization is more likely among *younger* speakers in production (Haddican et al., 2013). Thus, while the indexical field of these vowels may include broad categories such as social class, age and rurality, listeners' selections of these categories do not seem to reflect the social distribution of /u/ and /o/ variation in the speech community. Rather, it seems that these associations are 'warped' by listeners' implicit beliefs about the relationship between language and social identity.

### 4.3.2 Characterological figures

A reasonable explanation for the ‘warping’ of indexical meaning observed in the previous section might be that listeners responses were guided less by the broad social categories each character represented, and more by the specific characters they were able to identify in the visual stimuli. The *persona* (Eckert, 2008) or *characterological figure* (Agha, 2003) is a key construct in the sociolinguistic literature, referring to the representation of a ‘typical’ social type such as a ‘Valley Girl’ (D’onofrio, 2015), ‘hardcore Chicano gangster’ (Mendoza-Denton, 2011), or ‘classic New Yorker’ (Becker, 2014). While these characterological figures may represent combinations of regional, ethnic and gendered categories, they tend to be associated with very specific attitudes and behaviours, and a usually have unique label which identifies them. The open-ended evaluation data indicate that at least two characterological figures may be important to the indexical field of /u/ and /o/ variation: the Typical Yorkshire character, and the ‘Chav’. The following excerpts demonstrate this, and provide an outline of the particular social practices and traits associated with these figures.

#### *The ‘Typical Yorkshireman’*

‘Typical Yorkshire’ people are often described as either being farmers, or being involved with the railways (until recently, one of York’s premier employers).

(5) *Interview 4, 18:03 – 18:07, response to recording 1*

*David:* *I’d say he sounds like he’s worked in like **a train yard.***

*David, Eric,*

*Mark:* *Yeah.*

*Mark:* ***A typical Yorkshire job.***

(6) *Interview 2, 25:40 – 25:44, response to recording 1*

*Jane:* *I’d say he’s obviously a sort of farmer-y chap.*

When farming is mentioned, it is often linked to representations of rural Yorkshire life from popular culture. For example, in the following extract, Ollie refers to 'Last of the Summer Wine', a TV sitcom set in the rural Yorkshire:

(7) *Interview 1, 1:12:15 – 1:12:24, response to recording 9*

*Ollie: It reminded me then of 'Last of the Summer Wine'. Do you remember that programme?*

*Gemma: It reminded me of your mum.*

*Ollie: My mum? Well she's very York.*

The representation of Yorkshire identity the informants allude to here is a well-known stereotype: the authentic Yorkshireman, typically described as down-to-earth, practical, and proud of their heritage. The phrase 'Yorkshire born and bred' is often used in reference to this character, as in the following extract:

(8) *Interview 4, 1:01:05, Response to recording 7*

*Christine: It's like that old saying innit*

*Jane: **Yorkshire born Yorkshire bred,**  
strong in't arm thick in't head*

*Christine: Exactly. But it is, isn't it?*

This figure of the 'Typical Yorkshireman' is well-known in the popular discourse on regional identity in the United Kingdom, and is present even in relatively early writing on regional identity in England:

*'They were Yorkshire to begin with and Yorkshire they will remain to the close. Wave after wave of change may pass over them; but they will stand firm and immutable in their adherence to the traditions and customs of their forefathers.'*

(Burnely, 1875, p.9)



The existence of such a stereotype is also consistent with other work on language and identity, showing clear parallels with's (1963) 'Typical Islander', or the 'Typical Lower-East-Sider' of Becker's (2014) work.

### *The 'Chav'*

A second social type commonly mentioned is the 'Chav' or 'Townie'. This is a pejorative term which describes a specific stereotype of lower-class youth. The 'Chav' stereotype is strongly associated with areas of York which have a high density of social housing, most notably Clifton, Acomb and Tang Hall.

(9) *Interview 2, 5:21-6:07*

*Eric: As you start getting out of the centre it starts to get rougher.*

*David: Yeah **Clifton, Tang Hall.***

*Interviewer: Is Tang Hall rough?*

*Mark: I wouldn't go there on a night.*

*Interviewer: OK right, what kind of people...who is it that's making it rough?*

*David: Usually **Chavs.***

*Eric: **Chavs.***

*Mark: **Chavs.**  
[laughter]*

The figure of the 'Chav' is a well-known feature of the popular discourse around social class in the United Kingdom, and has been discussed widely in the sociological literature (Hayward & Yar, 2006; Tyler, 2008). Hayward & Yar (2006) argue that the key feature of the 'Chav' stereotype is a perceived pathology of consumption behaviour:

*The perceived 'problem' with this 'new underclass' is that they consume in ways deemed 'vulgar' and hence lacking in 'distinction' by superordinate classes.*

(Hayward & Yar, 2006, p.14)

This resonates with informants' comments in the open-ended evaluation data, where the 'Chav' was routinely linked to designer sportswear, and social practices such as the excessive modification of cheap cars. Thus, there is evidence of two characterological figures linked to language use in this community: the 'Typical Yorkshireman', a straight-talking farmer who adheres to traditional rural ways of life, and the 'Chav', a rough, antisocial young person who is stigmatized for their excessive, tasteless consumption choices. Since the visual stimuli were based on the open-ended evaluation data, they include representations of these characters: the 'Chav' is represented by a young man in the Tang Hall area accompanied by an audaciously-modified small car, and the 'Typical Yorkshireman' is represented in the 'Old Farmer' image (see section 4.1.1). The presence of these stimuli means that it is possible to explore their effect on listeners' experimental responses; asking, for example, 'Are all old/working-class/rural characters selected for the same auditory stimuli, or are some characters, such as the 'Chav' and 'Old Farmer' more likely to be selected than others?' In order to investigate the selections of individual visual stimuli, a set of one-vs-all logistic regression models were fit to the data. These models estimate the log odds that each character would be selected in response to each variant on any trial where that character was available as a choice. The effect of the auditory stimuli on selections of each character was evaluated through a likelihood ratio test, as in sections 4.2.2 and 4.3.4.

#### *Results for /u/*

Of the eight characters, only five show a statistically-significant effect of /u/ stimuli. These are the 'Old Farmer' ( $\chi^2(5)=29.5$ ,  $p < 0.001$ ), the 'Young Farmer' ( $\chi^2(5)=19.86$ ,  $p < 0.01$ ), the 'Businessman' ( $\chi^2(5)=24.41$ ,  $p < 0.001$ ), the 'Student' ( $\chi^2(5)=27.81$ ,  $p < 0.001$ ) and the 'Chav' ( $\chi^2(5)=26.97$ ,  $p < 0.001$ ). For brevity, the full model comparison tables and regression summaries are found in Appendix C4. Figure 4.3.4 shows the results for each visual stimulus item in response to tokens containing /u/.

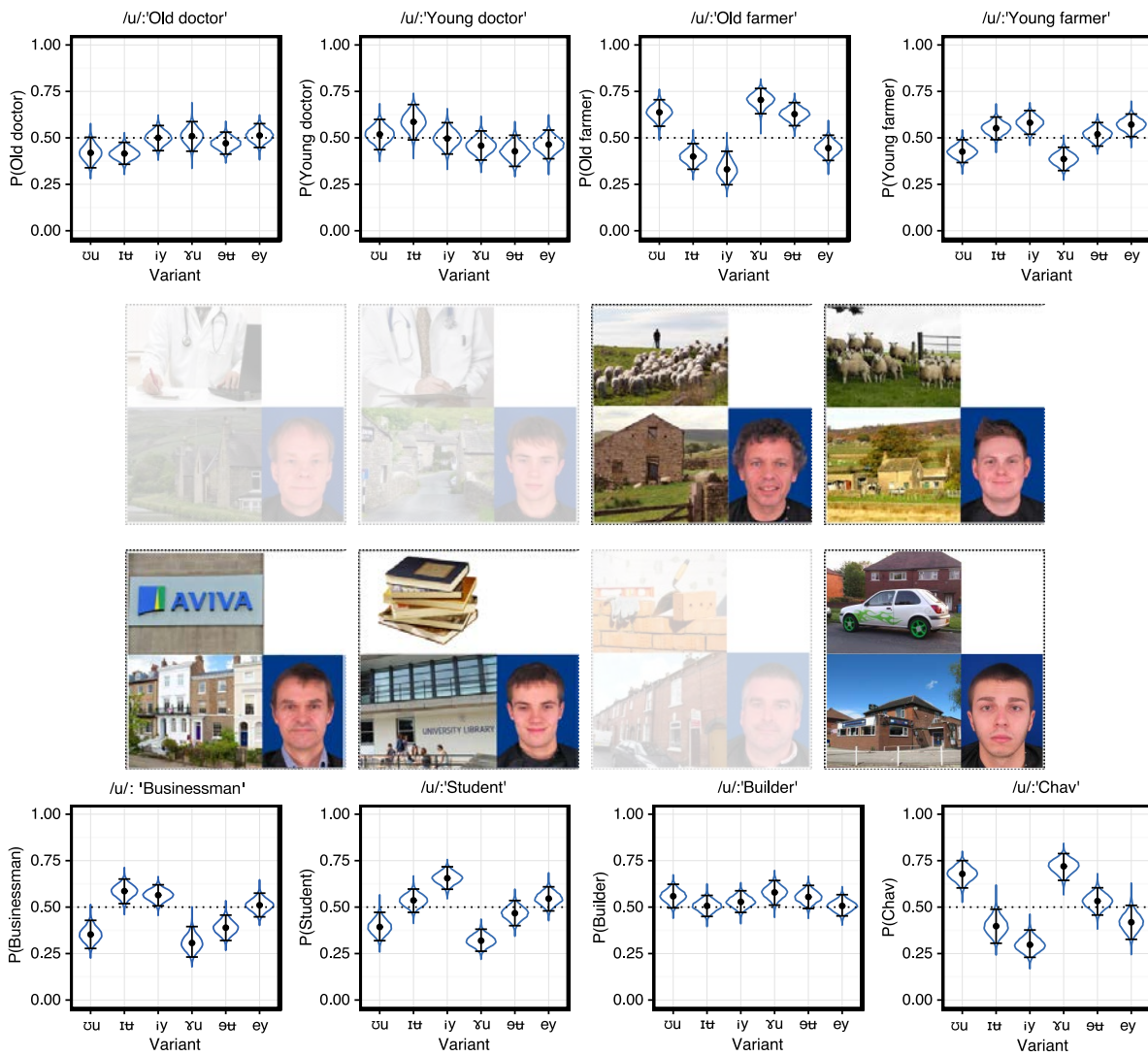


Figure 4.3.4: Effect of /u/ variants on selection of individual stimuli. Images are ghosted where auditory stimuli had no significant effect on their selection according to likelihood ratio tests.

It is immediately clear that four characters show the largest effects: the 'Chav', the 'Old Farmer', the 'Student' and the 'Businessman'. Fronted variants tend to cue the selection of the 'Student' or 'Businessman', and back variants tend to cue the selection of the 'Chav' or 'Old Farmer'. Of the remaining stimuli, only the effects for the 'Young Farmer' reach significance ( $\chi^2(5)=19.86$ ,  $p < 0.01$ ), with frontier variants cueing the selection of this character. Notably, both the 'Chav' and 'Old Farmer' show very strong effects, consistent with participants' regular reference to these figures in the open-ended evaluation data. These findings

imply that /u/ variation is not simply associated with broad notions of age, rurality, or social class, but that these specific characterological figures play a central role in the social meaning of this vowel.

#### *Results for /o/*

Variation in /o/ had a statistically-significant effect on the selection of six of the eight characters. The *Speech stimulus* term showed the greatest reduction in model deviance for the 'Chav' ( $\chi^2(7)=49.11$ ,  $p<0.001$ ), 'Student' ( $\chi^2(7)=44.77$ ,  $p<0.001$ ), 'Old Farmer' ( $\chi^2(7)=40.06$ ,  $p<0.001$ ) and 'Businessman' ( $\chi^2(7)=39.36$ ,  $p<0.001$ ). Statistically significant effects were also found for selections of the 'Young Farmer' ( $\chi^2(7)=17.94$ ) and 'Old Doctor' ( $\chi^2(7)=15.29$ ,  $p<0.05$ ), although the *Speech stimulus* term resulted in a smaller reduction in deviance for these models.

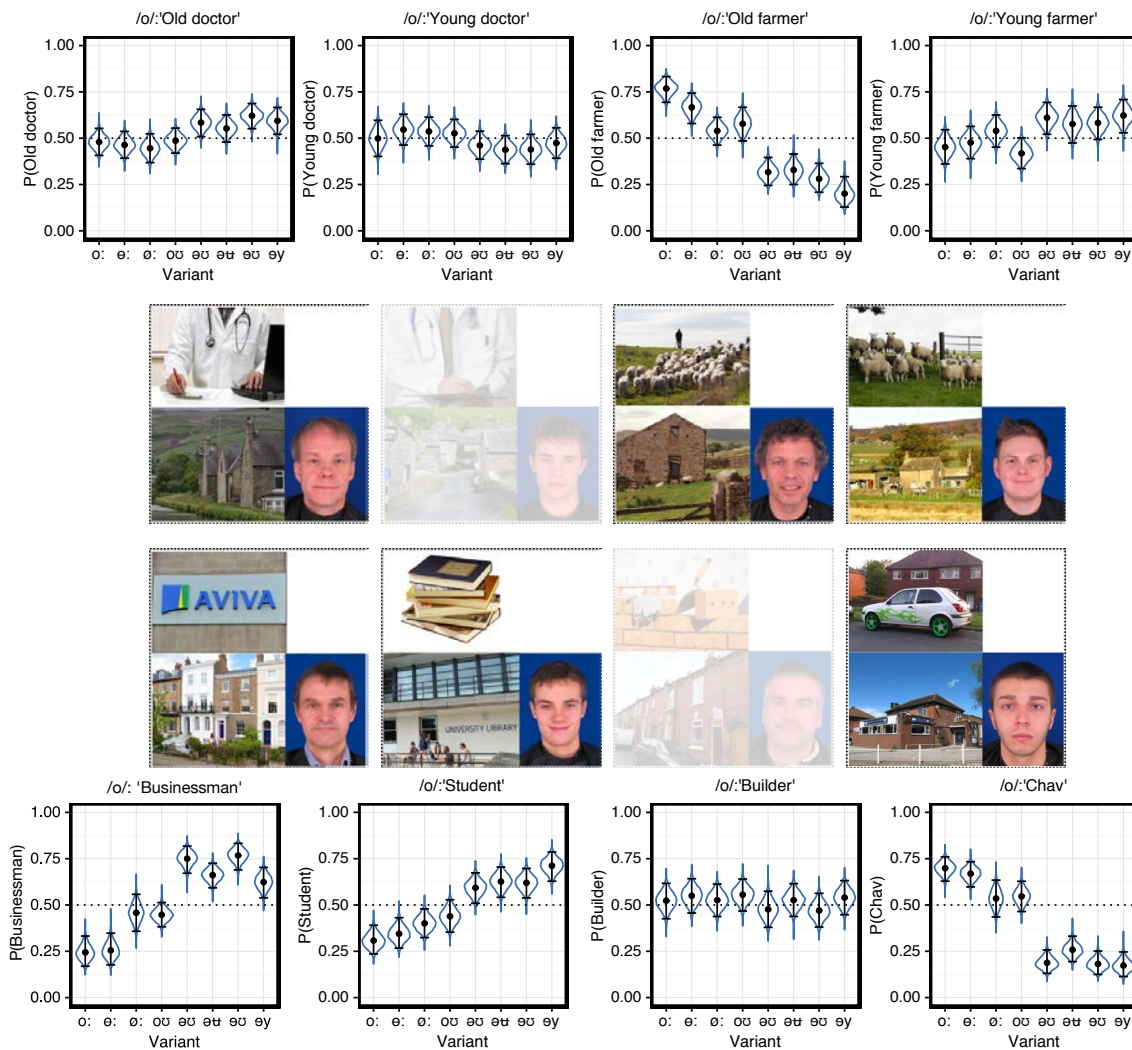


Figure 4.3.5: Effect of /o/ variants on selection of individual stimuli. Images are ghosted where auditory stimuli had no significant effect their selection.

The results for /o/ are strikingly similar to those for /u/. Once again, the largest effects are found for the ‘Businessman’, ‘Student’, ‘Chav’ and ‘Old Farmer’. Diphthongs tend to cue the selection of the ‘Student’ or ‘Businessman’; monophthongs tend to cue the selection of the ‘Chav’ and ‘Old Farmer’. This effect is mediated by fronting, with fronter variants of both monophthongal and diphthongal /o/ more likely to cue the selection of the ‘Businessman’ or ‘Student’. Significant effects are also found for the ‘Young Farmer’, with diphthongal /o/ cueing its selection. The key difference between the results for /o/ and /u/ is in the selections of the ‘Old Doctor’. While variation in /u/ had no

significant effect on selections of this character, there is a small but significant effect of variation in /o/: the 'Old Doctor' was selected in response to fronted, diphthongal variants, particularly for tokens with fronting at the vowel onset. Although this potentially points to a possible difference in the social meanings associated with the two vowels, the fact that the largest effects are found for the same four visual stimuli in both cases implies that these characters may play an important role in shaping York listeners' social perception of linguistic variation.

The key argument of the analysis so far is that selections in the perception experiment were driven by four stimuli: the 'Businessman', 'Student', 'Chav' and 'Old Farmer'. While variation in /u/ and /o/ had a significant effect on selections of some other characters (e.g. the 'Young Farmer' and 'Old Doctor'), the four characters mentioned above show the most consistent pattern of selections. This statement is impressionistically visible in figures 4.3.4 and 4.3.5, but can also be demonstrated quantitatively. Figure 4.3.6 plots a goodness-of-fit measure (McFadden's (1974) pseudo- $R^2$ ) for each model. This measure has an upper bound of 1, with higher values reflecting a better fit to the data. The higher this value, the stronger the effect of the acoustic stimuli in cueing selections of each character.

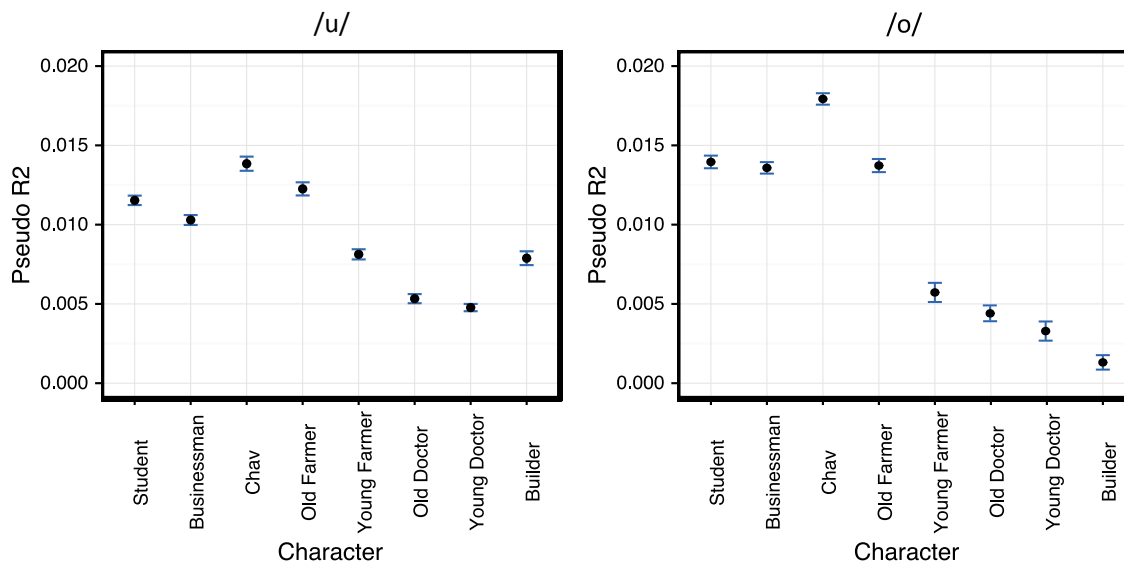


Figure 4.3.6: Goodness-of-fit comparison for models predicting the selection of each character in response to variation in /u/ and /o/. Error bars show 95% confidence intervals generated from 1000 bootstrap simulations of the model fitting process.

In both cases, it is clear that the auditory stimuli explain much more variability in selections of the ‘Businessman’, ‘Chav’, ‘Student’ and ‘Old Farmer’ than the other characters. These findings provide clear evidence of the relevance of characterological figures to the indexical field of /u/ and /o/ variation in York. While listeners can use variation in these vowels to distinguish between older/younger, working class/middle class and urban/rural characters, their responses appear to be driven by particular stereotypical characters represented in the stimuli. For example, a back variant of /u/ consistently cues the selection of the ‘Old Farmer’, but has no significant effect on selections of the ‘Builder’, despite both characters representing feasible examples of working-class identities, which participants can reliably identify (see training results, Appendix B). Fronted /u/ consistently cues the selection of the (urban) ‘Businessman’ and ‘Student’ characters, but *not* the (rural) older and younger doctor. If social class alone was central to listeners’ evaluations, such a difference would not be expected.

Another possible explanation for these effects is that the characters which drive the effects are somehow more readily identifiable as examples of the demographic categories they represent. However, there is no reason to think that the 'Builder' is a poor example of a working-class profession, or that the doctors are not recognised as middle-class by participants. Further, the training data (Appendix B) demonstrate participants were able to classify the images in terms of their age, occupation and urban/rural status with a very high accuracy. A more likely explanation, and one better supported by the open-ended evaluation data, is that the perceptual responses reflect the centrality of characterological figures such as the 'Chav' and 'Typical Yorkshireman' to York listeners' social interpretations of variation in /u/ and /o/, at least for male speakers.

These findings allow a clearer understanding of the results presented in section 3.3.1, where some perceptual responses appeared counterintuitive given what is known about /u/ and /o/ in production. The effect of diphthongal /o/ on the selection of older characters is driven not by the selection of any older character, but by a particular type of middle-class older character, the 'Businessman'. The working class selections for /u/ are not driven by any working-class characters, but by the younger, urban 'Chav' and older, rural 'Old Farmer' characters. The mismatch between perceptual responses and the social distribution of variation seems to happen because listeners group the stimuli together in a way which does not directly reflect sociolinguistic variation in production — rather, it reflects their implicit beliefs and ideologies regarding language and identity, of which stereotypes such as the 'Chav' and 'Typical Yorkshireman' form a crucial part. Based on this analysis, it is possible to introduce another layer of social meaning to the indexical field of these vowels, shown in Figure 4.3.7.



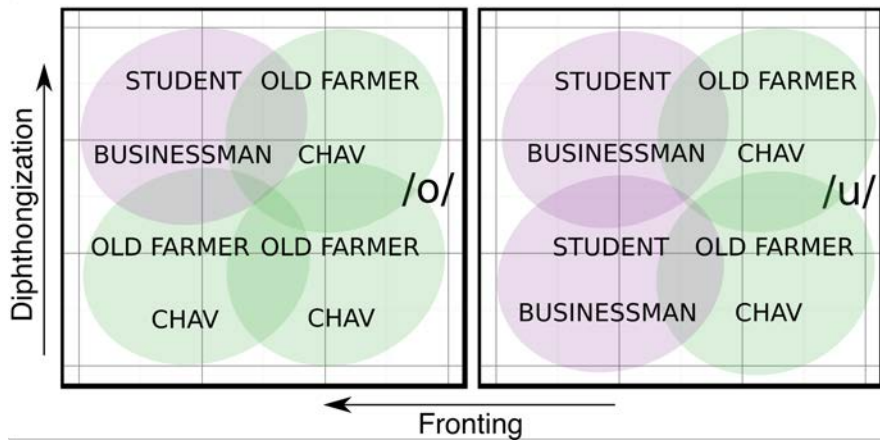


Figure 4.3.7: Updated indexical field for /o/ and /u/ based in the results of section 4.3.2, visualizing the effect of fronting and diphthongization on selections of the ‘Chav’, Old Farmer, ‘Student’ and ‘Businessman’ characters.

One thing that is clear from 4.3.7 is that there is *no* support in the experimental data for Haddican et al.’s (2013) claim that fronted, monophthongal /o/ is particularly associated with the ‘Chav’ (see section 4.1.2); rather, fronting *weakens* the association between /o/ and ‘Chav’ identity in perception (see Figure 4.3.5). Another clear pattern is that the ‘Student’ and ‘Businessman’ are consistently selected in the presence of phonetically similar stimuli – front, diphthongal variants of /o/, and front, monophthongal variants of /u/. The ‘Chav’ and ‘Old Farmer’ also pattern together, assigned to stimuli with the opposite characteristics of those associated with the ‘Student’ and ‘Businessman’: back variants of both vowels. What is it that links these characterological figures in this way, and what leads them to be associated with those particular phonetic characteristics? The following section will explore this question, proposing that the meanings available in the indexical field of /u/ and /o/ are united by the notion of ‘Broad Yorkshire’ speech.

### 4.3.3 'Broad Yorkshire' speech

Figure 4.3.8 demonstrates how listeners' selections of the 'Businessman', 'Student', 'Old Farmer' and 'Chav' seem to split into two clear groups. The 'Old Farmer' and 'Chav' are associated with almost the exact same variants of /u/ and /o/, while the 'Businessman' and 'Student' show the inverse of that pattern.

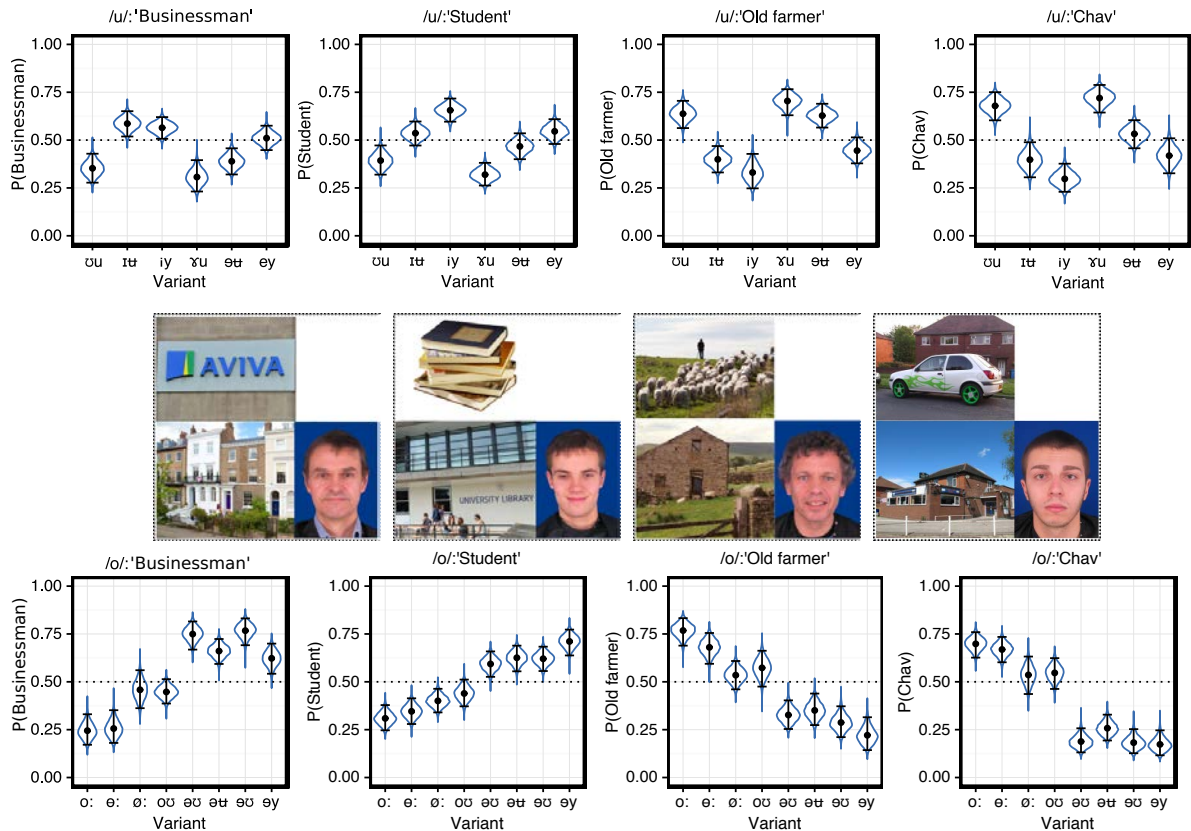


Figure 4.3.8: Similarities and differences between characterological figures.

The four characters seem to cluster into two groups, with characters from the same group selected in response to the same auditory stimuli, at the opposite ends of acoustic space to the characters in the other group. In other words, there seems to be single underlying dimension which listeners use to categorize the stimuli, related to, but distinct from, the meanings originally tested in the experiment. Whatever this meaning is, it unites the 'Chav' and 'Old Farmer' characters and sharply distinguishes them from the 'Student' and 'Businessman'. What could this meaning be?

One possible answer might simply be social status: both the ‘Chav’ and ‘Old Farmer’ represent examples of working-class identities vs. the middle-class ‘Student’ and ‘Businessman’. However, this would not explain why the ‘Young Farmer’ or the ‘Builder’, also clearly identifiable as working-class characters, do not also show this pattern. The ‘Chav’ and ‘Old Farmer’ differ on the two other dimensions initially tested: the ‘Chav’ is young while the Farmer is old; the ‘Chav’ is urban while the Farmer is rural. What do the seemingly disparate identity categories ‘Old Farmer’ and ‘Chav’ share that distinguishes them from the ‘Student’ and the ‘Businessman’? Some clues can be found in the open-ended evaluation data, where the notion of a ‘Broad Yorkshire’ accent’ were central to informants’ conception of language variation. The regularity with which this concept arises in speakers’ evaluations suggests that this notion of ‘accentedness’ or ‘Broadness’ may be central to the way they interpret the social meaning of phonetic variation. For example, in the following extract, Christine describes her ‘broad’ colleague:

(9) *Interview 4, 1:00:26 – 1:00:50*

*Christine: ...he is the **broadest Yorkshire** chap you’ve ever heard. He doesn’t care **he doesn’t need to put on a front** because he’s got to where he’s got working and doing what he does an’ he’s earned money already so he doesn’t need to put on that impression, whereas if you’re climbing a ladder you need to create a better impression.*

In this extract Christine clearly orients toward the link between ‘Broad Yorkshire’ features, authenticity and social mobility, contrasting the authenticity of her colleague who ‘doesn’t need to put on a front’ with a perceived pressure to avoid ‘Broad’ speech in order to further one’s career. Immediately after, she draws an explicit link between ‘Broad’ features and education.

(10) *Interview 4, 1:00:27-1:01:05*

*Christine: People think that [with a] 'Broad Yorkshire' accent you're not very educated I think*

*Jane: I think there is a lot of that*

'Broad' features are typically contrasted with 'Posh' features, and this distinction is often characterized in terms of effort. 'Posh' speakers are said to be 'pronouncing every word', 'speaking clearly' and 'not abbreviating as much'.

(11) *Interview 3, 47:50- 48:20*

*Grant: A **posh** person pronounces their words and has less shortcuts when they are speaking. They're more conscious of pronouncing the words and pronouncing them correctly.*

These extracts suggest that a 'Broad' accent signifies a speaker's regional identity, but also a possible lack of education; 'Broad' features may reflect authenticity, but also a lack of effort. Given the centrality of the notion of 'Broad Yorkshire accents' in these data, it is reasonable to suggest that the key dimension underpinning participants' selections may be their beliefs about the types of speaker who are likely to have a 'Broad Yorkshire' accent, versus the types of speaker who are likely to use Southern Standard British English ('Posh') forms. In the perception experiment, features such as back, monophthongal /o/ and back /u/ are assigned to the two stimuli who represent salient categories of local Yorkshire identity: the 'Old Farmer', and the 'Chav'. In contrast, fronted, diphthongal /o/ and fronted /u/ are assigned to the characters who represent the opposite: individuals who are associated with York's emergent industries of finance and education, and are likely to be incomers to the area. Thus, in addition to the social categories tested in section 3.3.4, and characterological figures in 3.3.7, the distinction between 'Broad Yorkshire' and 'Posh' appears to be a central part of the indexical field of /u/ and /o/, as visualized in Figure 4.3.9.

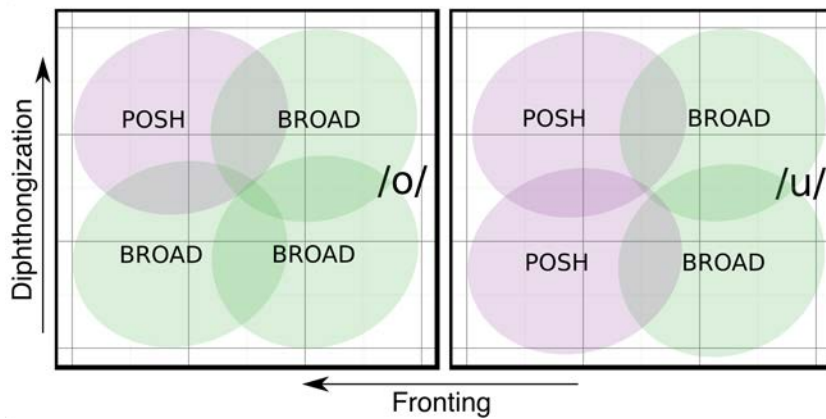


Figure 4.3.9: 'Broad Yorkshire' and 'Posh' as indexical meanings for /o/ and /u/.

The general pattern suggested by Figure 4.3.9 is that back /u/ is associated with 'Broad' speech, with fronted /u/ heard as Posh. Monophthongal variants of /o/ and back, diphthongal variants are heard as 'Broad', while fronted diphthongs are heard as 'Posh'. One thing not captured by this visualization is the effect of fronting within monophthongal /o/ realizations. While the models of 'Chav' and 'Old Farmer' selections contained positive coefficients for all monophthongs, effect sizes were generally much smaller for fronted monophthongs, suggesting that fronting weakens the association between monophthongal /o/ and 'Broad' speech. This is visible in Figure 4.3.8, and highlighted in 4.3.10 below:

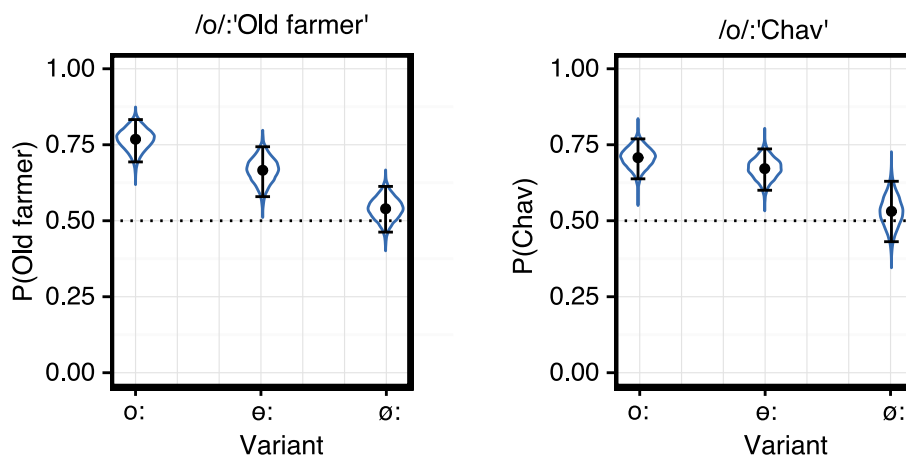

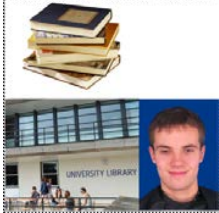




Figure 4.3.10: The effect of fronting on 'Chav' and 'Old Farmer' selections in response to monophthongal tokens of /o/.

The difference between fronted and back monophthongs for 'Old Farmer' selections is confirmed by post-hoc comparisons using Tukey's Honest 124

Significant Difference test: the back monophthong [o:] was more likely to cue an ‘Old Farmer’ selection than a fronted monophthong [ø:] ( $\beta=1.05$ ,  $SE=0.20$ ,  $z=5.14$ ,  $p<0.001$ ). The selection of the ‘Chav’ was more likely when listeners heard [o:] than [ø:], although this effect did not reach significance after controlling for multiple comparisons ( $\beta=0.70$ ,  $SE=0.25$ ,  $z=2.83$ ,  $p=0.08$ ). Overall, this analysis suggests that York listeners’ perceptions of /u/ and /o/ as ‘Broad Yorkshire’ are influenced by the interaction of fronting and diphthongization: monophthongal /o/ is heard as ‘Broad’, although this effect is weakened by fronting; back, diphthongal /o/ is also heard as ‘Broad’, and fronted diphthongs are heard as ‘Posh’.

Character	 <b>‘Businessman’</b>	 <b>‘Student’</b>	 <b>‘Old Farmer’</b>	 <b>‘Chav’</b>
Comments	‘Posh’ ‘Moved to the area’ ‘Educated and well-paid’ ‘Responsible’ ‘Well-spoken’ ‘Business man brought to York by his company”	‘Could be from anywhere’ ‘Affluent’ ‘Could come from a variety of backgrounds’	‘Deep country roots’ ‘Yorkshire born and bred’ ‘Genuine’ ‘Looks as Yorkshire as they come ‘	‘Tough’ ‘Rough’ ‘Thuggish’ ‘Uneducated’ ‘Yorkshire working class lad”

*Table 4.3.1 Selected post-task comments for the ‘Businessman’, ‘Student’, ‘Old Farmer’ and ‘Chav’ images.*

The comments made for each character in the post-task questionnaire provide further insight into the social characteristics associated with ‘Broad Yorkshire’ speech. The comments in Table 4.3.1 demonstrate how the ‘Old Farmer’ and ‘Chav’ are explicitly described as being from Yorkshire, in contrast to the ‘Businessman’ and ‘Student’, who are described as being incomers to York, or as

being from anywhere'. This is consistent with the proposal that regional identity, reflected in perceived accentedness, is central to listeners' interpretation of the stimuli. A second key point regarding Table 4.3.1 is that although the 'Chav' and 'Old Farmer' are both perceived as Yorkshire identities, and selected in response to similar auditory stimuli, the social attributes associated with them are very different — the 'Old Farmer' has 'deep country roots', and is described as 'genuine', while the 'Chav' is 'rough', 'tough' and 'uneducated'.

