Salience and social meaning in speech production and perception

Roy Alderton

Submitted in fulfilment of the requirements for the degree of Doctor of Philosophy in Linguistics

Department of Linguistics and English Language

Lancaster University

September 2019

Declaration

I declare that this thesis is my own work, and it has not been submitted in substantially the same form for the award of a higher degree elsewhere.

Roy Alderton

20th September 2019

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Abstract

Research has shown that phonetic features can index social meaning, yet less is known about whether this phenomenon occurs in the same way in speech production and speech perception. In particular, one of the factors that most seems to affect variables' capacity for social meaning-making is the notion of salience. This thesis addresses the question of how phonetic variation points to social meaning in speech production and perception and what role salience plays in influencing this process. I investigate these issues using a sociophonetic study of two phonetic variables currently undergoing change in the South of England – /t/-glottalling and GOOSE-fronting – as produced and perceived by adolescents at a state school and a private school in Hampshire, UK. While the former is reported to be highly salient with strong socio-indexical relations, the latter is said not to be very salient and to lack associations with speakers' social characteristics.

The production results show that /t/-glottalling displays macro-sociological variation in the community, while GOOSE-fronting varies between peer groups within the private school. Both features can be used to index stances in interaction, but this effect is much stronger for /t/-glottalling. In perception, listeners were easily able to notice glottal /t/ in auditory stimuli and consistently associated it with a set of related social meanings, yet this was not the case for fronted GOOSE. The findings have implications for our understanding of how the social meanings of phonetic variables are produced and perceived by the same individuals, especially in the contexts of adolescent peer groups at school and social stratification between different types of school. I argue that researchers employing the construct of salience in sociolinguistics should acknowledge the limitations and different dimensions of the concept and operationalise these in their study design.

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Acknowledgements

I am very grateful to a number of people who have helped me over the course of writing this thesis. All faults, of course, remain my own.

First, I offer a big thank you to the participants who lent their voices and views to this project, and to the staff at the three schools who allowed me to come and record them. It was a pleasure and a privilege to speak to such conscientious and articulate young people, without whom this thesis would not exist.

Massive thanks are due to my brilliant supervisors, Sam Kirkham and Claire Nance. Their academic expertise has been amazing but so has their support and patience. Working with them has been a wonderful experience from beginning to end and has undoubtedly made me a better researcher, learner, teacher and colleague.

I am also extremely grateful to the Department of Linguistics and English Language and the Faculty of Arts and Social Sciences at Lancaster University for the generous award of a Postgraduate Studentship to be able to conduct this research, and for further funding for conferences and training courses to disseminate and improve it.

I would like to thank the colleagues who served on my doctoral assessment panels and gave me valuable comments on my work: Luke Harding, Adrian Leemann and Alison Sealey. I also thank Luke Harding and Erez Levon for examining the thesis and providing robust and detailed feedback that helped make it better.

In addition, I am thankful for the people in the Department of Linguistics and English Language who made working there so enjoyable and productive. In particular, the members of the Phonetics Lab research group: Sam Kirkham, Claire Nance, George Brown, Ricky Chan, Adrian Leemann, Christin Kirchhübel, Max Topps, Luke Carroll, Bahar Aksu, Emily Gorman and Andrea Brink Siem. Thank you also to those with whom I could share the trials and tribulations of thesis writing, especially Daniel Alcaraz Carrión, James Balfour, Emma Franklin, Myriam Iliovits, Yejin Jung, Michael Ratajczak, Sayaka Sato, Laura Stiefenhöfer, Shungo Suzuki and Salomé Villa Larenas. Special thanks too to my office-mate Stef Strong for putting up with me and keeping me sane.

Finally, I'd like to express my deep gratitude to my friends, family, girlfriend and church family for their unwavering love, prayers and support as they shared the journey with me.

1 Introduction

This thesis is a sociophonetic investigation of the social meanings of phonetic variation in speech production and perception. I report on a study carried out on a sample of 16-19-year-old adolescents studying at two schools in Hampshire to explore how young people both construct and perceive the social meanings indexed by two phonetic features: /t/-glottalling and GOOSE-fronting. These two linguistic variables exemplify the high and low ends of a continuum of 'salience'. This term is used frequently in sociolinguistics to describe how some features undergoing variation and change in a community can typically be identified and commented upon by non-linguists, while others do not achieve this status. Salience is said to play a role in determining listener sensitivity to the socio-indexical associations of linguistic variables. The concept of salience itself, however, has proved notoriously difficult to define.

The thesis contributes to our understanding of these issues by exploring how the social meanings of two phonetic variables of supposedly different levels of salience, both of which are undergoing change in the South of England, are used and processed by the same group of speaker-hearers. In doing so, I seek to advance our knowledge of how social meaning works in production and perception and to make some suggestions for how to go about grappling with the concept of salience in future work in sociolinguistics. The thesis' focus on adolescent peer groups at school also allows me to discuss how language varies according to locally meaningful social categories, building on a rich vein of existing literature on how groups of teenagers use language as a stylistic practice in educational institutions. The study of speakers from two socially stratified schools – a state school and a private school – in a relatively prosperous rural location in southern England additionally enables me to offer some insight into related sociological and linguistic phenomena. These include the function of school type as a form of social class distinction in England; the school as a constellation of practice; and a survey of the spread of linguistic innovations in middle-class southern varieties of English.

I frame my discussion of these issues in this thesis using three main research questions:

1. To what extent are the patterns of sociolinguistic variation of phonetic features reflected in speakers' perceptions of these features?
2. Does a feature's availability for making social meaning depend on its fulfilment of salience criteria and whether it is noticed by speakers?
3. How do the production and perception of variables undergoing change operate on a local level among adolescents at a state school versus at a private school?

In Chapter 2, I describe the findings of previous work in the field. This includes an overview of the three 'waves' of variationist sociolinguistics, with reference to key 'third-wave' concepts such as social meaning, indexicality and style. I also review the literature on the notion of salience, explaining the different usages of the term and why it has been so difficult to come up with a single clear definition. In light of previous studies, I put forward my own operationalisation of salience, which distinguishes between the noticeability of a linguistic feature and its ability to index social meaning. In addition, I explore existing work on the language of adolescents, particularly third-wave work that has used the theoretical construct of the community of practice to analyse how teenage friendship groups play a role in developing innovative and socially meaningful linguistic practices. I also provide an overview of language variation and change in the South of England, focusing on regional dialect levelling and the rise of 'Estuary English'. I end the chapter by identifying the gaps in the literature and setting forth how the thesis aims to help fill them.

Chapter 3 covers the data and methodology used in the thesis, beginning with an introduction to the community under study in Hampshire. This includes information on the linguistic, geographical and socio-economic characteristics of the district of East Hampshire and the surrounding area. The following section outlines my research questions and how I go about answering them in the thesis. Part of the process of doing the research involved undertaking a pilot study in a separate school in the area, the design and results of which are summarised, before I provide details on the two schools at which I collected the main data and my experience of conducting fieldwork there. The final section lists how I went about measuring various social and linguistic variables used in the quantitative analysis. Particular attention is given to socio-economic class given the broadly middle-class character of East Hampshire, though details are also provided for other factors including parental region of origin, settlement type and word frequency.

The quantitative analysis of the two linguistic variables is presented in Chapters 4 and 5, which cover /t/-glottalling and GOOSE-fronting respectively. Both chapters follow the same basic format, starting with an overview of previous sociolinguistic research into the variables, establishing their patterns of variation, phonetic and phonological characteristics and how they are used for social meaning-making in speech production and perception. The main difference between the two chapters is in their respective methods sections, as tokens of /t/ were analysed via auditory coding, while tokens of GOOSE were subjected to acoustic measurement and vowel normalisation. Both variables were modelled using linear mixed-effects regression modelling according to exploratory principles of data analysis, which are described in the respective chapters. The results of the modelling are presented with graphical illustrations and considered in terms of the whole sample as well as a sub-set containing just the private school students in order to examine local factors within that school.

Chapter 6 examines the extent to which the quantitative patterns of variation in /t/-glottalling and GOOSE-fronting are mirrored in how individual tokens of these features

are employed for social meaning-making in particular moments of discourse. I do this by investigating how extremely high or low rates of glottal stops and acoustically extreme tokens of GOOSE are used by particular speakers to construct identity in interaction. My focus is on four speakers who best represent these extremes, presenting transcripts of the interactions and interpreting their stance-taking and other indexical work in relation to their use of the phonetic variables under study using Bucholtz and Hall's (2005) 'tactics of intersubjectivity' framework. This helps situate the variables as part of the overall construction of symbolic meaning by speakers to reinforce the stances and characteristics they project at specific moments in time, contextualising them as a form of stylistic practice.

The production data in Chapters 4 to 6 are complemented in Chapter 7 with the perception data. These data were elicited as two types of responses to four auditory stimuli featuring speakers recorded as part of the pilot study reading a short story. The responses encompassed a survey with multiple-choice answers capturing a range of traits that could be attributed to the stimulus voices, together with a conversation task during which listeners discussed their impressions of the voices and individual pronunciations of phonetic variables. The survey data are presented using descriptive statistics and graphs, while the conversation data are reported using transcripts of representative extracts of recorded interactions with participants. Together, the two types of perception data build a picture of how noticeable the listeners find /t/-glottalling and GOOSE-fronting as well as what social meanings they associate with them.

In Chapter 8, I summarise the findings of Chapters 4 to 7 and offer some interpretation of the patterns that I observe. My discussion is structured around my three research questions, focusing on how social meaning works in speech production and perception, the nature of salience in sociolinguistics and what the results tell us about adolescent language use at different types of secondary school. Throughout the chapter, I make suggestions for future directions to take in subsequent work. The findings are synthesised, and the thesis concluded, in Chapter 9.

2 Literature Review

2.1 Chapter overview

In this chapter, I contextualise the thesis in light of the findings of previous research. I first explain key theories in sociolinguistics such as indexicality and social meaning and how these have been used in studies of speech production and speech perception. I then describe how the term 'salience' has been used in previous literature and how it relates to social meaning. The following section reviews existing work on the language of adolescents, with particular reference to the concept of the community of practice, which has often been used when analysing adolescent peer groups. The fourth section introduces previous work on language variation and change in the South of England. In the final section, I make clear what the gaps in the literature are and how my study aims to advance our knowledge of social meaning, salience and young people's language.

2.2 Sociolinguistics and social meaning

2.2.1 Social meaning and indexicality

Since the beginning of research in sociolinguistics, studies have shown that different groups of speakers within a community use different forms of linguistic variables. Early work, pioneered by William Labov in New York (1966, 1972), showed that linguistic variation is often socially stratified according to macro-sociological categories such as age, gender and socio-economic class. Similar findings have been found by scholars all over the world in multiple languages and varieties (e.g. Wolfram 1969; Trudgill 1972, 1974; Cedergren 1973; Macaulay 1977; Modaressi 1978). Studies in this tradition, referred to by Eckert (2012) as the first of three 'waves' of the study of sociolinguistic variation, established common patterns such as the tendencies for working-class speakers to use more non-standard or 'stigmatised' features and for women to tend to lead sound changes. They also showed how different social situations, often placed on a continuum between formal and informal, cause people to vary in their use of some non-standard features, known as style-shifting (Labov 2001).

This early work established a certain way of viewing the relationship between linguistic variation, style-shifting and listener awareness, in the form of three terms: *indicators*, *markers* and *stereotypes* (Labov 1972). In Labov's terminology, sociolinguistic variables that are stratified according to macro-sociological identity categories such as age, gender and socio-economic class, yet do not shift according to speech style, are referred to as *indicators.* If a variable does display stylistic differentiation as well as social variation, then it is a *marker*. If a marker 'rises to overt social consciousness' (Labov 1972 p. 248), it becomes a *stereotype*. This model

is very helpful as it neatly captures how the social stratification of linguistic features is related to listener awareness of these features. One of the criticisms of this 'first-wave' work, however, is that sociolinguistic patterns tend to be interpreted in a static and deterministic fashion along broad macro-sociological lines; for instance, the statement that working-class men often use more stigmatised variants (especially in conversational style) is true for many studies but offers little insight into who counts as 'working class' in a given community or what it means for a feature to be 'stigmatised' among these speakers.

Work in the 'second wave' such as Milroy (1980), Cheshire (1982) and Holmquist (1985) showed the importance of understanding the local meaning of categories like age, gender and socio-economic class to see sociolinguistic variation as a phenomenon that is influenced by local factors such as social networks and groups of friends (Eckert 2012). These studies used ethnographic methods to understand what particular class or other group identities meant in the context of the local community. The 'third wave' builds on this by taking the focus away from simply investigating associations between linguistic variants, speaker identities and attention to speech, instead concentrating on the social meaning of linguistic forms – that is, 'the stances and personal characteristics indexed through the deployment of linguistic forms in interaction' (Podesva 2011, p. 234). In other words, research in this tradition considers language as a way for speakers to point to (or 'index') particular social characteristics that back up the message that they are making or the identity that they wish to project within specific interactions (Ochs 1992; Silverstein 2003). Linguistic variants are seen as a semiotic resource alongside clothing, gestures and other symbolic parts of human expression that can all do the job of making meaning in a particular moment of communication. These meanings span temporary conversational stances to stereotypical character types that, when invoked by a linguistic variant, may help reinforce the content of the utterance or the identity of the speaker via an indexical link (Silverstein 2003; Eckert 2008; Moore & Podesva 2009). The connections made between linguistic forms and social meanings are inherently ideological, which, according to Irvine and Gal (2000), take place via three semiotic processes: certain features may be seen as iconic of their speakers ('iconisation'); certain groups of speakers may be constructed in opposition to one another ('fractal recursivity'); and certain groups of speakers or their characteristics may be ignored or denied ('erasure'). In these ways, linguistic variables can come to be ideologically associated with particular stances, social groups or styles, simplifying the enormous variability between individual speakers and interactions into recognisable, distinct categories of people and their ways of speaking: an indexical relationship.

The notion of indexicality in variationist sociolinguistics is rooted in Silverstein's (2003) theory of *indexical order*. He uses the term *n-th order index* to refer to the indexical association between a feature and membership of some kind of group, such as macro-sociological category, without any ideological reinforcement or awareness on behalf of the members of the community. It is roughly equivalent to Labov's *indicator*. His *n+1st order index* refers to a variable that has become imbued with

sufficient social meaning to be internalised within members of a speech community and thus become part of a certain speech style. They thus are the equivalents of Labov's *marker* (if speakers are not aware of the ideological connotations of the variant) and *stereotype* (if speakers are aware). Yet Silverstein's ideas add a new dimension to this concept that is not captured in Labov's terminology, as the mere correlation between a variant and a social category as in traditional variationist study implies a fairly static, fixed association. Indexical order, however, shows how the fluid, ever-changing assignments of ideology mean that variants' social meanings can be continuously reinterpreted depending on the context, with new meanings adding to and potentially supplanting old ones (Silverstein 2003, Eckert 2008). For instance, Eckert (2008) uses Labov's data from the island of Martha's Vineyard (1963) to posit that some speakers took a variable that was already associated with the islanders – PRICE centralisation – and reinterpreted it as a stance of showing loyalty to the island and its traditional way of life and their opposition to tourism. Silverstein (2003) notes, however, that the process is not truly linear – indices overlap with each other, creating a complex cluster of potential meanings at different levels of consciousness and of varying associational strengths within a fluid ideological environment.

Related to indexicality is the notion of *enregisterment* (Agha 2003), which describes how a set of linguistic features (e.g. an accent or dialect) can become recognised by speakers of that language as distinct and emblematic of a particular regional or social group who use that set of features. Johnstone *et al.* (2006) reinterpret Labov (1972) and Silverstein (2003) to suggest that an *n*+1st order index that has gained yet more +1st meanings (Labov's 'stereotype') is now 'enregistered' with those meanings so that the relationship between the linguistic and the social is cemented for members of the community. Agha (2003) originally uses enregisterment to trace how Received Pronunciation (RP) became the prestigious 'standard' accent in England as from the 18th century, yet variationist sociolinguistic approaches to the concept have employed it to describe how particular linguistic variables have taken on such strong social meanings that they are seen as direct indices of particular places and speaker groups (Johnstone *et al.* 2006; Kirkham 2013; Jensen 2016), even to the point that they might be commodified by appearing on souvenirs, clothing or in popular music (e.g. Beal 2009; Johnstone 2009; Beal & Cooper 2015).