The fact that the two 'Yorkshire' characters are consistently selected when listeners hear back variants of /o/ and /u/, while the 'from anywhere' characters are selected for front, diphthongal /o/ and fronted /u/ suggests that listeners may interpret backness in these vowels as a property of 'Broad Yorkshire' speech. However, the specific stances and social attitudes assigned to these features may crucially depend on other aspects of the speakers' identity – if a speaker is perceived as aligning with the 'Old Farmer', their use of 'Broad' features may be interpreted as 'genuine', or as expressing a positive stance to local regional identity; however, if they are perceived as aligning with the 'Chav', they may be perceived as 'rough' or 'uneducated'. It should be admitted that treating the Chav and Old Farmer characters as mapping to the same social meaning may be something of an oversimplification. There is some evidence that back [o] may not map so strongly to 'Chav' as it does 'Old Farmer' (see figure 4.3.8); further, the marginal result of [o] vs. [ø] for 'Chav' would also imply that the indexical mappings between /o/ and these characters may be more complex than described here (see p.123). However, pursuing an analysis based around the notion of 'Broad Yorkshire' speech as outlined above is consistent with the major patterns observed in the perceptual data, and provides a reasonable starting point for making predictions regarding production behaviour. These predictions will be discussed in section 4.5.3.

## 4.4 Discussion

These results contrast previous claims about the social meaning of /u/ and /o/ variation in this community in a number of ways. Despite the claim that /u/ fronting tends not to attach to local social meanings, the results provide clear evidence that York listeners perceive /u/ variation as socially meaningful, consistently mapping back /u/ to the 'Old Farmer' and 'Chav' characters, and consistently mapping front /u/ to the 'Student' and 'Businessman'. While Haddican et al.'s (2013) claims that /o/ monophthongs are associated with social class and regional identity are supported by these results, the findings contradict the proposal that fronted, monophthongal /o/ is associated with the 'Chav' stereotype. Instead, they show that backness in both /u/ and /o/, and particularly back, monophthongal /o/, are associated with both the 'Chav' and 'Old Farmer' stereotypes. Despite the evidence that the 'Chav' is a highly salient characterological figure in this community, there is no clear evidence of any specific linguistic features being associated with the 'Chav' as distinct from the 'Old Farmer'. Rather, along with the 'Old Farmer', the 'Chav' is one of a pair of local characters which are linked to 'Broad Yorkshire' features.

The fact that the notion of 'Broad Yorkshire' speech seems to be central to listeners' evaluations is consistent with Agha's (2003) notion of a *register* – 'Broad Yorkshire' represents a socially-recognised speech variety which structures York listeners' social interpretation of variation in /u/ and /o/. The results of section 3.3.1 demonstrated that variation in /u/ and /o/ can be indexical of speaker attributes such as age, social class and rurality, but *not* in a way that necessarily reflects the distribution of these forms in production. In Agha's (2003) terms, this is because of the 'ideological work' that listeners do when perceiving variation socially, converting 'perceived variation of sound into perceived contrasts of social persona and identity' (p.233). This 'ideological work' is grounded in the public sphere discourses which circulate regarding language and social identity: in York, these discourses relate to accentedness



and authenticity. Like many Northern communities, York has seen a considerable shift away from traditional manufacturing industries over the past 60 years, and toward the tourism, service and Higher Education sectors. For many York residents, these changes represent a loss of older ways of life, as streets which were traditionally home to small shops catering to local people now cater toward a steady influx of tourists, highly-mobile service workers and university 'Student's, all bringing with them new ways of speaking and being. In this social context, it is easy to see how the contrast between authentic, local, 'Yorkshire born and bred' speech and the 'Posh' speech of incomers may be foregrounded for people in York, and this appears to be reflected in the way they categorized the linguistic stimuli in the perception experiment presented here.

The proposal that 'Broad Yorkshire' speech might be linked to notions of authenticity has a strong precedent in a number of studies of language change post-industrial communities. For example, Johnstone et al., (2009) document the enregisterment of 'Pittsburghese', demonstrating how forms which were once primarily linked to social class have become emblematic of what it means to be authentically 'from here' in Pittsburgh. They argue that this is a product of increased mobility in post-industrial societies, which has the effect of simultaneously erasing dialect differences through processes of dialect levelling (e.g. Auer et al., 2005) whilst leading to an increase popular attention to regional variation. Many of the characteristics described for Pittsburghese have strong parallels in 'Broad Yorkshire' speech; for example, the availability of t-shirts displaying folk representations of dialect (Johnstone, 2009). The present analysis demonstrates how sound change provides a potential resource for the enregisterment of 'local' speech, with the older variants of both sound changes consistently heard as 'Broad Yorkshire' by York listeners. However, it remains to be seen whether this association might lead speakers to adopt or reject innovative forms, a possibility which will be explored in the following chapter.

## 4.5 Conclusion

### 4.5.1 Summary of findings

The general hypothesis of this chapter was that York listeners perceive variation in /o/ and /u/ as socially meaningful. The analyses presented in this chapter clearly support this hypothesis: York listeners can use phonetic detail in /o/ and /u/ to distinguish between socially-meaningful visual stimuli in consistent ways.

A further aim of this chapter was to understand the indexical field of variation in the target vowels. The initial analysis demonstrated that York listeners can use variation in /u/ as a cue to socioeconomic status: back /u/ was associated with working-class characters, while fronted /u/ was associated with middle-class and characters. Similarly, back /o/ and monophthongal /o/ were associated with working-class and rural characters, diphthongal /o/ was associated with older characters, and central/fronted variants of /o/ (both monophthongal and diphthongal) were less likely to cue working-class selections in comparison to back variants. Thus, there is evidence that York listeners can link variation in the target vowels to age, social economic status and rurality, but that these connections do not always mirror the distribution of variation in the community.

In order to understand this mismatch between sociolinguistic perception and the social distribution of /u/ and /o/ variation in production, the second part of the chapter presented an exploratory analysis of individual visual stimuli. The results of this analysis suggested that listeners' social selections were most consistent when the visual stimulus did not simply represent a generic working-class, old or rural character, but when the stimulus item corresponded to an identifiable local stereotype. The most consistent responses were for the 'Chav', 'Old Farmer', 'Student' and 'Businessman'. These four characters appeared to cluster into two groups: a 'Chav' or 'Old Farmer' selection was cued by similar

variants of /u/ and /o/, and the 'Businessman' and 'Student' were cued by the phonetically 'opposite' variants. Drawing on an analysis of informants' metalinguistic commentary on linguistic variation in York, it was argued that these patterns reflected the central meaning which structures the indexical field of /u/ and /o/: the contrast between 'Broad Yorkshire' and 'Posh' speech. It was speculated that while 'Broad Yorkshire' forms are generally associated with 'typical Yorkshire' ways of speaking, they can take on different social meanings in the context of the styles they are deployed in: both the 'Chav' and 'Old Farmer' are associated with 'Broad' speech, but while the 'Old Farmer' is perceived as 'genuine' and 'Yorkshire born and bred', while the 'Chav' is described as 'rough' and 'thuggish'. This analysis provides a reasonable basis for forming predictions regarding the relationship between social identity and speakers' production behaviour, summarized in section 4.5.3.

#### **4.5.2 Limitations of the present analysis**

The social perception analyses presented in this chapter provide an invaluable window into the social meaning of variation in /u/ and /o/, providing crucial evidence that these vowels are perceived as socially meaningful in this community, and providing a foundation for the analyses presented in chapters 4 and 5 of this thesis. However, there are a number of limitations which should be highlighted. A major one regards the use of exclusively male identities in the visual stimuli, which mean that the present analyses arguably only provide information about the indexical meaning of /u/ and /o/ variation in male speech. The choice of male characters was based on an assumption that the 'Chav' and 'Local' meanings discussed in the previous literature were more likely to be associated with stereotypes of masculinity. In a sense, this was a reasonable assumption: the sociological literature on the 'Chav' stereotype traces this stereotype directly to a rise in unemployment primarily affecting young men (Nayak, 2006), and popular culture representations of stereotypically 'Yorkshire' figures are overwhelmingly male. However, it is

quite possible that variation in /u/ and /o/ would be assigned very different social meanings in the context of female styles – it is even possible that the ‘Chav’ meaning for /o/ fronting suggested by Haddican et al. (2013) applies only when the speaker is perceived to be female. Future work could usefully investigate how the meaning of ‘Broad’ features changes depending on the perceived gender of the talker.

The possibility that the social meaning of these vowels might differ in the context of different gendered styles raises the more general issue of the relationship between context and social meaning, which was not directly investigated in the present study. A repeated finding of work on indexical meaning is that the social evaluation of linguistic features depends greatly on other information available about the talker. For example, Phrao et al. (2014) demonstrate that the fronting of /s/ in Copenhagen Danish may be variably perceived as ‘feminine’ or ‘gangster’, depending on whether the feature was embedded in extracts of ‘modern’ or ‘street’ Danish. Similarly, Campbell-Kibler (2009) found that the apical variant of (ing) (e.g. ‘fishing’ as [fɪʃɪŋ]) had a negative impact on ratings of education/intelligence, but only when a speaker was also classified as aregional and not as working-class. These results are consistent with Eckert’s (2008) claim that linguistic features have general social meanings which become more specific in the context of the styles they are deployed in. In the present analysis it has been suggested that ‘Broad’ may be an example of such a general meaning, which may either be heard as ‘authentic and genuine’ or ‘rough and uneducated’, depending on other information available about the speaker. This was proposed based on the fact that listeners linked back variants of /u/ and /o/ with both the ‘Chav’ and ‘Old Farmer’ character, despite the very different social attributes associated with those characters. However, it remains to be seen how the social evaluation of /u/ and /o/ variation might differ across different speakers. An interesting avenue of future research would be to understand how the fronting and diphthongization of /u/

and /o/ are interpreted in the context of different regional varieties, or when used by speakers of different genders, ethnicities or sexual orientation.

A further issue with the present analyses regards possible social meanings which might not have been captured by the perception experiment. The experiment focused on meanings related to broad social categories (age, social class, rurality) and characterological figures connected to those categories ('Chav', 'Typical Yorkshireman'). This was done primarily due to these being the most common meanings raised in the open-ended evaluation task, as well as being consistent with previous work in this community. However, there are at least two levels of social meaning which warrant future investigation. One of these is region – it is clear that the meanings of 'Broad' and 'Posh' identified in this analysis are related to regional identity, but listeners' interpretation of the target vowels as regional markers was not investigated directly. This is particularly important in the case of /o/ fronting, which is known to be common in areas adjacent to York, such as East and West Yorkshire. A second question which warrants further investigation is how variation in these vowels might be used to express interactional social meaning — what kind of stances and attitudes can be conveyed by the monophthongization or fronting on these vowels?

#### **4.5.3 Implications for the thesis as a whole**

The driving question of this chapter was: *what does it mean, socially, for a York speaker to adopt a more fronted variant of /o/ and /u/?* The general trend in perception data is very clear: back variants — the older forms of the changing vowels — are consistently heard as 'Broad Yorkshire' by York listeners. The perceptual effect of fronting in both cases is that the vowels become less 'Broad' and more 'Posh', implying that a speaker adopting a fronted variant is less likely to be recognized as an authentic Yorkshire speaker, but also less likely to be heard as 'rough', or 'uneducated'. This analysis of the social meaning of 'Broad

Yorkshire' speech makes a clear prediction for production patterns under a social-indexical account of change in /u/ and /o/: speakers who are invested in signalling their identity as authentic 'Yorkshire born and bred' individuals might be expected to resist adopting innovative forms of /u/ and /o/; however, there might also be a pressure among certain groups of speaker to move away from the older forms, in order to avoid being associated with the stigmatized traits of the 'Chav'. These predictions will be explored in detail in Chapter 5.



## 5. Sound Change and Social Identity

### 5.1 Overview

This chapter investigates the relationship between the social meaning of changing linguistic features and their spread through a speech community. It asks: *to what extent is a speaker's adoption of a linguistic innovation influenced by the social meaning of that innovation?*

The central argument of social-indexical accounts of linguistic change is that the spread of innovations across social groups is motivated and/or inhibited by the social meaning of the changing forms. Speakers evaluate linguistic innovations in terms of the social meanings associated with them, and draw on the forms undergoing change to align themselves toward or away from those meanings. If this were the case for /u/ and /o/ fronting in York, it would be expected that the social meanings identified in Chapter 4 would allow predictions to be made regarding speakers' production patterns. Since back variants of the two vowels are heard as 'Broad Yorkshire' and associated with local regional identity, it might be expected that speakers who hold strong positive attitudes toward local identity would be likely to resist change in these vowels. Additionally, the association of /u/ and /o/ variation with the 'Chav' stereotype means that speakers who want to distance themselves from this stereotype might avoid back variants of these vowels. In contrast, under a change-by-accommodation account of /u/ and /o/ fronting, neither of these social meanings will necessarily matter to speakers' production patterns. Rather, it would be expected that any differences in the adoption of fronted variants will be related to speakers' opportunities for contact with innovative forms. Speakers who have the most exposure to the innovative variants will be the most advanced with regard to the change, and speakers who have the least exposure will lag behind.



In order to evaluate these predictions, this chapter presents an analysis of the production patterns of a sample of 52 York speakers. Through an acoustic analysis of speech data from two production tasks, the chapter will explore the relative influence of exposure and social attitudes on speakers' vowel productions, focusing on the fronting and diphthongization of /u/ and /o/. Speakers' exposure to innovations and their social attitudes are represented by four scales created through an ethnographically-informed analysis of interviews with each individual. Two of these are primarily related to exposure to innovative forms: the *Dialect contact* scale, which represents speakers' opportunities for contact with the innovations, and the *York networks* scale, representing the degree to which participants' social networks consist of other York speakers. The remaining two are primarily related to social attitudes, based on the social meanings uncovered in the perception analysis of Chapter 4: *Class attitudes* represents speakers' attitudes toward social class, and *York attitudes* represents speakers' attitudes toward local regional identity.

The results of this chapter are mixed. The findings from an analysis of map task and word list speech suggest that /u/ is fronting in a very uniform manner, unaffected by any of the social factors tested. In contrast, the fronting of /o/ appears to be affected by speakers' social network structure: controlling for age, speakers who report that most of their friends and family are from York are more likely to produce retracted variants of this vowel. However, no relationship between the attitudinal scales and the fronting of /u/ and /o/ was found, contrary to the predictions of a social-indexical account of change in these vowels. In contrast to the results for fronting, dynamic properties of /o/ and /u/ were found to be related to speakers' attitudinal scores: speakers who hold more positive attitudes toward York produce more diphthongal variants of /u/, and more monophthongal variants of /o/. However, there is no clear evidence of change in the diphthongization of /u/ and /o/, meaning that this finding cannot be treated as evidence for the role of social meaning in linguistic change.

Overall, the results of this chapter point to a clear connection between attitudes toward regional identity and York speakers' production patterns, but *only* for aspects of /u/ and /o/ which are not undergoing change. While variation in /u/ and /o/ is perceived as socially meaningful in this community, the social meanings associated with these vowels do not seem to have affected the spread of fronted variants in production, providing no support for a social-indexical account of change in these vowels.

## **5.2 Methods**

### **5.2.1 Production tasks**

The aim of the production tasks was to gather a representative sample of speech from each participant, including tokens of the vowels under study in a range of phonetic environments. Three tasks were included: a sociolinguistic interview, a map task, and a reading task, resulting in a dataset representing a range of speech styles. All recordings were made on a Zoom H2n digital recorder, using a Rode Lavalier lapel microphone attached to the participant's clothing.

#### *Sampling*

Participants in the production tasks were the same 52 individuals detailed in section 3.4.

#### *Sociolinguistic interview*

The sociolinguistic interviews aimed to collect a sample of conversational speech from each participant. They consisted of semi-structured interviews lasting between 45 minutes and 1.5 hours, which were conducted at a place of the participant's choosing – typically their home or place of work, or in a private study space in the University of York library. With the exception of four interviews which were conducted with co-habiting couples, all interviews were conducted one-on-one. A secondary aim of the interviews was to gather detailed

qualitative information about each participant’s background, including their attitudes and orientation towards York and Yorkshire identity, as well as the extent to which they interacted with people from outside York. Each interview began with questions regarding the participant’s experience living and growing up, before moving on to questions about changes they have experienced while living in York, how they felt about other areas in Yorkshire, and whether they planned to remain in York for the foreseeable future.

*Map task*

The aim of the map task was to elicit controlled-but-spontaneous speech (Boyd et al., 2015), ensuring that tokens of the target vowels in a range of phonetic environments were collected from each speaker. The task was based on the dialogue elicitation task used by Anderson et al. (1991). The participant guided the interviewer around a map which included a range of landmarks containing the target vowels in a range of linguistic contexts.

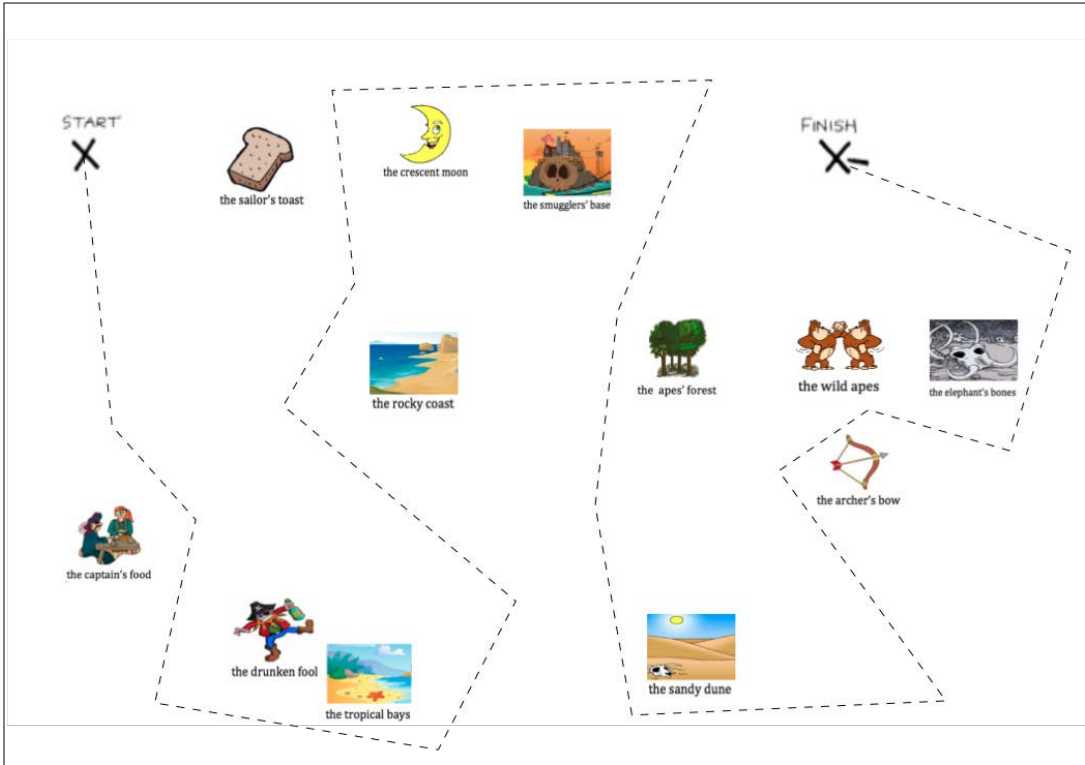


Figure 5.2.1: Example map used in the map task.

The phonetic environments chosen for the target items were those found to influence /u/ and /o/ variation in Haddican et al.'s (2013) study of York speech. Items for /o/ aimed to elicit the vowel in word-final and precoronal environments (*the archer's **bow*** and *the elephant's **bones***), as well as with a preceding coronal and velar consonant (*the rocky **coast*** and *the sailor's **toast***). Items for /u/ included contexts where the vowel was preceded by a coronal consonant (*the sandy **dune***) and labial consonant (*the crescent **moon***), as well as environments where /u/ was followed by an /l/ (*the drunken **fool***) and coronal consonant (*the captain's **food***). Maps were generated in pairs, one with a path drawn on, and one with no path. Minor differences between each map were included in order to increase the level of difficulty, necessitating a focus on the communicative aspect of the task.

#### *Word list*

The word list was included to elicit a more careful speech style from participants, as differences in speaking style are known to affect speech production, and the production of sociolinguistic variables in particular (e.g. Labov, 2001). The list included isolated word tokens based on the map task items, as well as examples of the target vowels in a range of contexts. A total of 15 target items per vowel class were included. Additionally, 20 further items were included representing 5 tokens each of a range of other vowel categories: /ʊ/, /a:/, /i:/, /ɔ:/ and /æ/. These were added in order to obtain a representative sample of tokens from across each speaker's vowel space, and provide reference vowels for normalization. Participants were asked to read the items in the frame 'Please say\_\_again'.

/u/	/o/	/ʊ/	/ɑ:/	/i:/	/ɔ:/	/æ/
moon	bow	put	stark	seek	port	back
goo	toast	book	star	peep	pork	bad
boo	bones	should	park	peace	talk	tap
two	oats	good	bark	feet	corn	cat
coop	toad					
choose	road					
dune	cone					
food	code					
do	coast					
fool	boast					
goose	tone					
soup	cope					
doom	soap					
school	pope					
sue	toe					

Table 5.2.1: Word list items

**5.2.2 Acoustic analysis**

Due to time constraints, only the data from the word lists and map tasks were used in the acoustic analysis, with the sociolinguistic interviews used for coding the social indices detailed in 5.2.3. The entire set of word list tokens were extracted for each speaker, along with a maximum of 50 vowel tokens from the map task data. Vowels were segmented from the first to the last glottal pulse, judged from the acoustic evidence of periodic pulses visible in the spectrogram and waveform. In cases where the vowel was followed by glottalization (e.g. ‘toe again’ in Figure 5.2.2), the vowel was segmented up until the first evidence of aperiodicity in the waveform. For items with a following nasal (e.g. *bones*), the segmentation boundary was identified by rapid changes in the third and fourth formants at the onset of closure. Items with preceding glides and rhotics were excluded from the analysis due to difficulties in segmentation. Items with preceding vowels (in e.g. ‘..say oats again.’) were unproblematic due to speakers’ tendency to precede them with periods of glottal closure. Items with following vowels (always schwa in ‘again’) such as ‘...say do again.’ were segmented up

until the F2 minimum unless a glottal stop was present. Following laterals could typically be distinguished from vowels by a slight raising of the first and second formant, and a boosting of the third formant. In cases where segmentation was ambiguous or impossible, tokens were annotated for exclusion and removed prior to analysis.

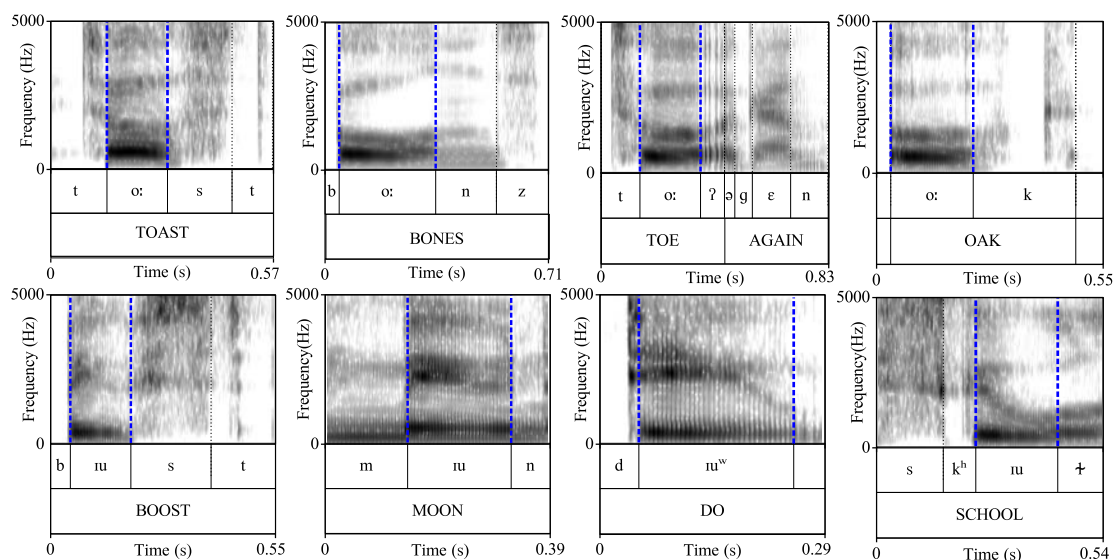


Figure 5.2.2: Examples of segmented vowel tokens: /o/ (top) and /u/ (bottom).

One limitation of this segmentation strategy is that it relies primarily on evidence of glottal fold vibration to identify the beginning and endpoints of each vowel, meaning that it excludes oral articulations which take place outside of periods of voicing. This has important consequences in contexts where /o/ or /u/ was followed by a voiceless consonant, as the offglide of the vowel may continue into any pre-aspiration preceding the following consonant. This is visible in the token of *oak* shown in Figure 5.2.2, where the formant structure of /o/ clearly extends beyond the end of the voiced portion of the vowel. A similar problem exists for tokens where the vowel was followed by glottalization: marking the end of the vowel at the first sign of aperiodicity would likely cut off the final part of the oral articulation of the vowel. Concretely, this means that the location of the vowel offglide and degree of diphthongization may have been

systematically underestimated in pre-glottal or pre-voiceless contexts. This means that it is essential for the phonetic environment to be considered as covariates in the statistical analysis (see section 5.2.4).

Measurements were taken at 20 time-normalized points along the vowel trajectory, and the preceding and following phonetic environment in which each token occurred were annotated. Measurements were normalized using the method presented in Fabricius et al. (2009). In this method, a reference frequency is estimated for each formant and each speaker, based on the mean values of three reference vowels representing the F1-F2 maxima and minima of that speaker's vowel space. The reference values for the present analysis were the mean temporal midpoint values of /ɑ:/ and /i:/, measured from 5 tokens per vowel per speaker. The third pair of reference values was calculated following the recommendations of Fabricius et al. (2009), with F1 and F2 values equal to each speaker's /i:/ F1. Normalized formant frequencies were then calculated as the ratio of the measured frequency in Hz to the reference frequency of that formant for the speaker being analyzed.

Of particular interest to the present analysis is variation in the fronting and diphthongization of /u/ and /o/. As discussed in section 3.3, an analysis of both of these properties was felt necessary because dynamic variation in /o/ is known to be associated with regional identity and social class in production, and previous work in York has suggested that change in /o/ may involve both fronting and diphthongization (Haddican et al., 2013). A number of techniques now exist which enable the modeling of entire formant trajectories over time (e.g. Stuart-Smith et al., 2015; Sóskuthy, 2016). However, to simplify statistical analysis and interpretation, the present analysis will focus on just two measurements: a measurement of the degree of fronting at the vowel offglide, and a measurement of the amount of spectral change from the onset to offglide of the vowel, reflecting the degree of diphthongization. Fronting is represented as the F2 value at the 15<sup>th</sup> time-normalized measurement point, reflecting the

point of greatest difference between the oldest and youngest speakers for both vowels. Diphthongization is represented as the Euclidean distance from the 5<sup>th</sup> to the 15<sup>th</sup> time-normalized measurement points in F1-F2 space. This approach to measurement is consistent with previous work in this community (Haddican et al, 2013), and is consistent with the sociophonetics literature more generally (Fox & Jacewicz, 2009; Thomas, 2011; Fridland et al., 2014).

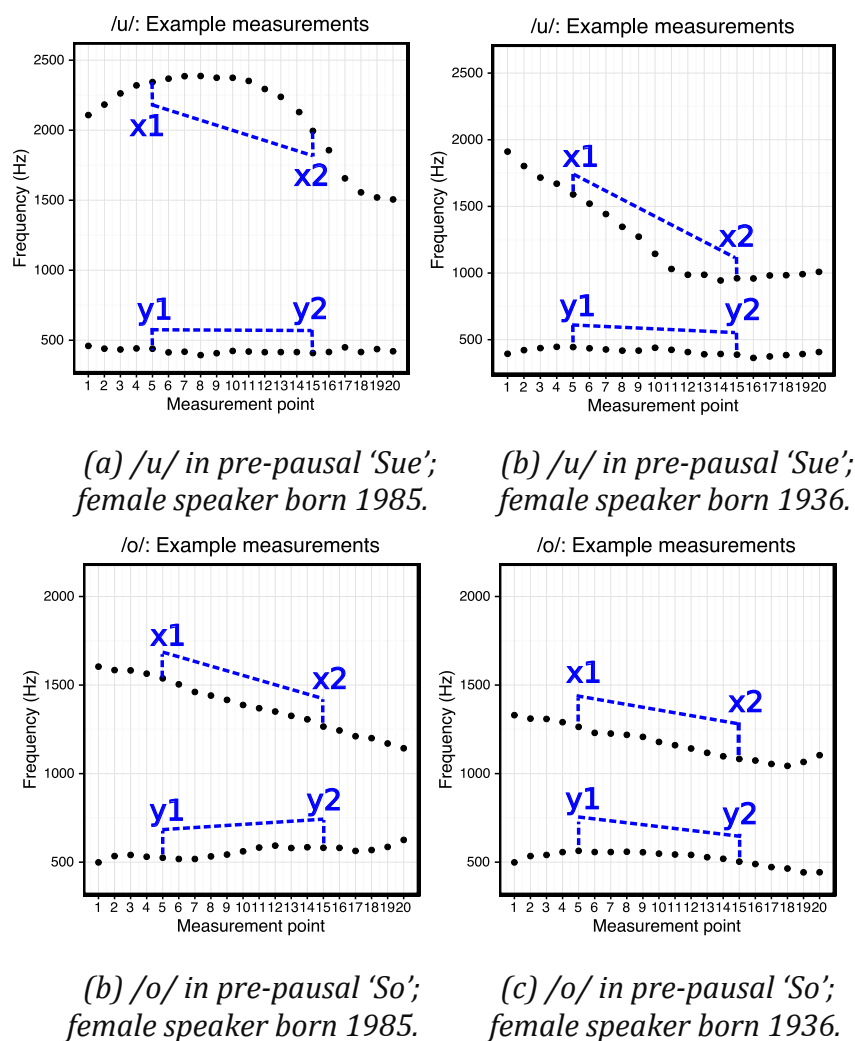


Figure 5.2.3: Measurement points for fronting and diphthongization. Fronting is measured at the 15<sup>th</sup> measurement point of the second formant ( $x_2$ ). Diphthongization is measured as the Euclidean distance from the 5<sup>th</sup> to 15<sup>th</sup> points in F1-F2 space:  $\sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$  (see annotated points in figure).



### 5.2.3 Social coding

The social coding aimed to capture two types of social information from the participants: the degree to which they were likely to have exposure to linguistic innovations, and their attitudes toward the social meanings associated with 'Broad Yorkshire' speech. To quantify this information, four variables were created through a qualitative analysis of the interview data. These were *Dialect contact*, representing speakers' potential contact with linguistic innovations; *York networks*, representing speakers' family, social and professional connections to York, *Class attitudes*, representing speakers' attitudes toward social class or the categories 'Posh' and 'Chav', and *York Attitudes*, representing speakers' orientation toward local identity. The scales were created by identifying a number of recurring categories in the interview recordings. These categories were based partially on the analysis of Chapter 4: it was known in advance that the speakers' attitudes toward local identity and social class were important; however, the specific variables coded were chosen based on the information speakers themselves raised during the interviews, and based on my own knowledge of the community under study. Following the semi-ethnographic approach of e.g. Fought (1999) and Hall-Lew (2010), this analysis aimed to capture the aspects of social identity which are important from the perspective of York speakers.

The categories were initially coded as nominal variables with values between 1-3, representing negative, neutral and positive values respectively. For example, for the 'Proud to be from York' category (Table 5.2.5), a participant who described themselves as being proud to be from York would receive a 3. A participant who described themselves as not being proud to be from York would receive a 1, and a participant for whom this information was not available or was unclear would receive a 2. These categories were grouped together into four thematic groups, which were used to create composite variables (Stuart-Smith et al., 2013). The composite values were generated by

taking the z-transformed sum of all variables in each group; z-scoring in this way ensured that each of the four resulting variables were on a similar scale. The categories coded are detailed below, with further examples provided in Appendix D.

The first thematic group was *Dialect contact* (Table 5.2.2), representing factors related to the composition of participants' family and friendship groups, as well as their experience of travelling or living outside of York. Since /u/ and /o/ fronting in the UK are believed to have originated in the South East (Haddican et al., 2013; Przedlacka, 2001; Kerswill & Torgersen, 2004), the first two categories in this group (*Family from the South of England* and *Friends from the South of England*) concerned the degree to which speakers had personal connections to the South of England. The second two categories (*Travels often in the UK* and *Travels often internationally*) were included to account for the possibility that speakers who travel more would be more likely to encounter innovative speech forms in general, especially those forms which are known to be spreading across diverse locales. The final two categories (*Involved with the university* and *Involved with the service/tourist industry*) are related to the opportunities for dialect contact afforded by key industries in York. One major way a York speaker might encounter innovative linguistic forms is through being involved in the university, where a large number of students and staff are incomers to York. Another way is through being involved in the service or tourist industry, which both cater primarily to people from outside the city.

<b>Category</b>	<b>Coding scheme</b>
Family from the South of England	1 no; 2 extended family; 3 parent
Friends from the South of England	1 no; 2 mixed; 3 mostly from the South
Travels often in the UK	1 no; 2 neutral; 3 yes
Travels often internationally	1 no; 2 neutral; 3 yes
Involved with the university	1 no; 2 family member; 3 self
Involved in the service/ tourist industry	1 no; 2 family member; 3 self

*Table 5.2.2 Dialect contact.*

The second thematic group was *York networks*, representing the degree to which speakers possess strong ties to York, either through personal or professional connections. As well as containing variables representing speakers' friendship networks and family connections, this thematic group also aimed to quantify speakers' connections to traditional York industries: the carriageworks, chocolate factories, glassworks, and farming. The final variable coded in this category reflected speakers' degree of involvement in local interest organizations. The most well-represented of these was *York Past and Present* (16 speakers), a local interest group concerned with collecting and preserving stories and photographs related to York. Other organizations coded in this category are the York Theatre Royal (4 speakers), the Yorkshire Film Archive (1 speaker), and York Minster (1 speaker).

<b>Category</b>	<b>Coding scheme</b>
Family from York	1 no; 2 extended family; 3 parent
Friends from York	1 no; 2 mixed; 3 mostly from York
Connection to carriageworks, chocolate factory or farming	1 no; 2 family member; 3 self
Involved in local interest groups	1 no; 2 family member; 3 self

*Table 5.2.3: York networks.*

The third thematic group was *Class attitudes*, which represented speakers' attitudes toward the class-related social meanings 'Posh' and 'Chav', which were found to be central to speakers' social evaluations of /u/ and /o/ variation in Chapter 4. The *Class attitudes* categories were coded such that a higher score represented speakers who were more likely to distance themselves from 'Posh' people and more likely to report engaging in antisocial behaviour, while speakers who distanced themselves from 'Chavs' and/or mentioned traditionally working-class areas of York negatively received a lower score. The binary coding of these categories reflects the limited range of evaluations with which the topics occurred — for example, 'Posh' people were only mentioned negatively.

<b>Category</b>	<b>Coding scheme</b>
Mentions 'Posh' people negatively	1 mentioned; 2 neutral (not mentioned)
Mentions Tang Hall/Acomb/Clifton negatively	1 neutral (not mentioned); 2 mentioned
Describes getting into fights/other antisocial behaviour	1 mentioned; 2 neutral (not mentioned)

*Table 5.2.4: Class attitudes.*

The third thematic group was *York attitudes*, which aimed to capture how strongly speakers identify as York people, and the way in which they position themselves with regard to social change in the area. A higher score on this scale represents speakers who are most proud to be from York, plan to stay in York, and who feel most negatively about the decline of local industries and the influx of tourists and students characteristic of York's recent history. Speakers who score higher on this scale are also unlikely to criticise York for its perceived parochialism and lack of cultural diversity.

<b>Category</b>	<b>Coding scheme</b>
Plans to stay in York/Yorkshire	1 no; 2 neutral; 3 yes
Proud to be from York/Yorkshire	1 negative; 2 neutral; 3 positive
Attitude toward incomers to York	1 positive; 2 neutral; 3 negative
Attitude toward changes in York	1 positive; 2 neutral; 3 negative
Attitude toward parochialism in York	1 negative; 2 neutral; 3 positive
Complains about lack of diversity in York	1 mentioned; 2 neutral

*Table 5.2.5 York attitudes.*

### **5.2.4 Predictions**

The general prediction of a social-indexical account of linguistic change is that speakers' production patterns with regard to forms undergoing change will be related to their social attitudes. Furthermore, this relationship should reflect the social meanings associated with the changing forms in perception. The perception results of Chapter 4 suggest that back variants of /u/ and /o/ are associated with 'Broad Yorkshire' speech, a speech register which indexes local

regional identity and social class. On this basis, it is expected that speakers who received higher scores on the *York attitudes* and lower scores on the *Class attitudes* scales will produce backer variants of these vowels than would be expected for someone of their age, controlling for other possible covariates (see section 5.2.4). Additionally, this effect should explain variation in fronting beyond any variation explained by the *Dialect contact* and *York networks* scales. Such evidence would suggest that above and beyond their exposure to innovations, speakers' attitudes toward the social meaning of /u/ and /o/ variation influence their participation in or resistance to linguistic change.

In addition to testing for a relationship between the four social scales and speakers' production patterns, it is also necessary to establish evidence of change in the vowels under study. This is essential, as the issue at hand is not simply whether or not social attitudes are related to phonetic variation. Rather, the driving question of this chapter concerns the degree to which the social attitudes held by speakers can influence the trajectory of linguistic change. To assess evidence of change in /u/ and /o/, the following analyses will draw on the notion of *apparent time* linguistic change (Bailey et al., 1991). This involves comparing the speech of individuals of different ages at one time point, then using variation observed between these individuals to make inferences about community-level diachronic change. While the apparent time construct rests on the potentially controversial assumption of limited lifespan change (see e.g. Sankoff & Blondeau, 2007; Wagner, 2012), it is widely accepted as a tool for assessing evidence of change in progress. For the present analysis, the key evidence required for both accounts of linguistic change is a positive relationship between speakers' year of birth and their degree of fronting, which would indicate a change toward fronter variants of /u/ and /o/.

Non-linguistic variable	Social-indexical change	Change-by-accommodation
<i>Speaker Year of Birth</i>	<b>Significant effect on degree of fronting:</b> <u>younger speakers have higher F2 values for /u/ and /o/, reflecting apparent-time evidence of change.</u>	
<i>Dialect contact</i>	No prediction.	<b>Significant effect on degree of fronting:</b> speakers with <u>higher <i>Dialect contact</i> scores have higher F2 values for /u/ and /o/.</u>
<i>York networks</i>	No prediction.	<b>Significant effect on degree of fronting:</b> speakers with <u>higher <i>York networks</i> scores have lower F2 values for /u/ and /o/.</u>
<i>York attitudes</i>	<b>Significant effect on degree of fronting:</b> speakers with <u>higher <i>York attitudes</i> scores have lower F2 values for /u/ and /o/.</u>	No prediction.
<i>Class attitudes</i>	<b>Significant effect on degree of fronting:</b> speakers with <u>higher <i>Class attitudes</i> scores have higher F2 values for /u/ and /o/.</u>	No prediction.

*Table 5.2.6: Predictions for the main independent variables.*

Table 5.2.6 contrasts the predictions of a social-indexical account of /u/ and /o/ fronting with those of a change-by-accommodation account, focusing on the five main independent variables: *Year of birth*, representing evidence of change, and the four social scales, two of which represent measures of exposure to

innovations (*Dialect contact* and *York networks*) and two of which represent measures of social attitudes (*York attitudes* and *Class attitudes*).

A necessary precondition of either account of linguistic change is that linguistic change is actually taking place; as discussed above, evidence of a positive relationship between speakers' F2 values and *Year of birth* would satisfy this requirement. The crucial evidence for a social-indexical account of linguistic change would come in the form of a relationship between one or both of the social attitudes scales and speakers' production patterns. This effect should be in the direction predicted by the perception findings of Chapter 4, and should explain variation in the target vowels over and above the variation explained by speakers' *Year of birth* and other possible covariates, described in section 5.2.4. If the spread of fronted /u/ and /o/ variants is affected by their association with 'Broad Yorkshire' speech, speakers who received lower scores on the *York attitudes* scale and/or higher scores on the *Class attitudes* scale are expected to have higher F2 values for /u/ and /o/. In contrast, if /u/ and /o/ fronting are spreading primarily through a 'neutral' process of accommodation, the factors related to exposure should be more important: speakers with higher *Dialect contact* and/or lower *York networks* scores would be expected to have higher F2 values for /u/ and /o/.

For simplicity, Table 5.2.6 refers only to the fronting of /u/ and /o/, without making strong predictions regarding categorical diphthongization. This is because the perception analysis of Chapter 4 found clear evidence that back variants of both vowels were consistently mapped to 'Broad Yorkshire' characters, providing a strong basis for forming predictions about the relationship between social attitudes and fronting. However, there was also evidence of an effect of diphthongization in the perception data: monophthongal /o/ and diphthongal /u/ were associated with 'Broad Yorkshire' speech, with particularly strong effects for /o/. Furthermore, Haddican et al. (2013) suggest that change in these vowels may involve both fronting and diphthongization. In

light of this, the analysis of fronting in this chapter will be supplemented by an analysis of /u/ and /o/ Euclidean distances (measured between the fifth and fifteenth time-normalized measurement points of the second and first formant; see section 5.2.5). A social-indexical account would predict that speakers who score higher on the *York attitudes* scale and/or lower on the *Class attitudes* scale will produce more diphthongal realizations of /u/ and more monophthongal realizations of /o/. In contrast, a change-by-accommodation account would predict a relationship between diphthongization and the exposure scales: speakers with higher Dialect contact and/or lower York networks scores would be expected to have lower Euclidean distances for /u/ and higher Euclidean distances for /o/, assuming that there is evidence of change in these properties.

### 5.2.5 Covariates

The central hypotheses of this chapter regard the relationship between the four social scales described in section 5.2.2 and speakers' production patterns. However, the multicausal nature of linguistic variation and change means that it is essential to consider a number of other linguistic and non-linguistic covariates in this analysis. To provide strong evidence for either a social-indexical or change-by-accommodation account of language change, it is not enough to simply demonstrate a relationship between the social scales tested and speakers' production patterns; rather, it is necessary to show that these relationships hold over and above other factors already known to influence phonological variation and change.

One important set of covariates are the linguistic factors which might influence variation in /u/ and /o/. The fronting of these vowels is known to be heavily affected by the preceding and following phonetic environment: in particular, fronting is most advanced after a coronal consonant, and the fronting of /o/ may be inhibited by a following nasal (Luthin, 1987; Watt & Tillotson, 2001). The fronting of /u/ is also commonly reported to be inhibited by a following /l/



(Di Paulo & Faber, 1990; Labov et al., 2005; Sóskuthy et al., 2015). An additional important phonetic factor is vowel duration, as articulatory gestures may be abbreviated at higher speech rates (Lindblom, 1983). A further reason for including these factors relates to the issues with segmentation discussed in section 5.2.3: a reliance on evidence of glottal fold vibrations for segmentation means that the diphthongization of vowels before glottal stops and voiceless consonants may have been systematically underestimated.

In addition to linguistic factors, it is also important to consider the possible influence of a number of non-linguistic factors on variation in /u/ and /o/, other than the four social factors of interest. The most important of these is each speaker's year of birth, which will be used as a diagnostic for evidence of change, as discussed in 5.2.3. Another important factor is speech style – speakers' production patterns may vary systematically across speaking contexts due to a combination of phonetic (e.g. Moon & Lindblom, 1994) and sociolinguistic factors (e.g. Labov, 2001). In this analysis, stylistic variation will be represented simply by contrasting speech from two tasks: a reading list and communicative map task (see 4.2.1). Gender and socioeconomic status are also known to be important to language change: women are typically reported to lead linguistic changes (e.g. Haeri, 1994; Eckert 1987), and many changes are reported to be initiated in the interior social classes (e.g. Labov, 2001). Here, gender is represented as self-identified *Male* or *Female*<sup>1</sup>, and socioeconomic status is measured as a scale from 1-4, representing the highest level of education reported for each speaker's parents. While characteristics such as gender and age clearly have both biological and social components (see e.g. Traunmüller, 1984; Whiteside, 2001; Eckert 1989; Coupland, 2001), this chapter will follow the conventions of sociolinguistic analysis in referring to these factors as 'social' variables, in contrast to the phonetic/linguistic factors described in the previous paragraph.

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<sup>1</sup> No participants expressed alternate gender identities.

### 5.2.5 Statistical Analysis

The aim of the statistical analysis was to evaluate the predictions outlined in Table 5.2.6: firstly, to establish evidence of change in the fronting and diphthongization of /u/ and /o/, and secondly, to evaluate the relative influence of the scales related to attitudes and exposure on speakers' production patterns, above and beyond the linguistic factors and general social factors described in section 5.2.4. In order to achieve this, a series of linear mixed-effects models were fit to the data for each vowel using the lme4 package (Bates et al., 2014) in R (R Core Team, 2015). Two dependent variables were modelled for each vowel: the second formant at the 15<sup>th</sup> temporal measurement point (75%), representing the degree of fronting, and the Euclidean distance in F1-F2 space, measured from the 5<sup>th</sup> to the 15<sup>th</sup> measurement points (25%-75%), which is a measure of the degree of diphthongization (see section 4.2.1). The natural log of the Euclidean distance measurements was taken to correct for positive skew. Tokens with F2 or Euclidean distance values more than 3 standard deviations from the mean measurements for each speaker were excluded. The independent variables tested as fixed effects are summarized in Table 5.2.7.

	<b>Variable</b>	<b>Form</b>
<b>Linguistic factors</b>	Preceding/Following environment:  Place of articulation Manner of articulation Voicing	Coronal, Labial/Velar, Lateral, Vowel/Glottal/Pause Vowel, Nasal, Pause, Other Voiced, Voiceless, Vowel/Glottal/Pause
	Log duration of vowel	Continuous
<b>General social factors</b>	Speech style	Word list, Map task
	Year of Birth	Continuous (1935-2001)
	Gender	Male/Female
	Parents' level of education	1:Primary, 2:Secondary, 3: Post-secondary, 4: University
<b>Exposure</b>	Dialect contact	Continuous (-2:+2) (Higher values = more opportunities for contact)
	York networks	Continuous (-2:+2) (Higher values = more dense local ties)
<b>Attitudes</b>	York attitudes	Continuous (-2:+2) (Higher values = positive attitudes toward York)
	Class attitudes	Nominal (1,2) (1 = more negative about 'Posh' people/more likely to report engaging in antisocial behaviour 2 = neutral)

Table 5.2.7 Independent variables tested in the regression analyses.

The models included the maximal random effects structure justified by the data (Barr et al., 2013), including random intercepts for each speaker and lexical item, and random slopes for speaker by speech style. Models were selected using a step-up procedure to identify the set of independent variables which best explained variation in speakers' F2 and Euclidean distance values. The contribution of each predictor to model fit was evaluated using the likelihood-ratio test to compare nested models, following the recommendations of Baayen et al., (2008). Under this approach, a model with the predictor being tested (the 'alternative' model) is compared to the a model which is identical in all respects except for the predictor in question (the 'null' model), using the likelihood ratio of the two models:  $-2\ln\left(\frac{\text{likelihood of null}}{\text{likelihood of alternative}}\right)$  as a test statistic. The statistical

significance of any change in the log likelihood contributed by the additional predictor is then evaluated using a  $\chi^2$  test.

Model selection proceeded in three stages. The general strategy was to evaluate the influence of any factors known to influence patterns of linguistic variation and change based on previous research, then to evaluate the contribution of the measures of exposure and social attitudes developed in this chapter, over and above those factors. The reason for taking this approach is that this analysis aimed to test a specific hypothesis: that the production of forms undergoing change would be related to the social attitudes relevant to the meanings uncovered in Chapter 5, above and beyond the other social and linguistic factors which might condition variation in these vowels. To achieve this, the first set of model comparisons evaluated the effect of the factors known to effect vowel variation in general: the factors representing the preceding and following phonetic environment and log duration. Having established this 'null' model of linguistically-conditioned variation in /u/ and /o/, the second set of comparisons evaluated the contribution of general social factors to the best model identified at the previous stage, testing the hypothesis that the target vowels are undergoing change, and establishing any general social factors which might condition variation and change in these vowels. The factors tested included *Speech style*, *Year of birth*, *Gender* and *Level of education*. Including *Year of birth* at this stage also allowed evidence for linguistic change to be evaluated. The interaction of *Year of birth* and all linguistic factors identified at the first stage was also tested, as was the interaction of *Year of birth* with any other social factors selected at this stage. The third set of model comparisons evaluated the effect of adding the measures of exposure and social attitudes to the best model identified in the second stage. *Dialect contact* and *York networks* were tested first, followed by *Class attitudes* and *York attitudes*. This final set of comparisons is the crucial one for this chapter, as it allows an evaluation of the relative contribution of exposure and social attitudes on speakers' production patterns above and beyond the social and linguistic factors already known to be

important to vocalic variation and change. It should be noted that this is arguably a very conservative strategy — this was felt necessary due to the potential collinearity of the independent variables being tested in this observational dataset.

<p><b>Stage 1: Linguistic factors</b></p> <p>All random effects +</p> <p>Preceding place Following place Preceding voicing Following voicing Preceding manner Following manner Log duration</p>	<p><b>Stage 2: General social factors</b></p> <p>Best model from Stage 1 +</p> <p>Speech style Year of birth Level of education Gender Year of birth: all linguistic factors Year of birth: Level of education Year of birth: Gender</p>	<p><b>Stage 3: Exposure and attitudes</b></p> <p>Best model from Stage 2 +</p> <p><i>Exposure:</i> Dialect contact York networks</p> <p><i>Attitudes:</i> Class attitudes York attitudes</p>
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Figure 5.2.4: Variables tested at each stage of model comparison.

The following section provides model summaries for the final models selected using the process described above. Significance levels for each coefficient were calculated with t-tests, using Satterthwaite’s (1946) approximations for the degrees of freedom as implemented in the *lmerTest* (Kuzntsova et al., 2013) package in R. Goodness-of-fit statistics were calculated using the method provided in Johnson (2014). The  $R^2_{GLMM(m)}$  statistic represents the proportion of variance explained by the fixed factors alone; the  $R^2_{GLMM(c)}$  statistic represents the proportion of variance explained by both the fixed and random factors.

## 5.3 Results

### 5.3.1 /u/ F2

Table 5.3.1 provides the coefficients from the best model of /u/ F2, selected using the procedure outlined at 5.2.4. For this model, the fixed effects account for 57% of variance in /u/ F2, while the complete model accounts for 77% of variance.

	Normalized /u/ F2 @ 75%					
	$\beta$	$SE(\beta)$	$df$	$t$	$p(>t)$	
<b>Fixed effects</b>						
Intercept	1.067	0.040	130.064	26.738	<0.001	***
(Preceding coronal, following coronal, Speech style = Map task)						
Preceding Labial/Velar	-0.112	0.022	14.772	-5.149	<0.001	***
Following Labial/Velar	-0.074	0.024	26.500	-3.033	<0.001	***
Following Lateral	-0.402	0.031	12.515	-12.939	<0.01	**
Following Vowel/Glottal/Pause	-0.188	0.020	43.179	-9.244	<0.001	***
Log Duration	-0.074	0.014	933.873	-5.420	<0.01	**
Speech style=Word list	-0.062	0.013	67.157	-4.664	<0.001	***
Year of birth	0.010	0.001	57.956	10.270	<0.001	***
Year of birth x						
Following Labial/Velar	-0.000	0.001	1145.930	-0.597	0.551	
Year of birth x						
Following lateral	-0.011	0.001	1120.986	-17.504	<0.001	***
Year of birth x						
Following Vowel/Glottal/Pause	-0.005	0.001	1149.963	-8.928	<0.001	***
<b>Random effects</b>						
$N_{\text{Speaker}}$	52					
$N_{\text{Word}}$	38					
$ICC_{\text{Speaker}}$	0.433					
$ICC_{\text{Word}}$	0.036					
$R^2_{GLMM(m)}$	0.57					
$R^2_{GLMM(c)}$	0.77					

Table 5.3.1: Best linear mixed-effects model of /u/ F2.

The best model of /u/ F2 includes significant main effects of preceding place of articulation and following place of articulation. The second formant of /u/ is highest when the vowel occurs in postcoronal environments, and lowest when it follows a labial or velar consonant ( $\beta=-0.11$ ,  $SE=0.02$ ,  $t(14.77)=-5.15$ ,  $p<0.001$ ).

This is likely due to the coarticulatory effect of the advanced tongue body in contexts such as /tu/ and /su/, which results in a raised second formant frequency in the following vowel (Flemming, 2001; Ohman, 1966). Prelateral environments inhibit the raising of F2 ( $\beta=-0.40$ ,  $SE=0.03$ ,  $t(12.52)=-12.93$ ,  $p<0.01$ ), consistent with previous findings (e.g. Ash, 1996). This effect can also be explained in terms of coarticulation: a result of the tongue body backing in anticipation of velarized coda /l/. Log duration has a negative effect on /u/ F2 ( $\beta=-0.07$ ,  $SE=0.01$ ,  $t(933.87)=-5.42$ ,  $p<0.01$ ). Shorter vowels tend to have a higher second formant frequency at the offglide, possibly reflecting articulatory undershoot (Lindblom, 1983).

In terms of non-linguistic effects, *Year of birth* has a significant positive effect on the second formant frequency of /u/ ( $\beta=0.01$ ,  $SE=0.001$ ,  $t(57.96)=10.27$ ,  $p<0.001$ ), providing apparent-time evidence of change toward more fronted realizations. *Year of birth* interacts with the following place of articulation: fronting has occurred most rapidly before coronal, labial and velar consonants and less rapidly in prepausal and prevocalic environments ( $\beta=-0.05$ ,  $SE=0.001$ ,  $t(1149.96)=-8.93$ ,  $p<0.001$ ). Prelateral environments show the least evidence of change in comparison to precoronal environments ( $\beta=-0.01$ ,  $SE=0.001$ ,  $t(1120.99)=-17.50$ ,  $p<0.001$ ), reflecting the familiar 'blocking' effect of prelateral contexts (e.g. Di Paulo & Faber, 1990; Fridland & Bartlett, 2006). Significant differences were also found between map task speech and the word list recordings, with more retracted realizations favoured in the word list recording ( $\beta=-0.06$ ,  $SE=0.01$ ,  $t(67.16)=-4.66$ ,  $p<0.001$ ). None of the remaining non-linguistic factors improved model fit significantly, including the measures of exposure and social attitudes.

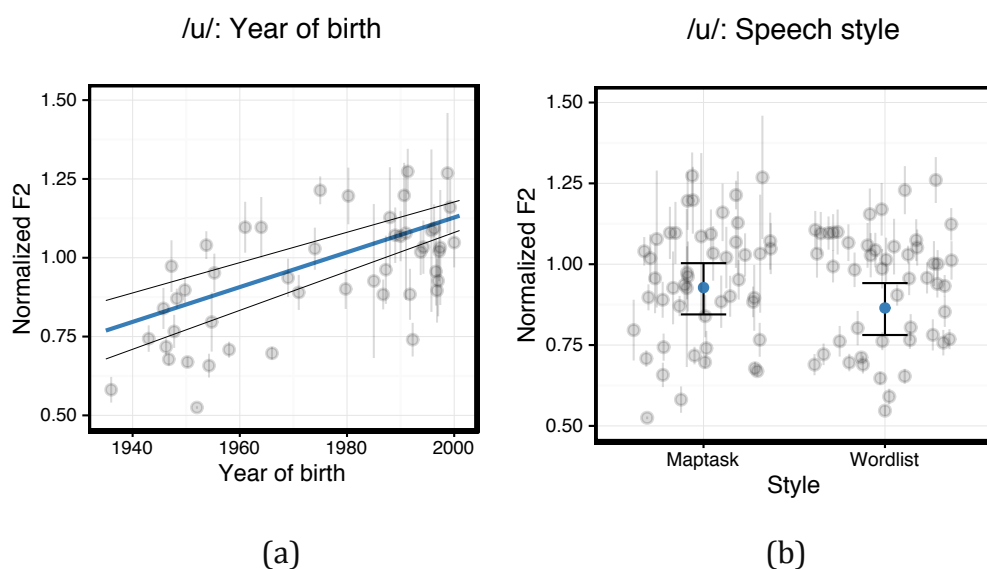


Figure 5.3.1: Non-linguistic effects from the best model of /u/ F2, measured at the temporal midpoint.

These results provide evidence that the fronting of /u/ has occurred in a rapid and socially-uniform manner in York, with no evidence of any patterning across speaker gender, socioeconomic status, or any of the measures of exposure or social attitudes. This is consistent with much previous work on /u/ fronting, where this innovation has been found to spread without being affected by the social factors which typically constrain linguistic change (Fridland, 2008; Fridland & Bartlett, 2006). While the significant effect of *Speech style* might imply some role of /u/ fronting in style-shifting, it is also possible that this reflects the influence of differences in speech rate across the two tasks, a point that will be returned to in section 5.3.2.

While the lack of social effects beyond *Speech style* and *Year of birth* is not surprising given the existing literature on /u/ fronting, it contrasts strongly with the predictions formed based on the perception results of Chapter 4. In the perception experiment, it was found that listeners reliably perceived back /u/ as 'Broad Yorkshire', in contrast to fronter variants, which were assigned to characters described as 'Posh' or 'from anywhere'. On this basis, a social-indexical account of change in /u/ might reasonably predict that speakers who



strongly identify as ‘Yorkshire’ people would be likely to resist /u/ fronting. However – this is not the case; rather, *Year of birth* is the sole significant social predictor of change in /u/. Thus, while back /u/ is strongly associated with ‘Broad Yorkshire’ speech in perception, there is no evidence that this fact influences the propagation of fronted variants in production. Interestingly, these results also fail to support the predictions of a change-by-accommodation account, at least if /u/ fronting is taken to be a pattern of diffusion from Southern varieties, as proposed by e.g. Przedlacka, 2001 and Kerswill & Torgersen, 2004. If it were the case that fronted /u/ variants were spreading primarily through contact, it would be expected that speakers with less close-knit social networks and/or more frequent contact with the South East would be more likely to adopt the fronted variant. However, none of these factors show any influence on speakers’ degree of fronting, suggesting a primarily phonetic motivation for its rapid spread (Harrington et al., 2008).

### 5.3.2 /u/ diphthongization

	Normalized /u/ F1/F2 Euclidean distance 25%-75% (log scale)					
	$\beta$	$SE(\beta)$	<i>df</i>	<i>t</i>	$p(>t)$	
<b>Fixed effects</b>						
Intercept (Preceding coronal, following coronal, Speech style = Map task)	-0.563	0.137	136.041	-4.121	<0.001	***
Preceding Labial/Velar	-0.153	0.069	17.042	-2.213	<0.05	*
Following Labial/Velar	0.104	0.082	26.806	1.265	0.217	
Following Lateral	-0.303	0.095	11.691	-3.197	<0.01	**
Following Vowel/Glottal/Pause	0.281	0.071	32.161	3.975	<0.001	***
Log Duration	0.583	0.054	810.762	10.839	<0.001	***
Speech style = Word list	0.165	0.056	59.998	2.928	<0.01	**
York attitudes	0.108	0.039	51.977	2.784	<0.01	**
<b>Random effects</b>						
$N_{\text{Speaker}}$	52					
$N_{\text{Word}}$	38					
$ICC_{\text{Speaker}}$	0.187					
$ICC_{\text{Word}}$	0.22					
$R^2_{GLMM(m)}$	0.27					
$R^2_{GLMM(c)}$	0.40					

Table 5.3.2: Best linear mixed-effects model of /u/ diphthongization.

The best model for /u/ diphthongization includes the effects of the preceding and following consonant and log duration, consistent with the model for /u/ F2. /u/ is less diphthongal when it follows a labial or velar consonant in comparison to in postcoronal environments ( $\beta=-0.15$ ,  $SE=0.07$ ,  $t(17.04)=-2.21$ ,  $p<0.05$ ). This is likely due to the greater distance between the onset and offglide targets caused by the coarticulatory fronting of the vowel onset after coronal consonants. Similarly, prelateral environments favour lower Euclidean distances ( $\beta=-0.30$ ,  $SE=0.1$ ,  $t(11.69)=-3.20$ ,  $p<0.01$ ) reflecting the anticipatory lowering of the tongue body before velarized /l/, which results in a more monophthongal vowel. The positive effect of log duration suggests that shorter tokens of /u/ tend to be more monophthongal than longer tokens ( $\beta=0.58$ ,  $SE=0.05$ ,  $t(810.76)=10.84$ ,  $p<0.001$ ) which can be explained by undershoot (Lindblom, 1983): where duration is shorter, the articulators have less time to complete the backing and rounding movements, resulting in hypoarticulated gestures and correspondingly lower Euclidean distances.

Two non-linguistic effects were found to significantly affect the dynamics of /u/ production, after controlling for the linguistic effects described so far. The first of these is *Speech style*, with speakers generally more diphthongal in the word list than the map task ( $\beta=0.17$ ,  $SE=0.06$ ,  $t(60)=2.93$ ,  $p<0.01$ ). The traditional sociolinguistic interpretation of stylistic differences reflecting the social prestige associated with variable forms (e.g. Labov, 1972) does not seem to apply here, since there is no reason to think that a very diphthongal /u/ is more prestigious than the monophthong. Given that diphthongs (less standard-like forms of /u/) are more likely to occur in the wordlist (where standard forms would typically be expected), it is more likely that this effect is related to speech rate, or a the effect of careful versus spontaneous speech, with speakers more likely to exaggerate the backing and rounding gesture of /u/ when reading than when focusing on the communicative goals of the map task.

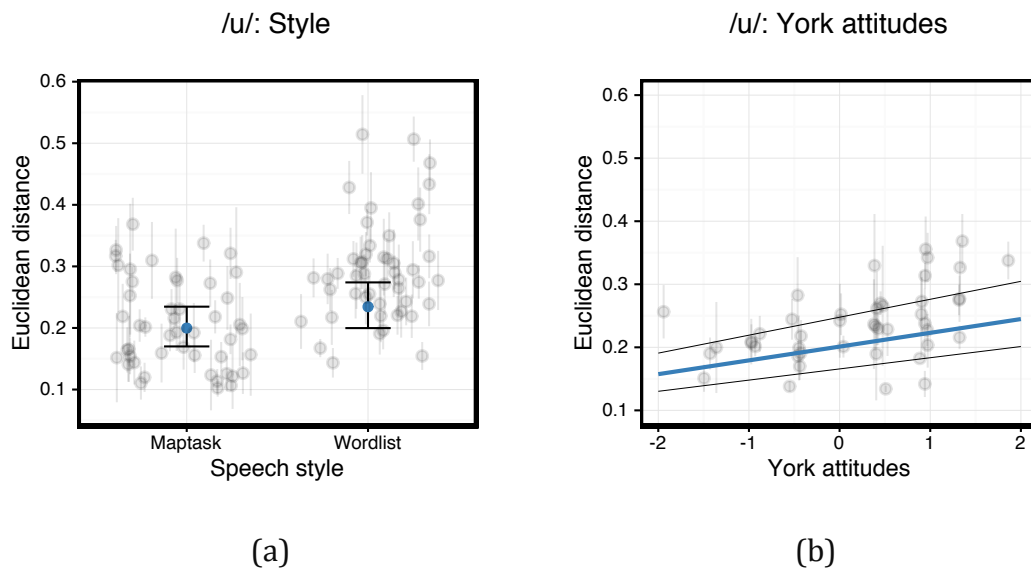


Figure 5.3.2: Non-linguistic effects from the best model of /u/ diphthongization, measured as the Euclidean distance between the onset (25%) and offglide (75%) of the vowel in F1-F2 space.

The second significant factor conditioning /u/ diphthongization was *York attitudes* ( $\beta=0.11$ ,  $SE=0.04$ ,  $t(52)=2.78$ ,  $p<0.01$ ). Speakers who produce more diphthongal realizations of /u/ are more likely to report being proud from York, to plan to stay in York, and to express negative attitudes toward social change in York. This finding potentially points to a role of social-indexical meaning in constraining variation in /u/. However, this result should be treated with caution, as a correlation between the *York attitudes* and *York networks* indices (Pearson's  $r=0.64$ ) made model selection problematic: both factors were found to improve the basic model of diphthongization independently, but resulted in a decrease in model fit when entered in combination. The relevant comparisons are summarized in Table 5.3.3

	<b>Model</b>	<b>Log likelihood</b>	<b>Deviance</b>	<b><math>\chi^2</math> (1)</b>	<b>p(&gt;<math>\chi^2</math>)</b>
(a)	Random terms + linguistic effects + Speech style	-1145.01	2290.02		
	Random terms + linguistic effects + Speech style <b>+ York attitudes</b>	-1141.42	2282.83	7.18	<0.001
(b)	Random terms + linguistic effects + Speech style	-1145.01	2290.02		
	Random terms + linguistic effects + Speech style <b>+ York networks</b>	-1141.82	2283.63	6.38	<0.01
(c)	Random terms + linguistic effects + Speech style + York attitudes	-1141.82	2283.63		
	Random terms + linguistic effects + Speech style + York attitudes <b>+ York networks</b>	-1140.77	2281.54	2.09	0.1482
(d)	Random terms + linguistic effects + Speech style + York networks	-1141.42	2282.83		
	Random terms + linguistic effects + Speech style + York networks <b>+ York attitudes</b>	-1140.77	2281.54	1.29	0.2561

*Table 5.3.3: Comparison of models of /u/ Euclidean distances containing the York networks and York attitudes variables.*

Comparisons (a)-(d) in Table 5.3.3 demonstrate that the model with *York attitudes* had a significantly better fit than the basic model with linguistic factors and *Speech style* alone ( $\chi^2(1)=7.28$ ,  $p<0.007$ ), as did the model with *York networks* ( $\chi^2(1)=6.38$ ,  $p<0.01$ ). However, a model with both *York networks* and *York attitudes* did not improve over the model with *York attitudes* alone ( $\chi^2(1)=2.09$ ,  $p=0.15$ ), or the model with *York networks* alone, ( $\chi^2(1)=1.29$ ,  $p=0.26$ ). In other words, the *York attitudes* and *York networks* variables both improve model fit, but their independent contribution to variation in /u/ Euclidean distances cannot be ascertained. The model with *York attitudes* was selected as this had the lowest deviance (2282.83 vs. 2283.63); however, the small difference between these values suggests that two models differ very little in overall fit. This means that while there is some evidence of an effect of social

identity on /u/ diphthongization, the present analysis does not allow the relative contribution of a speakers' social network structure versus their social attitudes to be assessed.

### 5.3.3 /o/ F2

	Normalized /o/ F2 @ 75%					
	$\beta$	$SE(\beta)$	$df$	$t$	$p(>t)$	
<b>Fixed effects</b>						
Intercept (Preceding coronal, following coronal, Speech style=Map task)	0.833	0.023	149.627	36.445	<0.001	***
Preceding Labial/Velar	-0.037	0.013	22.544	-2.898	<0.01	**
Preceding Vowel/Glottal/Pause	--0.052	0.018	51.836	-2.908	<0.001	***
Following Labial/Velar	-0.054	0.006	128.687	-5.084	<0.001	***
Following Vowel/Glottal/Pause	-0.044	0.018	330.982	-5.617	<0.001	***
Log Duration	-0.079	0.006	1604.803	-12.437	<0.001	***
Speech style = Wordlist	-0.030	0.012	72.928	-2.513	<0.01	**
Year of birth	0.003	0.001	52.271	2.506	<0.01	**
Year of birth x Following Labial/Velar	-0.000	0.000	1903.986	-1.235	0.214	
Year of birth x Following Vowel/Glottal/Pause	-0.001	0.000	1883.345	-4.775	<0.001	***
York networks	-0.045	0.020	52.037	-2.232	<0.05	*
<b>Random effects</b>						
$N_{\text{Speaker}}$	52					
$N_{\text{Word}}$	58					
$ICC_{\text{Speaker}}$	0.586					
$ICC_{\text{Word}}$	0.038					
$R^2_{GLMM(m)}$	0.28					
$R^2_{GLMM(c)}$	0.73					

Table 5.3.4: Best linear mixed-effects model of /o/F2.

The best model for /o/ F2 includes the effects of the preceding and following place of articulation and log duration. The second formant of /o/ is highest when the vowel follows a coronal consonant, and lower when it follows a non-coronal consonant ( $\beta=-0.04$ ,  $SE=0.01$ ,  $t(22.54)=-2.9$ ,  $p<0.01$ ) or in postpausal contexts ( $\beta=-0.05$ ,  $SE=0.02$ ,  $t(51.83)=-2.91$ ,  $p<0.001$ ). These patterns suggest similar coarticulatory effects to those discussed for /u/. Precoronal environments favour a higher second formant, with a lower F2 before labials and velars ( $\beta=-0.05$ ,  $SE=0.006$ ,  $t(128.69)=-5.08$ ,  $p<0.001$ ) and before a vowel or

a pause ( $\beta=-0.04$ ,  $SE=0.02$ ,  $t(330.98)=-5.62$ ,  $p<0.001$ ). Consistent with the findings for /u/ F2, Log duration has a significant effect on the second formant of /o/: longer tokens tend to have a more retracted offglide than shorter tokens ( $\beta=-0.079$ ,  $SE=0.01$ ,  $t(1604.80)=-12.44$ ,  $p<0.001$ ).

In terms of non-linguistic effects, *Year of birth*, *Speech style* and *York networks* all led to a significant improvement in model fit. Collinearity was observed between *Year of birth* and *York networks* ( $r=-0.63$ ). However, single-term deletions from the full model confirmed that each factor made a significant contribution to the explained variance (*York networks*:  $\chi^2(1)=4.84$ ,  $p<0.05$ ; *Year of birth*:  $\chi^2(1)=4.27$ ,  $p<0.05$ ). As a further check for multicollinearity, Variance Inflation Factors were calculated for the potentially problematic terms, providing a measure of the degree to which the variance of each coefficient is affected by collinearity. The VIF scores from this model were 1.67 for *Year of birth* and 1.65 for *York networks*, which are well beneath Fox's (1991) recommendation of 4 as an indicator of moderate multicollinearity.

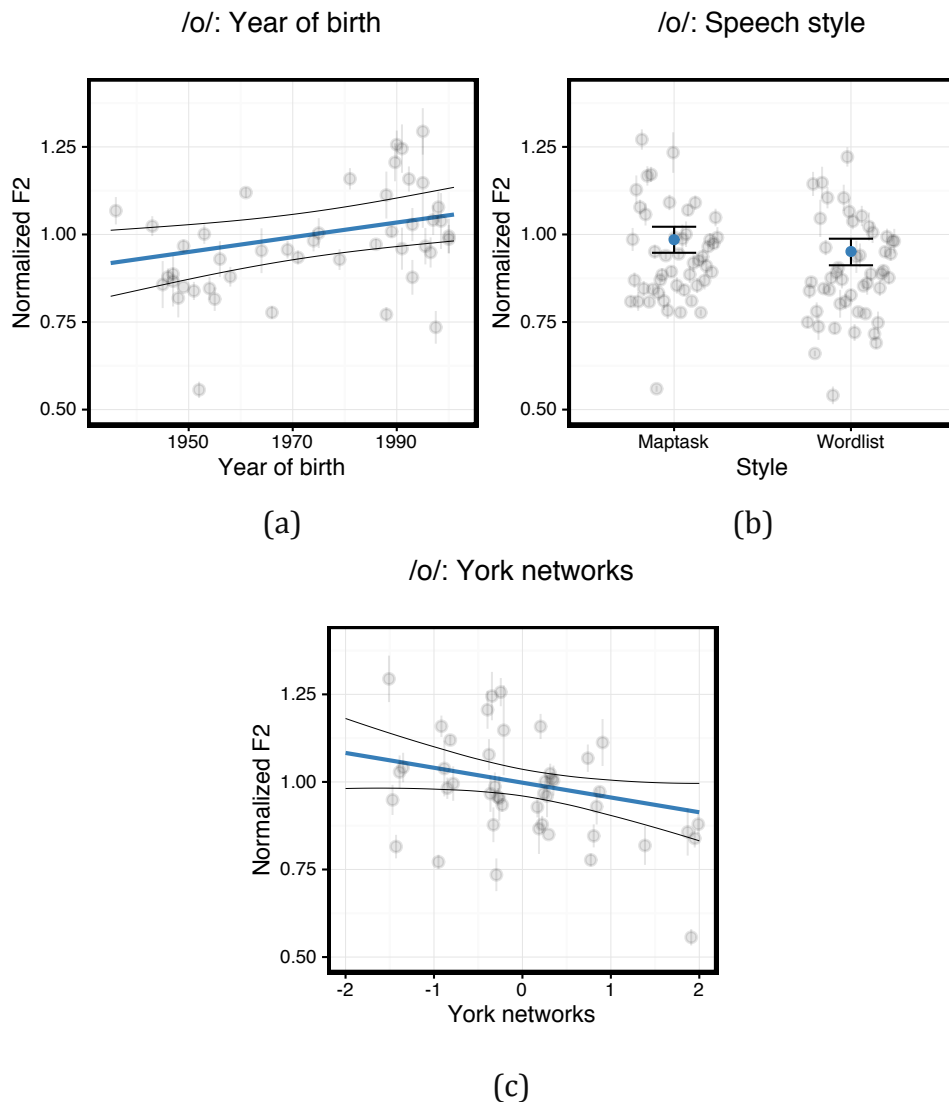


Figure 5.3.3: Non-linguistic effects from the best model of /o/ F2, measured at the temporal midpoint.

The positive coefficient for *Year of birth* suggests apparent-time evidence of /o/ fronting ( $\beta=0.003$ ,  $SE=0.001$ ,  $t(52.27)=-2.23$ ,  $p<0.01$ ). *Year of birth* interacts with the following phonetic environment: fronting has occurred most vigorously where /o/ precedes a coronal consonant, and less rapidly in prevocalic and prepausal environments ( $\beta=-0.001$ ,  $SE=0.0001$ ,  $t(1883.35)=-4.78$ ,  $p<0.001$ ). Turning to *Speech style*, speech in the map task tends to favour monophthongal /o/, in contrast to the reading task ( $\beta=-0.03$   $SE=0.01$ ,  $t(72.93)=-2.51$ ,  $p<0.01$ ). Finally, there is a significant effect of the *York networks* index on

the second formant of /o/: speakers who have dense social ties to York are more likely to retain a back variant, and speakers with fewer local ties more likely to adopt a fronter realization ( $\beta=-0.05$ ,  $SE=0.02$ ,  $t(52.04)=-2.23$ ,  $p<0.05$ ).

The results for /o/ fronting provide evidence of apparent-time change toward variants with a fronter offglide, although this change is less rapid and uniform than that seen in /u/. The significant effect of the *York networks* index on /o/ productions suggests a crucial role of social networks in the diffusion of fronted variants of /o/. Consistent with previous work on social network structure and linguistic change (Milroy & Milroy, 1985), it seems that speakers who come from multigenerational York families and who maintain close ties to the local community are less likely to adopt a fronter variant of /o/. In contrast, the innovative speakers are those who have friends and family in York, and have fewer connections to the local community. Crucially, there is no evidence of an effect of the attitudinal scales on /o/ fronting. Adding *York attitudes* did not significantly improve the basic model ( $\chi^2(1)=1.68$ ,  $p=0.2$ ), nor did the addition of *Class attitudes* ( $\chi^2(1)=0.04$ ,  $p=0.8$ ); the *Dialect contact* measure resulted in a marginal improvement over the basic model ( $\chi^2(1)=3.38$ ,  $p<0.07$ ). A full summary of comparisons can be found in Appendix E. These results are most consistent with a change-by-accommodation account of /o/ fronting: speakers who retain back /o/ are more likely to report having dense social ties within York, but are *not* necessarily more likely to express strong positive attitudes toward local identity, or negative attitudes toward social change in the community. In contrast, speakers with stronger ties outside of York and thus more opportunities for contact with linguistic innovations are more likely to adopt a fronted variant of /o/, regardless of their attitudes to local identity.



### 5.3.4 /o/ diphthongization

	Normalized /o/ F1/F2 Euclidean distance 25%-75% (log scale)					
	$\beta$	$SE(\beta)$	$df$	$t$	$p(>t)$	
<b>Fixed effects</b>						
Intercept	-1.387	0.237	67.124	-5.842	<0.001	***
(Preceding coronal, following coronal, Speech style = Map task, Parents' Edu= Primary)						
Preceding Labial/Velar	-0.173	0.053	32.053	-3.262	<0.01	**
Preceding Lateral	-0.152	0.101	68.417	-1.507	0.136	
Preceding Vowel/Glottal/Pause	-0.162	0.076	81.534	-2.143	<0.05	*
Following Labial/Velar	0.172	0.050	152.828	3.463	<0.001	***
Following Vowel/Glottal/Pause	0.155	0.039	258.548	3.929	<0.001	***
Log duration	0.416	0.033	1636.647	12.484	<0.001	***
Speech style = Wordlist	0.188	0.061	68.854	3.065	<0.01	**
Parents' Edu (Secondary)	0.213	0.236	52.127	0.903	0.371	
Parents' Edu (Post-secondary)	0.268	0.256	51.546	1.045	0.301	
Parents' Edu (University)	0.543	0.247	51.566	2.202	<0.05	*
York attitudes	-0.158	0.055	49.081	-2.887	<0.01	**
<b>Random effects</b>						
$N_{\text{Speaker}}$		52				
$N_{\text{Word}}$		58				
$ICC_{\text{Speaker}}$	0.258					
$ICC_{\text{Word}}$	0.017					
$R^2_{GLMM(m)}$	0.15					
$R^2_{GLMM(c)}$	0.45					

Table 5.3.5: Best linear mixed-effects model of /o/ diphthongization.