Eckert (2008) expands on these ideas with her concept of the *indexical field*. She defines it as 'a constellation of meanings that are ideologically linked' and 'an embodiment of ideology in linguistic form' (Eckert 2008, p. 464). She argues that when speakers use a particular variant, they are not simply adhering to their own pre-ordained social status or invoking a pre-existing indexical value (an *n*-th order index) – rather, they are making an ideological move which may well involve the above but equally may instead be staking a claim to a new indexical value that is often associated with an existing one (an *n*+1st order index). The constant reinterpretation of variables' social meanings, caused by speakers making different ideological moves in order to relate themselves in varying ways to pre-existing indexical values, means that a given variant can have multiple indices depending on the speaker, time, place,

interaction, context, etc., which together form the indexical field. This is well demonstrated in Figure 2.1, reproduced from Eckert (2008 p. 469), which shows her proposed indexical field for hyper-released /t/ in American English.

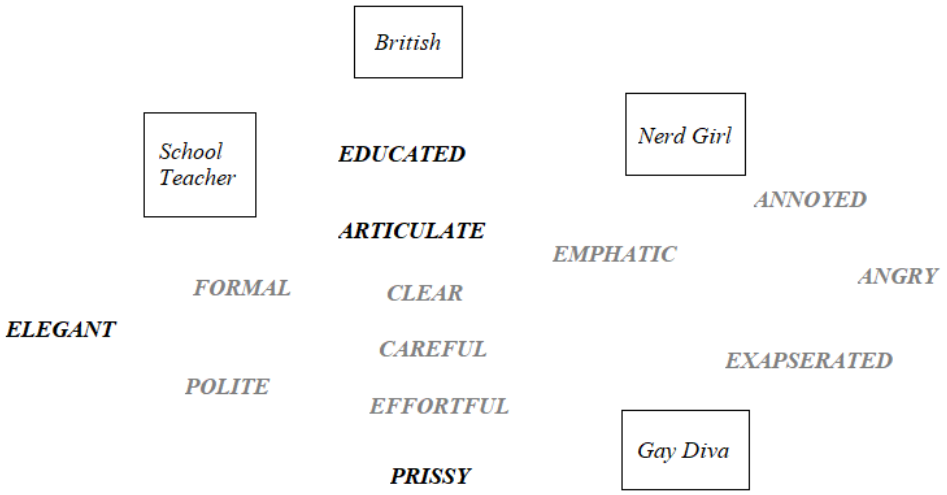

Figure 2.1: Indexical field of hyper-released /t/ in American English, adapted from Eckert (2008 p. 469). The words in grey represent stances, those in black represent permanent qualities and those in boxes represent social types.

/t/ release has been studied extensively in the United States and shows many social meanings in different contexts. For example, Bucholtz (2001, 2010) finds that released /t/ is used by a group of nerd girls in a school in California who distanced themselves from teachers and other students by projecting themselves as 'intellectual mavericks'. Also in California, Benor (2001) reports that among the students of an orthodox Jewish school, boys used significantly more /t/ release than girls – especially those boys who had formally studied the Talmud at a rabbinical school, and particularly when they were having an intellectual debate. Studies by Podesva *et al.* (2002) and Podesva (2006) also suggest that /t/ release is associated with the speech of gay men and is used by some such men to index a particular kind of gay persona, namely a 'prissy' or 'diva' persona. In addition, Americans often associate /t/ release with British English (Eckert 2008), since the common American inter-vocalic flapped realisation of /t/ is rarer in the UK. All these potential social meanings are incorporated into the indexical field in Figure 2.1, but not all of them will be activated at the same time. Instead, which indexical meanings are invoked or perceived will depend on the context of the interaction and the type of person speaking or hearing the utterance. A hyper-released /t/ produced by a self-described teenage 'nerd' to friends at school (Bucholtz 2001, 2010) will have a different indexical meaning to that produced by a flamboyant 'gay diva' doctor when speaking to patients (Podesva 2006), but both are linked by a sense of articulateness that could be re-interpreted for further related social meanings by these speakers or their interlocutors in different contexts.

2.2.2 Stance and style

The research above shows that the indexical field for a given feature is made up of inter-related social meanings at different levels of reinterpretation for different speakers in different contexts. It also shows how the different levels of social meaning can be reified into more permanent and recognisable types of categories as speakers continue to adapt indexical variables for ideological purposes. This happens when stances – 'a person's expression[s] of their relationship to their talk… and to their interlocutors' (Kiesling 2009 p. 172) gradually diverge and, with repetition, solidify into permanent personal qualities and then distinct personae and social types (Moore & Podesva 2009). This process is known as 'stance accretion' (Du Bois 2002; Rauniomaa 2003). Kiesling (2009) argues that when people describe others, they often attribute them with stances they regularly take – for example, 'she's very full of herself' or 'men are very confrontational' – giving credence to the idea that stance is an important aspect of identity and in some cases is thus the first step in the process of linguistic features gaining social meaning. As speakers take on or reject particular opinions and practices, they are involved in a process of stance-taking, which, after repetition, is eventually reinterpreted via generalisation into permanent personal characteristics (Ochs 1992; Kiesling 2009; Moore & Podesva 2009).

The implication of this view is that 'identity and personal style are both ways of stereotyping habitual patterns of stance-taking, or repertoires of stance' (Kiesling 2009, p. 175). This hence helps explain why people associate linguistic variants with groups of people, whether of the fixed, broad macro-sociological kind of the first wave (age, gender, class, etc.) or the fluid, local community-based kind of the second and third waves (e.g. Eckert's jocks and burnouts, etc.), since all of these are regarded as identities formed by the reification of (sets of) regularly-taken stances. These then eventually can end up forming well-known stereotypes based on macro-sociological categories, as long as the process of reinterpretation of indexical values continues and is taken up in a similar way by many people in a community (Eckert 2008). Hence, particular combinations of indexically meaningful features can be identified as a form of stylistic practice.

One notion of style captures how speakers vary in their use of linguistic variants depending on the speech situation. For Labov (1966) and other first-wave researchers, style is used to account for intra-speaker variation to try and avoid erroneously comparing two individuals speaking in different situations. Many studies have found that speakers use more non-standard linguistic variants when in more informal settings. For example, all participants in Labov's (1966) study in New York were less likely to use TH-stopping when reading a text compared to when they were having a casual conversation, regardless of their socio-economic class. Style here is linked to the notion of the vernacular – a speaker's most natural and automatic speech – that often displays the highest percentage of non-standard features. Since then, however, other researchers have taken a view of style that is more fluid, taking into account the shifting nature of individual interactions and the identities that speakers wish to

construct within them. Schilling-Estes (1998) discusses how speakers change their style in order to alter the image of the self that they are projecting to others. They do this in response to and as catalysts for changes in the context of the interaction, such as a new topic or someone else joining the conversation. This is a more complex account than that of the first-wave studies as it treats interactions and identities not as fixed categories but as constantly changing entities. However, it still traces style to that of the increased or decreased use of a single variant.

This stands in contrast to the rather different understanding of style espoused by some scholars working within the third-wave tradition of variationist sociolinguistics. These researchers place importance on seeing a single variant as just one part of a distinctive, socially meaningful cluster of features that together form a personal style or persona (Campbell-Kibler *et al.* 2006; Moore & Podesva 2009). These features need not all be linguistic; different behaviours, activities and fashion choices may also be incorporated into a personal style, a process sometimes known as *bricolage* (Hebidge 1979). For example, Eckert's (2000) ethnography of a secondary school in Detroit showed how pupils at the school constructed style through orientation towards jock or burnout personae, which involved not only the production of particular vowel variants, but also involvement in particular activities outside of school and wearing trousers with a certain length of leg. Outside of ethnographic research, the American 'mock white girl' persona analysed by Slobe (2018) includes linguistic features like up-talk and creaky voice as well as other stylistic elements like blonde hair and an obsession with Apple products and Starbucks coffee. These features are employed as part of humorous online parody videos about what 'white girls say to Latinas / black girls' to critique the way that white girls in the United States supposedly mark non-white girls' experiences as outside the norm. This shows that styles are distinctive, socially meaningful and involve multiple features, even if they are not noticed as distinct entities by the people who embody and encounter them (Moore & Podesva 2009).

2.2.3 Sociolinguistic speech perception

The study of how people perceive language and how they associate social information with phonetic variation has been done for some time as part of the field of language attitudes research (e.g. Agheyisi & Fishman, 1970; Garrett, 2010), which typically uses traditional evaluative techniques such as interviews, surveys and questionnaires. Research in this discipline developed the use of the Matched-Guise Technique (MGT), in which listeners are presented with audio stimuli produced by the same speaker but in different 'guises' and are asked to evaluate what they are told are the voices of different speakers (e.g. Lambert *et al.* 1960; Giles 1970; Ball 1983; Loureiro-Rodriguez *et al.* 2013). The idea is that participants respond in different ways to the various guises, showing how different pronunciations have different social meanings. Stimuli are often rated along a series of dimensions, usually measured via Likert scales (e.g. five points between two opposite adjectives like

'educated' and 'uneducated'), which are typically classified as measures of superiority, attractiveness and dynamism (Zahn & Hopper 1985). A variant of the MGT is the Verbal-Guise Technique, which uses different speakers for the stimuli in an effort to overcome the difficulty in creating convincing and sufficiently different stimuli from the same speaker (e.g. Nesdale & Rooney 1996; Bayard *et al.* 2001). The 'open-guise technique' (Soukup 2012) is another variant that does not attempt to hide the fact that the same speaker produces the various guises.

Other research on language attitudes, often within the framework of perceptual dialectology, employs a range of alternative methods. These include tasks based on linking social characteristics to written accent labels without the need for auditory stimuli (e.g. Bishop *et al.* 2005; Coupland & Bishop 2007; Grondelaers & van Hout 2010); asking participants to annotate maps of geographical areas to identify the accents spoken there and evaluate them (e.g. Preston 1993; Montgomery 2007); and interviews with speakers about their views on linguistic varieties (e.g. Garrett *et al.* 2004; Preston 2019). These kinds of studies do not only yield rating scale responses, but also written or spoken metalinguistic commentary from non-linguists. These comments can be a very useful source of data on listeners' perceptions of language, but they are yet to be properly integrated together with more quantitative variationist approaches to sociolinguistics (Preston 2019).

These approaches to studying the social meanings perceptually associated with linguistic variation are very helpful for eliciting overt evaluations from listeners on their views on language varieties or features. They are less effective at accessing the subtle and sub-conscious perceptions of phonetic variables that operate at a level below participants' awareness. For this, research in sociophonetic experimental speech perception has offered some solutions. Some studies adapt the MGT so that individual sounds are spliced from one word into another, creating stimuli that are identical other than the specific feature(s) under study (e.g. Campbell-Kibler 2005, 2007; Levon 2014; Levon & Fox 2014; Villarreal 2018; Bailey 2019). For example, the stimuli in Campbell-Kibler (2005, 2007) only vary in terms of their realisation of ING (alveolar vs. velar nasals). This is made possible thanks to accessible and powerful phonetics software such as Praat (Boersma & Weenink 2017) that allows researchers to digitally manipulate recordings by splicing sounds, shifting fundamental frequency and creating phonetic continua between two end-points, among other functions.

Together with the use of experimental software and sophisticated statistical analysis, a whole range of experimental paradigms and techniques are available for researchers to use to study sociolinguistic speech perception. One of these is the priming task, in which listeners are tasked with identifying phonemes from a continuum or matching an auditory stimulus to a written one while being exposed to social information pertaining to the speaker (e.g. a photograph or video of his or her face). If one of the variants has been found in production studies to be led by those of a particular demographic (e.g. age, gender, class, ethnicity or a locally meaningful social group),

it is expected that listeners are more likely to interpret the sound as the variant in question if the social information in the prime depicts the demographic who leads the change. These studies often use between-subjects designs so that different sub-sets of the participant sample are exposed to different primes. Early work in this paradigm found evidence for sociolinguistic priming effects (Johnson *et al.* 1999; Niedzielski 1999; Hay *et al.* 2006a, 2006b, 2009; Hay & Drager 2010; Drager 2011), although some recent studies have failed to replicate these findings (Squires 2013; Lawrence 2015; Juskan 2016; Walker *et al.* 2019). It has been suggested that part of the reason for the mixed results in this area and in similar work has been due to a lack of statistical power in the study design, particularly if using a between-subjects format (Westfall *et al.* 2014; Kirby & Sonderegger 2018). Another similar experimental technique is the Implicit Association Test or IAT (e.g. Greenwald *et al.* 2003; Babel 2009; Campbell-Kibler 2012), and its variants, the Personalised IAT (Rosseel *et al.* 2019) and the Social Category Association Test (Llamas *et al.* 2016). The IAT tasks participants with sorting emotional attributes (e.g. *good* and *bad* or *pleasant* and *unpleasant*) and certain target items (e.g. linguistic forms) into one of two categories, usually referring to social groups such as gender, ethnicity or region. For example, in Campbell-Kibler (2012), IATs were used to test the relationship between variants of ING and social stereotypes based on region and class using both written and auditory linguistic stimuli.

In summary, research on the perceptual associations between language variation and social information has found that listeners are able to make indexical links between varieties or features and the social characteristics of speakers. This has taken place using 'direct' methods such as language attitudes and perceptual dialectology research and 'indirect' methods such as speech perception experiments. Both approaches are useful in investigating this area, but debate has arisen over whether these methods are accessing the same type of perceptions. In other words, to what extent are listeners' explicit or conscious associations between language and social factors the same as those that exist below the level of awareness (Campbell-Kibler 2009; Kristiansen 2011; Pantos 2019; Pharao & Kristiansen 2019)? The majority of studies only use one of these approaches, and those that have combined them show a mixed picture of the relationship between explicit and implicit awareness of social meaning (e.g. Campbell-Kibler 2012; Pantos & Perkins 2013; McKenzie 2015; McKenzie & Carrie 2018; Adams 2019).

Similarly, it is not clear whether social meaning operates in the same way in both speech production and speech perception. Relatively few studies in sociolinguistics have explicitly tested this, but Drager (2015) uses ethnographic, quantitative and qualitative methods to study how phonetic variation and discourse function interact in the word *like* among adolescents at an all-girls' school in New Zealand. She finds that the girls in her study construct different personae using different phonetic realisations and discourse functions of *like*, and that they were also able to perceive these differences to some extent. Listeners were more likely to identify the stimulus voices as belonging to a non-common-room girl if they did not believe they recognised the

voice and if the stimulus contained a monophthongal token of quotative *like*, which reflected the production results. However, the differences in production of /k/ in *like* between common-room and non-common-room girls were not borne out in the perception results. Drager (2015 pp. 142-144) proposes a few potential reasons for this: first, the phonetic properties of the /k/ tokens in the stimuli (i.e. coming at the end of the recordings without a following segment) may have meant that listeners needed to attend to phonetic information from other sounds in the stimuli. Second, it is possible that sociolinguistic speech perception effects only take place for variables that are above the level of consciousness (or 'salient'; see the following section). This latter idea has been tested in other experimental perception studies (e.g. Juskan 2016), but needs further work in both production and perception, using methods that explicitly test whether a production pattern is something speakers are consciously aware of in the first place.

Another recent study of speech production and perception is Lawrence (2017), whose work on vowel changes in York finds that certain traditional Yorkshire variants like monophthongal GOAT are strongly enregistered in perception as indexing a 'Broad Yorkshire' identity encompassing qualities such as 'genuine' and 'authentic' and sometimes 'rough' and 'uneducated'. However, he finds that in terms of production, the quantitative patterns do not include an effect of speaker identity such as their attitudes towards social class or towards York, thus leading to a mismatch between speech production and perception. Lawrence concludes by warning researchers against giving speakers too much agency in models of sociolinguistic variation – for example, by assuming that the social meanings that we identify in our analyses are the same as those experienced by speakers in the community, and that all speakers have access to these social meanings to a sufficient degree to be able to use them as identity markers. He suggests that future work on local social meaning in production and perception may be better done in 'closed' communities with social structures that are more stable and easier to observe, in contrast to an apparent-time study of various groups in a locality with differing types of social networks and practices. In particular, he recommends secondary schools as a useful site to do this (see Section 2.4) and encourages researchers to build on Drager's combination of school ethnography and production-perception relations to advance our understanding of the role of social meaning in sociolinguistic variation and change. It is with these suggestions in mind that this thesis attempts to further our knowledge of these matters (see Section 2.6).