The best model for /o/ diphthongization includes the effects of preceding and following place of articulation and log duration. /o/ is most diphthongal when it follows a coronal consonant, and is more monophthongal after laterals and velars ( $\beta=-0.17$ ,  $SE=0.05$ ,  $t(32.05)=-3.26$ ,  $p<0.01$ ), and in prevocalic and prepausal contexts ( $\beta=-0.16$ ,  $SE=0.08$ ,  $t(81.53)=-2.14$ ,  $p<0.05$ ). The higher Euclidean distances observed in postcoronal contexts presumably reflect a similar coarticulatory influence to that seen for /u/: coarticulation with the preceding consonant brings the onset of the vowel forward, resulting in a longer overall trajectory. Following labials and velars also promote diphthongization ( $\beta=0.17$ ,  $SE=0.05$ ,  $t(152.83)=3.46$ ,  $p<0.001$ ), as do prepausal and prevocalic environments ( $\beta=0.155$ ,  $SE=0.04$ ,  $t(258.55)=3.93$ ,  $p<0.001$ ). Consistent with the

linguistic effects observed in the previous analyses, log duration is associated with diphthongization: longer vowels have larger Euclidean distances, reflecting a greater degree of diphthongization ( $\beta=0.416$ ,  $SE=0.03$ ,  $t(1636.65)=12.48$ ,  $p<0.001$ ).

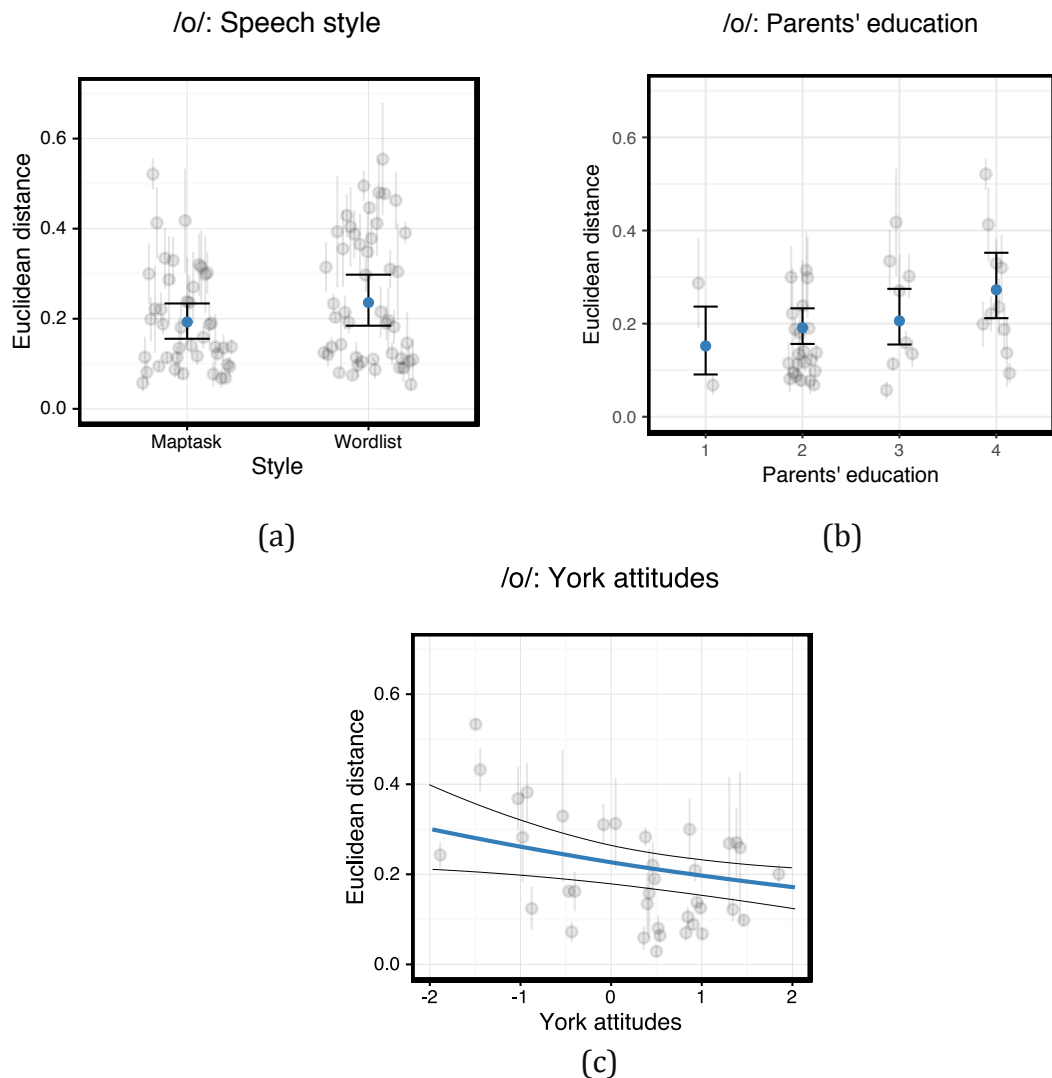


Figure 5.3.4: Non-linguistic effects from the best model of /o/ diphthongization measured as the Euclidean distance between the onset (25%) and offglide (75%) of the vowel in F1-F2 space.

Turning to non-linguistic factors, significant effects were found for *Speech style*, with the word list favouring more diphthongal /o/ realizations ( $\beta=0.19$ ,  $SE=0.06$ ,  $t(68.85)=3.07$ ,  $p<0.01$ ). This may reflect the effects of speech rate or hyperarticulation, as suggested for /u/ diphthongization in 4.3.2; however, given that diphthongal /o/ variants (at least, centralized and fronted

diphthongs) are known to be the overtly prestigious, Standard Southern British English forms, it is also reasonable to suggest that the effect may reflect speakers' shifting toward more standard forms in the reading style. Consistent with this proposal is the relationship between diphthongization and *Level of education* – speakers whose parents have a university education tend toward more diphthongal realizations of /o/ than those with primary education only ( $\beta=0.54$ ,  $SE=0.25$ ,  $t(51.57)=2.20$ ,  $p<0.05$ ). Finally, and crucially for the theoretical aims of this chapter, there is a significant relationship between *York attitudes* and diphthongization ( $\beta=-0.16$ ,  $SE=0.06$ ,  $t(49.08)=-2.29$ ,  $p<0.01$ ). Speakers who claim to be proud from York, who plan to stay in York, and who are more negative toward social change in the community are more likely to produce monophthongal variants of /o/, while speakers who are less positive about York and more positive about social change are more likely to produce diphthongs.

The fact that the dynamics of /o/ are associated with speakers' orientation toward local identity can be taken as evidence for the relationship between phonetic variation and social meaning in this community. The perception experiment demonstrated that York listeners are very sensitive to /o/ monophthongization as a social cue, with monophthongal /o/ reliably mapped to the 'Chav' and 'Typical Yorkshireman' characters. In Chapter 4 it was argued that this represented the status of monophthongal /o/ as an index of 'Broad Yorkshire' speech, which was strongly associated with a positive orientation to local identity. The prediction that speakers who are more invested in signalling their identity as 'Yorkshire born and bred' individuals would be more likely to retain 'Broad' features is supported by the significant relationship between /o/ diphthongization and the *York attitudes* index found in these data. Above and beyond their level of education, a York speakers' orientation to local identity predicts their degree of /o/ diphthongization, with more monophthongal speakers more likely to score higher on the *York attitudes* index. In contrast, the *York networks* index had no significant effect on model fit ( $\chi^2(1)=0.27$ ,  $p=0.6$ ),

nor did *Dialect contact* ( $\chi^2(1)=2.08$ ,  $p=0.14$ ), or *Class attitudes* ( $\chi^2(1)=0.89$ ,  $p=0.34$ ). The fact that speakers' attitudes to local identity are a better predictor of /o/ Euclidean distances than any of these variables provides strong evidence for the importance of /o/ monophthongization as an identity marker in York. However, the fact that no evidence of change toward diphthongal variants was found means that these results do not speak to the role of social meaning in linguistic change — only to its role in conditioning phonetic variation.

## 5.4 Discussion

The prediction put forward at the start of this chapter was that speakers' adoption of innovative forms of /u/ and /o/ would be related to their social attitudes, in a manner consistent with the social meanings uncovered in Chapter 4. Given the strong link between phonetic backness and 'Broad Yorkshire' speech uncovered in the perception analysis, it was predicted that speakers with a positive orientation toward local identity would be likely to resist fronting these vowels. The results of the production analyses presented in this chapter are mixed: while there is clear evidence of a relationship between /u/ and /o/ variation and social identity, it seems that this relationship applies mainly to the diphthongization of the two vowels, rather than their degree of fronting.

		/u/ fronting	/u/ diphthongization	/o/ fronting	/o/ diphthongization
	Evidence of change?	✓	✗	✓	✗
Change-by- accommodation	Effect of <i>Dialect contact</i> ?	✗	✗	✗	✗
	Effect of <i>York networks</i> ?	✗	✗	✓	✗
Social-indexical change	Effect of <i>York attitudes</i> ?	✗	✓	✗	✓
	Effect of <i>Class attitudes</i> ?	✗	✗	✗	✗

Table 5.4.1: Summary of production findings.

Of the aspects of vowel variation studied, only fronting shows evidence of apparent-time change. /u/ fronting is spreading without concern for any of the social factors tested. This finding is consistent with many previous accounts of /u/ fronting, where it is characterised by a consistent set of linguistic constraints, and a lack of differences across social groups (Fridland, 2006; Labov et al., 2005). While the fronting of /u/ showed no evidence of social conditioning beyond speaker age and speech style, the results for /o/ fronting demonstrate the role of social network structure in linguistic change, which appears to be more important than speakers' social attitudes in conditioning change in /o/. Speakers who have denser social ties to the local community are more likely to resist innovative forms of /o/, and speakers with weaker ties are more likely to adopt fronted variants. These findings are highly consistent with previous work on the role of social networks in language change, where dense social networks are reported to inhibit the propagation of innovations, and linguistic changes are spread by speakers with weak social ties across communities (Milroy & Milroy, 1985; Milroy & Milroy, 1993).

The contrast between the findings for /o/ and the general lack of social effects for /u/ fronting are consistent with Haddican et al.'s (2013) observations regarding the two changes in this community, where they also found evidence of the rapid and uniform fronting of /u/ in comparison to /o/. However, the present findings contrast with the authors' social-indexical explanation for these differences, since speakers' orientation to local identity and social class do not show any significant effect on their degree of /o/ fronting beyond the variation explained by their year of birth, even without the inclusion of the *York networks* variable. From this analysis, it must be concluded that of the social factors tested, the structure of speakers' social networks is the key motivator of /o/ fronting, again consistent with a change-by-accommodation account.

For both changes, the findings from the production analyses contradict the predictions of a social-indexical account of change formed based on the perception analysis of Chapter 4. For /u/ fronting, this comes in the form of a perception-production mismatch: back /u/ was strongly associated with 'Broad Yorkshire' speech in the perception experiment, and reliably mapped to working-class and rural characters. However, the fronting of this vowel shows no evidence of a relationship with social attitudes, which might be expected based on the strong effects found in the perception data. In the case of /o/ fronting, the absence of an effect of the social attitudes indices contradicts the predictions of a social-indexical account: while there is evidence that speakers with fewer social ties to York are more likely to adopt a fronted variant, there is no evidence that a speakers' orientation toward the social meanings associated with 'Broad Yorkshire' speech conditions their degree of fronting, for both monophthongal and diphthongal /o/ variants.

While the results for the fronting of /u/ and /o/ show no evidence of a relationship with the *York attitudes* index, there is evidence of a relationship between social attitudes and dynamic properties of the two vowels. Speakers who score higher on the *York attitudes* index produce more diphthongal

variants of /u/ and more monophthongal variants of /o/. The fact that /o/ monophthongization appears to be related to speakers' orientation to local identity is highly consistent with previous claims about this vowel in the North of England, where monophthongal /o/ is commonly mentioned as a shibboleth of Northern English identity (e.g. Watt, 2002; Pearce, 2009). The fact that /u/ diphthongization was also associated with the York attitudes index has less of a basis in the previous literature, although Ferragne & Pellegrino (2010) report considerable regional variability in this vowel — it is not unreasonable to propose that this regional variability may have led to dynamic variation in /u/ attaching to meanings of place in a similar way proposed for /o/, albeit with diphthongal rather than monophthongal variants sounding 'local'.

Importantly, the attitudinal effects found for /u/ and /o/ diphthongization in production are generally consistent with the social meanings listeners assigned to diphthongal vs monophthongal variants in the perception task presented in Chapter 4. With the exception of very fronted variants, /o/ monophthongization was associated with 'Broad Yorkshire' speech in the perception task, and /u/ diphthongization strengthened the relationship between back /u/ and listeners' selection of 'Broad Yorkshire' characters. This provides evidence that dynamic variation in /u/ and /o/ may serve as an important identity marker in this community. The fact that this relationship holds when measures of dialect contact, level of education and social network structure are included in regression models (for /o/, at least) lends weight to this conclusion. However, the lack of evidence for a move toward diphthongal variants of /o/ means that this finding does not provide evidence for the role of social meaning in linguistic change.

## 5.5 Conclusion

### 5.5.1 Summary of findings

This chapter has investigated the extent to which York speakers' adoption of linguistic innovations is influenced by the social meanings associated with those innovations. If social meaning is driving or inhibiting a linguistic change, it would be expected that speakers' adoption or rejection of innovations would be related to their social attitudes, in a way which reflects the meanings associated with the forms undergoing change. For example, if a form is perceived as 'local' or 'working-class' in a particular community, it would be expected that speakers who identify with the social values associated with being 'local' or 'working-class' would be more likely to use 'local' or 'working-class' forms in production. Further, it would be expected that these attitudes would explain production variation above and beyond factors related to speakers' exposure to innovative forms, such as dialect contact and/or social network structure.

To evaluate this prediction in York, this chapter tested the relationship between acoustic measures of fronting and diphthongization in /u/ and /o/ and a range of social scales, derived from an ethnographically-informed analysis of sociolinguistic interview data. Two of these scales represented factors related primarily to exposure to innovations: the *Dialect contact* scale reflected speakers' opportunities to interact with speakers from outside of York, such as being employed in the tourist industry, or regularly travelling outside of the area. The *York networks* scale measured the density of speakers' social ties to York, reflected in the degree to which their friends and family were from York, and their connections to local industries and social groups. The second pair of scales measured factors primarily related to social attitudes, based on the social meanings of 'Broad Yorkshire' speech discussed in Chapter 4. The *Class attitudes* scale reflected speakers' attitudes toward social class: speakers who scored lower on this scale were likely to describe others as 'Posh' and/or mention engaging in antisocial behaviour. Finally, the *York attitudes* scale attempted to



capture speakers' attitudes to local identity: speakers who scored highly on this scale described themselves as proud to be from York, had plans to stay in York, and were more likely to complain about social and demographic change in York. In contrast, speakers who scored low on this scale were less likely to describe themselves as proud to be from York and more likely to be positive about change in the community.

By comparing a set of mixed-effects linear regression models, the analysis explored the relative impact of these four social variables on the second formant of /u/ and /o/ (a measure of fronting) and the vector length of the vowel trajectory in F1-F2 space (a measure of diphthongization). The main hypothesis was that the attitudinal scales should explain variation in these acoustic properties when controlling for linguistic factors, as well as speakers' age, gender, and level of education. This hypothesis was based on the central prediction of social-indexical accounts of language change: that speakers recognise the social meaning of innovative forms and 'select' the variant most consistent with their social identity. In other words, if social-indexical meaning drives speakers' adoption of or resistance to innovations, their production patterns should be related to their social attitudes in a way which reflects the social meanings they assign to the changing forms in perception.

The results of this chapter were mixed. In the case of /u/ fronting, it was predicted that speakers who scored highly on the attitudinal indices would be less likely to adopt fronted variants of /u/, since back variants were reliably mapped to 'Broad Yorkshire' characters in the perception experiment. However, this was not the case: in fact, none of the social indices tested, nor any social factor beyond speakers' age had a significant effect on the fronting of /u/. The fact that /u/ fronting appears to be unaffected by the social meanings tested in production is generally consistent with previous accounts of this change (Fridland, 2008; Labov et al., 2005). However, the fact that fronting occurs despite the back variant's apparent strong association with 'Broad Yorkshire'

speech is problematic for social-indexical accounts of linguistic change in general: a speaker who uses fronted /u/ will potentially sound more middle-class and less authentically Yorkshire than one who uses a back variant, but younger speakers adopt more fronted variants *regardless* of their stated orientation toward these meanings.

In the case of /o/ fronting, the second formant frequency at the offglide of /o/ was found to be associated with the *York networks* index, suggesting that speakers who have more dense social ties to York are less likely to adopt fronted variants than those who do not. This is consistent with the perception findings, in the sense that listeners mapped back /o/ to the 'Typical Yorkshire' character, and fronted variants to characters described as 'from anywhere', such as the student and businessman. However, the attitudinal indices did not improve the models of /o/ fronting, even when the *York networks* index was excluded from the model. While being from a multigenerational York family or having friends mostly from York is a significant predictor of backness in /o/, a speaker's attitudes toward local identity and social class are not. These results are most consistent with a change-by-accommodation account of /o/ fronting. The structure of a speaker's social networks, but not necessarily their social attitudes, conditions their adoption or resistance to innovations. The social meanings assigned to innovations in perception reflect this pattern, but do not appear to influence it directly.

While the results for fronting provide no support for a social-indexical account of change in /u/ and /o/, dynamic properties of the two vowels were shown to be related to social attitudes in production: speakers who produce more monophthongal /o/ variants and more diphthongal /u/ variants tended to score higher on the *York attitudes* index. These results provide evidence of a close match between production patterns and the social meanings associated with diphthongization in perception: monophthongal /o/ and diphthongal /u/ were associated with 'Broad Yorkshire' speech in perception, and speakers who

express strong positive attitudes toward local identity are more likely to use these forms in production. Further, their social attitudes were a better predictor of their /o/ dynamics than any of the other factors tested, including the *Dialect contact* and *York networks* scales. These findings provide strong evidence for the role of diphthongization as a social-indexical cue in York: they demonstrate that /o/ monophthongs are reliably perceived as indexing social class and regional identity, and suggest that speakers may be drawing on these forms in production to construct their identities as authentic Yorkshire people. While these findings are broadly consistent with the claims of social-indexical accounts of linguistic change, it is not clear whether the degree of /u/ and /o/ diphthongization is actually changing: the data provide no evidence for change in /o/ and /u/ Euclidean distances.

At this stage, it must be concluded that the results of this chapter are generally more consistent with a change-by-accommodation account of /u/ and /o/ fronting than a social-indexical account, despite the considerable effort invested in capturing speakers' orientation toward the social meaning of these two vowels in the analysis. /u/ appears to be spreading in a rapid and regular manner, without being affected by any of the social factors tested. /o/ is fronting more slowly, led by speakers with weaker social ties to York. The findings of Chapter 4 demonstrated that both vowels are available as socially meaningful cues in perception: back forms of both vowels were mapped to the characterological figures associated with 'Broad Yorkshire' speech in perception. Despite this, there is no association between /u/ and /o/ fronting and the social attitudes related to 'Broad Yorkshire' speech in production: maintaining a back variant of /o/ and /u/ may mean that a speaker is heard as less local, but the fact that a speaker identifies strongly as local does not mean that they will resist change in these vowels. This mismatch between social perception and production is incompatible with a social-indexical account of these changes, where we would expect to find a close relationship between social perception, social attitudes, and speech production.

### **5.5.2 Limitations of the present analysis**

The results of this chapter have demonstrated the benefit of drawing on sociolinguistic perception data and an ethnographically-informed understanding of a speech community in analysing the spread of linguistic change. However, there are a number of limitations which need to be considered when interpreting the conclusions of this analysis, which could be addressed in future work.

A central methodological issue with this chapter is the fact that the analysis is based entirely on speech data captured in an experimental setting, through a combination of a map task and reading task. The issue with relying on these data alone is that they provide information about only part of each speaker's speech repertoire. Since the advanced forms of sound changes in progress are typically reported to be most frequent in informal speech styles (e.g. Labov, 2001), this represents a considerable limitation of the present work – while no significant differences related to social attitudes were found with regard to fronting in the present data, it is possible that differences might emerge in less controlled settings. A future analysis could draw on the interview recordings as a further source of production data; alternatively, following the recommendations of Boyd et al. (2015), further production data in the form of self-recordings could be collected, allowing for a wider sample of speech styles to be collected from each participant.

A second major issue with the methods of this chapter is the operationalization of social attitudes, which were measured through an analysis of the attitudes and stances expressed during the sociolinguistic interviews. One issue with such an approach is subjectivity: I, as a researcher with my own theoretical agenda, generated the categories and coded them. While the coding criteria were designed to be as replicable as possible, it is still possible that these choices and the subsequent coding could be influenced by my subjective interpretations of

speakers' responses. Aside from this methodological concern, it might be argued that the approach to attitudes adopted in this analysis only captured explicit attitudes, since it relied on an analysis of attitudes which could be clearly interpreted from the interview data. The literature on attitudes suggests that many of our social attitudes may be implicit: not necessarily directly evident from things we say or do, but nonetheless relevant to social behaviour (Nosek et al., 2002; Greenwald et al., 2015). Moreover, recent work connecting the idea of implicit attitudes to sociolinguistics suggests that implicit language attitudes may impact upon speech perception and production (Robertson, 2015). Thus, while the present data suggest that /u/ and /o/ fronting are not related to speakers' attitudes toward Yorkshire identity, it is possible that a future study incorporating measures of implicit attitudes might uncover a relationship not captured in this analysis.

Another methodological issue regards the empirical treatment of social networks. The approach taken in the present work was to use an ethnographically-informed understanding of network structures in York to choose which information to record for this category, following Milroy (1987) and Marshall (2004). However, in the present study this approach is limited by the lack of detailed participant observation implied by an ethnographic approach – instead, information regarding social network structure was inferred from participants' responses in the sociolinguistic interviews. This is problematic, since speakers may have misreported the number of social ties they possess in York. A future extension of this study might attempt to replicate the present findings in an environment where interaction patterns are more easily observable, such as a high school (e.g. Eckert, 2000; Kirkham, 2015; Alam & Stuart-Smith, 2011).

A further issue with the present analysis is the potential confounding of the independent variables. *York attitudes*, *York networks* and *Year of birth* were all moderately correlated. The model selection procedure adopted in this chapter

aimed to alleviate this problem to some extent, and where there were potential sources of multicollinearity, the regression diagnostics were well within the recommended guidelines. However, there is still the possibility of confounding due to construct overlap and measurement error – for example, perhaps the effects for *York attitudes* and *York networks* are really reflexes of a single latent variable, which would explain the overlap in variance explained by these factors in the models of /u/ diphthongization. In a sense, this issue was unavoidable in a community-level observational study: these collinearities reflect the reality of social change in York, as the conditions which supported speakers' forming tight-knit social networks have declined, resulting in a generation of generally more outward-looking young people who have far more opportunities to encounter linguistic innovations, and also tend to be less strongly invested in their identity as Yorkshire people. While the collinearity of attitudes and network structure weakens the argument that social networks, rather than social attitudes, are crucial to the spread of /o/ fronting, the mismatch between the social perception of /u/ and its distribution in production still demonstrates the key argument of this chapter; from the evidence presented here it seems that language change take place without social meaning necessarily being involved, and may even happen *despite* the social meanings which attach to the form undergoing change.

### **5.5.3 Implications for the thesis as a whole**

Combined with the evidence for the social meaning of /u/ and /o/ presented in Chapter 4, these results speak directly to the central question of this thesis:

*How, if at all, do the social meanings associated with linguistic innovations affect the way they spread across a speech community?*

The results provide no evidence of a direct link between the social meaning of /u/ and /o/ variation and the propagation of fronted variants, which would be

expected if social meaning played a direct role in constraining these changes. In the context of the two models of language change considered in this thesis, the findings seem more compatible with a change-by-accommodation account. Firstly, social network structure is a better predictor of a speakers' degree of /o/ fronting than the attitudinal scales, which do not explain a significant proportion of variance in speakers' F2 values. Secondly, despite /u/ and /o/ variation being associated with 'Broad Yorkshire' speech in perception, change in the production of these vowels is not related to speakers' attitudes toward the social meaning of 'Broad Yorkshire' speech. This implies that while speakers recognise that fronted /u/ and /o/ sound less 'Broad' than back variants, this meaning does not impact upon their production patterns in any consistent manner – their degree of fronting is primarily a function of their age and the structure of their social networks. It is thus unlikely that the indexing of back /u/ and /o/ as 'Broad Yorkshire' plays a direct role in the propagation of fronted variants, although an influence of this meaning might be expected under a social-indexical account of linguistic change.

Despite the lack of evidence of the role of social meaning in constraining the fronting of /u/ and /o/, there is good evidence that dynamic properties of these vowels are socially-meaningful in this community, as speakers' degree of diphthongization is significantly related to their attitudes toward local identity, consistent with the meanings assigned to diphthongal and monophthongal forms in the perception experiment. Thus, the message of this chapter is not that social meaning is irrelevant to phonetic variation. On the contrary, the results complement previous work on language and regional identity (e.g. Watt, 2002; Johnstone & Kiesling, 2008), demonstrating that vowel variation provides speakers with a rich resource for identity construction. In York this can be seen in the clear relationship between vowel dynamics and speakers' orientation toward local regional identity. However, the question of the ways in which social meaning interacts with processes of linguistic change remains an open one. This chapter has contributed to answering that question by demonstrating

how patterns which at first appear to reflect the influence of social meaning on linguistic change may be better explained by other motivating factors, once data from perception, production, and ethnographic analysis are triangulated. The following chapter will attempt to advance this approach even further, demonstrating how analysing individual differences in sociolinguistic perception can develop our understanding of the relationship between sound change and social meaning.





## 6. Connecting perception and production

### 6.1 Overview

This chapter explores how speaker-listeners differ in their awareness of the possible social meanings of changing linguistic forms, and attempts to understand how, if at all, these differences might be related to their production repertoires. It asks the following question:

*How does a speaker-listener's awareness of the social meaning of a linguistic innovation relate to their adoption of that innovation in production?*

Where Chapter 5 tested the relationship between speakers' social attitudes and speech production, this chapter investigates the impact of a further speaker variable on production behaviour: the degree to which speaker-listeners implicitly recognize the social meaning of changing linguistic features. If social meaning plays a direct role in the spread of linguistic innovations, it would be reasonable to expect that a speaker-listener's ability to notice and assign social meaning to the changing forms might be related to their production patterns in some way — for example, those individuals who are particularly perceptually attuned to the social meaning of a stigmatized form might be expected to be most likely to avoid that form in production. In light of the mixed results of Chapter 5, exploring the relationship between sociolinguistic awareness and speech production provides a further method for testing the predictions of a social-indexical account of linguistic change.

A key aspect of social-indexical accounts of linguistic change is that speaker-listeners notice (on some level) the difference between the innovative and conservative variants of a form undergoing change, and attach a set of social meanings to this difference. They then use this pattern of variation as a resource for identity construction, positioning themselves toward and away from the

values and practices associated with the social meaning in question through their production choices (e.g. Labov, 1963; Wong & Hall-Lew, 2014; Haddican et al., 2013). Although it may not be available to conscious introspection, speakers are implied to have some form of knowledge of the possible social meanings of linguistic innovations under social-indexical accounts. In contrast, for change-by-accommodation accounts (e.g. Trudgill, 2008; Kauhanen, 2016), any social meanings speaker-listeners attach to forms undergoing change are completely epiphenomenal to that change. Speakers simply adopt the form which they encounter the most, regardless of their attitudes toward the change and the social meanings they associate with it.

One prediction of social-indexical accounts of language change is that speakers' production patterns will be related to their social attitudes. This prediction has been the primary focus of the thesis so far: Chapter 4 focused on identifying the core social meanings of /u/ and /o/ variation in York; Chapter 5 then linked these meanings to production behaviour indirectly, assessing the relative contribution of speakers' social attitudes and social network structure to their degree of /u/ and /o/ fronting. However, social-indexical accounts of linguistic change do not only make predictions regarding the relationship between speech production and social attitudes — they also arguably make predictions about the relationship between speakers' awareness of the social meaning of forms undergoing change and their production patterns. If speakers' production behaviour is shaped by one of the social meanings associated with a form undergoing change, it would also be reasonable to expect that their recognition of that meaning in perception might play a role in their adoption or rejection of innovative variants. Not only should speakers' production patterns be related to their social attitudes, they should also be related to the degree to which they associate the changing form with the social meaning claimed to influence their behavior. Crucially, change-by-accommodation accounts of linguistic change make no a-priori predictions regarding sociolinguistic awareness — observing a consistent relationship between speaker-listeners' awareness of the social

meaning of innovations and their production patterns would place an explanatory burden on such accounts.

This chapter investigates the above proposal by testing a specific hypothesis regarding the role of social meaning in the fronting of /o/ in York. In particular, it explores the possibility that the move toward more fronted /o/ realizations in this community may be related to changes in the social indexing of variation in these vowels: the leaders of change in these vowels may have begun to associate back variants /o/ with the highly-stigmatized 'Chav' stereotype in a way that other speaker-listeners do not, leading them to distance themselves from these variants in production.

This account makes clear predictions regarding speaker-listeners' awareness of variation in the changing vowels and its relationship with their production patterns. If the leaders of change in /o/ have attached a new meaning to the back variants of this vowel, it would be reasonable to expect that they would hold a particularly strong association between 'Chav' speech and back variants compared to other speaker-listeners. If this is the case, it should be reflected in their responses in the perception task: they should be more likely to select the 'Chav' image when hearing back /o/ than other listeners. Based on the production findings of Chapter 5, this means that younger listeners, those with fewer close social ties to York, and those with negative or neutral attitudes toward local regional identity are expected to show more consistent 'Chav' selections for back variants of /o/ in comparison other listeners. Furthermore, it might be expected that a listener's awareness of the association between back /o/ and the 'Chav' stereotype would be predictive of their degree of fronting: people who are highly attuned to and socially invested in this association might be particularly motivated to avoid the forms they hear as 'Chav' features. Observing such patterns would place a burden of explanation on change-by-accommodation accounts of linguistic change, which make no a-priori

predictions regarding the relationship between listeners' awareness of the social meaning of innovations and their production patterns.

In order to test the predictions outlined above, the analysis in section 6.3 explores the relationship between listeners' responses in the perception task (presented in Chapter 4) and their production patterns, treating the consistency of participants' perceptual responses as reflecting their awareness of the association between phonetic properties of /o/ and the 'Chav' stereotype. To do this, the analysis extends the perception models from Chapter 4, testing for interactions between the speech stimulus listeners heard on each trial of the perception experiment and the non-linguistic factors explored in the production analysis of Chapter 5, including their age, gender, socioeconomic status, and the measures of social network characteristics and social attitudes discussed in that chapter. The analysis in section 6.4 then uses the perception models to generate a measure of *indexical sensitivity*, which represents the degree to which each speaker-listener associates phonetic characteristics of the target vowels (backness and diphthongization) with the 'Chav' stereotype. This is tested as an additional predictor in the production models of Chapter 5, allowing an assessment of the degree to which awareness of variation in /u/ and /o/ as a 'Chav' feature is related to speakers' production patterns.

The results of these analyses provide strong evidence of a relationship between listeners' age and the way they socially perceive the vowels under study, but no clear evidence of the predicted relationship between sociolinguistic awareness and speech production. While younger speaker-listeners are significantly more likely to perceive backness in /u/ and /o/ as a 'Chav' feature than older individuals, there is no clear evidence that their perceptual sensitivity to this meaning impacts upon their production patterns in the manner predicted. These findings imply that social meaning may play a very limited direct role in the spread of /u/ and /o/ fronting in this community, at least under a model where speakers' awareness of the social meaning of innovations is central to

their production choices. However, the results clearly demonstrate how the social meanings of speech patterns may shift as a consequence of linguistic change, with younger speakers adding new meanings to the outgoing forms of sound changes.

## **6.2 Motivating the perception-production analysis**

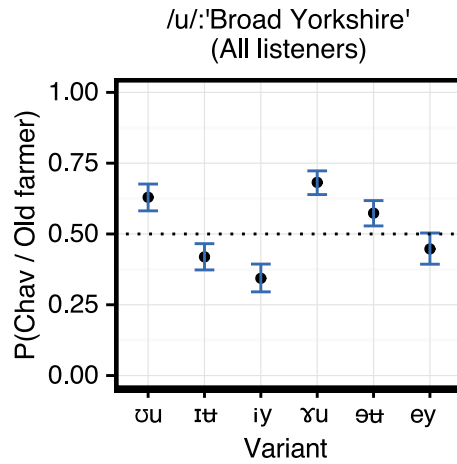
### **6.2.1 Theorizing awareness in sociolinguistic research**

The core proposal of this chapter is as follows: if social meaning plays a role in the spread of a linguistic innovation, it is reasonable to expect that speaker-listeners' adoption of that innovation in production might be related to their awareness of its social meaning in perception. To investigate this proposal it is first necessary to clarify the term *awareness*. The fact that speaker-listeners possess some kind of knowledge about the social significance of linguistic features is a core assumption of sociolinguistics. However, the concept of sociolinguistic awareness is one which is under-theorized, particularly in studies of linguistic change. A common approach has been to categorize forms as 'above' or 'below' the level of conscious awareness, as in Labov (1972). Under this framework, *indicators* are forms which vary across social groups in production, but do so with no conscious awareness on the part of speakers; *markers* are forms which vary across speech styles and may impact upon the social evaluation of a speaker, indicating a higher degree of speaker awareness than markers. *Stereotypes* are those forms which are the subject of overt commentary on the part of speakers.

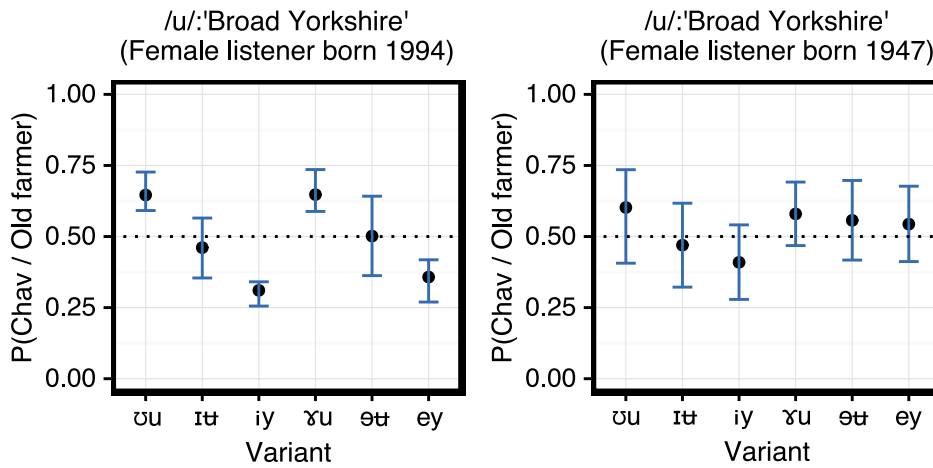
Labov's indicator-marker-stereotype hierarchy provides a useful tool for describing the fact that some variable language features seem to be explicitly noticed and commented on by speakers while others don't. However, for the purposes of the present work it is limited in at least three ways. Firstly, it does not make any reference to the social meaning(s) indexed by the linguistic forms

in question. Secondly, it does not make any reference to the individual speaker-listener, treating awareness as property of the speech community, rather than of individuals. Thirdly, it categorizes forms simply in terms of ‘conscious’ vs ‘unconscious’, without considering that the association between social meaning and linguistic form might vary by degree.

The use of the term *awareness* in this chapter stems primarily from an empirical observation from the perception data: participants appear to differ in the consistency of their social selections when hearing different variants of /u/ and /o/. Figure 6.2.1 demonstrates this, visualizing the population-level predicted probabilities for ‘Broad Yorkshire’ selections in response to variation in /u/ (a) alongside the predictions for two individuals (b,c). Full details of the perception methods and results can be found in sections 4.2 and 4.3 respectively.



(a)



(b)

(c)

Figure 6.2.1: Predicted probabilities and 95% confidence intervals for the selection of a 'Broad Yorkshire' character in response to /u/ variation.

The listener whose responses are depicted in panel (b) reliably selects a 'Broad Yorkshire' character (the 'Old Farmer' or 'Chav'; see Chapter 4) when hearing a back variant of /u/, and one of the other characters when hearing a fronted variant. However, the listener whose responses are shown in panel (c) shows a much less consistent pattern of selections — the overlapping confidence intervals imply that this listener was much less reliable in distinguishing front and back /u/ in terms of 'Broad Yorkshire' speech; additionally, there is some



evidence that this listener tended to select 'Broad Yorkshire' characters when hearing diphthongal /u/ variants, regardless of the degree of fronting. This suggests that there are at least two ways in which listeners differed in their perceptual behaviour during the experiment — some individuals were more consistent than others in their mapping of phonetic detail to the 'Broad Yorkshire' characters, and there is also evidence of variation in the specific cues (i.e. fronting vs. diphthongization) which listeners attended to when making their selections.

What could cause such different behaviour in the perception task? One reason might simply involve factors related to the experiment — perhaps some people were more comfortable with this particular task than others, or were feeling more engaged at the time of data collection. This possibility will be explored later in this chapter, after the predictors of perceptual variation have been explored in more detail. However, a more theoretically relevant possibility is that some listeners may have a greater awareness of the mapping between different vowel properties and social meanings than others. This could stem from listeners' varying experience of the usage of these vowels in different contexts; it could also be related to the degree to which the social categories tested were relevant to participants of different ages and social backgrounds at the time of sampling, or the degree to which individuals attend to the social-indexical possibilities of speech more generally. It is clear that Labov's (1972) approach to awareness does not really apply here, since Labov's approach focuses on community-level awareness of different linguistic features with regard to one social meaning (stigma/prestige). What is necessary is a definition which captures the fact that different forms can be socially meaningful in different ways for different individuals, and to different degrees. If the differences in perception responses shown in Figure 6.2.1 are taken to reflect listeners' varying awareness of the social-indexical mappings of phonetic detail in /u/ and /o/, a reasonable operational definition of sociolinguistic awareness might be as follows:

[1] An operational definition of sociolinguistic awareness:

*i. A gradient property of individuals...*

*ii. ...which reflects the degree to which they implicitly or explicitly recognize the relationship between a particular speech pattern and social meaning.*

The closest parallel to this construal of sociolinguistic awareness can be found in Preston (2016), as well as in exemplar-theoretic approaches to the mental representation of sociolinguistic meaning (e.g. Foulkes & Docherty, 2006; Drager & Kirtley, 2016). In accounts such as these, speaker-listeners' beliefs about the relationship between social categories and linguistic forms are encoded alongside phonetically-rich episodic representations. The degree of association between linguistic form and social meaning is gradient and is expressed through the notion of *activation* — the more frequently particular exemplars are accessed during speech perception and production, the more likely those exemplars will influence future instances of perception and production, subject to temporal decay.

A similar way of conceptualizing individuals' knowledge of sociolinguistic variation can be found in recent models of belief-updating in speech perception — for example, Kleinschmidt & Jaeger (2015) propose that listeners form probabilistic mappings between talker characteristics and the distribution of phonetic cues and update them in light of new experience; both Jaeger & Weatherholtz (2016) discuss this in relation to sociolinguistics, characterizing the association between speech patterns and social categories in terms of their perceived informativeness of linguistic variants as a cue to categories of social identity. For both Jaeger & Weatherholtz (2016) and Drager & Kirtley (2016), speaker-listeners' associations between linguistic variation and social categories are strongly influenced by their experience. However, this experience does not necessarily involve direct encounters with the forms and categories in

question — it may also come from more subjective stereotypes and beliefs about linguistic variation, or the association of linguistic forms with enregistered ways of speaking.

While Drager & Kirtley (2016) and Jaeger & Weatherholtz (2016) are not concerned directly with theories of language change, their general claims are shared by the approach adopted in this chapter: people develop associations between social categories and linguistic forms through language use, and the strength of these associations is likely to vary across individuals. This may be due to their differing experience of those indexical relationships, and/or their degree of familiarity with the culturally-circulated representations of those relationships. Additionally, these associations might be strengthened by the relevance of the category in question to an individual's social identity – someone who is particularly concerned with avoiding being identified as a 'Valley Girl' (Podesva, 2011) or a 'Burnout' (Eckert, 2000) might be particularly aware of the features which index those categories. The issue at hand for this chapter is the degree to which this awareness of indexical associations impacts on speakers' production patterns — something which is implied in many social-indexical accounts of language change, but not predicted by change-by-accommodation accounts. This will be explained further in section 6.2.2.

Use of the term *awareness* naturally raises the question of whether this term implies *conscious* knowledge of linguistic variation. The position taken in this thesis is that the conscious-unconscious distinction is not particularly useful to the question at hand. Work in perceptual dialectology demonstrates that speakers may articulate fairly detailed explicit beliefs regarding the regional and social distribution of linguistic variation (e.g. Preston, 1999); there is also good evidence that much sociolinguistic reasoning may happen in a rapid and implicit manner (e.g. Campbell-Kibler 2012; Robertson, 2015). It is likely that both of these processes come to bear on real-time language perception and production in some way. For example, in the open-ended perceptual evaluations

of Chapter 4, York informants referred to ‘long vowels’ as typical of Yorkshire speech when evaluating extracts containing examples of monophthongal /o/, reflecting an awareness of this feature which they can consciously articulate. This awareness also seems to be reflected in their experimental responses — monophthongal variants of /o/ were considerably more likely to cue the selection of a ‘Broad Yorkshire’ character than diphthongal variants. While this may reflect the impact of listeners’ explicit metalinguistic beliefs on their experimental behaviour, other aspects of their responses — for example, the association between backness and ‘Broad Yorkshire’ characters — seem harder to account for in this way. The concept of *awareness* as used in this chapter refers to the degree to which speakers-listeners associate a phonetic cue with a social category, as measured through their responses in the sociolinguistic perception task; however, it makes no strong claims regarding the relative contribution of conscious and unconscious processes to their social selections.

### **6.2.2 Connecting perception and production**

The fact that speaker-listeners may vary in their awareness of the possible social meaning of linguistic innovations has important consequences for social-indexical accounts of linguistic change. Under such accounts, speaker-listeners attach a social meaning to a form undergoing change, leading to their adoption or rejection of the innovative pattern (Labov, 1963; Hall-Lew, 2009; 2013, Becker, 2014a; 2014b; Watt, 2000; 2002). One factor that might lead to an innovation being rejected or adopted by a speakers is their attitude toward one of its possible meanings (Hall-Lew, 2009; 2013; Maegaard et al, 2013). This is what was explored in Chapter 5, where it was implicitly assumed that the meaning of back variants as ‘Broad Yorkshire’ was shared across the speech community. Another factor which might influence linguistic change under a social-indexical account are changes in the way a form is perceived socially (Labov, 1963, Becker, 2014b, Watt, 2002). A subgroup of speakers might attach a new social meaning to a variable pattern, leading them to shift their

production patterns toward or away the form in question. It is this second possibility which forms the basis of this chapter.

The classic example of such a claim comes from Labov's (1963) study of vocalic variation in Martha's Vineyard, Massachusetts. Labov found that the centralization of (ay) and (aw) was most advanced among residents who had positive orientations toward the island. Labov (1963) argued these speakers were using the centralization of these vowels to signal their identity as authentic 'Vineyarders' in contrast to the 'Mainlanders' who visited from the Massachusetts mainland, leading to a shift toward centralized variants among a subset of island residents. The mechanism implied is that the younger Vineyarders noticed a small speech difference between speaker groups encountered on the island, attached it to a new social meaning (the 'Vineyarder' stereotype), and began to exaggerate this pronunciation difference to signal their alignment with that meaning.

Another example of a case where a change in the social indexing of a form is claimed to lead to changes in its production can be found in Watt's (2002) account of dialect levelling in Tyneside. Watt suggests that the replacement of the ingliding mid vowels [ʊə] and [ɪe] with 'pan-northern' [o:] and [e:] can be explained by younger speakers' recognition of the outgoing variants as 'old fashioned' (p.56). The general claim here is that linguistic change is motivated by a new social meaning attached to the conservative variant: a form which may have been the typical way of speaking for a community in the past becomes associated with a new set of indexical meanings, which leads to a shift toward an innovative form which does not carry those stigmatized meanings.

The accounts of linguistic change described above both share the implication that aspects of speakers' social identity and social attitudes will be relevant to their participation in or resistance to linguistic change, as explored in Chapter 4 of this thesis. However, they also arguably make predictions regarding the

subgroups of speakers who would be expected to be particularly aware of the association between the forms undergoing change and the social meaning(s) proposed to influence their behaviour. For example, if the raising of (ay) and (aw) on Martha's Vineyard was motivated by the attachment of those vowels to the 'Vineyarder' stereotype, it is reasonable to predict that the speakers who adopted this innovation due to its social meaning would have been better able to (implicitly or explicitly) recognize the social significance of raising than other individuals. This proposal is consistent with the notion of *awareness* described in section 6.2.1: if speaker-listeners' speech behaviour is motivated by a variant's association with a particular social meaning, those individuals might be expected to hold a particularly strong association between that meaning and the innovation, reflecting the frequency with which they draw on that association when making production choices, as well as their social-psychological investment in the identity category in question. Similarly, Watt's (2002) claim regarding the perception of ingliding diphthongs as 'old fashioned' among younger Tynesiders does not imply that this association is held by the community as whole, but rather by the subset of younger speakers for whom the distinction between modern and 'old fashioned' ways of being a Tynesider is most important.

Crucially, social-indexical explanations of the type outlined above not only allow for predictions regarding the relationship between social attitudes and speech production; they also allow predictions to be formed regarding *which speakers* are expected to associate *which variants* with *which social meanings*. In contrast, strong change-by-accommodation accounts such as Trudgill (2008) or Kauhanen (2015) make no a-priori predictions regarding the relationship between sociolinguistic perception and speech production. Observing a consistent relationship between speaker-listeners' awareness of the social meaning of innovations and their production patterns would not necessarily falsify a change-by-accommodation account. However, it would place a burden

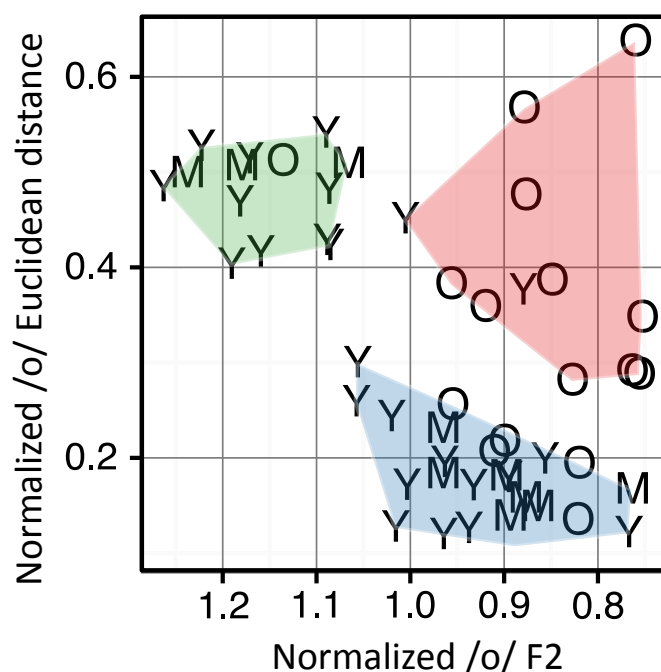
on such accounts to explain how such correspondences might arise if social meaning is epiphenomenal to linguistic change.

### **6.2.3 Predictions for back vowel fronting in York**

In order to explore this proposal for /u/ and /o/ fronting in York, it is necessary to form a concrete hypothesis regarding the role of social meaning in these changes. The main prediction tested in Chapter 5 was that speakers with a particularly strong investment in projecting an authentic ‘Yorkshire’ identity would be likely to resist change in /u/ and /o/, given the strong (community-level) association between the back variants of these vowels and ‘Broad Yorkshire’ speech found in the perception experiment. However, the results provided no clear evidence of a relationship between social attitudes and production patterns with regard to /u/ and /o/ fronting. Rather, the most important variables explaining /u/ and /o/ fronting were linguistic factors, such as vowel duration and the preceding and following phonetic environment, speakers’ year of birth, and (in the case of /o/ fronting), the diversity of speakers’ social networks. The conclusion of Chapter 5 was that these results did not support the initial hypothesis: change in /u/ and /o/ appeared to have taken place regardless of speakers’ stated attitudes toward social class and local regional identity. The fronting of /u/ was shown to be particularly socially regular, demonstrating a gradual shift toward fronted variants as a function of speakers’ year of birth, with no discernable relationship with any of the other social factors tested.

While the data for /u/ showed no clear evidence of social factors in the spread of fronted variants (beyond speakers’ age), the case of /o/ was more complicated. The fronting of /o/ was found to be considerably more advanced among diphthongal speakers than monophthongal speakers, and the speakers with diphthongal /o/ were particularly unlikely to express strong positive attitudes toward local regional identity. This means that the speakers with the

most fronted /o/ variants share at least three characteristics: they are young, they tend to have more diverse social networks than others, and they tend to express neutral or negative attitudes toward local regional identity. If an influence of social meaning on linguistic change is to be found anywhere in this dataset, the fronting of /o/ seems to be a reasonable candidate.



*Figure 6.2.2 Mean /o/ Euclidean distances as a function of F2, taken from the word list data for each speaker. Convex hulls represent three clusters identified through density based clustering (Ester et al., 1996). Letters represent three age groups: Older (1935-1960) Middle (1960-1980) and Younger (1980-2000). See section 5.2.2 for details of acoustic analysis. Speakers in the green hull tend to be younger and middle class; speakers in the red hull tend to be older (both working and middle class), and speakers in the blue hull are primarily younger/middle-aged and working class.*

Figure 6.2.2 demonstrates how change in /o/ has resulted in a striking difference between subgroups of younger speakers. One group remains fairly monophthongal, showing a moderate degree of fronting, while another shows a radical leap forward into the far corner of F2-Euclidean distance space, reflecting their very fronted, diphthongal pronunciations of /o/. A second important observation is that back, diphthongal /o/, which was common among



older speakers, is almost completely absent from the speech of the younger and middle cohorts.

How might a social-indexical account of linguistic change explain the radical shift toward fronted variants shown in Figure 6.2.2? One possibility is that a new, prestigious meaning has attached to fronted diphthongs, leading a subset of younger people to favour these forms. Another possibility is that younger speakers have attached a new, stigmatized meaning to back variants of /o/, facilitating the advance of fronting as they shift their production patterns away from back forms. One of the findings of Chapter 4 was that the ‘Chav’ stereotype was central to younger speakers’ evaluations of York speech. A plausible explanation for the move away from back /o/ is that younger speakers have begun to associate back variants, particularly back, diphthongal /o/, with the ‘Chav’ figure. Given the intense stigma surrounding the ‘Chav’ figure (Hayward & Yar, 2006; Tyler, 2008; le Grand, 2013), this association might drive speakers to avoid those forms in production. To recall the analysis of Chapter 4, the ‘Chav’ character was one of a pair of characterological figures associated with ‘Broad Yorkshire’ speech, typically described as ‘rough’ or ‘thuggish’ in the perception data, reflecting a well-known and highly-stigmatized stereotype of working-class youth. The stimulus image representing this character is provided below.



*Figure 6.2.3: ‘Chav’ image used in the perception experiment (see Chapter 4)*

The proposal that younger speakers' re-analysis of backness as a 'Chav' feature might influence change in this vowel is very similar to Watt's (2002) account of the loss of ingliding diphthongs in Tyneside — linguistic change could be facilitated not only by changes in social attitudes or social network structure, but also by a re-analysis of the social meaning of an existing pattern of variation. This proposal is also very similar to Haddican et al's (2013) proposal for /o/ fronting in this community — the authors claim that younger speakers have begun to associate fronted /o/ monophthongs with the 'Chav' stereotype, leading to a slower rate of fronting among monophthongal speakers. Haddican et al's (2013) account of /o/ fronting in York seems unlikely, given the lack of evidence of any perceptual association between the fronted /o/ monophthong [ø] and the 'Chav' stereotype (see Chapter 4). However, the general pattern of argument is similar to the hypothesis put forward in this chapter: a variant which was previously heard as 'local' or 'unmarked' may have become associated with a stigmatized characterological figure among a subset of younger speakers, leading to their avoidance of that form in production.

Following the reasoning outlined in section 6.2.2, the social-indexical account of /o/ fronting suggested above can be used to form predictions regarding the relationship between speakers' awareness of back /o/ as a 'Chav' feature and their adoption of fronted variants in production. The central proposal of the above account is that the speakers who lead change in /o/ may have begun to associate the back-front dimension of /o/ with 'Chav' speech in a way that other speakers do not, leading them to drive the changes forward, as they distance themselves from this meaning through their production choices. If this is the case, it might be predicted that the speakers who lead change in /o/ would hold a particularly strong association between back variants of /o/ and the 'Chav' stereotype. In light of the production analysis of Chapter 5, it is already clear who the leaders of change in /o/ are: they tend to be younger speakers, those with fewer dense social connections to York, and those who express negative or neutral attitudes to local regional identity. Based on this knowledge, a

reasonable prediction is that these speakers will be more consistent in mapping back variants of /o/ to the 'Chav' image in the perception data, reflecting the particular relevance of this indexical link to their production behaviour. A further prediction can also be made: in addition to the factors found to influence production patterns in Chapter 5, a speakers' degree of awareness of the link between back /o/ and the 'Chav' might be related to their degree of fronting, reflecting the influence of their awareness of the possible social meanings of variation in /o/ on their production patterns.

Since change-by-accommodation accounts make no predictions regarding the relationship between sociolinguistic perception and speech production, evidence of a such a relationship would place an explanatory burden on accommodation-based accounts. If speakers simply adopt the patterns they encounter most frequently, why should we observe predictable relationships between sociolinguistic awareness and speech production with regard to linguistic innovations? While there are possible responses to this challenge, they do not form a central part of the change-by-accommodation accounts in the literature (e.g. Trudgill, 2008; Kauhanen, 2016), so will be omitted from the predictions at this stage. The predictions are summarized in Table 6.2.1.

	Social-indexical change	Change-by-accommodation
Is there a relationship between individual listeners' awareness of the social meaning of innovations and their behaviour with regard to those innovations in production?	<p>Yes:</p> <p>a) The speaker groups who lead change in /o/ will be more consistent than others in mapping back variants of /o/ to the 'Chav' image in perception.</p> <p>b) Speakers' degree of /o/ fronting will be positively related to a measure of their awareness of the association between back variants of /o/ and the 'Chav' stereotype.</p>	No prediction.

*Table 6.2.1: Predictions for the perception-production analysis.*

In order to test these predictions, the following analysis will proceed in two stages. Section 6.3 tests the prediction that the speakers who lead in the adoption of fronted variants are more consistent than others in recognizing the association between back variants of /o/ and the 'Chav' stereotype. To do this, it extends the perception models of Chapter 4, testing for the influence of non-linguistic factors (such as listener age, gender, socioeconomic status, and the measures of social network diversity and social attitudes discussed in Chapter 5) on listeners' selection of the 'Chav' image in response to variation in /o/. The speakers with the most advanced fronting of /o/ tend to be young, have more diverse social networks (lower *York networks* scores), and neutral or negative attitudes toward local regional identity (lower *York attitudes* scores). Evidence that these factors are also predictors of speakers' awareness of back variants as a 'Chav' feature would provide support for the first prediction in Table 6.2.1, suggesting that change in /o/ may be facilitated by the reanalysis of back variants as 'Chav' features.

Section 6.4 tests the prediction that a speakers' degree of fronting is influenced by their awareness of back /o/ as a 'Chav' feature. It achieves this by using the speech stimulus:subject random slope terms of the mixed-effects models of perceptual classifications from Chapter 4 to derive a measure of perceptual sensitivity for each listener, which is then tested as an additional predictor in the production models from Chapter 5. Evidence that speakers' awareness of back /o/ variants as a 'Chav' feature was related to their production patterns would constitute further evidence in favour of the social-indexical account of change in /o/ outlined above.

Since change in /o/ showed the most evidence of being influenced by social factors in the analysis of Chapter 4, the predictions in Table 6.2.1 specifically concern change in this vowel. However, it seems reasonable to also consider the relationship between the perception and production of /u/ variation in this analysis. Given the lack of evidence for any social or attitudinal effects on /u/ fronting (beyond speakers' year of birth), evidence for a relationship between the social perception and production of this vowel might help inform an interpretation of any results for /o/. In particular, evidence that back variants of both vowels have been re-analyzed as 'Chav' features by the leaders of change in /o/ might point toward a more general bias for these individuals to hear outgoing forms as socially-marked, rather than indicating a role of social-indexical meaning in their adoption of fronted /o/ variants.

## **6.3 Extending the perception models**

### **6.3.1 Statistical analysis**

The basic hypothesis tested in this chapter is that the leaders of change in /o/ will be more sensitive to back variants of this vowel as 'Chav' features in comparison to other speakers. The following analysis tests this proposal by exploring the effect of the non-linguistic factors found to predict /o/ fronting in

production (*Year of birth, York networks and York attitudes*) on listeners' responses in the perception task. Under the social-indexical account of /o/ fronting put forward in section 6.2.3, Younger listeners, listeners with more diverse social networks (those with lower *York networks* scores) and those with neutral or negative attitudes toward local regional identity (lower *York attitudes* scores) are expected to be more consistent than other listeners in assigning back variants to the 'Chav' image.

In order to evaluate relationship between age, social network structure and social attitudes on listeners' responses, the following analysis extends the logistic regression models of Chapter 4, evaluating the contribution of these factors to explaining variation in listeners' selection of the 'Chav' character in response to variation in /o/. For comparison, a similar analysis is performed for the model of 'Chav' selections in response to /u/. The models predict the log-odds of a selection of this character compared to any other in response to each variant of /u/ and /o/ in the acoustic stimuli. While the central predictions of this chapter involve speakers' age, social network characteristics, and social attitudes, the entire set of subject-level variables from Chapter 4 were included in the analysis in order to control for potential confounding. The full set of variables tested is summarized in Table 6.3.1:

	<b>Variable</b>	<b>Form</b>
<i>General social factors</i>	Year of Birth	Continuous (1935-2001)
	Gender	Male/Female
	Parents' level of education	1:Primary, 2:Secondary, 3: Post-secondary, 4: University
<i>Exposure</i>	Dialect contact	Continuous (-2:+2) (Higher values = more opportunities for contact)
	York networks	Continuous (-2:+2) (Higher values = more dense local ties)
<i>Attitudes</i>	York attitudes	Continuous (-2:+2) (Higher values = positive attitudes toward York)
	Class attitudes	Nominal (1,2) (1 = more negative about 'posh' people/more likely to report engaging in antisocial behaviour 2 = neutral)

Table 6.3.1 Independent variables added to the perception models

The effects of key theoretical interest involve the interaction of the variables in Table 6.3.1 with the acoustic stimulus heard in the perception experiment, which would potentially reflect differences in the social interpretation of those stimuli. Evidence that younger listeners are more aware of back /o/ as a 'Chav' feature than older listeners would be reflected in a significant interaction between *Year of birth* and *Speech stimulus*, such that younger listeners show a more consistent mapping of back variants to the 'Chav' character than older listeners. Evidence that speakers with more diverse social networks are more aware of back /o/ as a 'Chav' feature than others would be reflected in a significant interaction between *York networks* and *Speech stimulus*, such that listeners with lower *York networks* scores show a more consistent mapping of back /o/ to that image. Similarly, evidence that speakers who have neutral or negative attitudes toward local regional identity are more aware of the indexical relationship between backness and 'Chav' would come in form of a significant interaction between *York attitudes* and *Speech stimulus*, with lower *York attitudes* scores corresponding to a higher frequency of 'Chav' selections when hearing back variants.

To test these predictions, models containing the main effect of *Speech stimulus* plus its interaction with each predictor in Table 6.3.1 were compared to models containing the main effects only. Statistical significance was evaluated using likelihood ratio tests. Where multiple interaction effects were identified, these were added to a single model; their independent contribution to explained variance was then evaluated through single-term deletions from the full model. The *Variant* term was sum coded, with the most fronted, diphthongal variant of /o/ ([əʊ]) and the fronted, more diphthongal /u/ variant ([ey]) set as the reference levels. Random intercepts were included for each subject, auditory stimulus item, and visual stimulus item. Random slopes were included for the effect of *Speech stimulus* on each subject and visual and auditory stimulus item, and by-item random slopes were included for all non-linguistic factors tested.



### 6.3.3 Interaction effects for the social perception of /o/

A comparison of models of ‘Chav’ selections in response to variation in /o/ found that interaction terms for *Speech stimulus x Year of birth* ( $\chi^2(7)=16.82$ ,  $p<0.01$ ), *Speech stimulus x York networks* ( $\chi^2(7)=14.11$ ,  $p<0.05$ ), and *Speech stimulus x York attitudes* ( $\chi^2(8)=14.02$ ,  $p<0.05$ ) significantly improved the fit of models containing those factors as main effects only. Subsequent backward selection from a model containing all three interactions resulted in the elimination of *Speech stimulus x York attitudes* and *Speech stimulus x York networks*, which did not contribute significantly to the fit of the full model. The best-fitting model contained the main effect of *Speech stimulus* and the interaction of *Speech stimulus x Year of birth*.

Log-odds of a ‘Chav’ selection					
	$\beta$	$SE(\beta)$	$z$	$p(> z )$	
Intercept	-0.472	0.087	-5.405	<0.001	***
o:	1.320	0.184	7.155	<0.001	***
ø:	1.181	0.182	6.497	<0.001	***
∅:	0.618	0.196	3.155	<0.01	*
ou	0.659	0.160	4.127	<0.001	**
əu	-0.599	0.163	-3.681	<0.001	***
əu	-1.016	0.169	-6.004	<0.001	***
əy	-1.123	0.190	-5.919	<0.001	***
əu	-1.050	0.17	-6.020	<0.001	***
Year of birth	-0.009	0.004	-2.157	<0.05	*
o: x Year of birth	0.019	0.009	2.121	0.054	
ø: x Year of birth	0.003	0.009	0.321	0.748	
∅: x Year of birth	-0.012	0.009	-1.270	0.204	
ou x Year of birth	0.029	0.008	3.811	<0.001	*
əu x Year of birth	0.001	0.008	0.111	0.911	
əu x Year of birth	-0.012	0.008	-1.496	0.135	
əy x Year of birth	-0.017	0.009	-1.961	0.05	*
əu x Year of birth	-0.010	0.008	-1.298	0.194	
$R^2_{McFadden}$	0.10				

Table 6.3.2 Best mixed-effects logistic regression model of ‘Chav’ selections in response to /o/ stimuli.

The main effect of *Speech stimulus* on ‘Chav’ selections reflects the influence of the auditory stimuli on listeners’ social selections, discussed in detail in Chapter 208

4. The back monophthong ([o:]) is strongly associated with a 'Chav' selection ( $\beta=1.32$ ,  $SE=0.18$ ,  $z=7.16$ ,  $p<0.001$ ), as is the centralized monophthong [ə] ( $\beta=1.18$ ,  $SE=0.18$ ,  $z=6.497$ ,  $p<0.001$ ). The most fronted /o/ monophthong ([ø:]) is significantly less likely to cue a selection of the 'Chav' than the baseline ( $\beta=-0.62$ ,  $SE=0.2$ ,  $z=-3.16$ ,  $p<0.01$ ). Fronted diphthongs ([əʊ]) disfavour a 'Chav' selection ( $\beta=-0.02$ ,  $SE=0.009$ ,  $z=-1.96$ ,  $p=0.05$ ), while back diphthongs ([oʊ]) tend to favour the selection of this character ( $\beta=0.03$ ,  $SE=0.008$ ,  $z=3.811$ ,  $p=0.05$ ). The main effect of *Year of birth* reflects a trend for older listeners to favour a 'Chav' selection regardless of auditory stimulus, although this effect is extremely small ( $\beta=-0.009$ ,  $SE=0.004$ ,  $z=-2.15$ ,  $p<0.05$ ).

The evidence of a significant interaction between *Speech stimulus* and *Year of birth* supports the prediction that younger listeners would be the most consistent in recognizing the association between variation in /o/ and the 'Chav' character. The effect is carried by differences in responses to the most back and most fronted diphthongal variants of /o/: younger listeners are more likely to select the 'Chav' when hearing a back diphthong than older listeners ( $\beta=0.03$ ,  $SE=0.008$ ,  $z=3.81$ ,  $p<0.001$ ); the opposite is true for the most fronted diphthongs ( $\beta=-0.017$ ,  $SE=0.009$ ,  $z=-1.96$ ,  $p=0.05$ ). This effect does not reach significance for monophthongal /o/ variants, but they trend in the expected direction: younger listeners appear to distinguish front and back variants in a more consistent manner than older listeners when selecting the 'Chav' image.

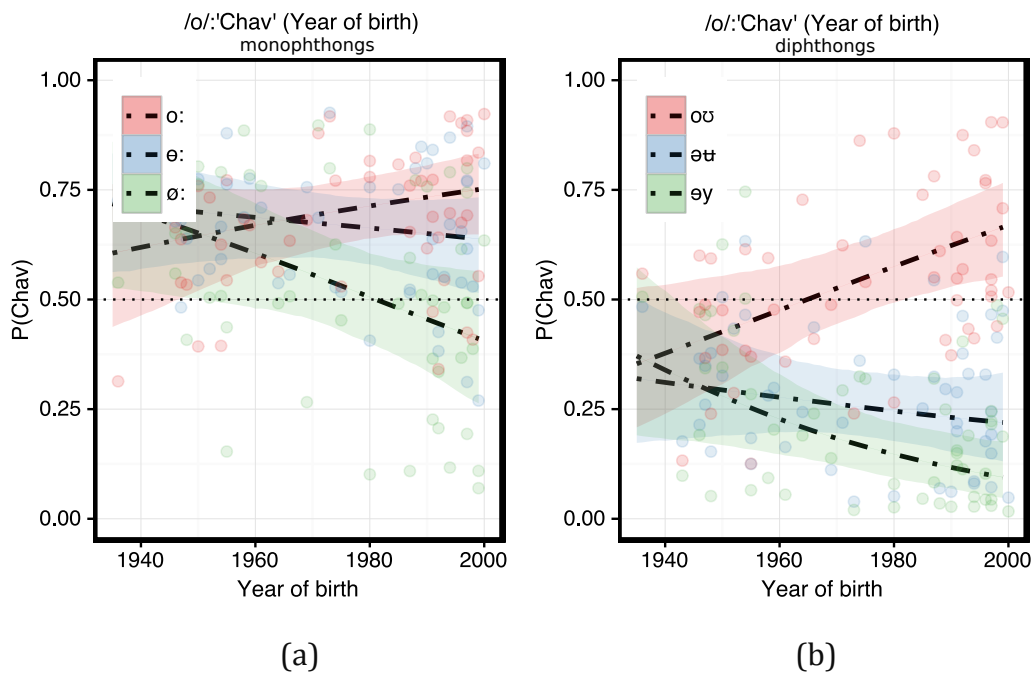


Figure 6.3.1: Interaction of Speech stimulus and Year of birth from the best model of 'Chav' selections for /o/, showing results for (a) monophthongs and (b) diphthongs.

Figure 6.3.1 visualizes the striking effect of *Year of birth* on 'Chav' selections in response to variation in /o/. For both monophthongal and diphthongal variants, the general trend is for the back-front dimension to have a larger effect on younger listeners' selections of the 'Chav' image than on those of older listeners. The largest effect is for back, diphthongal [oʊ]: the odds that a listener born in 1940 will select the 'Chav' when hearing this variant are ~0.5, while the odds of the same selection from a listener born in 2000 are ~2.5, around five times larger.

These results imply that younger people in York not only produce /o/ differently from their parents, they also perceive its indexical meaning in a very different way. The pattern is consistent with the hypothesis that variation in /o/ has been attached to a new social meaning by younger York residents. As predicted in section 6.2.2, the change in the social meanings associated with variation in /o/ appears to particularly target back variants, especially the back diphthong. The hypothesis of this chapter is that such a social re-analysis of this

form might explain its decline — in section 6.2.3 it was suggested that a subset of younger speakers may have recognized the back diphthong as a ‘Chav’ feature, and shift their speech away from this form in production. However, while it appears to be the case that younger speakers perceive this form differently from their elders, these results alone do not provide evidence for a role of this meaning in conditioning linguistic change. The lack of influence of *York networks* or *York attitudes* would imply that the association between backness and ‘Chav’ is not specific to the speakers who lead change in /o/, but shared by younger speakers in general. It seems likely that this pattern does not reflect a social motivation for fronting, but rather a more general process whereby younger speakers re-analyze outgoing forms as socially marked. Since there is no strong motivation for suggesting that /u/ fronting is socially motivated, evidence of a similar effect for the social perception of /u/ might point in that direction. This will be explored in the following section.

### 6.3.3 Interaction effects for the social perception of /u/

Comparisons of the /u/ perception models revealed a significant interaction of *Speech stimulus x Year of birth* ( $\chi^2(7)=28.63$ ,  $p<0.001$ ). No other significant interaction effects were found.

	Log-odds of a 'Chav' selection			
	$\beta$	$SE(\beta)$	$z$	$p(> z )$
Intercept	0.064	0.155	0.412	0.680
ou	0.757	0.263	2.881	<0.01
ɪʊ	-0.485	0.280	-1.736	0.083
ɪy	-0.954	0.347	-2.748	<0.01 **
ʊu	1.010	0.377	2.679	<0.01 **
əʊ	0.074	0.193	0.382	0.703
ey	-0.401	0.226	-1.772	0.076
Year of birth	-0.000	0.004	-0.109	0.913
ou x Year of birth	0.026	0.007	3.902	<0.001 ***
ɪʊ x Year of birth	-0.004	0.007	-0.604	0.546
ɪy x Year of birth	-0.014	0.007	-2.069	<0.05 *
ʊu x Year of birth	0.010	0.008	1.248	0.212
əʊ x Year of birth	0.003	0.006	0.619	0.536
əy x Year of birth	-0.021	0.007	-2.854	<0.01 **
$R^2_{McFadden}$	0.093			

Table 6.3.3 Best mixed-effects logistic regression model of 'Chav' selections in response to /u/ stimuli.

The main effect of *Speech stimulus* on selections of the 'Chav' character was documented in Chapter 4. The back, more monophthongal /u/ variants cue 'Chav' selections ( $\beta=0.76$ ,  $SE=0.3$ ,  $z=2.23$ ,  $p <0.01$ ), while fronter variants disfavour the selection of this character ( $\beta=-0.95$ ,  $SE=0.35$ ,  $z=-2.75$ ,  $p <0.01$ ). The back, more diphthongal variant also differs significantly from the baseline, favouring a 'Chav' selection ( $\beta=1.0$ ,  $SE=0.38$ ,  $z=2.68$ ,  $p <0.01$ ).

The significant interaction between *Speech stimulus* and *Year of birth* suggests that younger listeners responded quite differently to variation in /u/ in comparison to older listeners. The effect appears strongest for the most back and front monophthongal variants: younger listeners were more consistent in mapping back variants to the 'Chav' character than older listeners ( $\beta=0.03$ ,

SE=0.007,  $z=3.9$ ,  $p < 0.001$ ), and had a stronger bias against such selections when hearing a fronted variant ( $\beta=-0.01$ , SE=0.007,  $z=-2.06$ ,  $p < 0.05$ ).

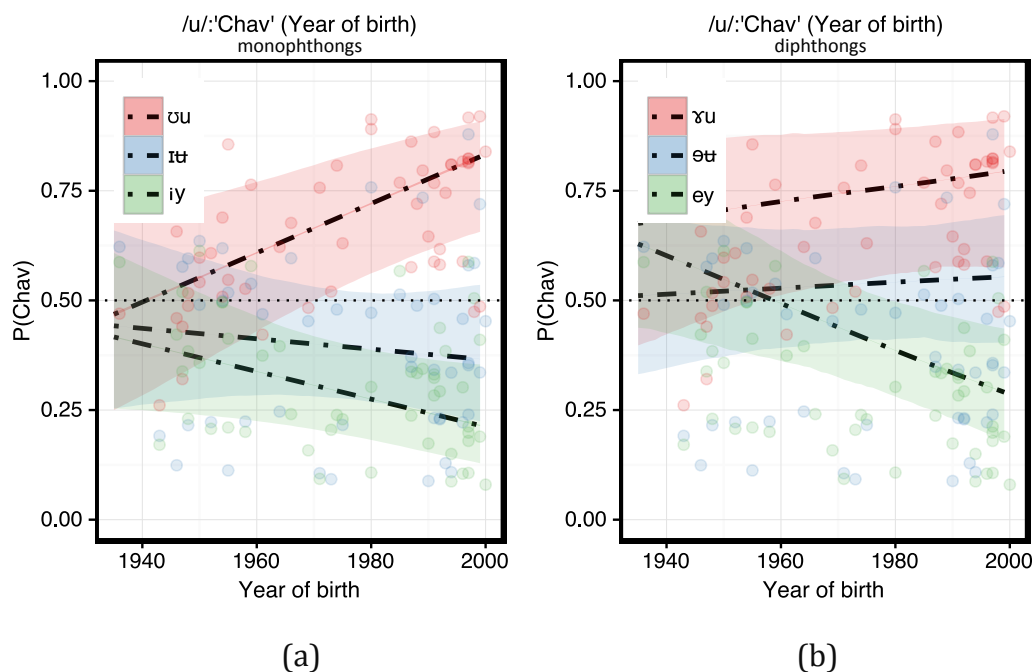


Figure 6.3.2: Interaction of Speech stimulus and Year of birth from the best model of 'Chav' selections for /u/, showing results for more monophthongal tokens (a) and more diphthongal tokens (b).

Similarly to the interaction effect found for /o/, these results suggest that younger York listeners associate the front-back dimension of /u/ with the 'Chav' stereotype in a way that older listeners do not. The odds that a listener born in 1940 will select the 'Chav' when hearing the back, more monophthongal variant are  $\sim 1.04$ , around chance level, while the odds that a listener born in 2000 will make the same selection are  $\sim 4.95$ , around five times larger. The results for diphthongal /u/ variants trend in a similar direction: the younger the listener, the larger the impact of the front-back dimension of /u/ on their 'Chav' selections.

While these results provide convincing evidence that younger listeners may perceive variation in /u/ in a different way to their older counterparts, it seems hard to motivate a role for the 'Chav' meaning in the propagation of /u/ fronting

in light of the production findings of the previous chapter. One of the most remarkable things about the fronting of /u/ is its social uniformity in production: the analysis of Chapter 5 provided no evidence of a differing adoption of fronted variants across gender, level of education, or with regard to any of the social scales tested. All younger speakers show some evidence of fronting, which is predicted very reliably by their year of birth alone. The present analysis suggests that awareness of the ‘Chav’ meaning of back /u/ increases in a similarly regular manner as a function of listener year of birth. However, there is no evidence that these two effects are related. A lack of evidence for a relationship between the social attitudes relevant to the ‘Chav’ stereotype and speakers’ production patterns makes it difficult to claim that fronting is facilitated by speakers’ distancing themselves from the social meanings identified in Chapter 5. While younger listeners appear to have re-analyzed back variants of /u/ as a ‘Chav’ feature, there is no evidence that their orientation toward this meaning impacts upon their production patterns, or on the propagation of innovative variants.

#### **6.3.4 Summary of interaction effects**

The key prediction of this analysis was that the speakers who show the most advanced /o/ fronting in production — younger speakers, those with more diverse social networks, and those with neutral or negative attitudes toward local regional identity — would be the most consistent in recognizing the indexing of back variants as ‘Chav’ features. This prediction was made based on the proposal that the move away from back /o/ variants in this community might be motivated by a re-analysis of the social meaning of back variants as ‘Chav’ features by those speakers, leading to their avoidance of those features in production.

The results show convincing evidence of age-related differences in the social perception of /o/, but no clear relationship between the other predictors of /o/

fronting and the perception of this vowel as a ‘Chav’ feature. Controlling for this age effect, there is no evidence that the speakers who lead in the adoption of fronted variants are more aware than others of the indexical mapping of back /o/ to the ‘Chav’ character — rather, it seems that younger speakers in general have begun to interpret backness as a ‘Chav’ feature, regardless of whether they are among the groups who show more advanced fronting in production. The fact that a similar effect of age was found for social selections in response to variation in /u/ casts further doubt on the proposal that the re-analysis of backness as ‘Chav’ facilitates fronting. Both /u/ and /o/ show a robust effect of age on listeners’ social selections, but the two changes show a very different relationship with social attitudes and social network structure in production: /o/ fronting is conditioned by social network structure and social attitudes, while /u/ fronting is proceeding in a very socially uniform manner. While there is a strong basis for hypothesizing a social motivation for /o/ fronting (the apparently rapid shift away from back diphthongs discussed in section 6.2.3), there is no clear reason to propose such a motivation for /u/ fronting. Based on this analysis, it seems more likely that the effect of age on ‘Chav’ selections represents a general tendency for younger speakers to recognise outgoing forms as socially-marked, without necessarily influencing their adoption or rejection of innovations.