2.3 Salience in sociolinguistics

2.3.1 Overview and early work

The term 'salience' has been widely used in sociolinguistics, but it has proven difficult to establish a clear definition for it or what exactly makes a variable salient. The basic idea is that some linguistic variables are more prominent than others. This notion has been part of sociolinguistics since the very beginning with Labov's (1972)

tripartite distinction between 'indicators', 'markers' and 'stereotypes', as discussed in Section 2.2. Markers vary according to the formality of the interaction and stereotypes can be overtly pointed out by speakers, while indicators do neither of these things. Salience has also been used as an explanatory factor for more recent conceptions of this continuum of linguistic awareness, such as Silverstein's (2003) indexical order. Variables that only index *n*-th order stances or social characteristics would be regarded as less salient than those that are further reinterpreted to index *n*+1st order personae and stereotypes. Salience is, therefore, an important part of the study of social meaning, but the actual properties of a variable that make it salient have been much discussed yet are challenging to pin down (Campbell-Kibler 2016; Drager & Kirtley 2016).

Early studies of salience attempted to identify one or more factors that had the biggest effect on making a feature salient or prominent. These criteria can largely be categorised into 'objective' or language-internal factors, such as the variable's frequency, degree of phonetic difference and effect on phonology (e.g. Schirmunski 1930; Bardovi-Harlig 1987), and 'subjective' language-external factors, such as a feature's capacity to undergo accommodation or be considered non-standard (e.g. Yaeger-Dror 1993; Cheshire 1996). I henceforth refer to these as 'linguistic' and 'social' factors respectively. Both of these aspects of salience are used by Trudgill (1986) specifically to distinguish between Labov's (1972) indicators and markers. Trudgill's (1986) criteria for salience are listed below (similar criteria are found in Schirmunski 1930 and Auer *et al.* 1998):

- Having at least one variant that is overtly stigmatised
- Having a high-status prestige variant reflected in the orthography
- Undergoing linguistic change
- Having radically phonetically different variants
- Having variants that are involved in maintaining phonological contrasts.

This set of criteria combines linguistic and social factors into one set of properties that make a variable salient. It is a very useful starting point when comparing which variables are salient and which are not, as each item is fairly easy to assess variables against. However, there are also some problems with these criteria. One is that some of them are subjective – what counts as radically phonetically different or high-status? Moreover, once one introduces social factors such as stigmatisation into one's model for salience, it is very difficult to avoid constructing a circular argument (Kerswill & Williams 2002). That is to say, is a variable salient because it is stigmatised, or is it stigmatised because it is salient?

Kerswill and Williams (2002) accept Trudgill's (1986) account to be the most complete since it best incorporates both linguistic and social factors, yet the issue of circularity poses a major problem. Hence the authors propose a model of salience that includes more sociolinguistic language-external elements such as social demographic information. They combine an analysis of language change in three English towns

with the linguistic and social criteria from Trudgill (1986) in order to test whether the socio-demographic patterns of linguistic variation correlate with the traditional indices of salience such as phonological contrast, phonetic distance, stigma and prestige. Their results show no clear correlation between the criteria of salience and the sociolinguistic patterns in their data, which makes it practically impossible to specify what conditions must be met in order for a feature to be salient. They accept that, having exhausted all possible factors, the salience of some features may be arbitrary. Kerswill and Williams conclude that a model of salience must incorporate all the above aspects and that a salient feature will display a combination of these components, but that there is no definitive, non-circular answer to the question of measuring salience, other than that a salient feature is 'noticeable in a psycho-acoustic sense' (2002 p. 105).

2.3.2 Recent work

More recent approaches to the question of how to define salience have attempted to bypass the entanglement of different criteria by separating out the linguistic and cognitive factors from the social factors. Hollmann and Siewierska (2006) argue that the primary mechanism behind salience is cognitive, with social factors only emerging later in certain circumstances. A similar view is held by Rácz (2013), who distinguishes between cognitive and social salience, the former leading to the latter. He models cognitive salience on the notion of 'surprisal', which originates from information theory (Shannon 1948; Hale 2001; Levy 2008) – that the less likely a sound is to occur in a particular sequence, the more surprising it is for the listener. His unit of measurement for surprisal is transitional probability (TP), calculated by dividing the number of occurrences of a pair of features next to one another in a corpus with the number of occurrences of the feature under study (that is, likelihood of *XY* ÷ likelihood of *X*). Socially salient variables, for Rácz, are those cognitively salient variables that end up becoming a marker of social indexation, though he does not go into detail on how or why this happens to some variables but not others. He makes the link between the cognitive and social aspects of salience through exemplar models of speech production and perception (see also Drager & Kirtley 2016), which posit that the phonetic and social detail of utterances are stored as exemplars in the human mind, forming categories which are activated upon exposure to new linguistic input (Pierrehumbert 2001; Foulkes & Docherty 2006; Johnson 2006). He concludes that variables that have a low TP, and thus a high surprisal value, are those that are well-suited for use as sociolinguistic markers because they are salient regardless.

This focus on salience as a cognitive or psychological phenomenon is shared by several recent studies in the field (Blumenthal-Dramé *et al.* 2017). Similarly to Rácz (2013), Jaeger and Weatherholtz (2016) encourage the use of surprisal to model salience, this time using the logarithm of the inverse of the contextual probability of the sound, though they restrict their discussion to 'initial' salience – the first time a hearer encounters a new sound – rather than sustained exposure over time. A

perceptual study by Zarcone *et al.* (2016), however, distinguishes between surprisal and salience and argues that language-internal factors need to be further separated from contextual aspects such as the goal of the interaction. Schmid and Günther (2016) go further, proposing a unified framework based on different cognitive and social contexts that accounts for the fact that salient variables can be those that are both highly familiar and entrenched or highly unfamiliar or unexpected. In summary, these articles use sophisticated mathematical modelling and insights from psychology to model salience, often using the notion of surprisal, which until recently had not been seriously tested in sociolinguistic treatments of salience. This shows how salience may not be just a linguistic or social phenomenon but is part of general human cognition, highlighting its complex and multi-faceted nature, that may not be able to be addressed solely using sociolinguistic methods. The field may thus be better suited to answer questions relating to the social aspects of salience rather than the cognitive ones, or at least make clear the differences between the two and treat them as separate entities.

This is the direction taken in some recent work in sociolinguistics, with some studies even defining salience in not two but three ways. Auer (2014) distinguishes between physiologically, cognitively and socially conditioned salience. The latter two are comparable to how they are used elsewhere (e.g. Rácz 2013), while physiologically conditioned salience refers to a perceptual, sensory noticeability evoked by, for example, sounds with higher duration or amplitude. Podesva (2011) explores intonational variation in American English with reference to three kinds of salience: categorial, phonetic and social salience. Categorial salience refers to how frequent a variant is in an individual's speech, with low-frequency forms being unexpected and thus carrying more noticeable social meanings, mediated by the formality of the situation. The focus on frequency has been debated in earlier conceptions of salience (Bardovi-Harlig 1987; Kerswill & Williams 2002) and the idea of unexpectedness is similar to the notion of surprisal (e.g. Rácz 2013; Jaeger & Weatherholtz 2016). Phonetic salience is similar to Trudgill's (1986) criterion of radical phonetic difference, in that more acoustically extreme variants are said to be more salient. This concept, as well as Auer's (2014) physiological salience, builds on Trudgill's work by emphasising that it is not only phonetically categorical variants that may be more salient, but also individual tokens of that variant that are extreme compared to others when measured acoustically (e.g. very steep intonation contours or very high vowels). For Podesva (2011), social salience encompasses the relationships expressed by Labov's (1972) indicator-marker-stereotype continuum and Silverstein's (2003) indexical order; variants are more likely to reach stereotype status if they are categorially and phonetically salient.

A similar conception of salience is used by Levon and Fox (2014), who make a distinction between 'salience' and 'social salience'. The former refers to language-internal and -external factors such as those mentioned in the previous section that make a feature more noticeable, while the latter refers to the relative availability of a form to evoke social meaning (Labov 2001; Kristiansen 2011). They highlight the

importance of Preston's (2010, 2011) work on 'language regard', which posits a four-step process between noticing a linguistic feature and reacting to it. First, listeners notice a variant in the speech of others, and then classify it according to the context of the interaction and the social information linked to the speaker. Depending on the listener's attitudes towards these classifications, he or she will imbue the feature with relevant attitudinal values and then react to it. This process is dynamic – that is, the perceptions people have of linguistic features will depend on the social and interactional context in which the variable is encountered. The big implication of this is that the social salience of a variable is not fixed or uniform for all contexts, or for all listeners, but that it may vary for different individuals or groups of people. Levon and Fox test this theory in their perceptual study of listener sensitivity to alveolar ING and TH-fronting in British English, which are said to be relatively less and more socially salient variables respectively. The only group to link one of the variants with an 'unprofessional' percept was Northern English listeners for TH-fronting, which the authors argue may be because alveolar ING is not very stigmatised, and that TH-fronting is less common in the North than the South. They emphasise that 'attitude strength' and 'attitude centrality' – for example, how strongly 'northern' or 'southern' listeners feel or how big a part of their identity it is – may play a role as part of the contextual information that mediates people's capacity to classify and imbue a feature with social meaning, though their study does not test this explicitly.

Similar ideas are invoked by Schleef (2017b), whose perception study of /t/-glottalling and alveolar ING shows that the former is associated with a stronger and more coherent cluster of social meanings than the latter. He interprets the results in terms of social salience based on Levon and Fox's (2014) definition of the term and on the notion of attitude strength, which is affected by the quantitative distribution of the features in speech production. His logic is that if a variant is highly socially stratified in patterns of production, it will make the process of noticing and imbuing a feature with social meaning ('attitude activation') more automatic and stronger, leading to quicker and more certain evaluations of accent features (which can be measured in perception tasks). These activations will also be more consistent across groups in a community compared to features with minimal social stratification, which have less automatic attitude activation and hence weaker and more fragmented attitudes between groups. This work again indicates that speakers of different social characteristics, such as accent and social class, may vary in how they perceive a feature as a result of their differing experiences of its social stratification (or lack thereof).

Related findings and interpretations are explored in a range of other recent studies of salience and sociolinguistic perception (e.g. Drager 2015; Juskan 2016; Llamas *et al.* 2016) that interpret the social aspects of salience in terms of the indexical order (Silverstein 2003) and consider how different levels of exposure may affect a variable's social salience for different groups in a community. One example is Jensen (2016), who uses the indexical order and enregisterment (Agha 2003; Johnstone *et al.* 2006) to analyse the indexical relationship between five grammatical features and

place on Tyneside. She tested participants' awareness of local forms and found that all variables were identified over 90% of the time and were strongly associated with the local area in participants' perceptions. She also found that for some features, those who expressed a strong affiliation with Tyneside were better at identifying them. Jensen's study finds a close relationship between variables' noticeability and enregisterment, linking the cognitive and social aspects of salience together. Her results also indicate that salience and social meaning may be different for some groups in the community depending on their ideologies towards their home town.

2.3.3 Summary

It is clear that salience is a rather contentious term that means somewhat different things to different people. Traditionally, work on salience has been characterised by the quest to find a set of objective language-internal factors such as phonological contrast and phonetic difference, together with language-external, social factors like stigmatisation, that act as criteria for salience (Schirmunski 1930; Trudgill 1986; Auer *et al.* 1998). However, it has become evident that none of these criteria definitively accounts for salience, and that the introduction of social factors leads to the potential for circular arguments that are very difficult to avoid (Kerswill & Williams 2002; Jansen 2014). More recent work has moved away from this endeavour by delineating different types of salience, particularly by separating out the psychological notion of a feature 'standing out' from its surroundings in human cognition from the ability to evoke social meaning at different levels of awareness (Podesva 2011; Rácz 2013; Levon & Fox 2014). This has led to something of a split as work on the cognitive factors takes an increasingly probabilistic turn (Rácz 2013; Jaeger & Weatherholtz 2016; Zarcone *et al.* 2016) while many sociolinguists have turned their attention to the integration of social salience into wider sociolinguistic theory, particularly that pertaining to Silverstein's (2003) indexical order (Podesva 2011; Levon & Fox 2014; Jensen 2016; Schleef 2017b).

Reviewing the last four decades of literature on salience seems to lead to the inevitable conclusion that the mechanisms of why some linguistic features are more noticeable and more strongly linked to social meaning than others is very poorly understood and that much more research – embracing both psychological and sociolinguistic methods and theories, and examining grammatical and discourse-level variables as well as phonetic ones – is needed (Jansen 2014). It is little wonder that some researchers, such as Auer (2014), have suggested abandoning the term 'salience' altogether and sticking more closely to less contentious and more specific terms already used in sociolinguistics such as 'indexicality'. When answering the question of how to operationalise salience in this thesis, it is very tempting to put Auer's suggestion into practice. However, despite the confusing variety of definitions for the term, it is still useful as a convenient shorthand for a phenomenon that undoubtedly exists but, as we have seen, is very difficult to pin down. What is more important instead is that one's definition of salience is clearly specified and that different

versions of the concept (or indeed other terms such as awareness, attention or noticeability) may be needed to talk about different things (Campbell-Kibler 2016; Drager & Kirtley 2016).

2.3.4 Salience in this thesis

In this thesis, I am primarily interested in social meaning in speech production and perception and whether different variables undergoing similar patterns of change can be used to make it in similar ways. For this reason, I make use of the term 'social salience', defined by Levon and Fox (2014 p. 1) as 'the relative availability of a form to evoke social meaning'. This is the most useful definition for the purposes of studying social meaning and clearly sets out that the kind of salience I am talking about is the kind that can be analysed using indexicality and other theories in sociolinguistics. However, as suggested in previous research, a socially salient feature is one that is cognitively salient as well (Rácz 2013). As good as it would be to be able to put forward a fully coherent model of salience in sociolinguistics that accounts for both cognitive and social factors, though, studying cognitive salience as in recent work requires large existing corpora and psychological techniques that are beyond the scope of the methods and questions employed in this thesis. These studies offer helpful insights into how salience is treated more broadly in human cognition, yet they can require complex resources such as large, pre-existing, fully transcribed corpora to test, which may not be appropriate for community-specific sociolinguistic studies that use original data. In addition, such psychologically-based conceptions of salience are generally limited only to 'initial salience' – when a listener encounters a novel variant for the first time – rather than later stages of socially-indexed salience that build up over time (Jaeger & Weatherholtz 2016), which restricts their usefulness for questions that involve social meaning.

Instead, I attempt to capture the 'surprising' or 'stand-out' aspects of salience using an alternative term, which is 'noticeability'. Here, I simply mean that a linguistic variable stands out enough so that listeners are able to identify it – i.e. 'notice' it – when asked to point out phonetic features that sound interesting or unusual to them from an audio stimulus, which is one of the methods used in the perception task (see Section 7.3).[1] The aim with this is to ground my study of salience at least partly in cognitive factors while admitting that my methods do not allow for a full investigation of 'cognitive salience'. Of course, the fact that listeners notice a phonetic feature is not purely a case of it 'standing out' compared to others due to its phonetic attributes – this process is socially mediated, not least by the fact that as untrained lay listeners, participants may not have the meta-linguistic discourse required to verbally describe the phonetic properties of the stimuli even if they 'notice' it (Kristiansen 2011).

[1] Note that this definition of 'noticing' is specific to this thesis and method. It is not the same as how the term is used in some literature in social psychology, in which noticing can be both conscious or unconscious (e.g. Devine 1989) or in some sociolinguistic work such as Preston (2016 p. 186), who defines it as 'the uptake of an event such that procedural work is carried out on it'.

However, my priority is to minimise the risk of falling into the trap of making circular arguments surrounding salience or conflating 'objective' linguistic factors with 'subjective' social ones, even though this is arguably impossible when considering a phenomenon in which cognitive and social factors are so closely intertwined. I do this by using the word 'noticeable' to refer to listeners' ability to identify a feature and the phrase 'socially salient' to describe how a feature can be used for social meaning-making in production (by being socially stratified and used for identity construction in interaction) and perception (by eliciting strong and consistent social associations from participants when they talk about individual features). This approach represents and builds on previous findings in the study of salience in sociolinguistics (e.g. Levon & Fox 2014) while also acknowledging the limitations and risks of using the term.

2.4 Adolescents' language use at school

2.4.1 Adolescence

The study of the language of adolescents has been part of sociolinguistics for some time. The teenage years represent a period of transition between childhood and adulthood as people undergo biological changes via puberty, while sociologically, teenagers in many societies experience unique opportunities and challenges at school while also having to navigate and renegotiate relationships with parents, friends and the community. The exact definition of adolescence in terms of chronological age, neuro-physiological development or role in society varies considerably (Kirkham & Moore 2013). In this thesis I restrict my discussion to teenagers (those aged 13-19) unless stated otherwise, although I acknowledge that some of the relevant sociolinguistic findings for adolescents can also apply to pre-teenage children and / or to young adults.

The linguistic consequences of adolescence as a stage of life are well-documented. On a simple biological level, the fundamental frequency (pitch) of boys' voices lowers sharply during puberty as a result of growth in neck length and width, causing descent of the larynx and enlargement of the vocal tract (Harries *et al.* 1997). In sociolinguistic work, one of the main findings is that of the 'adolescent peak'. Studies of apparent-time change find that the rate of use of innovative phonological and grammatical features tends to reach a high point in the teenage years, approximately ages 14-17 (Labov 2001; Tagliamonte & D'Arcy 2009; Holmes-Elliott 2015, 2016). Assuming that speakers remain stable throughout their lifetimes (though see e.g. Harrington *et al.* 2000; Harrington 2007 for evidence against this assumption), the speech of young people today represents how middle-aged and older people will speak in the future. Language change is argued to occur via incrementation (step-by-step change), so even higher rates of use of innovative features will likely be shown by the current younger generation's own children when they reach adolescence (Labov 2001).

Eckert (2000) argues that part of the reason why teenagers lead language change is because adolescent life is short and intense – 'a social hothouse' (p. 16). She claims that not only is adolescence a transition period between childhood and adulthood, it is its own distinctive stage of life with its own culture. This is particularly the case for western societies since the mid-20th century, during which time the word 'teenager' was coined to describe those going through this period (Savage 2014). Socio-economic changes that have occurred since then, such as longer life spans, the shift to service economies, urbanisation and compulsory secondary education, all facilitate the development of adolescence as a unique phase of life (Larson & Wilson 2004). Young people spend longer in school, enter the workforce later and get married later, thus not entering the adult world until a more advanced age. Such changes are, of course, not unique to the west, and even in parts of the globe where these shifts are less accelerated, adolescence is still a distinct part of the culture (Caldwell *et al.* 1998). Yet for teenagers living in urban western environments since the 1980s (i.e. the main objects of sociolinguistic research on adolescence), their lives are quite distinct to those of children and adults, and so we can expect their language to be different too.

One of the unique aspects of life for the majority of adolescents is daily attendance at school, which plays a major role in shaping their behaviours and worldviews. Borrowing from Bourdieu and Boltanski (1975), Eckert (2000) argues that secondary school is a 'symbolic market' in which language and other semiotic resources gain 'value' as 'commodities'. Some objects are overtly valued by teachers, authorities and wider adult society as they reproduce 'legitimate' norms – these might include standard or prestigious linguistic forms, conservative fashion choices or ideologies that promote educational achievement. Other objects are employed in opposition to these norms but have their own subversive value as ways of projecting adult-like qualities like independence, or age-restricted behaviours like smoking, without being submissive to adult authority. As young people develop cognitively and socially, they become more aware of themselves and of the value of all the goods in the marketplace. This includes the value of their own bodies and personalities in the 'marketplaces' of heterosexuality and popularity. With language as part of the 'products' of personal styles that have differing values in various contexts, Eckert makes the case that stylistic use of language is important for adolescents as they express themselves in a way that reflects how they wish to position themselves in the symbolic market at school in preparation for their entry into adulthood.

When previous studies in sociolinguistics have researched how language is used by young people in secondary schools, they have often used ethnographic methods (e.g. Eckert 1989, 2000; Moore 2003; Rampton 2006; Kirkham 2013; Alam 2015; Drager 2015; Howley 2015; Gates 2018). This involves becoming a participant-observer in the community, spending months immersed in school life and developing personal relationships with teenagers before collecting speech data (Eckert 2000). This gives researchers a number of advantages: they can get to know the community in detail; they can observe how individual participants' unique personalities work in everyday life; students are more likely to use a casual style during the recordings after having

already got to know the researcher; and they can contextualise the data from the recordings as snippets of a more prolonged experience of sharing life with the participants. These are all important when studying how linguistic variation operates stylistically at school, as the social meanings and values attached to features may be subtle and only make sense or be defined within and by the local community (Drummond & Schleef 2016). The main drawbacks of ethnographic research are that it takes a very long time to establish relationships with people before recording their speech, and that there is no guarantee that participants will be willing to include the researcher into their social lives, especially at school, where there is a large age and power gap between all adults and students, mandated by the structures of the institution. Indeed, other work in sociolinguistics on the speech of young people has not used ethnographic techniques but has still obtained insightful findings (e.g. Fabricius 2000; Badia Barrera 2015; Leach & Dann 2018; Dann 2019).

Studies of adolescents' linguistic practices at school frequently find that the production of linguistic variables differs between peer groups. In everyday speech, these groups are typically referred to using terms such as 'friendship groups', 'cliques' and 'sub-cultures'. They are often given names, either by the students themselves or as analytical tools by the researcher, connecting the members to a shared stereotype, ideological stance or set of practices. Some of these are common to many schools in the western world and are frequently invoked as part of popular discussions and depictions of school life in the media – 'geeks', 'jocks', 'goths' and 'popular kids', for instance. Others are more school-specific (e.g. the 'BBs', 'Trendy Alternatives' and 'Real Teenagers' in Drager 2015). At some schools, these group labels and the stereotypes associated with them become so ingrained into institutional social life that all individual students can be placed on a continuum between them, such as the jocks and burnouts in Eckert's study of a secondary school in Detroit (1989, 2000).

2.4.2 Communities and constellations of practice

In third-wave sociolinguistic research, adolescent friendship groups at school are often analysed using the framework of 'communities of practice' or CofP – a construct coined by Lave and Wenger (1991) as part of a social theory of learning and introduced to sociolinguistics by Eckert and McConnell-Ginet (1992). Communities of practice are aggregates of people who develop shared practices through mutual engagement and joint enterprise (Wenger 1998; Eckert & McConnell-Ginet 1999). Examples include families, teams of colleagues, bands, sports clubs, university research groups, neighbourhood gangs and internet forums (Wenger 1998). What all these groups have in common is people engaging in regular social practices together through interaction towards a common goal, with individual members forming a core and a periphery of the community depending on their level of participation. Communities of practice are very useful for sociolinguistic analysis in the third-wave tradition (Eckert 2005, 2012), as they allow for the analysis of the construction of

meaning and identity through language as a shared social practice, which can form ways of speaking that are particular to the members of a community of practice. In addition, the negotiation of meaning as part of the shared social knowledge displayed through the joint mutual endeavours of the community of practice can be performed through the construction of personal linguistic styles, facilitating linguistic variation between members of the same group. This can be caused by regular stance-taking and social indexation as part of how people construct their individual and group individual identities, both within the community of practice and in relation to other communities of practice and the wider social order (Eckert 2005).

It is unsurprising, then, that communities of practice have frequently been used in sociolinguistic research on adolescents to help explain how peer groups at school use distinct linguistic styles (Eckert & McConnell-Ginet 1999; Bucholtz 1999; Moore 2003; Kirkham 2013; Drager 2015). These studies show that groups of teenagers position themselves in relation to other groups at school and the school itself by taking stances in interactions with their friends, which build up to form a group identity through participation in shared social practices, particularly stylistic practice (Eckert 2005). In some research, clusters of communities of practice have been found to share certain linguistic features on the basis of shared ideologies or other characteristics. For example, Kirkham (2013) identifies six communities of practice in his ethnographic study of a Sheffield secondary school, which can be grouped according to their broad orientation towards the school (supportive or resistant). He finds that there are some sociolinguistic similarities between groups within the pro-school and anti-school categories, with the anti-school communities of practice using laxer realisations of the happY vowel than the pro-school ones.

These sets of related communities of practice can be analysed using the notion of the constellation of practice, which is a group of inter-connected communities of practice that are linked through shared locations, institutions, members, causes, goals or styles (Wenger 1998). This construct is used by Drager (2015) to analyse variation between peer groups in an all-girls' school in New Zealand, where there were many communities of practice, but they could all be organised into two constellations of practice based on where their members hung out at lunchtime: inside the common room (CR) or outside it (NCR). The communities of practice in the common room all shared a broadly pro-school ideology, regular participation in sports and a taste for mainstream fashion trends. On the other hand, a diverse range of communities of practice hung out outside the common room, including groups known as 'the goths', 'the geeks' and 'the Christians'. Each NCR group had its own unique norms, practices and styles, but all were united in their geographical isolation from the common room in the centre of the school and their rejection of the mainstream norms set by the CR girls, who dominated social life at the school. Drager finds phonetic differences in the use of the word *like* between the two constellations of practice, showing that not only do the mutual endeavours of individual communities of practice cause new linguistic styles to be formed, but that this process can extend to constellations of related communities of practice based on similarities in the stances their members take up.

Constellations of practice are a useful construct as they help explain variation in linguistic and other behaviour at multiple higher-level tiers of the social order based on inter-related communities of practice. As Drager (2015 p. 44) explains, not only is the CR / NCR distinction in her study a type of constellation of practice, but so is the entire year group and the school as a whole. One way of advancing this research, therefore, would be to compare the linguistic practices of different levels of constellations of practice, such as sets of peer groups within multiple schools in the same locality. Similarly, future work could examine how a supra-local feature can be used in different ways by different adolescent communities or constellations of practice (Kirkham & Moore 2013). This would help us gain a better understanding of how language variation operates at micro and macro levels in society.

2.5 Language variation and change in the South of England

Much of the literature on varieties of English in the South of England from the last two decades has centred on the phenomenon of regional dialect levelling (e.g. Williams & Kerswill 1999; Kerswill 2003; Torgersen & Kerswill 2004; Holmes-Elliott 2015), also known as supra-localisation (Britain 2010). This term encompasses two separate but complementary processes: 'levelling', which is the loss of distinctive local linguistic variants from accents and dialects; and 'diffusion', which is when a variety gains features from other accents that are often used across a wider region. For example, the traditional local productions of the MOUTH vowel in Hastings, East Sussex, [ɛɪ ~ ɛʊ], are declining in usage in favour of RP-like [aʊ] and the London monophthongal form [aː] (Holmes-Elliott 2015). These findings are closely related to another productive strand of research in varieties of southern England, which has concentrated on the changes taking place in the traditional 'prestige' accent of British English, Received Pronunciation (RP), which is historically based on pronunciation used in the South East (e.g. Ramsaran 1990; Wells 1994; Fabricius 2000, 2018; Hannisdal 2006; Trudgill 2008; Badia Barrera 2015; Hinton 2015; Bjelaković 2017). This research is often discussed with reference to the supposed emergence of a 'new variety' in the South East known as 'Estuary English', which is alleged to be rising in popularity among young people and challenging RP as a new reference accent (e.g. Rosewarne 1984, 1994; Coggle 1993; Altendorf 1999, 2003, 2016, 2017; Kerswill 2001; Przedlacka 2002; Britain 2005).

The idea that Estuary English has arisen as a 'new accent' sweeping the South East to displace RP has become popular with journalists, yet linguists have generally interpreted the situation in light of the overall patterns of language variation and change in the South mentioned above. That is to say, processes of levelling and diffusion, caused by language contact resulting from high social and geographical mobility in the region, have led to the spread of formerly local features (mostly from

working-class London speech) around the Home Counties[2] and beyond alongside the disappearance of traditional dialect pronunciations. In combination with other social factors and changes relevant to British society in the late 20th and early 21st century, such as the breakdown of the traditional social class structure and the proliferation of mass broadcast media, it is argued that high mobility in the South East has driven the loss of local variants from young people's speech and the spread of a set of features that supposedly index a non-regional, trendy, 'youth' identity (Williams & Kerswill 1999; Altendorf 2003; Milroy 2007). These changes are also being embraced by some young people from elite and middle-class backgrounds, which helps explain why references are made to changes in RP. While the phenomenon has been reported throughout the UK, particularly in urban areas (e.g. Milroy *et al.* 1994; Docherty & Foulkes 1999; Stuart-Smith 1999; Foulkes & Docherty 2000), it is said to have developed earliest and quickest in the South East due to its well-connected transport links, relatively high prosperity and close proximity to London, from which many of the changes are reported to have spread. The supra-local phonetic features that have been observed to be spreading in the South East and sometimes labelled as Estuary English include the following features (this is not an exhaustive list – see Altendorf 2003, 2017):[3]

- **/t/-glottalling (or /t/-glottalisation):** realisation of /t/ in word-medial and word-final position (especially pre-vocalically) with a glottal articulation, most commonly described as a glottal stop [ʔ], e.g. *sort of* [sɔːt ɒv] > [sɔːʔ ɒv]; *butter* [bʌtə] > [bʌʔə].
- **TH-fronting:** realisation of the dental fricatives /θ/ and /ð/ (spelt <th>) with the labio-dental realisations [f] and [v] respectively, e.g. *three* [θɹiː] > [fɹiː]; *bother* [bɒðə] > [bɒvə].
- **/l/ vocalisation:** realisation of coda /l/, which is usually a velarised or 'dark' lateral [ɫ] in southern varieties, with a vocalic articulation, typically in the back rounded range [ʊ ~ o ~ ɔ], e.g. *ball* [bɔːɫ] > [bɔːʊ]; *milk* [mɪɫk] > [mɪok].
- **GOOSE-fronting:** realisation of /uː/ (the lexical set GOOSE in Wells 1982) with a centralised or fronted articulation [ʉ ~ ʏ ~ y] in any position apart from before a coda /l/, e.g. *soon* [suːn] > [syːn].
- **/ɹ/ labialisation:** realisation of the alveolar approximant /ɹ/ with a labio-dental approximant [ʋ], e.g. *red* [ɹɛd] > [ʋɛd].
- **/h/-dropping:** deletion of the glottal fricative /h/ or replacement with a glottal stop phrase-initially, e.g. *he's happy* [hiːz hapi] > [ʔiːz api].

[2] The term 'Home Counties' usually refers to the counties of England that share a border with Greater London, though it is sometimes used to describe a larger area of the South East that also includes Hampshire, which does not border London. In this thesis, I use the term in the first sense.

[3] Some of the variables listed have existed in traditional dialects across southern England for some time, such as /l/ vocalisation and /h/-dropping (Trudgill 1999a). However, they are often investigated today as part of the spread of London features across the UK, especially in the speech of those who would not have ever spoken traditional dialect anyway (i.e. middle-class people).

These phonetic variables have taken up much of the literature in sociolinguistic studies of the South East, but they do not represent the entirety of it. For example, Holmes-Elliott (2015) studies variation in the MOUTH vowel in Hastings, which has many variants including RP [aʊ], the traditional southern [ɛʊ] and the London [aː]. Kerswill and Williams (2005) investigate MOUTH together with the other diphthongs PRICE and GOAT in Milton Keynes. In the South West of England, research has been done on the loss of traditional variables such as rhoticity (Piercy 2006; Barras 2018) and the long front BATH vowel (Piercy 2010; Dann 2019).

The overall picture of sociolinguistic research on southern varieties of English is that regional dialect levelling and language change in London and in Home Counties towns such as Reading and Milton Keynes is well-studied (e.g. Cheshire 1982; Tollfree 1999; Williams & Kerswill 1999; Przedlacka 2002; Torgersen 2002; Altendorf 2003; Cheshire *et al.* 2008, 2011; Kerswill *et al.* 2008; Gates 2018), yet there remain large tracts of southern England whose language has not been investigated since the Survey of English Dialects (Orton & Dieth 1967). This has prompted renewed interest in a wider variety of southern dialects with reference to a range of linguistic changes in the region (see e.g. the chapters in Braber & Jansen 2018; Wright 2018). The language of the cities and counties of the central South of England (roughly equivalent to the 'Central Southwest' dialect region in Trudgill 1999a), including Hampshire, remain particularly under-studied, even though they offer a potentially useful site for research on the spread of 'Estuary English' features outside of the Home Counties and the loss of traditional dialect features in mostly rural locations.