How do these results relate to the claims of social-indexical versus change-by-accommodation accounts of linguistic change? Proposing a social-indexical analysis of /o/ fronting allowed very specific predictions to be made regarding the relationship between the social perception of variation in this vowel across speaker groups and their adoption of innovations in production. If it had been found that the same factors predicting a speaker’s adoption of more fronted /o/ realizations were those which predicted their recognition of back /o/ variants as ‘Chav’ features, this would constitute tentative evidence of a social-indexical motivation for the change, as outlined in section 6.2.3. The present results do not completely exclude this possibility — the factors known to predict /o/



fronting in production were shown to be related to the social perception of /o/ variation when tested independently. However, the influence of these factors was found to be non-significant once *Year of birth* was entered into the regression models, suggesting that controlling for listener year of birth, there is no significant relationship between social network diversity, social attitudes, and the social perception of /o/ variation. Furthermore, *Year of birth* also had a significant effect on the social perception of back /u/ variants, for which there were no strong predictions. In light of this, the results provide convincing evidence for a re-analysis of the indexical meaning of back variants of /u/ and /o/ as a 'Broad' or 'Chav' feature, but no clear evidence that this re-analysis has influenced the spread of the changes. It seems that /u/ and /o/ fronting may have proceeded without the influence of the social indexing of the two vowels, with back variants becoming available as a social-indexical cue as consequence of the change, but not directly affecting it.

## **6.4 Indexical sensitivity and the leaders of linguistic change**

### **6.4.1 Measuring sociolinguistic awareness**

The previous section tested the prediction that the speaker groups who lead in the fronting of /o/ would be more consistent in recognizing back variants as 'Chav' features than others. This was based on the proposal that those speakers may have begun to associate of those forms with a new social meaning, leading them to avoid back variants in production. One of the issues of such an approach is that even if the expected pattern had been found, it could still be argued that the factors influencing sociolinguistic perception are the same factors which influence speech production, without the two processes necessarily being related. This section approaches the problem from a different angle — instead of asking whether the groups who lead in fronting are more aware of the 'Chav' meaning of back variants than others (predicting perceptual awareness on the basis of production behaviour), it tests the prediction that a speakers'

awareness of the relationship between variation in /o/ and the 'Chav' stereotype might influence their production behaviour. This is something which might be expected under a social-indexical account of change in this vowel, reflecting the claim that speakers' production patterns are influenced not only by their social attitudes and social network structure, but also by their knowledge of the possible social meanings of variation in /o/.

In order to test this prediction, the perception data were used to generate a set of variables representing individual speaker-listeners' awareness of variation in /u/ and /o/ as a cue to the 'Chav' stereotype. These measures were generated using the random coefficients from the best-fit mixed-effect models identified in the analysis of Chapter 4. Although the most common use of the random terms of mixed-effects models is to control for the effects of individual-level variation, they also have an analytical interpretation — they represent the estimated deviations from the population-level parameters for each sampling unit. This means that they can be used as a useful tool for investigating individual differences in the behaviour being modelled; in this case, the social classifications made by listeners in response to variation in /u/ and /o/. Treating the random terms of the perception models as an analytical tool was inspired by the approach of Drager & Hay (2012), who used the random intercepts of mixed-effects models to understand individual variation in the production patterns of New Zealand speakers. Hall-Lew (2013) has also used random intercepts to diagnose individual-level engagement in language change in San Francisco. The present analysis extends this approach to capture individual differences in sociolinguistic perception among York listeners.

In order to evaluate the effect of listeners awareness of the association between /u/ and /o/ variation and the 'Chav' stereotype, two measures of sociolinguistic awareness were created for each vowel, visualized in Figure 6.4.1. One of these reflected the influence of fronting on each participant's 'Chav' selections, and the other reflected the influence of diphthongization. For the first index, the

mean of the by-subject random slope estimates for the most back variants ([ou] and [o:]) was subtracted from the mean slope of fronted variants ([ey] and [ø:]) for each listener, providing a measure of the degree to which each participant associated back /o/ with the 'Chav' character. For the second index, the mean of the each listeners' random slope estimates for the diphthongal variants ([ou], [əu], [əʌ], [əʊ], [əy]) was subtracted from that subject's mean slope for monophthongal variants ([o:], [ø:], [ø:]), providing a measure of the degree to which each participant associated /o/ diphthongization with the 'Chav' character. Similar measures were extracted for fronting and diphthongization in /u/. The resulting values were then scaled and centred, resulting in a measure between -2 and +2 for each participant, where larger values reflect a greater degree of sensitivity to backness and diphthongization as 'Chav' features, relative to the typical behaviour of the sample. The following analyses will refer to these measures as each listeners' *indexical sensitivity* with regard to fronting and diphthongization and the 'Chav' category.

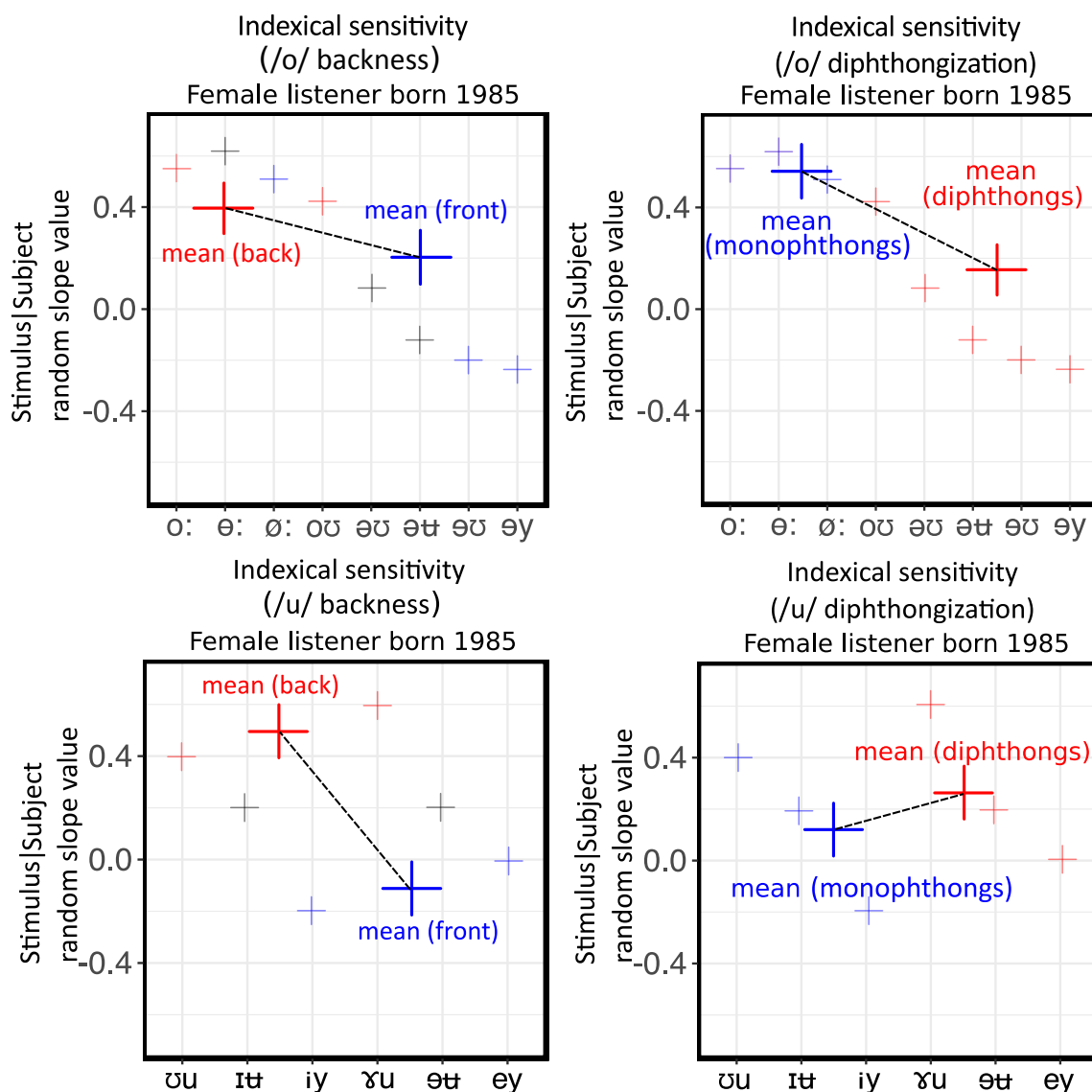


Figure 6.4.1: Indexical sensitivity measures for /u/ and /o/. In each case the sensitivity measure is the mean of each subject's random slope terms for the most back/diphthongal variants minus the mean of those for the most fronted/monophthongal variants.

## 6.4.2 Connecting perception and production

Figure 6.4.2 visualizes the relationship between listeners' perceptual sensitivity to backness and diphthongization as a cue to the 'Chav' stereotype, and their production values for /u/ and /o/. For both /o/ and /u/, the speakers with the

highest *Indexical sensitivity* values with regard to backness and the ‘Chav’ stereotype tend to have the most advanced F2 values. The indexical sensitivity measure significantly improves simple linear regressions predicting F2 at the 15<sup>th</sup> temporal measurement point of both vowels (/u/:  $\beta=0.04$ ,  $SE=0.008$ ,  $t=4.91$ ,  $p<0.001$ ; /o/:  $\beta=0.05$ ,  $SE=0.003$ ,  $t=13.38$ ,  $p<0.001$ ); the effects for Euclidean distances were non-significant in both cases.

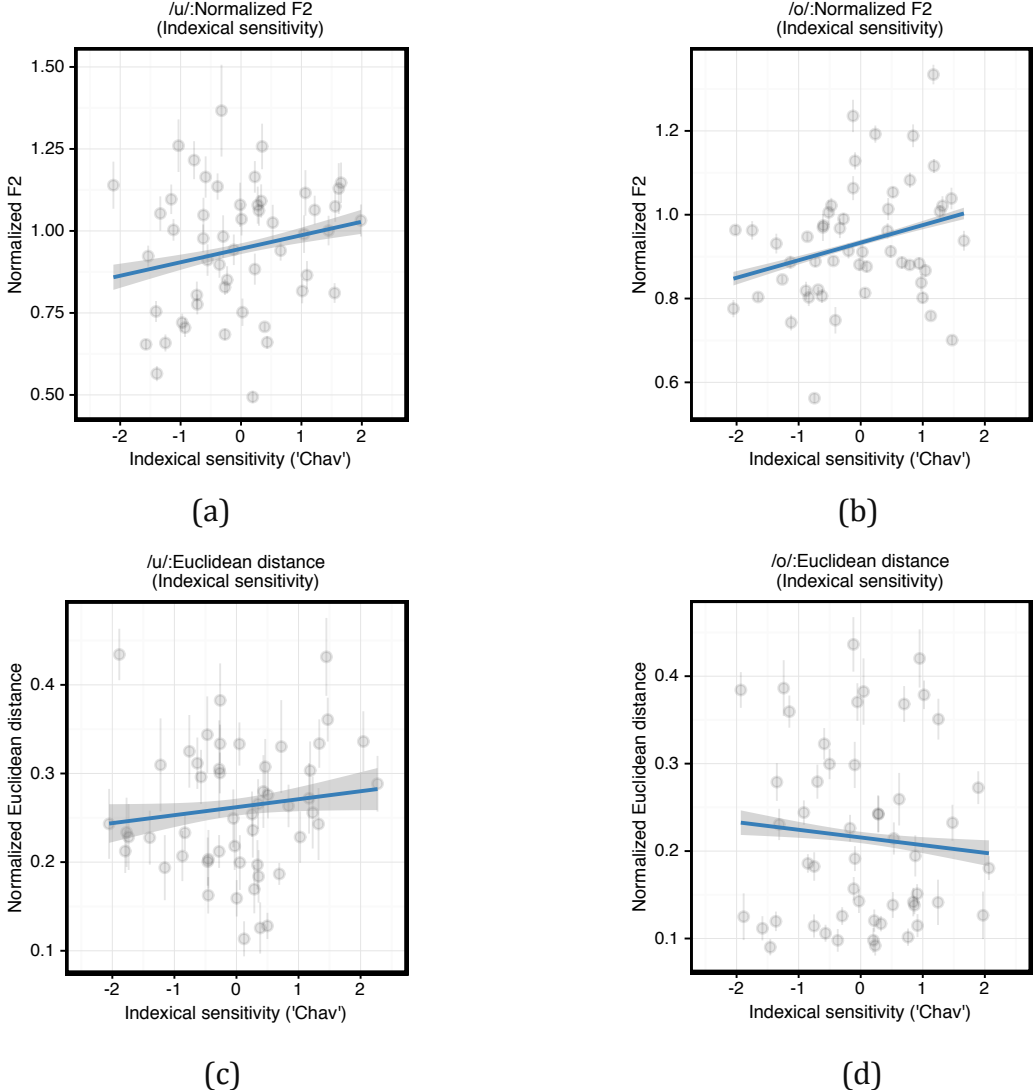


Figure 6.4.2: Normalized F2 and F1-F2 Euclidean distances as a function of the indexical sensitivity measures for the fronting and diphthongization of /u and /o/.

While Figure 6.4.2 implies that awareness of backness as a ‘Chav’ feature is a significant predictor of a speaker’s degree of fronting, there is an obvious confound — it is quite possible that the relationship between sensitivity to

backness and fronting simply arises due to both variables' association with *Year of birth*. In order to control for the factors already known to influence the production of /u/ and /o/ in this community, the *Indexical sensitivity* measure was added to the best-fitting mixed-effects regression models of F2 and Euclidean distances from Chapter 5. The contribution of *Indexical sensitivity* to model fit was assessed through single-term deletions from the full model.

Variable	Df	$\chi^2$	P( $\chi^2$ )
Preceding place	1	19.74	<0.001***
Following place x YOB	3	314.94	<0.001***
Log duration	1	29.66	<0.001***
Speech style	1	16.33	<0.001***
<b>Indexical sensitivity</b>	<b>1</b>	<b>3.78</b>	<b>0.05</b>

Table 6.4.1: Likelihood ratio tests for linear mixed-effects models of /u/ F2.

Variable	Df	$\chi^2$	P( $\chi^2$ )
Preceding place	3	22.61	<0.001***
Following place x YOB	3	26.92	<0.001***
Log duration	1	190.94	<0.001***
Speech style	1	7.36	<0.05*
York networks	1	4.35	<0.05*
<b>Indexical sensitivity</b>	<b>1</b>	<b>2.70</b>	<b>0.10</b>

Table 6.4.2: Likelihood ratio tests for linear mixed-effects models of /o/ F2.

Variable	Df	$\chi^2$	P( $\chi^2$ )
Preceding place	1	5.46	<0.05*
Following place	3	23.65	<0.001***
Log duration	1	111.90	<0.001***
Speech style	1	8.66	<0.001***
York attitudes	1	6.72	<0.05*
<b>Indexical sensitivity</b>	<b>1</b>	<b>0.82</b>	<b>0.36</b>

Table 6.4.3: Likelihood ratio tests for linear mixed-effects models of /u/ F1-F2 Euclidean distances.

Variable	Df	$\chi^2$	P( $\chi^2$ )
Preceding place	3	8.72	<0.05*
Following place	2	20.62	<0.001***
Log duration	1	127.19	<0.001***
Speech style	1	9.13	<0.001***
Parents' education	1	7.63	<0.05*
York attitudes	1	6.44	<0.05*
<b>Indexical sensitivity</b>	<b>1</b>	<b>0.51</b>	<b>0.47</b>

Table 6.4.4: Likelihood ratio tests for linear mixed-effects models of /o/ F1-F2 Euclidean distances.

Only in the case of /u/ fronting is there evidence that the *Indexical sensitivity* measure improves model fit ( $\chi^2(1)=3.64$ ,  $p=0.05$ ), and this effect is only marginally significant. Controlling for the effects of *Year of birth* on perceptual responses, individuals who were more consistent than average in distinguishing back and fronted variants of /u/ in the sociolinguistic perception task tend to have a more fronted realization of /u/ in production ( $\beta=0.004$ ,  $SE=0.002$ ,  $t(49.6)=2.14$ ,  $p<0.05$ ). While there no clear relationship between any social or attitudinal factors and the production of fronted /u/ variants was found in Chapter 4, this result implies that the leaders of change in /u/ may to be more aware of the possibility for back variants of /u/ to index 'Chav' than other speakers.

Although this result is what might be expected if speakers' awareness of the 'Chav' meaning of back variants influenced their production behaviour, such an explanation seems inconsistent with the fact that /u/ fronting shows no evidence of any social conditioning beyond the influence of age in production. If /u/ fronting were facilitated by speakers' distancing themselves from the social meaning of the back variants, this process should be visible in the social patterning of the innovation. If a relationship between *York attitudes* or *Class attitudes* and /u/ fronting had been found, the evidence of a role of awareness of the social indexing of back variants would be easier to interpret as reflecting a social motivation for /u/ fronting. However, there is no evidence of such a relationship. A further issue is the lack of evidence for a relationship between *Indexical sensitivity* and /o/ fronting. If the association between back variants and 'Chav' speech facilitates fronting, then why does this pressure not apply to /o/? The production analysis showed a clear effect of *York networks* on speakers' degree of /o/ fronting, as well as a relationship between *York attitudes*, and the diphthongization of this vowel. Given this evidence, there was arguably a stronger basis for proposing a social motivation for the adoption of fronted, diphthongal /o/ than fronted variants of /u/. However, only the results for /u/ show any evidence of a relationship between listeners' sensitivity to its

indexing as 'Chav' and their production patterns, once other conditioning factors are controlled for. In light of these issues, as well as the small size of this effect, it seems best to treat the results of the *Indexical sensitivity* analysis as inconclusive at this stage.

## 6.5 Discussion

The findings of the analyses presented in sections 6.3 and 6.4 demonstrate a strong relationship between the age of the listeners who took part in the perception experiment and their behaviour in the social perception task. The younger the listener, the more consistently they associated back variants of /u/ and /o/ with the 'Chav' character in the perception task, suggesting that this meaning may be a relatively new addition to the indexical field of /u/ and /o/, held particularly by younger York residents. However, it is not clear that the association between backness and 'Chav' speech has any direct role in the spread of innovative forms. Firstly, the lack of any effect of the other factors known to predict /o/ fronting on the perceptual results suggests that younger listeners *in general*, rather than the individuals who lead in fronting, have a sense of back variants as 'Chav' features. Secondly, the tendency for back variants to be associated with 'Chav' speech among younger listeners seems to apply not only to /o/, but also to /u/. There are good reasons to think that the fronting of /o/ might be influenced by its social meaning, given its social distribution in this sample (see Chapter 5) and the widely-reported association between diphthongization and regional identity (e.g. Watt, 2002). However, the case for a social motivation for /u/ fronting seems less convincing, given the socially-regular manner in which it seems to have spread in production. Thirdly, there is no strong evidence that speakers' production patterns are related to their awareness of the 'Chav' indexing of back variants, once other non-linguistic factors are controlled for.



The fact that /u/ and /o/ fronting seem to occur without the direct influence of speakers' awareness of their social meaning is consistent with a number of recent findings on speakers' awareness of sociolinguistic variation. For example, Nycz (2016) explored the acquisition and loss of dialect features among Canadians living in New York City. The author compared speakers' acquisition of the low-back (COT-CAUGHT) contrast and their maintenance/loss of Canadian Raising alongside their awareness of these features as regionally distinctive. Similar to the findings of this chapter, Nycz (2016) found a disconnect between speakers' explicit awareness of these features, their explicitly stated desire to avoid being identified as Canadian, and their production patterns. Most speakers retained Canadian Raising in some linguistic contexts, despite their awareness of this feature and apparent desire to avoid it. Speakers varied in their awareness of the COT-CAUGHT contrast, but this awareness was not related to their acquisition of the feature. The present results show a similar disconnect between speaker-listeners' awareness of the social meaning of a feature and their use of that feature in production: a speaker may be consistently identify back variants of /o/ as a 'Chav' feature, but retain a relatively back variant in production, despite the intense stigma associated with this figure.

Another example of a mismatch between listeners' awareness of the indexical meaning of a variable feature and their adoption of it as speakers can be found in Johnstone & Kiesling (2008). The authors investigated the maintenance of monophthongal (aw) in Pittsburgh. While this feature is generally receding in the dialects of Western Pennsylvania, the change appears to be occurring more slowly in the speech of people born in Pittsburgh, and particularly slowly among male speakers. In order to test the hypothesis that speakers' maintenance of the form was driven by the association of (aw) monophthongs with local identity, the authors systematically compared listeners' ability to perceptually identify (aw) monophthongs as a marker of 'Pittsburgher' speech with the degree to which they used those variants in production. The results were the exact opposite of their predictions: people who heard monophthongal (aw) as an

index of localness were *unlikely* to have this feature in their own speech, and many of the people who *did* monophthongize (aw) did not associate this variant with localness. While the present analysis has focused on the hypothesized avoidance of a stigmatized form, the pattern observed is similar: while the older variants of /u/ and /o/ are consistently recognized as ‘Chav’ features, the degree to which speaker-listeners recognise this meaning does not seem to be related in any straightforward manner to their use of the feature. These findings challenge explanations of speakers’ resistance to or adoption of linguistic innovations in terms of the social meaning of changing forms, at least if those explanations focus on specific characterological figures such as the ‘Chav’ or ‘classic New Yorker’ (Becker, 2014b). The results of this chapter suggest that some speakers may adopt or resist a linguistic innovation with very limited awareness of the meaning that an analyst has proposed may explain their behaviour.

The results of this chapter speak directly to Haddican et al.’s (2013) account of /o/ fronting in York, contradicting their claims regarding the role of the ‘Chav’ meaning in constraining /o/ fronting. Following the authors’ proposal that younger people in York have begun to associate fronted, monophthongal /o/ with the ‘Chav’, it might be expected that younger listeners would reliably map centralized and fronted monophthongs to the ‘Chav’ image, perhaps more reliably than they do back variants. However, this is not what the results of the present analysis suggest: although young people hear centralized monophthongs as ‘Chav’, they also map back monophthongs this meaning. This highlights the importance of supplementing production analyses with social perception data when making inferences about the social meaning of variable forms.

Despite the inconclusive findings regarding the possible social motivation of these changes, the finding that younger listeners are increasingly aware of backness as a cue to the ‘Chav’ character is an interesting one. There are a

number of possible explanations for this pattern. One possibility is that the effect is related to older listeners' level of comfort with the task. Many of the older participants were born in the 1940s, and would have been in their mid 70s at the time of data collection; in contrast, the youngest listeners were born in the late 1990s and early 2000s, with the youngest participant aged 16 at the time of data collection. While the task was relatively simple and designed to be as intuitive as possible, it is possible that the older participants found the task more demanding than younger individuals.

Another possible explanation is that the results are related to the effects of aging on speech perception. Although none of the participants reported any hearing impairments, there is good evidence that age-related decline in auditory and cognitive abilities may affect performance in speech perception experiments (e.g. van Rooij & Plomp 1989; 1990); it is also possible that speaker-listeners' general perceptual awareness of sociolinguistic variation declines with age.

One way of evaluating these possibilities is to consider the kind of effects which would be expected if the observed differences were caused primarily by general factors related to aging, rather than differences in the social meanings listeners of different ages assign to variation in /u/ and /o/. If the effects were caused by general factors related to the effect of age on speech perception, the effect would be expected to apply in a similar manner, across all the auditory stimuli: younger listeners would be more consistent than older listeners in mapping all variants of all vowels to the visual stimuli. The relative effect of the variants would be roughly the same, but more extreme among younger listeners than older listeners; in other words, the slope of the *Speech stimulus x Variant* interaction would be of a similar size across the auditory stimuli, and across the vowel categories. Figure 6.5.1 demonstrates that this is not the case.

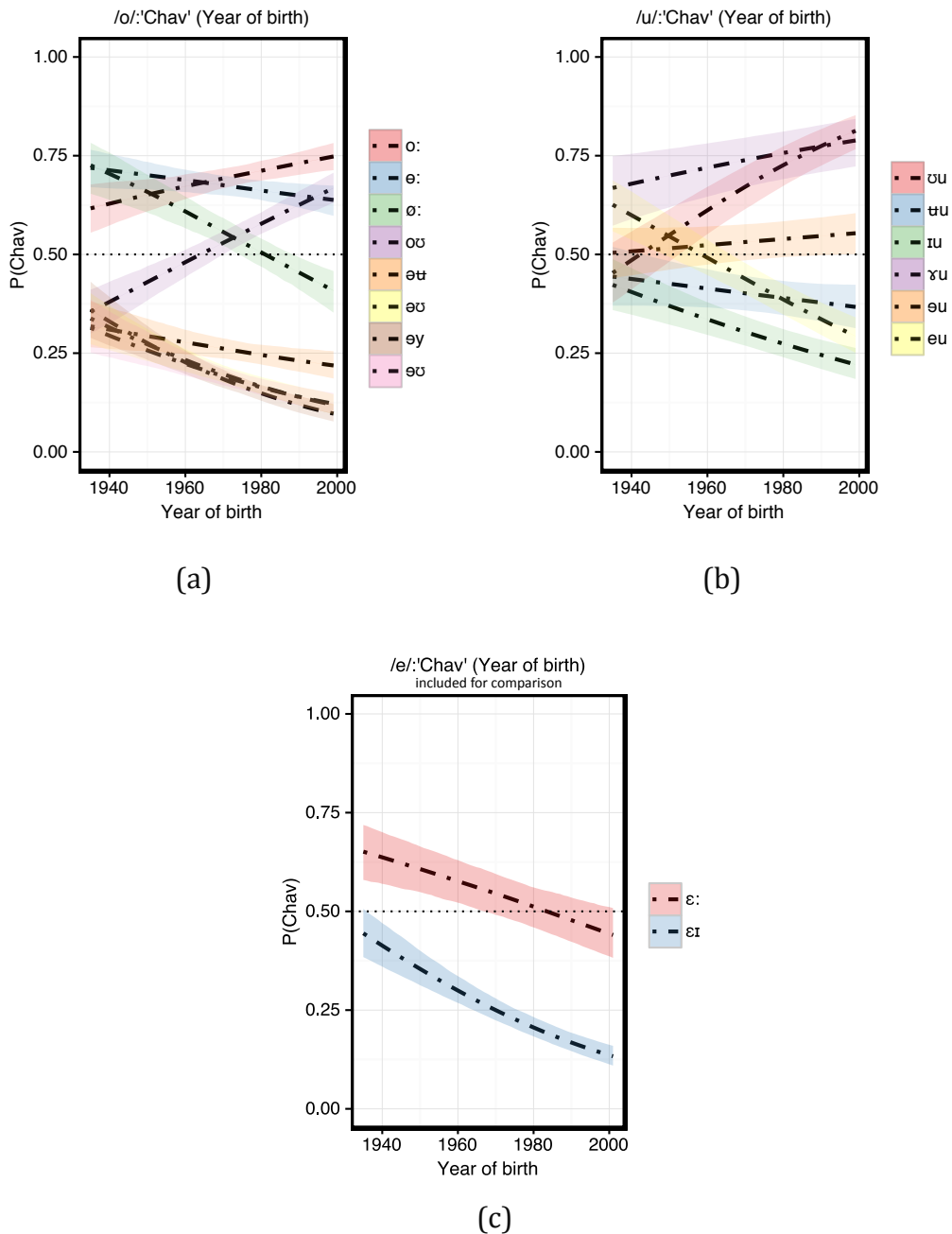


Figure 6.5.1: Effect of Year of birth on 'Chav' selections for all auditory stimuli. Confidence bands show the interquartile range around model estimates. While the perception and production of variation in /e/ has not been the focus of this thesis, it is included here for comparison.

While there appears to be general trend for younger listeners' responses to /u/ and /o/ be more consistent than those of older listeners, this effect is much more drastic for certain variants (e.g. back, diphthongal /o/) while others show

little variation across listeners of different ages (e.g. back, monophthongal /o/). Thus, while general age-related differences may have played a role in listeners' responses, they do not seem to account for the fact the effect of age seems to apply to specific variants of /u/ and /o/, rather than applying in the same way across the auditory stimuli. Although not the focus of this chapter, Figure 6.5.1 also includes results from a model of 'Chav' selections in response to variation in /e/. Similarly to /o/, monophthongal /e/ is widely-recognized as a marker of regional identity and social class in the North of England, evidenced here in the higher probability of a 'Chav' selection in response to monophthongal variants in comparison to diphthongs. Crucially, if the effect of age on social selections was solely related to a general effect of age on experimental performance, a similar interaction effect would be expected for /e/ as for the other vowels. In fact this is not the case — older speakers are equally consistent in distinguishing monophthongal and diphthongal variants of /e/, although they show a stronger bias toward a 'Chav' selection than younger listeners.

The evidence presented in Figure 6.5.1 suggests that a general effect of aging on perceptual behaviour cannot account for the major age-related effects in the social perception data. An alternative possibility is that these effects reflect a heightened sensitivity to sociolinguistic norms among adolescents and young adults (e.g. Wagner, 2012; Rickford, 2013). While this may have contributed to listeners' responses, what is interesting is that the differences across age groups appear to apply particularly to the social perception of *backness* in /u/ and /o/ — the property of the vowels which is most clearly undergoing change in production. The effect seems to not only reflect a heightened sensitivity to sociolinguistic variation among younger speakers, but a particularly heightened sensitivity to the social meaning of forms undergoing change.

Rather than being primarily due to the effects of age or life stage on general sociolinguistic awareness, these results are more consistent with the proposal that younger listeners perceive variation in /u/ and /o/ differently from older

listeners, possibly due to the changing social indexing of these vowels. It may be that these age-related differences in social perception reflect the relatively recent enregisterment of back /u/ and /o/ as 'Broad Yorkshire' or 'Chav' features, which has occurred in parallel with or subsequent to the change in production patterns. This would be consistent with Trudgill's (2008) proposal that social meaning is 'parasitic on, and subsequent to' linguistic change (p.251). Given the absence of a clear relationship between social attitudes and fronting in production, the lack of evidence that speaker-listeners' awareness of the social meaning of /u/ and /o/ is related to their production patterns, and the strong evidence of younger listeners re-analysis of backness as a 'Chav' feature, it seems likely that the fronting of /u/ has made back variants available for social indexing, rather than their indexing necessarily influencing the change itself.

A reasonable criticism of the claim that the age effect represents the changing indexical meaning of back /u/ and /o/ might be that the effect could be related to differences in the way the visual stimuli were interpreted by older and younger speakers, rather than reflecting differences in the perception of the changing vowels. For example, it is likely that older participants evaluated the 'Chav' image in a very different way to younger participants — perhaps they just saw it as a young man in a working-class area of York, rather than identifying the specific stereotype implied by the image. This could be related to the historical emergence of the 'Chav': this term is reported have first entered popular consciousness in the mid 2000s (Hayward & Yar, 2005), perhaps long after the older participants in the sample would have been sensitive to popular culture stereotypes. It could also be related to life stage: as a stereotype which specifically targets youth behaviour, it may be that the 'Chav' is particularly relevant to younger participants. These possibilities do not necessarily contradict the proposal that 'Chav' has been added to the indexical field of /u/ and /o/; the results still demonstrate that younger participants are able to identify the set of social characteristics and practices provided in the image

(such as being young, being from the Tang Hall area, and having an audaciously modified low-cost car), and map these to back /u/ and /o/ in a way that older participants do not. It may be that older participants associate back variants of /u/ and /o/ with a very different set of social meanings not tested in this experiment — this could be an interesting avenue of future research.

## **6.6 Conclusion**

### **6.6.1 Summary of findings**

This chapter has investigated how listeners differ in their awareness of the possible social meanings of changing linguistic forms, and has explored how those differences might impact upon their production patterns. Since some form of awareness of the possible social meanings of changing forms is central to many social-indexical accounts of linguistic change, it was proposed that such accounts can be used to make predictions regarding which speakers are likely to associate which aspects of variation in changing forms with which social meanings, evidenced in the consistency of their selections in the sociolinguistic perception tasks.

Following the above line of reasoning, section 6.2.3 put forward a specific hypothesis regarding the role of the ‘Chav’ figure in the spread of fronted variants of /o/. It was suggested that the rapid shift toward fronted, diphthongal variants among a subgroup of younger speakers might be motivated by their reanalysis of back variants of /o/ as ‘Chav’ features. Given the intense stigma surrounding the ‘Chav’ stereotype, it was suggested that its association with back /o/ might lead these speakers to avoid back variants, motivating them to adopt more fronted variants in production. This led to the prediction that the speakers leading in the adoption of fronted variants (younger speakers, those with few close ties to the local community, and those with negative or neutral attitudes toward local regional identity) would be more

consistent in mapping back /o/ variants to the 'Chav' character in the perception task than others. A further prediction put forward was that a speaker's degree of awareness of the association between back /o/ variants and the 'Chav' stereotype would be related to speakers' degree of fronting — the stronger a speaker associates backness with this stigmatized figure, the more likely they might be to adopt a fronted variant in production, in order to avoid being perceived as a 'Chav'. Since Chapter 5 found no clear evidence of social effects on change in /u/ (beyond *Year of birth*), no strong predictions were made regarding the relationship between sociolinguistic awareness and /u/ fronting.

In order to test these predictions, the first stage of the analysis explored the non-linguistic factors influencing the social perception of variation in /u/ and /o/ by extending the logistic regression models of Chapter 4. The second stage used the logistic regression models of Chapter 4 to generate a measure of each individual's awareness of the association between variation in /u/ and /o/ and the 'Chav' stereotype. This was then tested as a predictor of speakers' F2 and Euclidean distance values for /u/ and /o/, building on the production analysis of Chapter 5.

The results of this analysis provide strong evidence of a relationship between listeners' age and their perception of variation in the vowels under study, but no clear evidence of the predicted relationship between sociolinguistic awareness and speech production. While there was marginal evidence that listeners' sensitivity to backness in /u/ as a 'Chav' feature is related to their degree of fronting, this effect was very small, and the fact that no other social factors appear to influence speakers' adoption of fronted /u/ variants makes it difficult to form a strong argument for a role of the 'Chav' meaning in the fronting of /u/.

Overall, these results are consistent with previous findings which report a mismatch between speakers' awareness of the social meaning of changing forms



and their production patterns (e.g. Nycz, 2016; Johnstone & Kiesling, 2006). They imply that social meaning may play a very limited direct role in the spread of /u/ and /o/ fronting in York, at least under a model where speakers' awareness of the social meaning of innovations is central to their production choices. However, the results provide convincing evidence of a change in the indexical meaning of variation in /u/ and /o/: younger listeners appear to consistently recognize back variants as socially meaningful in a way that older listeners do not. This suggests that while the association of /u/ and /o/ variation with the 'Chav' stereotype may not have directly influenced the spread of fronting, the move toward fronted variants may have made the back-front dimension of these vowels available as a social-indexical cue among younger listeners.

### **6.6.2 Limitations of the present analysis**

The results of this chapter have demonstrated how a combined analysis of speakers' social perception of linguistic innovations and their production patterns can be used to test hypotheses regarding the role of social meaning in linguistic change. However, it should be noted that the analysis has a number of important limitations, which might inform the direction of future work.

Firstly, a major issue is that the analysis of this chapter is based around only one of the visual stimulus items: the 'Chav' character, which consisted of an image of a young man, an image of Tang Hall Working Men's Club, and a modified small family car. This specific image was developed based on the ethnographic analysis from Chapter 4, where these places and practices were found to be associated with the 'Chav' stereotype. While the training data and post-task comments provide good evidence that participants were able to identify this character as 'Working class', 'Young' 'Urban' and a 'Chav', it is possible that the effects found might not generalize beyond this stimulus item — with only one such item there is no way of testing this. However, although this chapter has

focused on the 'Chav' image specifically, an analysis of the other stimulus images suggests that a similar effect of age on social selections is present for all of the 'Broad Yorkshire' characters. This suggests that the effect is not related to some idiosyncratic aspect of this particular image, and that it may apply more generally to the perception of /u/ and /o/ as 'Broad Yorkshire', rather than just to the 'Chav' stereotype. A related issue regards the fact that the visual stimulus for the 'Chav' character was male. It is possible that including a female representation of the 'Chav' stereotype might reveal an influence of this meaning on production patterns not captured in the present analysis.

Another methodological issue regards the collinearity of the non-linguistic factors tested as predictors of perceptual responses in the analysis of this chapter. The key prediction tested in section 6.3 was that listeners' social selections would be influenced by their *York networks* and *York attitudes* scores. While listeners' selections appeared to be influenced by these variables when tested independently, these factors were eliminated from the final models due to their limited contribution to model fit over and above the effect of *Year of birth*. Since these factors were shown to significantly co-vary with *Year of birth* in the analysis of Chapter 5, it is possible that there may be an independent effect of these factors. However, any such effects cannot be distinguished from the influence of *Year of birth* in this dataset. A future study might attempt a similar combined perception-production analysis among a group of speakers where these factors might be more easily distinguished. Conducting a similar study in an environment where age-related differences are controlled for, such as a secondary school, might lead to clearer results. An additional methodological issue is the fact that the production data come entirely from tasks conducted in an experimental setting. It is possible that while sensitivity to social meaning is not related to participants' speech in these settings, differences might emerge in more naturalistic settings, particularly those which elicit expressive speech (see e.g. Podesva, 2007; Podesva et al., 2015).

In addition to the methodological issues discussed above, there are a number of conceptual issues with the present analysis which should be noted. This chapter has looked for the influence of social meaning on linguistic change by focusing on listeners' awareness of one very clearly specified meaning of variation in /u/ and /o/. The prediction that awareness of this particular meaning should be related to speakers' production patterns represents something of an oversimplification of theories of social indexicality. In particular, the concept of *underspecification* (Eckert, 2008; 2016) is central to these theories: the social meaning of linguistic variation is not necessarily strongly tied to specific stereotypes such as the 'Chav', but to a broader set of possible meanings which are activated depending on the context. This means that indexical meaning may influence the spread of fronted /u/ and /o/ in a way not captured by this analysis — for example, it could be that individual speaker-listeners' experience of the social meaning of /o/ variation is not necessarily tied to the 'Chav' character as tested in this chapter, but to a more diverse set of stances and characteristics, such as 'tough' or 'uneducated' (see Chapter 4, section 4.3.3), which may then impact upon their adoption or rejection of an innovation. This proposal is echoed in Johnstone & Kiesling (2008). The authors propose that, while some people's experience of social meaning may be influenced primarily by 'widely circulating metapragmatic practices that link forms and social meanings' (p.7), other individuals may 'draw on more personal experience to interpret meaning-form links' (Johnstone & Kiesling, 2008, p.7). This may be the case; however, it raises the question of how such idiosyncratic links can go on to influence population-level patterns of sound change, and how hypotheses regarding this influence can be evaluated.