2.6 This thesis's contribution to the literature

In this chapter, I have discussed how studies in sociolinguistics have shown that quantitative patterns in the use of a linguistic feature in a community speech production vary according to social groups at macro and micro levels. Furthermore, individuals use phonetic features to make social meaning in interaction, which can be modelled using the indexical order and the indexical field: social meanings can be reinterpreted to form a constellation of multiple potential meanings that can be indexed by a given linguistic form depending on the social and interactional context. Research has found that these patterns in production exist to some extent in people's perceptions of language varieties and individual linguistic features, using explicit measures as in studies of language attitudes and implicitly through techniques such as speech perception experiments. I have also tracked the use of the term 'salience' in sociolinguistics, with early work seeking to establish a set of linguistic and social criteria for why some features are more prominent in listener perceptions than others. More recent studies have attempted to avoid the inherent circularity involved in these definitions by separating cognitive and social salience, the latter of which has been used in conjunction with theories of indexicality to investigate why some features

reach higher levels of the indexical order while others do not. Studies of social meaning and linguistic variation are often carried out on adolescents as the leaders of language change and as merchants in the 'symbolic marketplace' of secondary school, with the constructs of the community of practice and the constellation of practice serving as useful tools to model the shared networks, ideologies and practices of the friendship groups that characterise school life.

Throughout the chapter, I have also touched on what we do not know about these matters. For example, little work has been done on how sociolinguistic speech production and speech perception occur in the same speakers. Evidence from Drager (2015) indicates that there may be a link between the two, but this may be mediated by whether listeners are conscious of the variation. Similarly, the debate over how to access the social information perceptually linked to linguistic variants – via direct or indirect methods – shows that there is still a lot that we do not know about speech perception and its relation to 'consciousness' or 'awareness', and so studies that use innovative and multiple kinds of methods to study this are required. Both of these points are closely linked to salience yet disentangling the cognitive aspects of the concept from the social ones is still a work in progress.

The study reported in this thesis is an attempt to progress our understanding of these concepts. In a similar way to Drager (2015), I study both speech production and speech perception in the same set of participants in order to understand whether local patterns of usage are socially meaningful both in interaction and in listener perceptions of speakers from the same background. I do this in a secondary school context as it allows for an examination of local social factors such as friendship groups as well as macro-level effects among speakers who are likely to use high rates of variables undergoing change in order to construct identity in a symbolic marketplace. However, I build on existing research by studying two linguistic variables that represent opposite ends of a continuum of salience, based on previous work suggesting that salience may play a role in mediating production-perception relations and that this may be different for different groups in the community. I do this using a range of analytical techniques in order to come to a comprehensive picture of the social meanings of the two variables. These involve both quantitative variationist analysis and qualitative interactional analysis for speech production, and a rapid-response survey task and a considered conversation task for speech perception. This is inspired by Campbell-Kibler's (2005, 2007) work using surveys and conversations to study the social meanings of ING in the USA, but my thesis combines such methods with a community-level production analysis to try to understand how these meanings work at both a macro and micro level.

In addition to these broad theoretical aims, my thesis seeks to offer an original contribution on a more methodological and descriptive level. The use of techniques more associated with language attitudes research, such as surveys and conversations, as part of a study in sociophonetics is relatively rare. It is done with the goal of examining the extent to which speakers' own comments about their perceptions of

individual linguistic features in natural, unmodified samples of recordings can reveal as much as their categorical responses to digitally manipulated stimuli in tightly controlled experiments. Also, my study samples teenage participants attending two schools, each representing a different level of the social class spectrum (a state school and a private school), which helps us understand the role of class on sociolinguistic variation. However, class is not solely measured here by (parental) occupation or similar traditional measures, but it takes the form of two different constellations of practice (schools) that reproduce different ideologies around education and mobility that influence the social world that young people inhabit – and thus, the stances they take and the meanings they make, displayed through phonetic variation. Finally, the thesis adds to the literature on varieties of the South of England, in particular the under-studied accent of the county of Hampshire. Much of the literature on language variation and change in the region focuses on regional dialect levelling and the diffusion of a set of features known as 'youth norms' (Williams & Kerswill 1999), sometimes labelled as a new variety called 'Estuary English', in diverse, urban locations. Hence a study of some of these variables among adolescents in small towns and villages in Hampshire, as a prosperous rural location straddling the boundary between the Estuary heartland of the London-dominated South East and the more isolated South West, would help us assess the spread and social meanings of innovative 'youth' features among the new generation of Standard Southern British English speakers.

3 Data and Methodology

3.1 Chapter overview

In this chapter, I discuss the community studied in the thesis and the approach I took in collecting and analysing the data obtained from it. The first part of this chapter outlines linguistic research conducted on English in Hampshire, together with a description of the geographical and socio-economic characteristics of the area from which my participant sample is drawn. The next section explains the research questions and how I answer them in the thesis. This is followed by an introduction to and a justification of my overall methodological approach, particularly relating to the perception data. The details of the procedure for collecting the data are given in Section 3.6.1. The methods for each type of analysis are discussed in depth in the methods sections of the corresponding chapters.

I then provide details about the pilot study and explain how the results of this study informed the design of the main study. This is followed by an account of my experience visiting the schools and conducting the group discussions with participants, together information about the schools' social make-up and culture. The last section of this chapter explains how some of the variables used in the quantitative analysis were measured, with a focus on socio-economic class.

3.2 The community: Hampshire

3.2.1 Hampshire accent and dialect

In terms of studies of the language of Hampshire itself, very little research has been conducted. The county's location in the central south of England between West Country dialects and the Home Counties in the east, however, makes it an interesting potential transition area between the two. Ellis (1889) visited the towns of Lymington and Christchurch in the south-west of the old county borders, where his writings suggest that there, as in several well-connected places in England, dialect levelling had already begun to take place. He describes this area as having 'no dialect' (1889 p. 37, quoted in Kerswill 2018 p. 30), by which he means that some of the distinctive local features of speech had disappeared and sounded rather more like what he calls 'received speech' – a levelled, more standard-sounding variety. The Survey of English Dialects (SED) by Orton and Dieth (1967) aimed to record the speech of rural elderly men from across the UK before their traditional dialects disappeared; this included speakers from villages in Hampshire and the surrounding counties. Trudgill's (1999a) classification of traditional dialects, mainly based on the SED data, places western Hampshire in the 'Western Southwest' dialect area, which extends all the way to Cornwall. This is motivated by these dialects' use of a set of common features, including rhoticity, /h/-dropping, fricative voicing, and a low TRAP vowel. The eastern

part of the county is included in Trudgill's 'Eastern Southwest' dialect area, which also comprises the Home Counties west and south of London from Berkshire to Kent. These dialects differ from the Western Southwest area by not having fricative voicing, but they share many of the other features. Some of these traditional pronunciations are in evidence in folk-linguistic descriptions of the local dialect aimed at the popular market (e.g. Fernley 2014), which use eye-dialect spelling but from which phonetic realisations such as fricative voicing can be observed. One professional accent coach working in film and theatre today even provides training on producing a so-called 'Hampshire accent' that better resembles the speech recorded in the SED than that of the county's current inhabitants (Meier 2012).

The use of these traditional variables has much diminished in modern dialects, with rhoticity now restricted to an ever-shrinking portion of the South West and fricative voicing almost non-existent. Regional dialect levelling has meant that contemporary Hampshire English, as with most other varieties of England, now sounds much more like the dialects of the east of the country, which RP is based on. This is reflected in Trudgill's (1999a) classification of the modern dialects of English, which places the east of Hampshire together with the Home Counties, and the west in a 'Central Southwest' region that ranges from Somerset to Oxfordshire. The primary distinction between these two areas seems to be that those places west of the line have so far resisted innovations from London such as /l/ vocalisation, while retaining rhoticity. Similarly, the isogloss for the long and front [aː] in BATH, a feature of south-western dialects, runs through the middle of Hampshire in Hughes *et al.* (2012), yet evidence from Piercy (2010) suggests that this kind of realisation is in the process of dying out even further west in Dorset. Trudgill (1999a) argues that in the future, this line is likely to move further and further west, having already taken place for younger generations. Based on my own experience, I can impressionistically confirm that rhoticity and [aː] in BATH are very rare in Hampshire and restricted to only the oldest and least mobile speakers, yet very few academic studies of language variation in Hampshire have taken place since the SED to study this systematically. To my knowledge, the only example in the later 20th century is Fudge's (1977) investigation of /a/ in his own native Southampton speech.

Recent years, however, have seen an uptick in scholarly interest in the region, the findings of which appear to support the claims of Trudgill (1999a) and Hughes *et al.* (2012). Wallace's (2007) comprehensive dialectological study of Southampton finds that the use of rhoticity and [aː] is, as expected, less frequent among younger speakers, but also more prevalent among those who see the city as part of the South West, in contrast to participants who consider it to be in the South East or in neither. Wallace argues that the mixture of south-eastern and south-western features in the city is linked to the fact that many of her respondents identified most strongly with a 'Southern' identity, constructed in opposition to negative connotations of the South West as rural and the South East as associated with London. The link between social class and changes in RP is explored in Hampshire in a recent investigation by Badia Barrera (2015). Her study of the speech of pupils and recent leavers of four schools of

different levels of social exclusivity (two of which are located in the county) finds that /t/-glottalling – one of the main members of the set of variables said to be spreading from London – is socially stratified according to type of school. In particular, speakers at the state comprehensive school, located in the prosperous and rural Hart district of the county, used /t/-glottalling a majority of the time in word-final pre-vocalic position, suggesting that even among middle-class young people from small towns and villages, /t/-glottalling in certain phonological environments has become the norm under influence from the Home Counties. Their resistance to word-medial pre-vocalic /t/-glottalling, however, indicates that the change is less advanced here than it was 20 years ago in other parts of the South East (cf. Altendorf 1999 and Tollfree 1999 in London; Williams & Kerswill 1999 in Reading and Milton Keynes).

In summary, the fairly limited body of research on Hampshire English has allowed us to gain some idea of changes in pronunciation in the county, but that these are best interpreted together with findings from across the south of England. The traditional dialect of Hampshire has all but disappeared and is now likely to be extremely limited to older speakers, specifically those from working-class backgrounds and / or those who have lived the vast majority of their lives in the county. Given Hampshire's overall high levels of prosperity and mobility (see Section 3.2.3), speakers matching the description above are likely now very rare. Among middle-class speakers of all ages, RP / SSBE-like pronunciations are the norm. For many middle-aged and younger people, the accent shows variation according to the variables discussed throughout the chapter (the 'youth norms' or 'Estuary English' features) that are said to be spreading from London across southern England. However, Hampshire's central location in the south of England means that these changes are likely to be less complete than in the Home Counties, while some speakers may also retain some south-western pronunciations such as rhoticity and [aː], potentially depending on their orientation towards traditional south-western ideologies and practices like rural living. The next section goes into further detail on the geographical and social profile of Hampshire and provides some insight into the local community sampled for this thesis.

3.2.2 Geographical profile

Hampshire is the ninth-largest county in England out of 48 in terms of size and the fifth-largest in terms of population with 1.8 million inhabitants. Located in the central south of England but classified as part of the South East for government statistical purposes, its two largest cities are Southampton (254,000) and Portsmouth (205,000), both port cities best known for their leading roles in the UK's commercial and naval shipping industries respectively, though both are now diverse and thriving economic hubs. The county is also the location of the historic city of Winchester (45,000), which served as the capital of England during the Middle Ages. The county has strong connections to the military: the British Army's main garrison is located in Aldershot with training camps at Sandhurst and Bordon. Two-thirds of the Royal Navy's surface

fleet is docked at Portsmouth while the village of Odiham is home to a Royal Air Force station. Some of Britain's most well-known historical figures, including Jane Austen, Charles Dickens, Florence Nightingale and Isembard Kingdom Brunel were born or made their home in the county.

The population studied in this thesis centres around the local government district of East Hampshire, which is located 15-30 miles north of Portsmouth and 40-60 miles south-west of London, with a population of 121,000. It is predominantly rural, with a large number of villages spread out over an area of almost 200 square miles. The most populous settlements in the district are three towns of roughly equal size: Alton (population 18,000), Bordon (16,000) and Petersfield (15,000). The far south of the district is more suburbanised, with some of the villages there forming the outer edge of the conurbation surrounding Portsmouth. Other large nearby towns and cities are Basingstoke (114,000) and Guildford (77,000). The A3 and A31 main roads pass through the district and link it to London and the south coast.

Alton and Petersfield are market towns that prospered as a result of their locations on the roads from London to Winchester and Portsmouth, with direct road and rail connections to the capital and to other cities. Bordon has been home to an army base since the late 19th century and does not have its own train station or immediate access to a dual carriageway, requiring residents to travel further to get in or out of the town from other places. The South Downs National Park, established in 2011, covers the majority of the district in recognition of the area's natural beauty in the form of rolling chalk hills and ancient woodland.

The two schools I visited to collect the speech data were located in two of the towns in East Hampshire mentioned above.[4] However, owing to the district's rural nature, good transport links with other towns and the large catchment areas of the schools, 20 out of the 45 participants whose data I analysed lived outside the district. The largest number of these lived in the district of Waverley in Surrey, which borders East Hampshire to the north-east. Waverley shares many characteristics with East Hampshire and the villages on the border essentially form the same community. The most notable differences are its slightly larger towns and its closer proximity to London. A number of participants also came from Hart (Hampshire) to the north, which is similar to Waverley. The districts of Chichester (West Sussex) to the south-east and Guildford (Surrey) to the north-east are also represented in the study. These are large, rural districts comprising a small historic city or large town surrounded by villages. One informant each lived in Rushmoor (Hampshire) to the north-east and Havant (Hampshire) to the south. These are more (sub-)urban districts with a greater proportion of built-up areas.

Throughout the thesis, I mostly refer to the location of my study as 'Hampshire' or 'the East Hampshire area / region', but these should be interpreted as shorthand for the area comprising East Hampshire together with the other districts named above.

[4] For reasons of participant confidentiality, the town names are not disclosed.

Since there is no official name or local nickname for the area my participants lived in, I am required to either come up with my own term or use a slightly inaccurate generalisation. Given the absence of a satisfactory candidate for the former[5], I have decided to use 'Hampshire' and 'East Hampshire' in fulfilment of the latter, acknowledging (i) that a minority of my participants live in other districts, including some in Surrey and West Sussex and (ii) that the area dealt with in this thesis only covers a portion of the county. Notably, the speech of the urban south coast of Hampshire and the New Forest in the west may show some differences to those of the speakers in my study. Figure 3.1 shows a map of the region, with East Hampshire highlighted.

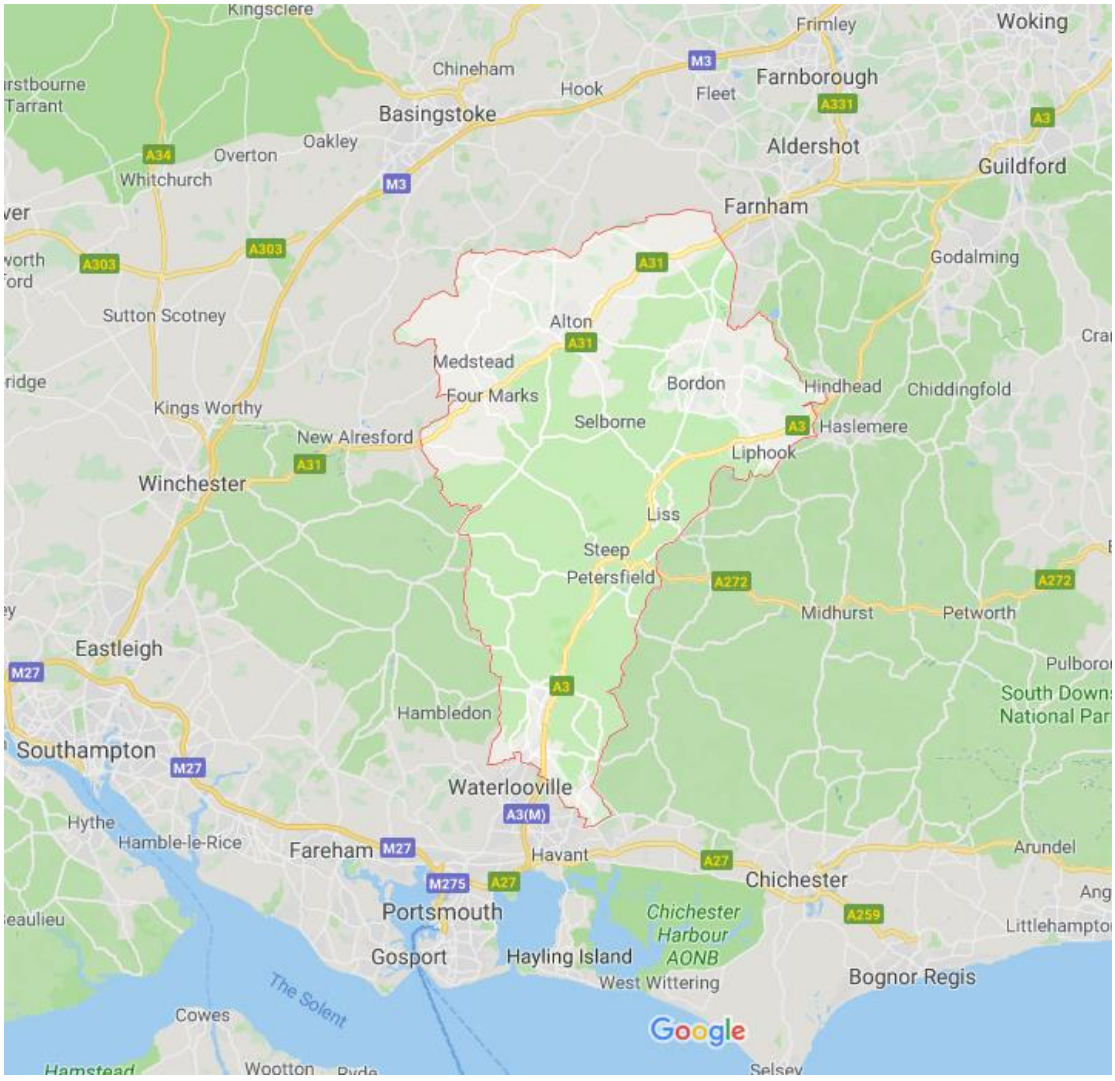

Figure 3.1: Map of main towns and villages in East Hampshire and surrounding area. Map data from Google.

[5] Options included 'the South Downs' and 'the A3-M3 corridor'. The South Downs National Park extends much farther east into East Sussex, however, so the former label seemed even more inaccurate than 'Hampshire'. The latter would likely only make sense to readers familiar with British roads.

3.2.3 Socio-economic profile

An article in the British national newspaper *The Guardian* describes Petersfield, one of the main towns in East Hampshire, as 'nirvana for commuters', owing to its 'bustling high street, vigorous markets, cosy flint walls and wooded hinterland', all 'just over an hour from London' (Dyckhoff 2013). This description could equally apply to many of the towns and villages in East Hampshire and the surrounding area, as they are sufficiently close to the capital to allow for daily travel (typically around 45-75 minutes on the train), but are far enough away that a semi-detached or detached family home in a peaceful rural setting is within the price range of many middle-class city workers. The area's close proximity to other large towns and cities such as Portsmouth, Guildford and Basingstoke mean that commuters to these places are also well-served. As a consequence of the area's popularity with commuters, house prices are closely tied to accessibility to major roads and railway stations with direct connections to London. Research suggests that buyers typically pay 18% less on homes 40-59 minutes' travel from London compared to those 19-39 minutes away, with another 17% drop for a 60-79-minute commute (White 2019). These dramatic differences in house prices can be observed in the East Hampshire area in Table 3.1. The gap in prices between the top three, which have journey times to London of an hour or less, and the rest of the table is particularly large. This does not include villages and towns that do not have railway stations, which are often cheaper. Nevertheless, the average house price for the area as a whole is £491,591, which is over double that for England (£229,431) and higher than that for South East England (£412,724), hence limiting many neighbourhoods to only those with above-average incomes.

Table 3.1: Average house prices for towns and villages in the East Hampshire area. Train journey times obtained from NationalRail.co.uk. Average house prices correct for August 2019 and obtained from Zoopla.co.uk.

Town / village	**Fastest train journey time to London (minutes)**	**Average house price**
Haslemere	49	£652,120
Farnham	54	£613,347
Bentley	60	£614,427
Petersfield	63	£522,362
Liphook	64	£547,232
Alton	67	£484,518
Liss	71	£536,626
Havant	77	£270,076

The high cost of housing in the East Hampshire area is also reflected in the distribution of occupations among the population. Table 3.2 shows the percentage of the population for each National Statistics Socio-Economic Classification (NS-SEC)

group in East Hampshire and in England.[6] The NS-SEC is a measure of employment relations and occupations based on sociological research (Goldthorpe 2007) used by the UK Office for National Statistics (ONS), described in ONS (2010). Compared to England as a whole, East Hampshire has a higher proportion of inhabitants in the two most prestigious and well-paid groups of occupations (Higher and Lower managerial, administrative and professional occupations). 40.3% of workers in East Hampshire are employed in these two categories, while the figure for England is 30.3%. In contrast, the proportion of the population employed in Semi-routine or Routine occupations is lower than England as a whole (19.8% vs. 25% respectively). The same applies to those who have never worked or have been unemployed for a long period of time (2.6% vs. 5.6% respectively). By making a parallel between the NS-SEC and conventional conceptions of socio-economic class based on occupation, it is reasonable to state that East Hampshire has a greater proportion of middle-class people (and a correspondingly smaller proportion of working-class people) than is typical for England. The other districts in which some of my participants live show similar figures, with the exception of the more suburban Havant and Rushmoor, which are closer to England as a whole.

Table 3.2: Distribution of the populations of East Hampshire and England by NS-SEC group

NS-SEC group	**East Hampshire**	**England**
1. Higher managerial, administrative and professional occupations	14.5%	10.4%
2. Lower managerial, administrative and professional occupations	25.8%	20.9%
3. Intermediate occupations	12.7%	12.8%
4. Small employers and own account workers	11.9%	9.4%
5. Lower supervisory and technical occupations	6.2%	6.9%
6. Semi-routine occupations	12.2%	14%
7. Routine occupations	7.6%	11%
8. Never worked and long-term unemployed	2.6%	5.6%
Not classified – Full-time students	6.4%	9%

Another way of measuring social stratification is to look at levels of deprivation. The Index of Multiple Deprivation (IMD) is a UK government statistic encompassing various indicators of deprivation including income, crime and access to education and healthcare. The map in Figure 3.2 shows each neighbourhood of approximately 1,600 inhabitants in Hampshire and the Isle of Wight coloured according to which decile it belongs to in the 2015 IMD ranking for England. Darker colours indicate higher levels of deprivation. It is clear that most of the county falls into the least deprived portion of the scale, especially rural areas in East Hampshire and Hart. Havant and

[6] NS-SEC data, together with those for other socio-economic factors discussed in this section, are taken from the 2011 Census, the results of which are reproduced at www.ukcensusdata.com.

Rushmoor contain a larger proportion of more deprived neighbourhoods. Waverley, Guildford and Chichester are not shown on the map as they are not in Hampshire, but as primarily rural districts, they are comparable with East Hampshire and Hart. Further examination of the data from the 502 neighbourhoods that make up these eight districts reveals the overall lack of deprivation in the area. The median neighbourhood in the region (i.e. the 251st-most deprived area out of 502) is only ranked 26,028 out of 32,844 neighbourhoods in England, putting it among the 21% least deprived neighbourhoods nationally. Only six neighbourhoods find themselves in the top decile of the most deprived in England, while 159 are in the bottom decile (the least deprived).

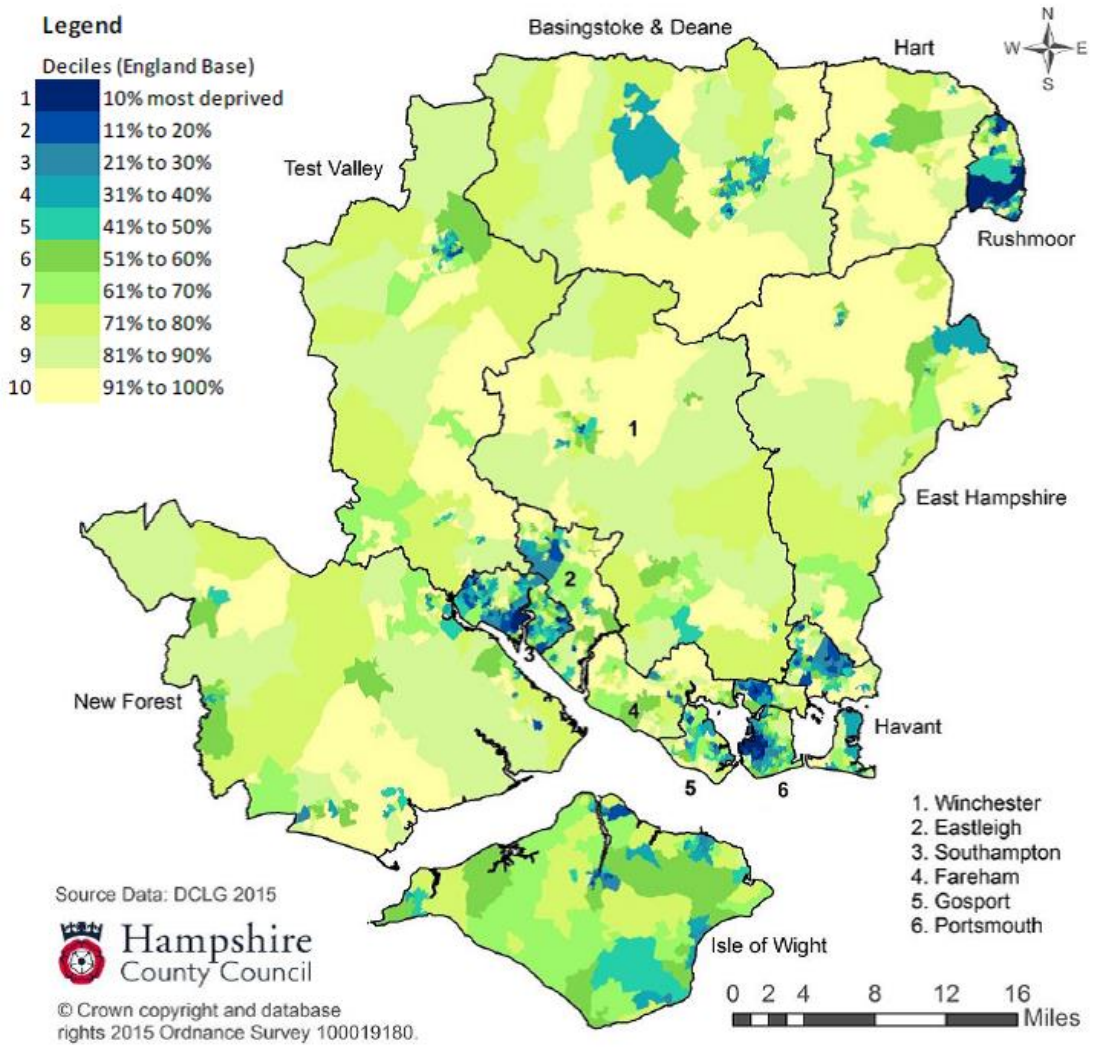

Figure 3.2: Deprivation levels in Hampshire and the Isle of Wight (2015)

The information presented here for socio-economic class, as shown through house prices, NS-SEC occupational data and deprivation, has implications for the study of language variation and change in the East Hampshire area. Ever since the beginning of variationist research, differences in language use between members of different class groups have been identified (e.g. Labov 1966, Trudgill 1974, Milroy & Milroy 1992). More recent work has also shown how sociolinguistic variation can be used as

part of the construction of class-related identities in interaction (e.g. Snell 2010; Rampton 2011; Eckert 2012). In order to discuss class-related patterns in the data, it is of course necessary to recruit participants from a range of social class backgrounds. The demographic data from East Hampshire and surrounding districts, however, indicates that this area displays less socio-economic variation than many places in England. In particular, more people are concentrated at the top of the NS-SEC occupation continuum and high levels of deprivation are restricted to small pockets in specific areas. This means that those from working-class backgrounds are a fairly small minority and may be even further excluded from public life than in more typical neighbourhoods. In addition, it may also imply that among middle-class individuals, a perception may exist that what is actually a high level of affluence is 'normal'. In addition, the homogeneity of middle-class-ness that exists in Hampshire may result in more subtle semiotic resources being employed to distinguish between different groups or different middle-class identities.

The idea that different middle-class identities may be at play in the region can be explored further by examining its political character. On the surface, it would appear to be fairly homogenous, as all eight parliamentary constituencies represented among my participant sample had a Conservative Member of Parliament, seven of which with Tory majorities of over 30%. Indeed, the Westminster constituencies of North East Hampshire, Meon Valley and East Hampshire[7] find themselves in third, fourth and seventh positions respectively out of 317 in terms of the size of the Conservative majority over the second-placed party in each seat at the 2017 UK general election. At the 2016 referendum on the UK's membership of the European Union, however, not all districts voted the same way. East Hampshire, Hart, Guildford and Waverley voted to remain in the EU, while Rushmoor, Havant and Chichester voted to leave. The former four are well-connected to London, while Havant and Chichester are further away and more influenced by Leave-voting Portsmouth. Rushmoor is relatively close to London but its more compact, built-up nature and reliance on the Aldershot Garrison may influence its voting habits. The area as a whole may be prosperous, therefore, but individuals' lived experiences may vary across the region and so have an effect on their ideological tendencies.

One domain in which there is less variation between the districts in the study, however, is ethnicity, where most of the region is less diverse than England as a whole, which is 85.4% White, 7.8% Asian / Asian British, 3.5% Black / Black British and 2.3% Mixed. In East Hampshire, 96.3% of the population identified as White in the 2011 Census. Those of non-White ethnicities hence make up only a tiny fraction of the population: 1.6% Asian / Asian British, 0.4% Black / Black British and 1.1% Mixed. Similar figures are found in most of the other districts in the study, all but two of which have a total White population of 95-97%. Guildford (91% White) is slightly

[7] Westminster parliamentary constituencies (seats) do not necessarily map on one-to-one with local government districts. The North East Hampshire seat covers roughly the same area as the Hart district, and the Meon Valley seat encompasses rural parts of Winchester and East Hampshire districts.

more diverse owing to its universities, while Rushmoor (85% White) has a sizable minority of Nepali Gurkhas as a result of its military connections.

This also has implications for the study, as many investigations of language variation and change in a community find that language can be used as a resource to index ethnic and related identities (e.g. Mendoza-Denton 1997; Bucholtz 2001; Shankar 2008; Hall-Lew 2009; Benor 2010; Sharma 2011; Kirkham 2013, 2015; Alam 2015; Gates 2018). These studies are mostly set in diverse, multi-ethnic urban environments, but the demographic characteristics of the Hampshire community are such that it is highly unlikely that sufficient numbers of non-White inhabitants can be recruited to be able to include ethnicity as a parameter in the statistical analysis without targeting them specifically. Research has found that sociophonetic variation can be used to index whiteness (Bucholtz 2010), but this may not occur in a very obvious way in a community with very little ethnic diversity.

In summary, East Hampshire and the seven other districts represented in my study are, by and large, prosperous, well-connected commuter towns in a rural setting with relatively low ethnic and socio-economic diversity. The excellent transport links between many of the settlements there and large economic hubs nearby, especially London, indicate that the area has high social and geographical mobility and looks outwards to other places as part of its socio-economic development. This particularly applies to the districts of East Hampshire, Hart, Waverley and Guildford, which are the most well-connected, prosperous and open places in the region in my study. Rushmoor and Havant share these features to a lesser extent due to their higher levels of deprivation and military connections and distance from London, respectively, although that is not to say that they are completely closed off from mobility and prosperity. Rather, they are simply closer to the average for England.

To use Kerswill's (2018) classification of types of communities in the context of dialect change (using terminology adapted from Andersen 1988), almost the whole of the region is open – that is, it has a high degree of external contact – rather than closed. The most well-connected towns are both open and exocentric (i.e. they have a positive attitude towards outsiders and their linguistic norms), while a minority are somewhat more endocentric (with more negative attitudes). However, because the area is further away from London and is less well-connected than the kinds of Home Counties locations whose accents seem to have changed the most under influence from London, I would say that it is less open and less exocentric than places like Milton Keynes (cf. Williams & Kerswill 1999). Within the East Hampshire area itself, some places are more open and exocentric than others, as described above. The characteristics of East Hampshire and its surroundings thus make it an interesting case in the context of the study of language variation and change in England, which has traditionally focused on highly stratified urban centres. It is hoped that this thesis will help contribute to our knowledge of how sociolinguistics works in small, rural communities that, far from being isolated, are perceived as islands of tranquillity for a highly mobile population.

3.3 Research questions

In Chapter 2, I summarised the literature, pointed out the gaps and explained how this thesis goes some way to contributing to our knowledge of sociophonetics. The thesis is hence centred around the following research questions:

1. To what extent are the patterns of sociolinguistic variation of phonetic features reflected in speakers' perceptions of these features?
2. Does a feature's availability for making social meaning depend on its fulfilment of salience criteria and whether it is noticed by speakers?
3. How do the production and perception of variables undergoing change operate on a local level among adolescents at a state school versus at a private school?