A further conceptual issue is the assumption that some level of awareness of a possible social meaning of an innovation is necessary for it to influence speakers' production behaviour. The central assumption of this chapter has been that some ability to perceptually recognize the indexical meaning of a form is a necessary condition for a speaker's behaviour to be motivated by that

meaning. The model of sociolinguistic behaviour assumed has been one where speakers recognise the social meaning of individual variants in perception, then 'select' the appropriate forms in production to meet their social goals. This is not the only way in which social meaning could be imagined to influence speakers' behaviour, although it is the mechanism implicitly assumed in many sociolinguistic studies of linguistic change. For example, rather than individual linguistic forms, it is possible that the targets of socially-meaningful speech production are larger units, such as what Eckert (2008) refers to as *styles*. It may be that some elements of these units are more available to perceptual processes than others, but that the implicit grouping of linguistic features within these larger units means that they are produced as part of the style in question, without necessarily being associated with that style in perception.

Another interesting possibility is that speakers may not draw directly on individual language features when making socially-meaningful production choices. Rather, speakers may use more general aspects of speech production, such as the overall setting of the vocal tract, as the targets of identity work. If this is the case, it is possible that linguistic features may become associated with socially-meaningful language behaviour in production, without speakers necessarily being able to retrieve their meaning in perception. This would be consistent with recent discussions of *embodiment* in sociolinguistics (e.g. Podesva et al., 2015; Bucholtz & Hall, 2016). At the heart of these issues is a need within sociolinguistics to develop what Campbell-Kibler (2016) refers to as a 'cognitively realistic model of meaningful sociolinguistic variation': a clear understanding of what speaker-listeners know about the social meaning of linguistic variation, how this knowledge impacts upon their production patterns, and how this process could contribute to patterns of community-level linguistic change.

### 6.6.3 Implications for the thesis as a whole

The results of this chapter speak directly to the central question of this thesis:

*How, if at all, do the social meanings associated with linguistic innovations affect the way they spread across a speech community?*

The analysis presented in this chapter has demonstrated that despite clear evidence of a strong perceptual association between back /u/ and /o/ and the 'Chav' stereotype among younger speakers, there is no clear evidence of a link between a listeners' awareness of this association and their production patterns with regard to these vowels. Building on the findings of Chapter 5, these results suggest that the key factors influencing the adoption of fronted variants of /u/ and /o/ are related to speakers' age and social network structure, rather than their awareness of the social meanings associated with changing forms, or their attitudes toward these meanings.

Despite the considerable effort exerted in identifying a set of ethnographically-grounded social meanings for /u/ and /o/ variation and evaluating their influence on speakers' production behaviour, the results of this chapter and the previous ones seem inconsistent with an account of linguistic change where social meaning is central to the propagation of linguistic innovations. The evidence of a general tendency for younger speakers to attach new social meanings to the outgoing forms of phonological changes is more consistent with the proposal that linguistic change tends to happen *without* the direct influence of social meaning, with linguistic innovations becoming associated with social distinctions as the younger generation begin to notice their elders' speech as distinct from their own.

## 7. Conclusion

### 7.1 Summary of findings

This thesis has investigated the factors influencing linguistic change in an urban dialect of the North of England. The investigation was motivated by a debate surrounding one of the central ideas of sociolinguistics: that the social meanings associated with linguistic innovations influences their propagation across a speech community. This proposal has formed the basis of many sociolinguistic studies of community-level sound change, which were referred to as *social-indexical accounts* throughout the thesis. In contrast to these accounts, a number of authors have argued that social meaning may arise as a consequence of linguistic change, but with limited influence on the spread of innovations. These were referred to as *change-by-accommodation* accounts.

In **Chapter 2** it was argued that these competing accounts of linguistic change are underpinned by very different assumptions about sociolinguistic competence and its relationship with linguistic performance. Social-indexical accounts imply that speaker-listeners have some form of knowledge of the possible social meanings of changing forms, an ability to use the changing forms to construct social meanings in production, and an ability to co-ordinate these two processes in such a manner that socially-patterned regularities can emerge at the community level. In contrast, change-by-accommodation accounts make very few assumptions about these processes — all that is necessary is some form of bias for speakers to sound like those around them, and some form of constraint on who speaks to whom. While there are major differences in the parsimony of these two accounts of linguistic change and their implications for modelling the sociolinguistic competence of the individual, they are indistinguishable on the basis of production patterns alone: since social structure constrains who speaks to whom, both change-by-accommodation and social-indexical accounts predict that linguistic innovations will spread along social lines.

To distinguish between these two accounts, the present work investigated the fronting of the tense back vowels /u/ and /o/ in York, Northern England. **Chapter 3** provided an outline of the general research strategy, which focussed on triangulating evidence from three sources: sociolinguistic perception data, gathered through listeners' open-ended responses to extracts of York speech and a controlled sociolinguistic perception experiment; data on social attitudes, based on in-depth interviews with each participant; and production data, based on an acoustic analysis of their speech patterns. The possible role of social meaning in the changes under study was evaluated by examining the relationship between the social meanings associated with the changing forms, speaker-listeners' awareness of and attitudes toward those meanings, and their production behaviour. In Chapter 2 it was argued that social-indexical accounts of linguistic change predict a relationship between these factors, since speakers' adoption or rejection of an innovation comes from their assigning it a social meaning and drawing on that meaning to inform their production choices. In contrast, change-by-accommodation accounts predict that only speakers' exposure to the innovation, reflected in the structure of their social networks, should have a significant impact on their production patterns.

**Chapter 4** tested the prediction that variation in /u/ and /o/ would be assigned social meaning by York listeners. It did this by analysing listeners' open-ended reactions to natural speech samples and their responses to digitally-manipulated speech stimuli in a controlled sociolinguistic perception experiment. The results demonstrate that York listeners can use phonetic detail in /u/ and /o/ to distinguish between socially-meaningful visual stimuli in consistent ways, satisfying the basic prediction of a social-indexical account of linguistic change. Additionally, listeners' selections were found to be most consistent for four visual stimuli: the 'Student' and 'Businessman', who were consistently selected for fronted variants of /u/ and /o/, and the 'Chav' and 'Old Farmer', who were consistently selected in response to back variants. It was argued that this pattern reflects listeners' association of backness with a

socially-recognized register, which they refer to as 'Broad Yorkshire' in metalinguistic commentary. The 'Chav' and 'Old farmer' characters represent local stereotypes of 'Broad Yorkshire' speech, or the characterological figures (Agha, 2003) associated with this register.

Having established 'Broad Yorkshire' as the core meaning shaping listeners' perceptions of variation in /u/ and /o/, **Chapter 5** assessed the relationship between speakers' attitudes toward the values and practices associated with 'Broad Yorkshire' identities and their production patterns. Given the strong association between 'Broad Yorkshire' speech and the notion of authentic local identity, it was hypothesized that speakers who are invested in signalling their identity as 'Yorkshire born and bred' individuals might be expected to resist adopting innovative variants of /u/ and /o/. Additionally, it was suggested that the association of the 'Chav' figure with variation in /u/ and /o/ might lead speakers who wish to distance themselves from this highly-stigmatized stereotype to avoid back variants of these vowels. While such patterns would be reasonably expected under a social-indexical account of change in these vowels, a change-by-accommodation account would not predict such a relationship; rather, it would be expected that any differences in the adoption of fronted variants would be related to speakers' opportunities for contact with the innovative forms: speakers with the most exposure to innovations would be the most advanced with regard to the change in production, and those who have the least exposure would lag behind.

These predictions were evaluated by exploring the relationship between four social scales and speakers' production patterns. Two of these (*Dialect contact* and *York networks*) reflected speakers' opportunities for contact with innovative forms, including the degree to which they travel within the UK and the diversity of their social networks. The other two (*York attitudes* and *Class attitudes*) represented speakers' attitudes to the key associations of Broad Yorkshire speech uncovered in Chapter 4: local regional identity and social



class. The results of Chapter 5 suggest that /u/ is fronting in a very socially uniform manner, unaffected by any of the social factors tested. The fronting of /o/ was shown to be affected by the diversity of speaker's social networks, and the diphthongization of both vowels was shown to be related to their attitudes to local regional identity. However, no relationship between speakers' degree of /u/ and /o/ fronting and the social attitudes scales was found, contrary to the predictions of a social-indexical account. Overall, the production results provided no direct evidence of the role of social meaning in linguistic change — while variation in /u/ and /o/ was shown to be socially meaningful in Chapter 3, there was limited evidence that the meanings identified affect the spread of fronted variants in York.

**Chapter 6** approached the search for the role of social meaning in /u/ and /o/ fronting from a different angle, assessing the relationship between speaker-listeners' awareness of the possible social meanings of /u/ and /o/ variation and their production patterns. It was proposed that social-indexical accounts of linguistic change allow predictions to be formed regarding which speakers are expected to be especially sensitive to particular meanings of changing forms in perception. The analysis explored this proposal by motivating a specific hypothesis regarding /o/ fronting in York. It was suggested that the rapid move toward fronted, diphthongal /o/ among a subset of speakers might be due to their re-analysis of back variants of /o/ as 'Chav' features, leading them to avoid those forms in production. If this were the case, it would be reasonable to predict that the leaders of change in /o/ might be more perceptually sensitive to the 'Chav' association of backness than other speakers.

This hypothesis was evaluated in two ways: the first analysis tested the effect of the non-linguistic factors predicting /o/ fronting (the *York networks* and *York attitudes* scales) on listeners' social selections in response to variation in /o/ in the perception task. The second analysis tested the relationship between individuals' awareness of relationship between variation in /o/ and their

production patterns. The results provided strong evidence of a general bias for younger listeners to associate backness in both /u/ and /o/ with the 'Chav' character much more strongly than older listeners, which was argued to reflect the changing social meaning of these vowels in York. However, there was no clear evidence of a relationship between awareness of backness as a 'Chav' feature and a speakers' degree of fronting, as might be expected if this meaning were playing a role in the spread of fronted variants.

Overall, these results are inconsistent with an account of linguistic change where social-indexical meaning drives the spread of linguistic innovations. They provide strong evidence of a change in the social meaning of the two vowels, and of a trend toward more fronted variants in production, but no clear evidence of that social meaning is a motivating factor in linguistic change. York speakers' adoption of fronted variants of /u/ and /o/ is reliably related to their age, and in the case of /o/, the diversity of their social networks. These speakers also reliably associate variation in the changing forms with a range of social meanings in perception tasks. However, there is no clear evidence that their awareness of these meanings, nor their attitude toward them, plays a direct role in their adoption of innovations. Speakers may vary in how strongly they associate back variants of /u/ and /o/ with 'Yorkshire' identity, and how strongly identify as 'Yorkshire' people, but there is no evidence that these factors contribute to their adoption or rejection of fronted variants, which is what would arguably be expected if social meaning has a strong influence on the propagation of linguistic innovations.

## 7.2 Implications for theories of linguistic change

### 7.2.1 Social meaning may play a limited role in linguistic change

The findings of this thesis pose a challenge to the proposal that social meaning plays a central role in the propagation of linguistic innovations, as suggested by studies such as Labov (1963), Hall-Lew, (2009; 2013), Becker, (2014a; 2014b) and Watt (2000; 2002). To re-cap, this study has:

- Identified a set of social meanings which are central to York speakers' perceptual evaluation of a pair of vowel changes.
- Tested for a relationship between speakers' social attitudes with relation to those meanings and their production patterns.
- Tested for a relationship between speaker-listeners' perceptual awareness of those social meanings and their production patterns.

However, despite the effort invested in the steps above, there is no strong evidence for the role of social meaning in the spread of /u/ and /o/ fronting in York. Rather, the primary non-linguistic factors related to speakers' production patterns were their age (in the case of /u/ and /o/) and the diversity of their social networks (/o/). Crucially, it is not simply the case that these changes are taking place without attaching to any social meaning — there is clear evidence that York listeners hear back variants of both vowels as 'Broad Yorkshire' features, and that they hold a wide range of attitudes toward the social practices and values associated with this register. However, there is no clear evidence that these attitudes impact upon their speech patterns, suggesting that linguistic innovations may become perceptually available for social indexing, without this necessarily influencing their spread through the production patterns of a speech community.

This lack of evidence for a clear role of social meaning in linguistic change is unexpected under theories which propose a central role for social meaning in

the spread of linguistic innovations. This idea can be traced as far back as Sturtevant (1947), through to Le Page & Tabouret-Keller (1985), who treat the adoption of linguistic innovations as ‘acts of identity’ (p.181). Speakers are implied to evaluate incoming variants in terms of their social meaning, then adopt the variant most consistent with their social identity, resulting in socially-stratified patterns of linguistic change. Croft (2000) also aligns with this view, describing the social values associated with an innovation as providing a ‘selective advantage’ (p.182) for those variants over others, facilitating their adoption.

If such a process of social selection was central to the spread of linguistic innovations, it would be reasonable to expect a relationship between the social meanings listeners assign to changing forms in perception, their stated attitudes toward those meanings, and their production patterns. However, the present results provide only very limited evidence of such a relationship for the social meanings studied, despite the centrality of the ‘Broad Yorkshire’ register to York residents’ evaluation of speech. For the spread of /u/ and /o/ fronting in York, the move toward fronted variants is more likely to be driven by an internal pressure toward fronted variants (i.e. Labov’s (2001) *Principle III* of vowel-shifting), as well as a shift toward less locally-embedded social networks in this community. In this sense, the results agree more with Bloomfield’s (1933) *principle of density*, as discussed in Labov (2001):

*The principle of density implicitly asserts that we do not have to search for a motivating force behind the diffusion of linguistic change. The effect is a mechanical and inevitable one; the implicit assumption is that social evaluation and attitudes play a minor role.*

(Labov, 2001:20)

The present results support this view — rather than being clearly related to social attitudes, linguistic divergence in York seems more a matter of who interacts with whom. Labov (2001) has also expressed skepticism with regard

to the role of social meaning in linguistic change, suggesting that 'language change may simply reflect changes in interlocutor frequencies, which are in turn the result of changes in social preferences and attitudes' (p.191). This suggestion is echoed in the York data: younger people are increasingly likely to have social ties outside of the local community, and are increasingly less likely to express a strong positive attitude to local regional identity. The way people speak in York is also changing, as is the way they interpret the social meaning of the linguistic features undergoing change. However, it is not clear that the social meanings speaker-listeners assign to the changing forms have any direct bearing on their production patterns.

One criticism of previous arguments against the role of social meaning in linguistic change is that they have typically been made on the basis of a relatively simplistic understanding of social meaning. For example, Trudgill's (2008) argument that social identity may play a limited role in new-dialect formation primarily concerns *national* identity; Labov's (1972; 2001) work has focused primarily on broad social categories such as gender and social class. One reason that these researchers might report a lack of evidence for a role of social identity in linguistic change is that they rely on social categories imposed by the researcher, rather than attempting to understand the social meaning of changing features from the perspective of the community under study. This is what Eckert (2016) alludes to when she points out that 'arguments against the role of the social in sound change have fixated on macrosociological notions of identity' (p.81).

In light of the above criticism, a major contribution of the present work has been to draw on ethnographic and perceptual data to develop a nuanced and perceptually-grounded understanding of the social meaning of linguistic change in York. The perception results of Chapter 4 support the proposal that concepts such as *register* and *characterological figure* may be more adequate than broad social categories such as 'Working Class' or 'Urban' in explaining speaker-listeners' experience of sociolinguistic meaning, consistent with recent findings

on the social meaning of linguistic variation (e.g. Agha, 2003; Johnstone, 2008; Becker, 2014b). The analysis of Chapter 4 also highlights the range of stances and attitudes speakers may take toward the meanings indexed by variation in /u/ and /o/ (e.g. Moore & Podesva, 2003; Eckert, 2008). However, these do not seem to be related to their production patterns in any straightforward manner. The present study suggests that even when the analysis of indexical meaning goes beyond the macro-social, there remains no clear evidence for the role of social meaning in the propagation of linguistic innovations.

### **7.2.2 Comparison with previous findings on sound change and social meaning**

The lack of clear evidence for a role of social meaning in linguistic change reported in this dissertation contrasts strongly with the claims made in a number of previous studies. For example, Labov's (1963) report of advanced centralization of (ay) and (aw) on Martha's Vineyard is often cited as a case where the spread of a linguistic innovation can be explained by the social meaning of that feature. There are a number of differences between the present study and Labov (1963) which might lead to contrasting results. For example, it is possible that the isolated location and socio-historical situation of Martha's Vineyard in the 1960s made it easier for relevant social meanings and their effect of speech behaviour to be identified. However, the major difference is methodological: Labov's (1963) conclusions were based primarily on production data, supplemented by the author's knowledge of the social history of the community. It remains to be seen whether Labov (1963) would have made the same conclusions had the production analysis been supplemented with perceptual and attitudinal data: the central conclusion of the present study is that while variation in the adoption of innovations across social groups may point to a role of a particular social meaning in a given change, triangulating data from perception, attitudes and production may lead to very different conclusions.

Labov's (1972) study of language variation in the Lower East Side of New York provides an early example of a study supplementing production analysis with sociolinguistic perception data. Labov (1972) argued that the spread of coda /r/ was motivated by the prestige assigned to this feature, based on three observations: firstly, that the most rapid adoption of the innovation was visible in the speech of lower middle-class speakers, especially lower middle-class women. Secondly, that lower-middle class speakers tended to show more extreme behaviour in sociolinguistic perception tasks when reacting to the presence or absence of coda /r/, judging speakers who retained a non-rhotic more harshly than other listeners. Thirdly, lower middle-class speakers demonstrated the most extreme production differences across speech tasks, adopting higher rates of r-ful productions in more careful speech styles. The fact that the social stratification of coda /r/ across social groups was mirrored in their patterns of style-shifting, as well as their perceptual sensitivity to the social meaning of the feature, points toward a possible role of social meaning in the spread of rhoticity: the same people who showed the most rapid adoption of the new feature were those who were most sensitive to its social meaning in perception, and also showed the greatest degree of style-shifting across situations. Labov's (1972) result is quite different from the findings of the present study: in terms of /u/ and /o/ fronting in York, the greatest adoption of innovations was found among those with social ties outside of the local community, the greatest sensitivity to the social meaning of fronting was found among younger listeners in general, and no clear patterns were found with regard to fronting and style-shifting. This suggests that the patterns of social stratification observed in Labov's (1966, 1972, 2001) work, and in particular the relationship between style-shifting, sociolinguistic perception and speech production may not generalize across communities or variables: while prestige may have facilitated the spread of rhoticity in New York City, it is not clear that social meaning has played any direct role in the spread of /u/ and /o/ fronting in York.

Another example of study which has argued that social meaning plays a direct role in linguistic change is Hall-Lew (2013). Observing a rapid move toward the low-back merger among Chinese Americans and apparent resistance to merger among European Americans in San Francisco, the author argues that difference in adoption across ethnic groups might be related to a shift in local identity from 'Irish Parish' to 'New Chinatown' (p.384). The fact that sound change and social change have occurred in tandem might lead to the older forms becoming associated with older (European-American) norms, explaining the apparent resistance to merger among European Americans. A key difference between Hall-Lew (2013) and the present study is that the author does not present any perceptual or attitudinal evidence to support their claims — rather, the role of social meaning is primarily inferred from the group-level patterns observed in production. As with Labov (1963), it remains to be seen whether the author's account would hold up in light of perceptual and attitudinal evidence: demonstrating that the low-back merger is available as a perceptual cue to the social meanings related to 'New Chinatown' speech would lend weight to the argument, as would evidence that merger is most advanced among speakers who orient more strongly toward the values and practices associated with those meanings.

One study which has effectively integrated perception and production analyses in a study of sound change is Becker (2014b). Studying the perception and production of the BOUGHT vowel in New York City English, the author found apparent-time evidence that this vowel is lowering, reversing the change toward raised variants noted in Labov (1972). Comparing the progress of the change across ethnic groups and social strata, Becker (2014b) demonstrates that young people, white and Jewish speakers and middle class speakers are most advanced with regard to the change in production. Drawing on data from a sociolinguistic perception task, the author demonstrates that raised BOUGHT is associated with specific characterological figure: the 'classic New Yorker', who is white, old, mean and aloof. The author argues that this association motivates



white and Jewish speakers to avoid raised forms, in order to avoid being associated with the 'classic New Yorker' stereotype. While the perception data clearly support Becker's argument regarding the social meaning of raised BOUGHT, it is not clear from these data alone that the 'classic New Yorker' meaning directly influences the change: it is equally possible that some combination of phonetic factors and or changes in population structure have lead to the reversal taking place, with the 'classic New Yorker' meaning attaching only after the reversal began. Demonstrating a clear relationship between relevant social attitudes and speech production would support Becker's (2014b) argument more clearly. The present study attempted this for /u/ and /o/ fronting in York. identifying the social meaning of these vowels from perception data, then using these findings to make predictions regarding the relationship between social attitudes and speech production. While there was good evidence that the changes were associated with locally-meaningful social stereotypes, and evidence of a role of social network structure in the spread of innovative forms, there was no clear evidence of a relationship between social attitudes and speech production with regard to the changing forms. Thus, while both Becker (2014b) and the present study provide good evidence that the older forms of sound changes may attach to local social meanings, neither study provides clear evidence of a role of social meaning in linguistic change.

To summarize, several previous studies of sound change have argued for a central role of social meaning in linguistic change. For the most part, they have relied primarily on production analyses (e.g. Labov, 1963), or detailed analyses of the social histories of individuals and their speech patterns (Hall-Lew, 2013). While perception data have been collected in some studies (e.g. Becker, 2014b), the present study is the first to use perceptual data to form predictions regarding the relationship between the adoption of innovations and social attitudes. The central argument of the present work has been that, if social meaning plays a role in linguistic change in the manner proposed in previous

work, we would expect to observe a consistent relationship between the social meanings assigned to innovations in perception, social attitudes relevant to those meanings, and speakers' production patterns. However, the present study found no such evidence, despite strong evidence of consistent social evaluations of the forms undergoing change. This implies that in many cases social meanings may attach to linguistic innovations without directly affecting the trajectory of change.

### **7.2.3 On the limitations of production data in sociolinguistic studies of linguistic change**

The key innovation of the present work has been its attempt to systematically combine data from ethnographic analysis, sociolinguistic perception and speech production in a study of community-level linguistic change. Had these three sources of data not been triangulated, it is possible that very different conclusions would have been drawn. For example, looking at production data alone, it would have been perfectly reasonable to conclude that the apparent resistance to /o/ fronting among monophthongal speakers was related to the stigmatization of fronted /o/ monophthongs, as is argued by Haddican et al., (2013). This has important methodological implications, since the vast majority of studies presenting evidence for the role of social meaning in linguistic change have done so primarily on the basis of production patterns, sometimes supplemented by ethnographic observation and metalinguistic commentary. For example, Labov's (1963) claim regarding the social meaning of /aɪ/ and /aʊ/ centralization on Martha's Vineyard was based entirely on production data and the author's knowledge of the social history of the island. Watt's (2002) claims regarding the stigmatization of ingliding diphthongs in Tyneside is based exclusively on production analyses. Similarly, Haddican et al.'s (2013) social-indexical account of /u/ and /o/ fronting in York is based primarily on production data.

In each of the studies mentioned above, the approach is very similar: observing the patterning of linguistic innovations across speaker groups, the authors attempt to infer a social-semiotic function for the changing forms, and propose this as an explanation for the change. The problem with such an approach is that many possible processes might lead speaker groups to adopt innovations at different rates, and these are often indistinguishable based on production data alone. This point is clearly demonstrated by the present findings. The production findings of Chapter 5 are highly consistent with those of Haddican et al. (2013): /u/ fronting is advancing in a rapid and socially-uniform manner in this community, while /o/ fronting is advancing in a less rapid manner than /u/, with the fronting of /o/ less advanced among monophthongal speakers. If the present study had followed previous work in using production differences as the starting point for analysis, it might have reasonably been concluded, following Haddican et al. (2013), that the differences in adoption of fronted /u/ and /o/ reflect differences in the social meaning of those forms. Haddican et al.'s (2013) suggestion is that variation in /u/ is less socially marked than variation in /o/, and that younger York residents avoid fronted /o/ monophthongs due to the association of this form with the 'Chav' stereotype. In light of the present results, Haddican et al.'s (2013) account seems particularly unlikely: the analysis of Chapter 4 demonstrates that both /u/ and /o/ are available to index 'Broad Yorkshire' speech; the analysis of Chapter 5 provides no evidence that attitudes toward 'Chav' practices (e.g. antisocial behaviour and toughness) have any bearing on speakers' production patterns, and the analysis of Chapter 5 suggests that the younger listeners are *less* likely to hear centralized monophthongs ([ø]) as a 'Chav' feature than older listeners, in contrast to what might be expected based on Haddican et al.'s (2013) account.

The point here is that, based on production patterns alone, and even when accompanied with ethnographic analysis, there is no clear way of distinguishing between the possible processes which might lead speaker groups to adopt innovations at different rates. An important methodological contribution of the

present work is to demonstrate specific pitfalls that need to be considered in future research on linguistic change and social meaning:

**1. It cannot be assumed that the social meanings a researcher infers from production patterns are consistent with speaker-listeners' experience of those patterns.**

This point was demonstrated in Chapter 4, where it was argued that listeners' responses in the social perception task were strongly shaped by culturally-circulated ideas about language and social identity. Rather than directly reflecting the empirical distribution of variants across social categories such as age or social class, the meanings listeners assign to /u/ and /o/ variation in York are mediated by the association of these vowels and the 'Broad Yorkshire' register. Based on production patterns alone, it might reasonably have been proposed that /u/ fronting is associated with the social meaning of 'being young', as proposed by Haddican et al. (2013). However, the perception results suggest that listeners paid very little attention to age when inferring social identity from variation in /u/ and /o/. For example, while strongly associated with age in production, fronted variants of /u/ were mapped on to *both* older and younger characters in perception, but strongly disfavoured the selection of the 'Chav' and 'Old farmer' characters. It seems that their responses were shaped more by the beliefs and ideologies which circulate regarding language use than their awareness of the relationship between fronting and age in production. This could only have been discovered through the combined analysis of the sociolinguistic perception data and speakers' metalinguistic commentary.

**2. It cannot be assumed that all speakers in the community have access to the meaning proposed to explain their behaviour.**

This was demonstrated in Chapter 6, where listeners were shown to vary considerably in the consistency with which they recognised back variants of /u/ and /o/ as ‘Broad Yorkshire’ features. This finding contrasts strongly with Labov’s (2001) *Principle of Uniform Evaluation*:

*A regularly stratified linguistic variable is evaluated in a uniform manner by the speech community.*

Labov (2001, p.214)

This principle underpins many claims made in more recent sociolinguistic work, and has rarely been critically scrutinized. A large body of work has focused on theorizing differences in the level of awareness a community has of patterns of variation, or the ‘salience’ of those patterns. However, this work has rarely considered how forms may vary in salience for individual speaker-listeners – salience is treated as a property of the pattern under study, shared by the members of a speech community (e.g. Trudgill, 1974; Kerswill & Williams, 2002; Rącz, 2013; Watson & Clark, 2013). In studies such as these, it is implicitly assumed that the ‘salience’, ‘stigma’ or ‘prestige’ associated with language variation are a relatively stable part of the shared norms of the speech community. The results of this thesis suggest that this is not the case: speaker-listeners may vary in the social meanings they associate with linguistic innovations, and these associations may change over time: for example, older listeners in York hear back, diphthongal /o/ as relatively unmarked or standard, while younger listeners strongly associate this form with ‘Broad Yorkshire’ or ‘Chav’ speech. These results highlight how, when making claims regarding the social meanings of a language feature, it is essential to consider which meanings are associated with which forms by which speaker-listeners. Verifying these claims can only be achieved through sociolinguistic perception tasks which allow listener variation to be captured.

### **3. It cannot be assumed that speaker-listeners have sufficient access to and control of the form in question to use it as an identity marker.**

The key finding of this thesis is that despite perceiving changing language features as indexes of 'Broad Yorkshire' speech, York speakers' attitudes to the values and practices associated with the 'Broad Yorkshire' register have no discernable impact on their production patterns. In practice, this implies that a younger York speaker with a relatively back, monophthongal variant of /o/ is likely to be heard as 'Broad' by others, and potentially interpreted as possessing the social traits associated with 'Broad' speech: they may be heard as 'genuine' and 'authentic', or possibly 'rough' and 'uneducated', following the analysis of Chapter 3. However, there is no evidence that this speaker's desire to identify with any of these meanings will be reflected in their production patterns. In light of this, it seems problematic to argue that this speaker's maintenance of the outgoing form represents their socially-motivated resistance to linguistic change, as suggested by Haddican et al. (2013): instead, their production patterns may reflect their lack of access to the innovative form.

The above point is echoed by Johnstone & Kiesling (2008), who argue that sociolinguists need to be careful to avoid the 'intentional fallacy', or 'the assumption that it is possible to derive a speaker's intention from a hearer's interpretation' (p.7). While it is clear that speakers are able to use some aspects of linguistic variation as a resource for identity construction, this ability is limited by their access to and control of the forms in question, which needs to be considered when proposing a social motivation for a speaker's choice of a particular form. This lack of access can have real-world implications for how these individuals are perceived and treated by others – for example, it may inhibit their access to certain areas of employment (Milroy, 2002), their ability to access housing (Purnell et al., 1999), or even the outcome of a court judgement (Lippi-Green, 1994). It is thus important that, in foregrounding speaker agency in explanations of sociolinguistic behaviour, researchers do not

erase the importance of the social structures which restrict access to standard varieties and the ideologies which rationalize discrimination against those who do not possess them.

In summary, the findings of this thesis are of central relevance to sociolinguistic research. Firstly, they demonstrate that even when a phenomenologically-grounded approach to social indexicality is adopted, there is still limited evidence for the role of social meaning in sound change. This implies that many changes may spread without the direct influence of social meaning, even if they appear to be associated with a social meaning on the basis of independent perception and production analyses. Secondly, they demonstrate three possible pitfalls of relying primarily on production data in analyses of social meaning, highlighting the necessity of triangulating data on perception, production and social attitudes in sociolinguistic work.

## **7.3 Open questions**

### **7.3.1 Alternative roles for social meaning in linguistic change**

There are many possible mechanisms by which social factors might influence the propagation of linguistic innovations. This thesis has focussed on two extreme positions: at one extreme, the ‘change-by-accommodation’ accounts of scholars such as Bloomfield (1933), Trudgill (2008), and Kauhanen (2016) argue that social patterning of innovations arises from patterns of interaction alone, implying limited agency on the part of speakers. At the other extreme, the ‘social-indexical’ account of LePage & Tabouret-Keller (1985), invoked in recent work such as Haddican et al. (2013) and Becker (2014), implies that speakers have a very high degree of awareness and control of linguistic variation. Speakers are argued to be highly sensitive to the social values associated with changing forms, selecting the form most consistent with the social identity they wish to project. The present study has argued that there is limited evidence for the kind of mechanism implied by such an account. However, it is possible to

imagine other ways in which social meaning might constrain the spread of sound changes, which might form the basis for future investigations.

One possibility is that social identity may play a role in determining the structure of speakers' social networks, affecting the spread of innovations indirectly. This is the position taken by Labov (2001), who proposes that social attitudes may influence 'who a person talks to and how often they talk, and so affect the flow of linguistic influence and the diffusion of sound changes within and across local social networks' (p.49). A related possibility is that accommodation is filtered through identity factors: speakers may accommodate more to some interlocutors than others based on how they perceive their social identity, without necessarily targeting specific variants based on their social meaning. There is empirical evidence to support such a proposal — Babel (2010) found that New Zealand speakers' degree of accommodation to Australian model talkers in a shadowing task was influenced by their social-psychological orientation toward Australia, demonstrating that accommodation is 'simultaneously automatic and social' (p.437). Both of these mechanisms account for the fact that speakers are capable of making socially-agentive choices which may impact on their speech behaviour, without potentially overestimating speakers' awareness and control of patterns of linguistic variation. One way of investigating these possibilities in York would be to carry out a similar experiment to that of Babel (2010), replacing the regionally-accented talkers used in that study with talkers representing various degrees of 'Broad Yorkshire' speech. Social attitude indices such as those collected in the present study could then be tested as predictors of speakers' degree of convergence with the model talkers, testing the hypothesis that speakers who express more positive attitudes to Yorkshire identity are more likely to accommodate to 'Broad Yorkshire' speakers.

A second possibility is that social meanings other than highly enregistered constructs such as 'Broad Yorkshire' may play a role in linguistic change. One



interesting proposal is that the expressive meanings that can be communicated through vowel variation might facilitate the initiation and spread of vocalic changes. Eckert (1996) argues that preadolescent stylistic practice may be key to the propagation of linguistic innovations, a proposal supported by the author's evidence that younger teenagers deploy advanced variants of changes in progress in highly expressive performances of affect. Eckert (2010) has demonstrated how preadolescent girls in California use backed and lowered variants of /ow/ and /ay/ to express negative affect, and extreme fronted variants to express what she refers to as 'sweetness and light' or 'childlike innocence' (p.76). This evidence implies that that interactional meanings, particularly those related to affect, may play a role in the initiation and spread of linguistic innovations. However, the majority of studies of social meaning and linguistic change have focused on meanings related to enregistered ways of speaking (such as 'Broad Yorkshire') and conventionally-recognized social types (such as the 'Chav'). While there is limited evidence that social meanings of this type play a role in linguistic change, understanding the possible role of interactional and expressive social meaning in the spread of linguistic innovations represents an interesting avenue for further research.

### **7.3.2 Linguistic change and social meaning in a 'closed' system**

A recurring issue encountered in the present study regards the potential confounding of the independent variables. In York, linguistic change has been accompanied by social change, with older speakers' social attitudes and social network structure quite different from those of younger speakers. This means that it is difficult to distinguish the independent effect of these factors, or to account for the possible relationships between them. This thesis has followed conventional practice in sociolinguistic studies of sound change (e.g. Labov, 2001; Becker, 2014; Hall-Lew, 2013) by collecting data from a diverse sample of speakers of different ages and social backgrounds from the community under study. This approach allows the general patterns of variation and change in the

community to be captured very effectively; however, it may be that other types of data and methodologies are better suited to testing specific hypotheses regarding the mechanisms of linguistic change. In particular, collecting data in a context where speakers' social networks were more easily observable, and one where the set of social concerns relevant to language use were more stable, would make the task of distinguishing the possible role of these factors more manageable.

One possibility might be to follow Eckert (1999), Kirkham (2015), Mendoza-Denton (2008), and Alam & Stuart-Smith (2011) in studying language variation in a high school. The potential benefits of studying the spread of linguistic change in such a context are numerous: the fact that school forms the centre of most social interaction for adolescents means that their social network structures are likely to be more readily observable than in a community study such as this one. Adolescence is a time where people may engage in stylistic practice much more overtly than they do in adulthood (Eckert, 1999), meaning that capturing speakers' orientation toward the possible social meanings of innovations might be easier in a high school study than was found in the present work. A future study could adopt the methodological approach of the present work in the context of a high school, exploring the social meanings adolescents attach to linguistic innovations and how these meanings might facilitate or inhibit the spread of those innovations across social groups within the school. While Drager (2009) has combined ethnography with the analysis of speech perception and production in a high school, few studies since Eckert (1999) have focused specifically on the spread of linguistic innovations in such a context.



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## Appendix A

**Table A1: Open-ended evaluation stimuli**

Recording no.	Vowel	Variant	Speaker	Transcript
1.	/o/	[o:]	M,55	...I went out on t'main <b>road</b> , over this bridge; then he said well if you don't mind I'll have a go , I said I don't mind it's your wagon you own it...
2.	/o/	[əʊ]	F,56	...because she lives up Tranby avenue which is off Hull <b>Road</b> , and poor Jonothan goes to Badger Hill school. so if he went to Heslington Sunday School he'd be meeting children he knows.
4.	/o/	[o:]	F,35	...and there you can't cross over the street by car 'cos there's like barriers. We had to go right past the hotel to the end of the <b>road</b> and then come back on their side.
4.	/o/	[oʊ]	M,20	I've never been knocked off my bike. Erm, I've had an accident on my bike going over Lendal Bridge. They were resurfacing it and it was night and there was just this huge hole in the <b>road</b> that they hadn't marked out. They'd taken all the surface off and not put any bollards out, probably because they'd all been stolen.
5.	/o/	[ə]	F,43	...and that traffic can be queued back beyond Knavesmire <b>Road</b> , which never used to happen. So I dive off down Knavesmire <b>Road</b> now, an' round at Bishopthorpe <b>Road</b> , which is just creatin' more traffic on another <b>road</b> !
6.	/o/	[əʊ]	F,20	...you would think that if they want less people on the <b>road</b> then they would make the bus free...
7.	/u/	[ʊʊ]	F,80	...aye, he'd gone thinner an' all that; they didn't get the proper <b>food</b> like. They lived on corned beef an' all that
8.	/u/	[ʊʊ]	F,20	...they worked four hours in the morning and they got their accommodation and <b>food</b> and use of the sports facilities, so it was alright...
9.	/u/	[ɪʊ]	F,35	...and I remember there was a strawberry patch. Trust me to remember the <b>food</b> .
10	/u/	[ɪʊ]	F,20	...it was very nice <b>food</b> . I can't remember what it was but it was very nice.