In order to answer the first question, the study required an investigation of speech production and perception in the same speakers. Hence, I designed the study to encompass collecting recorded speech data from young people and analysing it using sociophonetic methods, as well as getting them to complete a speech perception task involving responding to audio speech stimuli. The stimuli had to be as similar as possible to the participants' own speech, so that their responses were being directed towards the kind of speech that they heard in their everyday lives at school and that they would produce themselves. This meant collecting speech recordings of adolescents in Hampshire before embarking upon the main phase of the study, which I did using a pilot study (see Section 3.5).

In order to address the second question, the features analysed had to represent those at the high and low ends of the spectrum of salience. As explained in Section 2.3.4, salience in this thesis refers primarily to language-internal or cognitive factors that make a feature stand out or surprising given the context. Social salience – the extent to which a variable can be used to make social meaning – is regarded as a separate construct that is in some way related to salience but is not the same thing. In Section 2.5, I listed the main phonetic changes occurring in southern accents of English. Of these, /t/-glottalling is one that fulfils most of the criteria for salience in previous work (e.g. Trudgill 1986). It is a phonetically categorical change (i.e. glottal [ʔ] vs. alveolar [t]) which can be reflected in orthography (e.g. *computer* > *compu'er*, as in Hodgkinson 2015). It is not involved in a phonological contrast because the glottal stop is not a phoneme in English, but it is often interpreted by speakers as one since the [t] is regarded as being deleted, 'dropped' or 'silent'. One of the features that least fulfils the criteria for salience is GOOSE-fronting, as it is a phonetically gradient change across vowel backness that does not have an orthographic equivalent. Nor does it involve a phonological contrast – fronted variants of GOOSE such as [yː] and [ʏː] are not separate phonemes in English. Other variables undergoing change in southern varieties of English were less viable candidates, since they are more mixed in terms of their fulfilment of salience criteria (e.g. /ɹ/ labialisation is reflected in orthography with a <w>, yet the sound produced is not usually [w] but [ʊ], so is of

debatable phonological status). In terms of the sounds' social salience, too, /t/-glottalling is often led by certain social groups in production; it is reported as being 'stigmatised' (Fabricius 2000); and it is identified and commented on by non-linguists (e.g. Hodgkinson 2015). In contrast, GOOSE-fronting has weaker sociolinguistic patterning and rarely attracts attention outside of academic linguistic texts. The salience, social associations and other important information about the two features, as found in existing literature, are discussed in further detail in their corresponding chapters, but this brief explanation argues that /t/-glottalling and GOOSE-fronting are ideal for studying salience in the South of England as both are undergoing change, yet they represent opposite ends of the salience continuum.

The third research question is motivated by the gap in the literature on adolescent language use within multiple schools as loci of different class backgrounds in the same community. In order to answer this question, I conducted research at a fee-paying private school and a government-funded state school and spent time asking pupils about the social structures of each school. Many similar sociolinguistic studies of adolescent friendship groups use ethnographic methods (e.g. Cheshire 1982; Eckert 1989, 2000; Moore 2003; Kirkham 2013; Nance 2013; Alam 2015; Drager 2015), whereby the researcher spends several months or more as a participant-observer in the community, in order to gain the best understanding possible of the groups' ideologies and practices, which are often analysed using Lave and Wenger's (1991) framework of communities of practice (Eckert 2006). Because I was conducting research at two schools (three including the one visited for the pilot study), I did not have the time to be able to do an ethnography of each school. The disadvantage of this is that I did not get to know the pupils beyond the hour I spent with them for the data collection session and hence did not get first-hand experience of the individuals' behaviour, activities and speech outside of the recording room. However, as will become clear in Section 3.6, even in the short time I was with the students, they were very forthcoming about the social life of their school and, in the private school in particular, they gave me detailed information about the friendship groups in their year group. This enabled me to integrate this information into the sociolinguistic analysis in a similar way to ethnographic research. Other studies of sociolinguistic variation between types of schools also find quantitative differences without employing ethnographic methods (e.g. Badia Barrera 2015).

In addition, as a former inhabitant of Hampshire and former student of one of the schools who was not much older than the participants, I already had 18 years' experience of observing and participating in life among young people at school in Hampshire and so was not entering a completely alien community. I recognise that my experience is in no way a replacement for sharing intimate life experiences directly with participants as part of an ethnography, but such methods were not required for a study of multiple schools in the timeframe required for a doctoral thesis. By completing the production and perception tasks with students reported here, I was still able to gain sufficient information about the social lives of the schools to capably answer my research questions.

3.4 Methodological approach

Detailed information about the data collection procedure can be found in Section 3.6.1, while the methods and techniques used for each type of analysis are given in the appropriate methods sections of each chapter. However, in this section I give an overview of the overall methodological approach that I take in this thesis, particularly regarding the perception data, which is somewhat unusual in sociophonetics.

The production analysis is done, as in many studies in third-wave sociolinguistics (e.g. Moore & Podesva 2009; Kirkham 2013), by combining quantitative variationist analysis (Milroy & Gordon 2003; Tagliamonte 2006) with qualitative interactional analysis (specifically using a framework by Bucholtz and Hall 2004, 2005). This allows me to observe the overall patterns of variation in the community as well as how social meanings are made in interaction by individuals.

The perception analysis uses direct questioning of participants on their views towards language and speakers via survey and conversation tasks in a similar way to language attitudes research (e.g. Garrett *et al.* 2004; Garrett 2010; Preston 2019) rather than a controlled laboratory-style experiment that accesses listener perceptions indirectly. It also uses auditory stimuli that are not manipulated in any way. In many studies of sociolinguistic speech perception based around the Matched-Guise Test (MGT) and its variants, the features of interest are often spliced into identical carrier sentences so that the only element of the stimuli that varies is the variable being researched (e.g. Campbell-Kibler 2005, 2007, 2012; Labov *et al.* 2011; Levon & Fox 2014; Drager 2018). This makes sense, as without doing so, other differences between the stimulus voices could have an effect on listener perceptions.

However, the disadvantage of splicing features from one recording into another is that this can end up producing unnatural-sounding stimuli. This is especially the case if vowel synthesis, pitch shifting or further digital manipulation is required to produce a range of variants along a continuum. In addition, it is debatable whether changing one sound in a subtle way inside a carrier sentence actually has an effect on participants' responses, or whether listeners interpret utterances in terms of small single differences or as clusters of features that form an overall personal style. For instance, Soukup (2012) uses an 'open-guise' evaluation test in which participants are aware that the different guises are performed by the same speaker, yet she still finds predictable differences in perception between standard and regional Austrian German dialects. This indicates that the issue in designing an MGT-style speech perception experiment may be less about convincing listeners that the guises are uttered by different speakers, but more about whether the guises are sufficiently different enough from one another (both in terms of linguistic detail and social associations) that listeners can attribute different characteristics to them.

The upshot of this is that digitally manipulated stimuli featuring spliced variants of sounds may not necessarily be an effective way of getting at differences in perception of social meanings of phonetic variables, or a meaningful way of representing the

kinds of utterances that people hear in everyday life (Hamilton & Huth 2018). It is with this in mind that I elected to use non-manipulated stimuli for this study – specifically, recordings of four young people from another school in East Hampshire reading a short text, collected as part of the pilot study (see Section 3.5 for further information about the pilot study, and Section 7.3.1 for details about the stimuli). There is little doubt that differences between the four speakers and the presence or absence of other variables had an effect on listener perceptions. However, because I used a combination of survey and conversation data, I had the opportunity to find out what aspects of the speakers' voices most contributed to participants' perceptual responses by asking them about it directly during the conversations. This helps mitigate the fact that other differences between the stimuli mean that it is impossible to attribute the survey responses purely to variation in /t/-glottalling and GOOSE-fronting. Having employed traditional experimental sociophonetic methods in a laboratory perception study of GOOSE-fronting elsewhere with mixed results (Alderton 2015), I felt it necessary to sacrifice some of the tight control of the stimuli in order to create more ecologically valid ones that displayed variation in many linguistic variables. This would be easier for the participants to respond to, make it less obvious what the goal of the study was and allow for a detailed look into the salience and social meanings of multiple variables at the same time as part of an overall personal style.

The survey was designed to contain a large number of social characteristics in the form of labels that could be circled on paper sheets by listeners (see Appendix C). The idea with this was that it would not 'coerce' listeners into hearing the stimuli in a certain way, but would allow them to express their thoughts using a large menu of options that represented social characteristics used in previous studies (e.g. Campbell-Kibler 2005, 2007) as well as those relevant to the community elicited from the pilot study. This would hopefully lead to a more nuanced understanding of the social meanings associated with phonetic variation. The point of the survey was to get participants' immediate reactions to the audio stimuli in the form of the social traits they associated with the voices they heard, which are linked to variation in /t/-glottalling and GOOSE-fronting between the speakers' voices. These data are quantifiable in the sense that total counts of selected traits can be analysed using descriptive statistics, word clouds and graphs, but complex statistical procedures cannot be applied to them because of the data set's small size and its multiple potential dependent variables.

This lack of quantitative analytical possibilities is the main disadvantage of this approach compared to techniques more commonly employed in sociophonetic speech perception research. Measurements such as Likert scales or phoneme categorisation tasks elicit easily quantifiable data that are amenable to regression modelling. However, these techniques restrict participants' responses to whatever parameters the researcher pre-selects (e.g. the Likert scales or phonemes included), potentially predisposing the results to fit existing theories. My desire with this thesis was to minimise the effect on the results of the researcher's prior expectations of the social

characteristics linked to phonetic variables, especially given that one of the variables that I look at is not consistently attributed to index a particular social stereotype. Instead, I wanted to give participants as much freedom as possible to express their perceptions of the phonetic variables in their own words and using categories that were relevant to their own lives. This is particularly important for teenagers in a school context, as previous work in secondary schools shows that sociophonetic variation occurs on a micro level that is specific to the friendship groups and structures of a particular school (e.g. Eckert 1989, 2000; Moore 2003; Kirkham 2013; Alam 2015; Drager 2015). While I could not hope to design a task whose social labels or features perfectly reflected the unique social make-up of each school without at least conducting a long-term ethnography (see above), what I could do was acquire knowledge about the lives of young people in the community and integrate that into the study design, which was enabled via the pilot study.

The perception data also involved a conversation task. The conversations took place immediately after the survey and were conducted in three phases in a style similar to the 'funnel debriefing' technique used in social psychology (Bargh & Chartrand 2000). First, participants gave their general impressions of the stimulus voices, expanding on their survey responses; second, they were played the clips again, asked to concentrate on the pronunciation and identify and discuss any interesting phonetic realisations they heard; third, I pointed out specific features in the stimuli and asked listeners if they had noticed them before and what their thoughts were. The point of this was to get perceptual information on the social meanings of the overall stimulus voices (in other words, each speaker's personal style) as well as individual phonetic variables. This approach is inspired by Campbell-Kibler's (2005, 2007) combination of survey and conversation data into the study of the social meanings of variants of ING. Other work on language attitudes has used interviews to ask participants about their thoughts on auditory stimuli and language varieties (e.g. Garrett *et al.* 2004; Preston 2019), though as far as I am aware, the way I present samples of individual phonetic realisations to participants and ask them to comment on them is original in sociolinguistic work to date. This helps contribute to our knowledge of people's ability to respond to and discuss linguistic variables in an overt way, which is poorly understood (Campbell-Kibler 2016).

Studying non-linguists' metalinguistic knowledge is potentially very fruitful, but it is also challenging because of the limitations of people's knowledge of language (Coupland *et al.* 2004; Preston 2004). Listeners may not simply have the discourse available to talk about finer points of phonetic detail (Kristiansen 2011), so the third phase of the conversation task helped bridge this gap. In this phase, I identified features and explained them to listeners, and all participants had to do was attribute them to social associations. This structure also allowed me to assess the noticeability of individual features – those that appeared in phase one or two (without my prompting) were more noticeable than those that relied on me pointing them out in

phase three. The same goes for features that informants said that they had never noticed before or struggled to 'hear' as distinctive after being pointed out by me.
Overall, it can be said that the study design sacrifices some close control and quantifiability for greater ecological validity. This is a dilemma that every researcher faces when designing a speech perception experiment, but I have chosen to err more towards the ecologically valid end of the spectrum for this study. The diverse range of survey responses, conversations and unmanipulated stimuli have rarely been used before in sociophonetics and they are suitable to answer my research questions.

3.5 Pilot study

3.5.1 Pilot study design

In order to be able to study how people perceive and describe the social meanings associated with phonetic variables, I needed to obtain recordings of speech samples to play to listeners as stimuli. I also wanted to gain an understanding of the relevant social groups, stereotypes and characteristics that young people in Hampshire generally associated with particular kinds of speakers. For these reasons, I conducted a pilot study at another school in East Hampshire before embarking on the main data collection.

The school at which I collected the pilot study data is located in the same town as one of the schools used in the main study. It is a state secondary school covering ages 11-16 up to GCSE[8] level. After finishing their exams, most pupils continue their education at a range of further education providers in the area, including the sixth forms at both schools investigated in the main part of the study. Twenty-six pupils took part, who were evenly split between Years 9 and 10 (age 13-15), with 12 boys and 14 girls.

The pilot phase had two main aims: (i) to obtain spoken recordings to make stimuli for the perception experiment; (ii) to gain information on how speakers talked about accent variation, Hampshire as a community, and their lives at school, so that the social labels included in the perception experiment reflected the language and ideas used by young people in the area. In order to fulfil these goals, I designed the pilot study sessions so that they encompassed the following tasks:

- Reading task: *The Boy Who Cried Wolf* and hVd monophthong word list (see Appendices A and B; these tasks are discussed in further detail in Section 3.6.1).
- Accent evaluation task. I played four clips to students, each depicting around 15 seconds of the speech in the following accents: conservative RP, traditional

[8] The General Certificate of Secondary Education (GCSE) is the qualification studied for by the majority of 16-year-olds in England before they leave secondary school. Most students take around five to 10 GCSEs in a range of subjects.

Hampshire, contemporary RP (SSBE) and Estuary English. I then asked the questions below:

  - Was there anything that struck you about the way this person said the words?
  - Do you know anyone who talks like that?
  - Do you think there are many people in (*town*) and the surrounding area who talk like that?
  - What kind of person from (*town*) and the area would talk like that?

- General conversation about school and community life. Topics varied according to the flow of the interaction and time constraints, but I usually covered the following topics:
  - School friends – how big is your group? Where do you hang out? What do you and your friends have in common?
  - Other groups – what are the other groups like? Where do they hang out?
  - Do the different groups at school speak differently?
  - What are your hobbies and interests? Do you spend much time with your friends outside of school?
  - What do you think of (*town*) / your home village? Do you like living there? Would you like to live there when you grow up?
  - If you could write a sitcom set in (*town*) and the surrounding area, what characters would you have in it and what stereotypes in the community would they represent? Would the characters speak differently?

Sessions were conducted in pairs of pupils with me as the moderator in a small room in the main school building. I obtained clearance to work with children via a Disclosure and Barring Service (DBS) check and my study design was approved by the Research Ethics Committee at Lancaster University. Students were recruited via a teacher, who emailed parents information sheets and consent forms that I had prepared. Pupils who gave written consent and whose parents did the same were able to take part in the study.

The clips used for the accent evaluation task were acquired from publicly available dialect archives online. The four speakers were chosen as they represented the range of accents most likely to be heard in Hampshire: conservative RP, contemporary RP

(SSBE), traditional Hampshire and 'Estuary English'.[9] Finding comparable speech data for all four accents proved challenging and so not all the speakers are of the same demographic or completing the same kind of speaking task. The SSBE and Estuary English speakers read the same text; the conservative RP speaker reads a different text, while the traditional Hampshire speaker produces spontaneous speech as part of an interview. There are also age and gender differences – the Hampshire speaker is male while the others are female; age data is not available for him and the conservative RP speaker, but they sound at least middle-aged if not older, whereas the other two speakers are in their 20s. These factors are likely to have an influence on listeners' responses, but this is not a problem for this pilot study since the idea of the task was primarily to get participants talking about language in the community and the stereotypes they associate with accents.