**Table A2: Open-ended evaluation participants**

Interview	Name	Age	Occupation
1	Gemma	25	Student (Computer Science)
	Ollie	24	Student (Business Studies)
	John	25	Student (English Literature)
2	Eric	19	Barman (parents: probation officer/graphic designer)
	David	19	Student (Computer Science)
	Mark	18	Apprentice framer (parents: mental health workers)
3	Grant	46	Salesman - retail
	Lisa	36	Apprentice stonemason
4	Jane	51	Cleaner, part-time student
	Christine	27	Criminology graduate; flag marshal (motorsport)
5	Pauline	66	Retired, former school cook

## Appendix B

**Table B1: Summary of pre-task ratings for faces used in visual stimuli**

Image	Modal age category	Modal education category	Mean 'Typical Yorkshire?' rating	Mean attractiveness
	56-65	Undergraduate degree	47	59.7
	18-25	Secondary school	31.5	34.5
	18-25	Apprenticeship/Vocational training	42.4	43.9
	46-55	Postgraduate/professional degree	38.1	49.3
	18-25	Undergraduate degree	46.6	38.1
	56-65	Apprenticeship/Vocational training	41.8	59.3
	18-25	Apprenticeship/Vocational training	42.1	35.3
	46-55	Apprenticeship/Vocational training	41.5	62.1



**Table B2: Percentage of selected vs. target selections: Age**

		<i>Target</i>	
		<i>Older</i>	<i>Younger</i>
<i>Selected</i>	<i>Older</i>	97.1%	1.9%
	<i>Younger</i>	2.8 %	98.0%

**Table B3: Percentage of actual vs. target selections: Social class**

		<i>Target</i>	
		<i>Middle</i>	<i>Working</i>
<i>Selected</i>	<i>Middle</i>	95.4%	8.3%
	<i>Working</i>	4.5%	91.7%

**Table B4: Percentage of actual vs. target selections: Urban/rural**

		<i>Target</i>	
		<i>Urban</i>	<i>Rural</i>
<i>Selected</i>	<i>Rural</i>	4.5%	91.1%
	<i>Urban</i>	96.5%	8.9%

## Appendix C

**Table C1: Model comparisons for ‘older’, ‘working-class’ and ‘rural’ selections in response to variation in /u/**

Model	Df	logLik	deviance	$\chi^2$	$\chi^2$ Df	p (> $\chi^2$ )
WC~ Random terms	26	-1510.09	3020.19			
<b>WC~ Random terms + Speech variant</b>	31	-1495.92	2991.84	28.35	5	0.0000
Rural~Random terms	26	-1707.73	3415.46			
Rural~ Random terms + Speech variant	31	-1705.01	3410.02	5.44	5	0.3651
Older~ Random terms	26	-1709.31	3418.62			
Older~ Random terms + Speech variant	31	-1704.36	3408.72	9.91	5	0.0779

**Table C2: Model of ‘working class’ selections in response to variation in /u/**

Log-odds of a ‘Working class’ selection					
	$\beta$	$SE(\beta)$	$z$	$p(> z )$	
Intercept	0.312	0.108	2.897	<0.001	***
ou	0.723	0.206	4.509	<0.001	***
u	-0.755	0.199	-4.786	<0.001	***
iy	-1.075	0.191	-5.641	<0.001	***
ru	1.127	0.226	4.994	<0.001	***
eu	0.448	0.174	2.575	<0.05	*
ey	-0.468	0.205	-2.280	<0.05	*
$R^2_{McFadden}$	0.009				

**Table C3: Model comparisons for ‘older’, ‘working-class’ and ‘rural’ selections in response to variation in /o/**

Model	Df	logLik	deviance	$\chi^2$	$\chi^2$ Df	p ( $>\chi^2$ )
WC~ Random terms	41	-1784.78	3569.57			
<b>WC~ Random terms + Speech variant</b>	<b>48</b>	<b>-1759.00</b>	<b>3518.01</b>	<b>51.56</b>	<b>7</b>	<b>0.0000</b>
Rural~Random terms	41	-2234.42	4466.84			
<b>Rural~ Random terms + Speech variant</b>	<b>48</b>	<b>-2225.47</b>	<b>4450.94</b>	<b>15.90</b>	<b>7</b>	<b>0.0261</b>
Older~ Random terms	41	-2235.58	4471.16			
<b>Older~ Random terms + Speech variant</b>	<b>48</b>	<b>-2226.28</b>	<b>4452.56</b>	<b>18.59</b>	<b>7</b>	<b>0.0096</b>

**Table C4: Model of ‘older’ selections in response to variation in /o/**

	Log-odds of an ‘older’ selection			
	$\beta$	$SE(\beta)$	$z$	p( $> z $ )
Intercept	0.167	0.111	1.494	0.135
o:	-0.057	0.110	-0.518	0.604
ø:	-0.292	0.130	-2.258	<0.05 *
ø:	-0.209	0.123	-1.699	0.089
ou	0.052	0.112	0.468	0.640
əu	0.240	0.112	2.144	<0.05 *
əʊ	0.120	0.097	1.241	0.215
əʊ	0.309	0.108	2.868	<0.05 *
$R_{McFadden}^2$	0.004			

**Table C5: Model of ‘working class’ selections in response to variation in /o/**

Log-odds of a ‘working class’ selection					
	$\beta$	$SE(\beta)$	$z$	$p(> z )$	
Intercept	-0.366	0.097	-4.761	<0.001	***
o:	2.280	0.264	8.624	<0.001	***
ø:	1.767	0.237	7.461	<0.001	***
∅:	0.866	0.248	4.489	<0.001	***
ou	0.790	0.221	4.575	<0.001	***
əu	-1.277	0.230	-5.551	<0.001	***
əʊ	-0.818	0.216	-4.782	<0.001	***
əʊ	-1.779	0.275	-6.471	<0.001	***
$R_{McFadden}^2$	0.01				

**Table C6: Model of ‘rural’ selections in response to variation in /o/**

Log-odds of a ‘rural’ selection					
	$\beta$	$SE(\beta)$	$z$	$p(> z )$	
Intercept	0.093	0.083	1.109	0.268	***
o:	0.532	0.145	4.673	<0.001	***
ø:	0.362	0.126	2.872	<0.01	**
∅:	0.125	0.110	1.143	0.253	
ou	-0.053	0.107	-0.496	0.620	
əu	-0.122	0.105	-1.158	0.247	
əʊ	-0.342	0.108	-4.163	<0.05	**
əʊ	-0.212	0.112	-1.892	0.058	
$R_{McFadden}^2$	0.003				

**Table C7: Model comparisons for selections of each image in response to variation in /u/**

Model	Df	logLik	deviance	$\chi^2$	$\chi^2$ Df	p ( $>\chi^2$ )
Old doctor ~ Random terms	26	-1275.51	2551.02			
Old doctor ~ Random terms + Speech variant	31	-1270.40	2540.81	10.21	5	0.0696
Young doctor ~ Random terms	26	-1265.27	2530.53			
Young doctor ~ Random terms + Speech variant	31	-1260.30	2520.60	9.93	5	0.0772
Old farmer ~ Random terms	26	-1209.09	2418.17			
<b>Old farmer ~ Random terms + Speech variant</b>	<b>31</b>	<b>-1194.39</b>	<b>2388.78</b>	<b>28.60</b>	<b>5</b>	<b>0.0000</b>
Young farmer ~ Random terms	26	-1274.02	2546.03			
<b>Young farmer ~ Random terms + Speech variant</b>	<b>31</b>	<b>-1264.08</b>	<b>2526.17</b>	<b>19.86</b>	<b>5</b>	<b>0.0013</b>
Businessman ~ Random terms	26	-1232.57	2465.14			
<b>Businessman ~ Random terms + Speech variant</b>	<b>31</b>	<b>-1220.50</b>	<b>2441.00</b>	<b>24.14</b>	<b>5</b>	<b>0.0002</b>
Student ~ Random terms	26	-1248.76	2497.52			
<b>Student ~ Random terms + Speech variant</b>	<b>31</b>	<b>-1234.85</b>	<b>2469.71</b>	<b>27.81</b>	<b>5</b>	<b>0.0000</b>
Builder ~ Random terms	26	-1282.07	2564.15			
Builder ~ Random terms + Speech variant	31	-1279.66	2559.33	4.82	5	0.4384
Chav ~ Random terms	26	-1189.07	2378.14			
<b>Chav ~ Random terms + Speech variant</b>	<b>31</b>	<b>-1175.59</b>	<b>2351.17</b>	<b>26.97</b>	<b>5</b>	<b>0.0001</b>

**Table C8: Model of ‘Old Farmer’ selections in response to variation in /u/**

	Log-odds of an ‘Old Farmer’ selection				
	$\beta$	$SE(\beta)$	$z$	$p(> z )$	
Intercept	0.103	0.074	1.402	0.161	
ou	0.461	0.151	4.048	<0.01	**
u	-0.513	0.142	-4.622	<0.001	***
iy	-0.816	0.178	-4.571	<0.001	***
ru	0.769	0.163	4.716	<0.001	***
u	0.422	0.113	-4.725	<0.001	***
ey	0.103	0.074	1.402	0.161	
$R_{McFadden}^2$	0.01				

**Table C9: Model of ‘Young Farmer’ selections in response to variation in /u/**

	Log-odds of a ‘Young Farmer’ selection				
	$\beta$	$SE(\beta)$	$z$	$p(> z )$	
Intercept	0.024	0.121	0.197	0.843	
ou	-0.326	0.120	-2.717	<0.01	**
u	0.187	0.116	1.609	0.108	
iy	0.310	0.116	2.675	<0.01	**
ru	-0.493	0.134	-4.673	<0.001	
u	0.055	0.112	0.490	0.624	
ey	0.267	0.113	2.360	<0.05	*
$R_{McFadden}^2$	0.007				

**Table C10: Model of ‘Businessman’ selections in response to variation in /u/**

	Log-odds of a ‘Businessman’ selection				
	$\beta$	$SE(\beta)$	$z$	$p(> z )$	
Intercept	-0.207	0.105	-1.981	<0.05	*
ou	-0.405	0.135	-4.009	<0.01	**
u	0.556	0.135	4.125	<0.001	***
iy	0.466	0.122	4.832	<0.001	***
ru	-0.617	0.143	-4.306	<0.001	***
u	-0.246	0.122	-2.017	<0.05	*
ey	0.247	0.120	2.055	<0.05	*
$R_{McFadden}^2$	0.009				

**Table C11: Model of ‘Student’ selections in response to variation in /u/**

<b>Log-odds of a ‘Student’ selection</b>					
	$\beta$	$SE(\beta)$	$z$	$p(> z )$	
Intercept	-0.060	0.084	-0.709	0.478	
ou	-0.378	0.128	-2.950	<0.01	**
u	0.203	0.117	1.740	0.082	
iy	0.707	0.124	5.721	<0.001	***
ru	-0.701	0.117	-5.982	<0.001	***
əu	-0.074	0.111	-0.670	0.503	
ey	0.243	0.120	2.020	<0.05	*
$R^2_{McFadden}$	0.01				

**Table C12: Model of ‘Chav’ selections in response to variation in /u/**

<b>Log-odds of a ‘Chav’ selection</b>					
	$\beta$	$SE(\beta)$	$z$	$p(> z )$	
Intercept	0.038	0.145	0.262	0.793	
ou	0.721	0.165	4.361	<0.001	***
u	-0.458	0.165	-2.786	<0.01	**
iy	-0.908	0.160	-5.677	<0.001	***
ru	0.923	0.172	5.360	<0.001	***
əu	0.096	0.134	0.716	0.474	
ey	-0.373	0.176	-2.122	<0.05	*
$R^2_{McFadden}$	0.01				

**Table C13: Model comparisons for selections of each image in response to variation in /o/**

Model	Df	AIC	logLik	deviance	$\chi^2$	p ( $>\chi^2$ )
Old doctor ~ Random terms	41	-1684.97	3367.94			
<b>Old doctor ~ Random terms + Speech variant</b>	<b>48</b>	<b>-1676.33</b>	<b>3352.65</b>	<b>15.29</b>	<b>7</b>	<b>0.0325</b>
Young doctor ~ Random terms	41	-1672.3	3337.6			
Young doctor ~ Random terms + Speech variant	48	-1668.8	3336.6	6.92	7	0.4367
Old farmer ~ Random terms	41	-1499.79	2999.59			
<b>Old farmer ~ Random terms + Speech variant</b>	<b>48</b>	<b>-1479.76</b>	<b>2959.53</b>	<b>40.06</b>	<b>7</b>	<b>0.0000</b>
Young farmer ~ Random terms	41	-1652.41	3304.83			
<b>Young farmer ~ Random terms + Speech variant</b>	<b>48</b>	<b>-1644.44</b>	<b>3286.89</b>	<b>17.94</b>	<b>7</b>	<b>0.0123</b>
Businessman ~ Random terms	41	-1492.01	2984.01			
<b>Businessman ~ Random terms + Speech variant</b>	<b>48</b>	<b>-1472.32</b>	<b>2944.65</b>	<b>39.36</b>	<b>7</b>	<b>0.0000</b>
Student ~ Random terms	41	-1620.46	3240.93			
<b>Student ~ Random terms + Speech variant</b>	<b>48</b>	<b>-1598.08</b>	<b>3196.16</b>	<b>44.77</b>	<b>7</b>	<b>0.0000</b>
Builder ~ Random terms	41	-1688.74	3377.48			
Builder ~ Random terms + Speech variant	48	-1685.56	3371.12	6.36	7	0.4988
<b>Chav ~ Random terms</b>	<b>41</b>	<b>-1438.74</b>	<b>2877.48</b>			
<b>Chav ~ Random terms + Speech variant</b>	<b>48</b>	<b>-1414.19</b>	<b>2828.37</b>	<b>49.11</b>	<b>7</b>	<b>0.0000</b>



**Table C14: Model of ‘Old Doctor’ selections in response to variation in /o/**

Log-odds of an ‘Old Doctor’ selection					
	$\beta$	$SE(\beta)$	$z$	$p(> z )$	
Intercept	0.116	0.079	1.457	0.145	
o:	-0.200	0.132	-1.514	0.130	
ø:	-0.266	0.132	-2.011	<0.05	*
ø:	-0.336	0.144	-2.330	<0.05	*
ou	-0.169	0.114	-1.477	0.140	
əu	0.226	0.132	1.715	0.086	
əu	0.097	0.124	0.780	0.435	
əu	0.381	0.119	4.193	<0.01	**
$R^2_{McFadden}$	0.06				

**Table C15: Model of ‘Old Farmer’ selections in response to variation in /o/**

Log-odds of an ‘Old Farmer’ selection					
	$\beta$	$SE(\beta)$	$z$	$p(> z )$	
Intercept	-0.180	0.100	-1.811	0.070	
o:	1.389	0.201	6.923	<0.001	**
ø:	0.877	0.187	4.679	<0.001	**
ø:	0.341	0.136	2.512	<0.05	*
ou	0.498	0.161	4.099	<0.01	**
əu	-0.589	0.140	-4.201	<0.001	***
əu	-0.536	0.152	-4.538	<0.001	***
əu	-0.765	0.161	-4.756	<0.001	***
$R^2_{McFadden}$	0.06				

**Table C16: Model of ‘Young Farmer’ selections in response to variation in /o/**

Log-odds of an ‘Young Farmer’ selection					
	$\beta$	$SE(\beta)$	$z$	$p(> z )$	
Intercept	0.141	0.130	1.082	0.279	
o:	-0.339	0.160	-2.116	<0.05	*
ø:	-0.238	0.138	-1.723	0.085	
ø:	0.017	0.126	0.136	0.892	
ou	-0.477	0.119	-4.018	<0.001	**
əu	0.310	0.129	2.402	<0.05	*
əu	0.171	0.148	1.151	0.250	
əu	0.192	0.130	1.483	0.138	
$R^2_{McFadden}$	0.06				

**Table C17: Model of ‘Businessman’ selections in response to variation in /o/**

	Log-odds of a ‘Businessman’ selection				
	$\beta$	$SE(\beta)$	$z$	$p(> z )$	
Intercept	0.111	0.067	1.648	0.099	
o:	-1.249	0.211	-5.930	<0.001	**
ø:	-1.191	0.220	-5.418	<0.001	**
∅:	-0.280	0.186	-1.507	0.132	
ou	-0.324	0.127	-2.539	<0.05	*
əu	0.995	0.191	5.207	<0.001	***
əʊ	0.560	0.149	4.748	<0.001	***
əʊ	1.093	0.198	5.519	<0.001	***
$R^2_{McFadden}$	0.06				

**Table C18: Model of ‘Student’ selections in response to variation in /o/**

	Log-odds of a ‘Student’ selection				
	$\beta$	$SE(\beta)$	$z$	$p(> z )$	
Intercept	0.024	0.118	0.205	0.837	
o:	-0.840	0.153	-5.489	<0.001	**
ø:	-0.670	0.143	-4.692	<0.001	**
∅:	-0.428	0.121	-4.537	<0.001	**
ou	-0.272	0.127	-2.133	<0.05	*
əu	0.356	0.126	2.825	0.01	**
əʊ	0.497	0.127	4.919	<0.001	***
əʊ	0.470	0.134	4.500	<0.001	***
$R^2_{McFadden}$	0.06				

**Table C19: Model of ‘Chav’ selections in response to variation in /o/**

	Log-odds of a ‘Chav’ selection				
	$\beta$	$SE(\beta)$	$z$	$p(> z )$	
Intercept	-0.469	0.088	-5.356	<0.001	***
o:	1.314	0.184	7.122	<0.001	***
ø:	1.177	0.174	6.768	<0.001	***
∅:	0.613	0.188	4.264	<0.01	**
ou	0.657	0.174	4.781	<0.001	***
əu	-1.007	0.162	-6.201	<0.001	***
əʊ	-0.598	0.156	-4.835	<0.001	***
əʊ	-1.046	0.166	-6.318	<0.001	***
$R^2_{McFadden}$	0.06				

## Appendix D

### Examples of interview coding:

#### *D1: Dialect contact*

The *Dialect contact* variables represent factors related to the composition of participants' family and friendship groups, as well as their experience of travelling or living outside of York

**Table D1: Dialect contact (reproduced from Table 5.2.2)**

Category	Coding scheme
Family from the South of England	1 no; 2 extended family; 3 parent
Friends from the South of England	1 no; 2 mixed; 3 mostly from the South
Travels often in the UK	1 no; 2 neutral; 3 yes
Travels often internationally	1 no; 2 neutral; 3 yes
Involved with the university	1 no; 2 family member; 3 self
Involved in the service/ tourist industry	1 no; 2 family member; 3 self

These variables were coded based on speakers' direct responses to interview questions. For example, the following extract was coded '2' for 'Friends from the South of England':

(1) *LB\_290315 (26:40 – 26:55)*

*Lisa: Yeah I don't know really I mean I've got lots of quite close friends but **not** you know, I was focusing mainly around here to be honest but I've got lots of friends I met in Madrid that are you know living in London.*

## **D2: York networks**

*York networks* represents the degree to which speakers' possess strong ties to York, either through personal or professional connections.

**Table D2: York networks (reproduced from Table 5.2.3)**

<b>Category</b>	<b>Coding scheme</b>
Family from York	1 no; 2 extended family; 3 parent
Friends from York	1 no; 2 mixed; 3 mostly from York
Connection to carriageworks, chocolate factory or farming	1 no; 2 family member; 3 self
Involved in local interest groups	1 no; 2 family member; 3 self

This information was collected from speakers' responses to interview questions – for example, the extract below was coded as a '3' in the 'Friends from York' category.

(2) *JB\_260615 (07:50 – 08:20)*

*Interviewer: So would you say you have many friends from York?*

*John: Yeah. Um. Probably yeah. Well. No I would, **I would say most of my friends are from York.** There's a couple from other surrounding areas but. **Yeah.***

The third category in this group aimed to quantify speakers' connections to the industries which are recognised as identifiably 'local' in this community: the carriageworks, chocolate factories, glassworks, and farming. The extract below provides an example of someone strongly connected to local industry, who would receive a '3' for this category.

(3) *JG\_080615 (10:33 – 10:45)*

*Jill: York in my childhood was industry. **My father worked at Rowntree's, my mother worked and my sister worked at Terry's. Um I you know did holiday jobs in both and the railway.***

### ***D3: Class attitudes***

The *Class attitudes* variable was coded such that a higher score represented speakers who were more likely to distance themselves from ‘Posh’ people and more likely to report engaging in antisocial behaviour.

**Table D3: Class attitudes (reproduced from Table 5.2.4)**

<b><i>Category</i></b>	<b><i>Coding scheme</i></b>
Mentions ‘posh’ people negatively	1 neutral; 2 mentioned
Mentions Tang Hall/Acomb/Clifton negatively	1 mentioned; 2 neutral
Describes getting into fights/other antisocial behaviour	1 mentioned; 2 neutral

The most common way speakers referred to class in the interviews was in reference to ‘Posh’ people, which happened exclusively in instances where speakers distanced themselves from being ‘Posh’. For example, in the following extract, Henry describes his experiences at school, and explicitly identifies as ‘not posh’.

(4) *SL\_HK\_10615 (12:45- 13:09)*

*Henry: My group of friends were all different from everyone at that school. It were a posh school, Huntington School. An we weren’t posh. An then me an my mates weren’t posh. My group was just known for being the bad ones.*

Speakers who mentioned ‘Posh’ people and expressed a negative attitude toward them were assigned a ‘1’ in this category, and all other speakers were assigned a ‘2’. A number of speakers also explicitly referred to class anxiety, and were also assigned a ‘1’ in this category. For example, in the extract below, Steve describes his experience of changing schools as a teenager:

(5) SJ\_290615 (23:38 – 24:14)

Steve: *So I went there and you'd have groups and pockets of people from **Sort of families that you know earn more** and you sort of you project a sort of I think **it's a uh class anxiety and I had to deal with that when I first moved there.***

Unlike the focus group participants (see Chapter 4), no interview participants directly mentioned 'chavs' or class directly, but a number of participants expressed a negative attitude toward the same areas found to be associated with the 'Chav' stereotype in Chapter 4. For example, in the following extract:

(6) LB\_030715 (26:23-26:43)

Lizzie: *There's some a bit **mingin** places*

Interviewer: *Yeah. Which places?*

Lizzie: *When you go like through **Acomb** I like Acomb but **there's some places that I wouldn't walk alone at night***

Participants were coded 2 if they mentioned Acomb, Tang Hall or Clifton as places they would avoid, and 1 otherwise. The final category coded regarded references to antisocial behaviour. A number of participants described their involvement in antisocial behaviour – either getting in to fights at school and/or taking or selling drugs. For example, in the following extract, George describes attacking a 'Posh' student at his school:

(7) GR\_060715 (21:00-21:18)

George: *I tried to keep my head down but if you pop it up then **there's always a fist to your face or summat. All those posh twats that you've beaten up** 'cos they're just like I remember like some rude kid who's always being rude to my friends and being really ungrateful like so **I run up to him one morning and smacked him in the face.***

(8) ME\_250615 (04:36-04:55)

*Matt: Then some guy started on her, like had a massive go at her. So then like I stepped in. And then uh he took a swing for me but **as I swung for him** teacher saw me.*

*Interviewer: Yeah*

*Matt: Not him. 'Cos he's a goody-two shoes. I think 'cos I've got a couple people that I know from there that know me I've got a reputation already. So I got kicked out 'cos **I broke his glasses with one hit**.*

#### **D4 York attitudes**

*York attitudes* represents how strongly speakers identify as York/Yorkshire people, and the way in which they position themselves with regard to changes in the area. A higher score on this scale represents speakers who most strongly identify as authentic 'Yorkshire' people, and who feel most negatively about the decline of local industries and influx of tourists and students characteristic of York's recent history. Speakers who score highly on this scale are also unlikely to criticise York for its perceived parochialism and lack of cultural diversity.

**Table D4: Class attitudes (reproduced from Table 4.2.5)**

Category	Coding scheme
Plans to stay in York/Yorkshire	1 no; 2 neutral; 3 yes
Proud to be from York/Yorkshire	1 negative; 2 neutral; 3 positive
Attitude toward incomers to York	1 positive; 2 neutral; 3 negative
Attitude toward changes in York	1 positive; 2 neutral; 3 negative
Attitude toward parochialism in York	1 negative; 2 neutral; 3 positive
Complains about lack of diversity in York	1 mentioned; 2 neutral

Each speaker was asked directly about their plans to stay in York, and whether or not they were proud to be from York. The second of these questions elicited a range of responses. In the following extract, Barbara is clearly very positive, and was assigned '3' for this category:

(9) BL\_260615 (10:24-10:50)

*Interviewer: So would you say that you're proud to be from York?*

Barbara: ***Oh yes! I'm a real white rose girl, yeah.***

In contrast, Lisa is more reluctant to self-identify as a 'Yorkshire' person, leading her to be assigned '2' for this category.

(10) *LB\_290315 (16:40-17:20)*

Lisa: *You know I say I'm from Yorkshire, but I don't really class myself as ... I think because I've lived in so many different places and I've spent a lot of time around so many different people, **I don't feel that I'm specifically a Yorkshire person.***

A further category coded was *Attitude toward incomers*. Most participants made reference to the demographic changes which have taken place over the past 50 years, as in the following extract:

(11) *SC\_070615 (29:27 - 29:50)*

Simon: ***I think that York's been hijacked by a load of incomers.***  
*[laughter]*

Interviewer: *Right [laughs]*

Simon: ***Well it has! I'm one of the only – I don't meet many people who are actually are York people.***

Here Simon expresses a clear negative attitude toward 'incomers' from outside of York. Typically, these comments involved the university or students, tourists, or people 'from down South'. Not all participants' expressed a negative stance toward these groups. For example, in the extract below, Diane (a wheelchair user) adopts a positive stance toward tourism in York, which has led to increased facilities for people with mobility issues:



(12) DO\_290615 (33:07 – 34:00)

Diane: *I love the way the city has developed. There are those of my colleagues/friends who don't see it that way, **don't like the influx of tourism. I would focus on the fact that the provision of facilities for tourists and tourism have reverberated really well on me because I can access them as well.***

The *Attitude toward incomers* category was coded as 2 for participants who adopted a clearly negative stance toward incomers (like Simon), 2 for participants who were either neutral or did not mention the topic, or 3 for participants like Diane, who adopted a clearly positive attitude toward them. A similar category was coded for general *Attitudes toward changes in York*, which typically involved discussions of the loss of local industry:

(13) LL\_060715 (17:58 – 18:15)

Laura: *I suppose a lot of the places like Terry's have closed. I worked at Terry's for a while as a student. But that's now closed **which is quite sad really.** And I think a lot of the big you know places like the gas works and the glass factories and all these and **the printing factories have all gone which is sad.***

Again, while many York residents expressed a sadness with regard to changes such as de-industrialization, others were more positive about the growing affluence of the city:

(14) RP\_080615 (17:40 – 18:30)

Rebecca: *I think the um the whole culture of the place bars, restaurants are a lot more upmarket than they used to be.*

Interviewer: *Yeah*

Rebecca: *I remember from when I was younger when I first started going out in York it was very much the pubs sort of town-y type pubs um but now I think **you've got such a great choice** yeah there's some*

*really great real-ale type pubs if you want a cocktail you're spoilt for choice. I think York's got a lot to offer on a night.*

Another topic on which participants expressed a wide range of attitudes was a perceived parochialism associated with York. Despite being a city, many participants described York as a place where 'everyone knows everyone'. For some participants, this 'small-town' mentality was perceived as a positive aspects of life in York:

(15) TR\_080715 (12:18 – 12:40)

Trisha: ***York's quite small.** Every other person you see you probably know them somehow. Not quite on that scale obviously but **everybody seems to know everybody in York. And most people look out for each other obviously.** Erm but somewhere perhaps like Leeds it's a lot bigger scale and I dunno I'm maybe a bit of a wimp.*

Here, the fact that 'everybody knows everybody' is clearly a positive aspect of living in York for Trisha. In contrast, other participants expressed clearly negative attitudes toward this perception:

(16) LB1\_030715 (25:48 – 26:06)

Interviewer: *Is there anything you don't like about it?*

Lizzie: ***How small it is maybe. Yeah. I think it's weird. It's like everyone knows everyone in York.** So it's like you'll see someone and think 'oh no, I know them', so you can never go out just thinking oh OK I'm just going to have a nice time and then you'll always see someone like on a bus.*

Participants were coded '1' in this category if, like Lizzie in the above extract, they expressed negative attitudes toward parochialism. They were coded '3' if they expressed a positive attitude toward this topic (e.g. 'most people look out for each other'). Interviewees who did not mention this topic were coded '2'. A related issue often raised was a perceived lack of cultural diversity in York. For

many participants, this was something seen as lacking in comparison to surrounding urban areas:

(17)           LB2\_030715 (03:44-03:59)

*Interviewer: Do you think there are any negative things about living in York?*

*Laura: Uh **it's a very white place. It's hardly multicultural at all**, and it has stayed like that all the time so over in Bradford and Leeds you get much more variety of people.*

While a number of participants expressed a negative attitude toward a perceived lack of cultural diversity in York, there was no direct evidence of negative attitudes towards diversity. This variable was coded as a 2 if the issue was not mentioned by the speaker, or as a 1 if they expressed a positive attitude toward cultural diversity.

## Appendix E

**Table E1: Selection of best model of /u/ F2 (nested comparisons)**

Model	Df	AIC	logLik	deviance	$\chi^2$	$\chi^2$ Df	p(> $\chi^2$ )
Random terms	6	-601.43	306.71	-613.43			
Random + linguistic effects	11	-718.46	370.23	-740.46	127.03	5	<0.0001
Random + linguistic effects + style	12	-729.61	376.80	-753.61	13.14	1	<0.0001
Random + linguistic effects + style + year of birth	13	-764.71	395.35	-790.71	37.10	1	<0.0001
Random + linguistic effects * year of birth + style	17	-1058.86	546.43	-1092.86	302.15	4	<0.0001

**Table E2: Non-significant effects of social predictors tested in models of /u/ F2 (comparison with model 5 from Table E1)**

Model	Df	AIC	logLik	deviance	$\chi^2$	$\chi^2$	p (> $\chi^2$ )
Model 5 + parents' education	18	-1059.88	547.94	-1095.88	3.02	1	0.0821
Model 5 + York networks	18	-1059.08	547.54	-1095.08	2.22	1	0.1358
Model 5 + dialect contact	18	-1059.31	547.65	-1095.31	2.45	1	0.1176
Model 5 + class attitudes	18	-1058.19	547.09	-1094.19	1.33	1	0.2490
Model 5 + York attitudes	18	-1059.05	547.52	-1095.05	2.19	1	0.1388
Model 5 + gender	18	-1058.78	547.39	-1094.78	1.92	1	0.1657

**Table E3: Selection of best model of /u/ Euclidean distances (nested comparisons)**

Model	Df	AIC	logLik	deviance	$\chi^2$	$\chi^2$ Df	p(> $\chi^2$ )
Random terms	6	2466.04	-1227.02	2454.04			
Random + linguistic effects	11	2319.98	-1148.99	2297.98	156.07	5	<0.0001
Random + linguistic effects + style	12	2314.02	-1145.01	2290.02	7.96	1	0.0048
Random + linguistic effects + York attitudes	13	2308.83	-1141.42	2282.83	7.18	1	0.0074

**Table E4 Comparison of models of /u/ Euclidean distances including network/attitude variables**

Comparison	Df	AIC	logLik	deviance	$\chi^2$	$\chi^2$ Df	p(> $\chi^2$ )
Model 3	12	2314.02	-1145.01	2290.02			
Model 3 + York attitudes	13	2308.83	-1141.42	2282.83	7.18	1	0.0074
Model 3	12	2314.02	-1145.01	2290.02			
Model 3 + York networks	13	2309.63	-1141.82	2283.63	6.38	1	0.0115
Model 3 + York attitudes	13	2309.63	-1141.82	2283.63			
Model 3 + York attitudes + York networks	14	2309.54	-1140.77	2281.54	2.09	1	0.1482
Model 3 + York networks	13	2308.83	-1141.42	2282.83			
Model 3 + York attitudes + York networks	14	2309.54	-1140.77	2281.54	1.29	1	0.2561

**Table E5: Non-significant social predictors for /u/ Euclidean distances (comparison with model 3)**

<b>Model</b>	<b>Df</b>	<b>AIC</b>	<b>logLik</b>	<b>deviance</b>	<b><math>\chi^2</math></b>	<b><math>\chi^2</math> Df</b>	<b>p(&gt;<math>\chi^2</math>)</b>
Model 3 + year of birth	13	2313.66	2379.94	-1143.83	2.36	1	0.1246
Model 3 + class attitudes	13	2314.46	-1144.23	2288.46	1.55	1	0.2126
Model 3 + dialect contact	13	2315.11	-1144.56	2289.11	0.91	1	0.3413
Model 3 + parents' edu.	13	2315.73	-1144.86	2289.73	0.29	1	0.5924
Model 3 + gender	13	2381.10	-1144.41	2288.82	1.20	1	0.2739

**Table E6: Selection of best model of /o/ F2 (nested comparisons)**

<b>Model</b>	<b>Df</b>	<b>AIC</b>	<b>logLik</b>	<b>deviance</b>	<b><math>\chi^2</math></b>	<b><math>\chi^2</math>Df</b>	<b>p(&gt;<math>\chi^2</math>)</b>
Random terms	4	-2901.54	1454.77	-2909.54			
Random + linguistic effects	12	-3129.47	1576.74	-3153.47	243.93	8	<0.0001
Random + linguistic effects + style	15	-3223.14	1626.57	-3253.14	99.67	3	<0.0001
Random + linguistic effects + style + year of birth	16	-3237.13	1634.56	-3269.13	15.99	1	0.0001
Random + linguistic effects * year of birth + style	18	-3260.14	1648.07	-3296.14	27.02	2	<0.0001
Random + linguistic effects * year of birth + style + York networks	19	-3262.44	1650.22	-3300.44	4.30	1	0.0382

**Table E7: Non-significant effects of social predictors tested in models of /o/ F2 (comparison with model 5 from Table E1)**

Model	Df	AIC	logLik	deviance	$\chi^2$	$\chi^2$ Df	p(> $\chi^2$ )
Model 5 + parents' education	19	-3259.67	1648.84	-3297.67	1.53	1	0.2158
Model 5 + dialect contact	19	-3261.52	1649.76	-3299.52	3.38	1	0.0660
Model 5 + York attitudes	19	-3259.82	1648.91	-3297.82	1.68	1	0.1954
Model 5 + class attitudes	19	-3258.18	1648.09	-3296.18	0.04	1	0.8477
Model 5 + gender	19	-3153.49	1648.95	-3297.89	1.75	1	0.1858

**Table E8: Selection of best model of /o/ Euclidean distances (nested comparisons)**

Model	Df	AIC	logLik	deviance	$\chi^2$	$\chi^2$ Df	Pr(> $\chi^2$ )
Random terms	6	4436.49	-2212.25	4424.49			
Random + linguistic effects	12	4265.23	-2120.62	4241.23	183.26	6	<0.0001
Random + linguistic effects + style	13	4256.62	-2115.31	4230.62	10.61	1	0.0011
Random + linguistic effects + style + parents' education	14	4250.23	-2111.11	4222.23	8.40	1	0.0038
Random + linguistic effects + style + parents' education + York attitudes	15	4246.25	-2108.13	4216.25	5.97	1	0.0145

**Table E9: Non-significant social predictors for /o/ Euclidean distances (comparison with model 3)**

<b>Model</b>	<b>Df</b>	<b>AIC</b>	<b>logLik</b>	<b>deviance</b>	<b><math>\chi^2</math></b>	<b><math>\chi^2</math>Df</b>	<b>Pr(&gt;<math>\chi^2</math>)</b>
Model 3 + year of birth	14	4258.60	-2115.30	4230.60	0.02	1	0.8872
Model 3 + dialect contact	14	4258.35	-2115.18	4230.35	0.27	1	0.6037
Model 3 + york networks	14	4256.55	-2114.27	4228.55	2.08	1	0.1494
Model 3 + class attitudes	14	4257.73	-2114.87	4229.73	0.89	1	0.3445
Model 3 + gender	3872.20	3939.05	-1924.10	3848.20	0.02	1	0.8916



## Appendix F

**Table F1: Model comparison for ‘Chav’ selections in response to variation in /o/**

Model	Df	logLik	deviance	$\chi^2$	$\chi^2$ Df	Pr(> $\chi^2$ )
Random terms + Speech variant + Year of birth	180	-1428.06	2856.11			
<b>Random terms + Speech variant * Year of birth</b>	<b>187</b>	<b>-1411.45</b>	<b>2822.90</b>	<b>33.22</b>	<b>7</b>	<b>0.0000</b>
Random terms + Speech variant + Gender	180	-1364.03	2728.07			
Random terms + Speech variant * Gender	187	-1363.42	2726.83	1.23	7	0.9901
Random terms + Speech variant + Parents’ education	245	-1361.69	2723.37			
Random terms + Speech variant * Parents’ education	266	-1355.76	2711.51	11.86	21	0.9433
Random terms + Speech variant + York networks	180	-1362.74	2725.48			
Random terms + Speech variant * York networks	187	-1355.68	2711.37	14.11	7	0.0492
Random terms + Speech variant + Dialect contact	180	-1362.94	2725.88			
Random terms + Speech variant * Dialect contact	187	-1359.99	2719.97	5.90	7	0.5509
Random terms + Speech variant + Class attitudes	180	-1362.34	2724.68			
Random terms + Speech variant * Class attitudes	187	-1360.96	2721.92	2.76	7	0.9063
Random terms + Speech variant + York attitudes	180	-1364.10	2728.20			
Random terms + Speech variant * York attitudes	187	-1357.09	2714.18	14.02	7	0.0508

**Table F2: Single term deletions from maximal model of 'Chav' selections in response to variation in /o/**

<b>Model</b>	<b>Df</b>	<b>LRT</b>	<b>Pr(&gt;<math>\chi^2</math>)</b>
All interactions			
Variant:York_attitudes	7	9.90	0.19
Variant:York_net	7	10.39	0.17
<b>Variant:YOB</b>	<b>7</b>	<b>15.69</b>	<b>0.03</b>

**Table F3: Model comparison for ‘Chav’ selections in response to variation in /u/**

<b>Model</b>	<b>Df</b>	<b>logLik</b>	<b>deviance</b>	<b><math>\chi^2</math></b>	<b><math>\chi^2</math> Df</b>	<b>Pr(&gt;<math>\chi^2</math>)</b>
Random terms + Speech variant + Year of birth	112	-1200.77	2401.55			
<b>Random terms + Speech variant * Year of birth</b>	<b>117</b>	<b>-1186.46</b>	<b>2372.92</b>	<b>28.63</b>	<b>5</b>	<b>0.0000</b>
Random terms + Speech variant + Gender	112	-1149.40	2298.81			
Random terms + Speech variant * Gender	117	-1147.49	2294.98	3.82	5	0.5749
Random terms + Speech variant + Parents’ education	112	-1144.96	2289.91			
Random terms + Speech variant * Parents’ education	117	-1141.21	2282.41	7.50	5	0.1862
Random terms + Speech variant + York networks	112	-1150.38	2300.76			
Random terms + Speech variant * York networks	117	-1149.08	2298.16	2.61	5	0.7601
Random terms + Speech variant + Dialect contact	112	-1150.18	2300.37			
Random terms + Speech variant * Dialect contact	117	-1148.59	2297.19	3.18	5	0.6725
Random terms + Speech variant + Class attitudes	112	-1150.54	2301.08			
Random terms + Speech variant * Class attitudes	117	-1149.42	2298.84	2.24	5	0.8147
Random terms + Speech variant + York attitudes	112	-1148.85	2297.70			
Random terms + Speech variant * York attitudes	117	-1147.53	2295.06	2.63	5	0.7565