3.5.2 Pilot study results

The results for the accent evaluation task were fairly predictable based on UK accent stereotypes (see e.g. Giles 1970; Coupland & Bishop 2007). The conservative RP speaker was regarded as 'posh' and 'upper-class', with few participants being acquainted with someone who spoke in this way, with the possible exception of some wealthy elderly people in the area. The traditional Hampshire accent was met with confusion by most listeners, eliciting comments to the effect that the speaker did not sound local at all and was more likely to come from elsewhere in the UK (e.g. the West Country, the North of England or Scotland). After I pointed out that he was from Hampshire, participants were surprised and thought that if he was local, he would be an old farmer living in an isolated rural place. Responses were more mixed for the SSBE speaker – some listeners regarded her as a younger version of the conservative RP speaker, with traits including 'posh', 'well-spoken' and 'educated', while others thought she sounded 'normal' and representative of the speech of most people in the local area. The reverse situation occurred for the Estuary English speaker – most participants who considered SSBE 'posh' described Estuary English as 'normal', while those with the opposite view typically said that the latter sounded like someone who was less educated and less well-off.

The only specific phonetic feature that was regularly mentioned by participants was /t/-glottalling in the speech of the Estuary English stimulus, articulated as 'dropping her Ts', which was regarded as less educated. A minority of informants identified smoothing (Wells 1982) in the conservative RP stimulus (e.g. *two o'clock* as [tʊəklɒk]) and rhoticity in the traditional Hampshire stimulus, but comments on individual pronunciations were generally rare. The results of this task were helpful in allowing me to identify words and phrases used by young people in Hampshire to describe others' speech, such as 'posh', 'educated', and 'not local', that could then be

[9] As discussed in Section 2.5, some linguists avoid using the term 'Estuary English' as a label for a particular variety. However, it proves useful here to refer to a speaker who produces many of the innovative variants reported to be spreading throughout the South East.

included in the perception experiment for the main study. It also revealed that /t/-glottalling was one of the most noticeable phonetic features among the participants, motivating its selection as one of the variables to study in depth for this thesis.

The conversation about life at school and in the community also proved a useful and revealing exercise. The most prominent and frequent groups mentioned by participants included the so-called 'popular', 'nerdy' and 'chavvy' groups. Others included 'sporty' and 'arty' groups, as well as those named after a leading individual member. These groups are briefly described below.

The popular group was a very large group of Year 10 boys and girls that was comprised of three smaller sub-groups who hung out outside near the school's main building. The boys were described as sporty and the girls as fashionable. This group regularly had house parties at weekends with alcohol and relationship 'drama', to which people outside the clique were rarely invited. This group was often the first one mentioned by pupils after I asked the question and was most associated with SSBE or Estuary English pronunciation.

The nerdy group spent their time in classrooms, the library or near the playground reserved for the youngest pupils and spoke 'posh'. In contrast to media stereotypes and other studies of so-called nerds (e.g. Maegaard & Jørgensen 2015), this group was not defined by stereotypically nerdy recreational practices such as an interest in computer games and role-playing. Instead, nerdiness at the school was constructed as caring about one's education, striving to achieve top marks in assessments and complying with school uniform policy. Being a nerd was more about one's behaviour and ideology in relation to the school than one's hobbies and interests.

Similar remarks were made about the chavvy group, who were almost always referred to in terms of their lack of care towards all aspects of life, particularly their education, other people, presenting themselves well and their future prospects. A 'chav' is a pejorative term for a popular stereotype in British culture of an anti-social and loutish young person of low socio-economic status (OED 2018). While some participants referred to stereotypical 'chavvy' practices such as smoking, doing drugs, violence, certain fashion choices, hanging around aimlessly and living in council houses, the prevailing view seemed to be that chavs' attitudes, particularly towards education and the future – 'they don't care' – was their most important attribute. Their speech was said to reflect their uncaring attitude – that is, they were too 'casual' with their speech and didn't make an effort to make it presentable or comprehensible. Their speech was usually likened to the Estuary English speaker's, sometimes described as 'a Portsmouth accent'.

The other groups were not mentioned as often as the three described above. A 'sporty' group of boys who hung out by the AstroTurf football pitch was sometimes discussed as well as an 'arty' group of girls who dedicated much of their spare time to visual and performing arts. When I asked participants about their own groups, those who did not identify themselves as part of the large 'popular' group tended to refer to their

friendship group as small and 'normal'. These small groups were almost always same-sex.

In summary, then, the pilot results revealed that at the state secondary school, the most prominent group was the 'popular' group, which was large, centrally located on school grounds, and, uniquely among the groups, engaged in risky but 'cool' behaviour outside of school within a mixed-sex environment. The dichotomy between geeks and chavs was based primarily on attitudes rather than practices, and most of the other groups were small, specialist and same-sex.

The results of this discussion prompted the selection of which traits and group labels to include in the survey task for the main data collection (see Section 7.2.1). 'Popular', 'geeks', 'chavs', 'sporty' and 'arty' were specifically included in the survey as a result of the discussions in the pilot data. These are, of course, specific to one specific school and not the other two schools whose data make up the main analysis. This means there is no guarantee that these social categories are relevant for other schools as separate constellations of practice. However, the group labels used were sufficiently generic and reflective of stereotypes found in popular media that I felt that they would be applicable to other schools in the area.

3.6 The schools

3.6.1 Conducting fieldwork

I initially contacted eight schools in East Hampshire to gauge their interest in allowing me to come and conduct recording sessions with students. Three schools agreed to host me – a state secondary school, a private school and a state sixth-form college. I conducted the pilot research at the state secondary school in June 2016, the results of which informed the main data collection, as described in the previous section. I then visited all three schools in December 2016 and January 2017, doing the main production and perception tasks with 80 teenagers across the three institutions. In this thesis, I only analyse the main results from the private school and the sixth-form college. This is because the cohorts of students in these two schools are the same age (16-18, with one 19-year-old exception) and are thus directly comparable. Participants from the state secondary school were aged 14-16 which, while not numerically very much younger than those in the other two schools, represents quite a different stage of adolescent cognitive and social development, which may also have an effect on language use. In addition, one state sixth-form college participant was excluded from the data set as this individual had recently moved to Hampshire from the North West of England and had a correspondingly different accent. Hence the main data set consists of /t/ and GOOSE tokens and perception results from 45 speakers: 19 from the private school and 26 from the state sixth-form college, all of whom were native speakers of English and had lived in the area since early childhood.

For the private school, participant recruitment was done via teachers, who emailed parents with the information sheet and consent form I had supplied. Pupils who gave written consent were eligible to take part as long as their parents had also given written consent. At the state sixth-form college, students and parents were emailed about the study in advance but the young people were recruited on a more ad-hoc basis from English classes. Students provided written consent to take part, but parental consent was not sought as this was deemed unnecessary by staff in line with the college's safeguarding policies. I underwent a check with the Disclosure and Barring Service (DBS) before entering the schools and my written materials and study design were approved by Lancaster University's Research Ethics Committee before undertaking the data collection.

Sessions with participants were completed in small rooms in school buildings and the only people present were me and the informants. The selection of participants to take part in each session was done by teachers. Sessions took place during one period of the school day; sixth-form college students missed an English lesson in order to take part in the study, while private school pupils gave up their free independent study time. Most of the participants were recorded in small groups of two to four, with the exception of one person who completed the tasks by herself after the other pupils scheduled to take part in that session failed to turn up. Students were informed that participation in the study was wholly voluntary and that they could leave the room or switch off their microphones at any time. Their speech was recorded using Zoom H1 and H4S digital audio recorders and Audio Technica ATR3350 lapel microphones at a 16-bit sampling rate of 44.1 kHz.

Sessions began by asking participants to read the information sheet, sign the consent form and give me their parental consent form if appropriate. They then completed a short questionnaire about their demographic information (see Appendix D).

The first main task for participants was to take it in turns to read the story *The Boy Who Cried Wolf* (see Appendix A), presented on a laptop screen. This text, based on the well-known fable by Aesop, was chosen because it is designed to be representative of the phonemic inventory of English. It was selected instead of the more traditional text for such purposes, *The North Wind and the Sun*, as it contains a wider range of sounds and phonological environments than the latter (Deterding 2006) and is becoming increasingly popular in sociophonetics (e.g. Nance 2013; Boyd *et al.* 2015; Leemann *et al.* 2018).

The next task was the perception survey, which involved participants listening to recordings of four teenagers from another school in East Hampshire reading *The Boy Who Cried Wolf* and assigning them various social characteristics such as social class background, school clique membership and personality traits (see Section 7.2 for further details), which were informed by the results of the pilot study. I explained the perception task to the participants, gave them the survey sheets (see Appendix C) and played each stimulus three times via a portable speaker connected to the laptop. This gave participants sufficient time and opportunity to fill in the answers for all the

questions on the survey sheet for each stimulus voice while listening to the recordings at the same time.

Most of the remainder of the session was spent doing the conversation task. I asked participants to discuss their impressions of the stimulus voices and particular pronunciations of sounds. This took place in three phases in order to observe whether a particular pronunciation was immediately noticed by listeners or whether it required extra concentration or my intervention in order for participants to identify it (see Section 7.3 for further explanation). I also facilitated informal conversations about students' interests and life at school.

The final task was for participants to read the hVd word list (e.g. *heed*, *head*, *had*, etc.) in turn (see Appendix B), which was presented via Microsoft PowerPoint, one word per slide. This task was done in order to obtain participants' productions of the monophthongs of English in the same reading style and phonological context to be used for vowel normalisation (see Section 5.3.2). In total, each session lasted roughly an hour.

As a native of East Hampshire, my accent was very similar to the speakers'. I did not quantitatively measure my own usage of /t/-glottalling and GOOSE-fronting in the recordings, but impressionistic observation suggests that I used more glottal stops than most of the participants and similar degrees of GOOSE-fronting. This is worth bearing in mind given that linguistic accommodation is common in interaction – that people converge towards their interlocutors in their speech style (Coupland 1984; Giles *et al.* 1991; Meyerhoff 1998), especially in less formal contexts. While moderating the conversations, I purposely tried to maintain a consistent style that did not vary between sessions. It is very difficult to measure and assess the possible effect of accommodation that may have taken place without comparing individual pronunciation change over the duration of the sessions, but it should be borne in mind when considering the results.

3.6.2 The state school

The state school that I study in this thesis is a sixth-form college[10] located in one of the main towns in East Hampshire and has around 2,000 students, the vast majority of whom are aged 16 to 18. Students are recruited mostly from nine local secondary schools at age 16 after completion of GCSE exams, though some come from further afield. The college's primary educational provision centres around General Certificate of Education Advanced Level qualifications, commonly known as 'A-levels' –

[10] Post-16 or 'sixth-form' education in England encompasses a range of different qualifications and types of institution. Some secondary schools offer provision for 11-18-year-olds, while others stop at 16 and so pupils are forced to continue studying elsewhere. Sixth-form colleges offer dedicated education for 16-18-year-olds, typically based around A-levels as the traditional route to university. Further education (FE) colleges are similar, but usually offer a wider range of vocational and adult education courses alongside A-levels.

usually taken by teenagers planning to go to university – which are offered in 32 subjects, including traditional academic ones alongside modern ones. The college also provides a smaller range of vocational qualifications including Business and Technology Education Council Diplomas (commonly known as 'BTECs' /ˈbiːtɛks/), Cambridge Technical diplomas and foundation degrees. Some of these can be used as alternative routes to university, while others are primarily aimed at gaining trade-specific training. In addition to its post-16 provision, the college also runs courses in adult education and part-time vocational qualifications for secondary school pupils. In its most recent inspection, the college was judged to be 'outstanding' (the highest possible mark) in all areas. The proportion of ethnic-minority teenagers was around 3%, which is similar to the figure for the overall population of East Hampshire.

Life at the college was designed to be notably different to secondary school. Students called teachers by their first names and they were allowed to wear their own clothes (as casual or as smart as they wanted) rather than adhering to a school uniform, the latter of which is common in secondary schools in the UK. The college site was more of a campus than a traditional school grounds, with a large central library with a computer suite as well as green spaces, shops, cafés and recreational areas. Outside of lessons and other timetabled activity, there was no expectation for students to be at college – they could come and go as they pleased with buses stopping at the college throughout the working day. The college also had its own students' union and student-run clubs and societies. All of these characteristics are key parts of university life in Britain, and so the college's social and academic structure was aimed at preparing students for higher education. Some elements of secondary school-style life remained, such as in the kinds of discipline meted out for disruptive behaviour and the close involvement of parents in monitoring students' progress, but overall, the college positioned itself as a site of transition between school and university.

State education in England is free of charge and, since 2015, compulsory up to the age of 18 (this includes apprenticeships as well as full-time education). This means that the state sixth-form college was able to recruit students from across the socio-economic and ability spectra. As I showed in Section 3.2.3, however, East Hampshire and the surrounding area is, overall, disproportionately white, middle class and less deprived compared to England as a whole, which was reflected in the student body at the college. Class and education are closely linked, with vocational routes such as BTECs more likely to be taken by those from lower social class backgrounds (Connor *et al.* 2001) and often regarded as 'too easy' or 'useless' for further study and employment (Leathwood & Hutchings 2003). In contrast, the more academic A-levels are preferred by middle-class students, for some of whom, going to university is treated as a given (Bathmaker *et al.* 2016). In a school like the sixth-form college in my study, then, at which most students studied A-levels and those doing vocational qualifications formed a minority, the potential for social stratification along educational lines (which, as described above, are often tied up with class), is high. This was borne out in some of the comments from my participants. The sample was recruited via teachers in the English Department at the college, who asked students in

the classes they taught to participate in the study – all of which were A-level classes. This meant that all of the informants in my study studied A-level English in some form,[11] mostly in conjunction with related subjects. When I asked students what the main social divisions or groups were at college, some participants mentioned the split between A-level and BTEC students. Two examples are given below.

IMOGEN: er well (laughs) I take A-level Drama and (.) I see a lot of the um (.) BTEC like (.) Dance or (.) er I think it's Performing Arts? and (1) it's not that (1) I j- I just don't wanna sound horrible but I feel like (1) sometimes (1) they might they're not as (.) maybe (.) like competent as us cause we went on trips and stuff and I just find them a little bit annoying to be honest (1) and they're just really full-on they're like just (.) just not up for it (laughs)

REBECCA: like listening to them like they're on the floor below and they're always quite loud and (1) that's not necessarily a bad thing it's just like (1) they're expressive… it's like (.) maybe their GCSEs weren't quite high enough to get into A-levels

The participants' comments indicate that BTECs are regarded as less academically rigorous and that the BTEC students do not care as much as the A-level students about their education, reinforcing some of the tendencies discussed above. They also use euphemistic descriptions such as 'annoying', 'full-on', 'loud' and 'expressive' to suggest that the BTEC students' behaviour is less cultured and refined than theirs. However, the split between educational routes was not socially meaningful for all informants. The college was so educationally stratified that many students rarely interacted with those doing other qualifications, as in the example below.

MICHAEL: I think (.) I think there's a split mainly because (.) all my friends from college are in my same (.) class as me (.) so they're all A-level students as well (.) I don't really know (.) any BTEC students apart from the ones from (.) my school who went here (.) so

Instead, when asked about the social groups at college, students tended to emphasise how much more inclusive and less cliquey college was compared to secondary school. If any clear friendship groups did exist, they were mostly based around where students were from (and which secondary schools they formerly attended) or which classes they took. Some examples are shown below.

[11] There are three English qualifications available at A-level: English Language, English Literature and English Language & Literature. All three of these were offered at the state sixth-form college in my study.

GRACE: it's like no one's at any groups at college (laughs)

NATASHA: no it's not really a thing… everyone just mixes up completely

JOEL: cause we've all got different classes different frees and stuff to

MELISSA: mm

ROY: would you say that's different to how it was at school?

JOEL: [definitely]

MELISSA: [definitely]

NATASHA: [yes] (.) definitely (.) it was like a whole hierarchy at school (laughs)

MELISSA: oh my Go- (laughs)

PETER: I noticed last year there was (.) two tables that were always the same people (.) like (.) I know that the (*village*) and (*town*) and (*village*) lot were on the table right up the end (.) in the sec- the second year (.) people were up the end (.) and then the (*school*) people were on the table (.) next to it and then the (*town*) people one across from that (.) and you can sort of group them but people would mingle (.) from those tables but I could (.) I could like point out people from (*town*) and people from (*town*) quite easy

To summarise these findings, there was no clear and consistent social order at the school that every student had to negotiate or orientate around, unlike the jocks and burnouts, for instance, in Eckert's (1989, 2000) work. The A-level–BTEC split is probably the closest equivalent, but the large numerical imbalance between the two cohorts and the fact that they rarely interacted meant that the distinction only had a social influence on the small minority of students who either sat both types of qualifications or shared study space with the other group. Among the students who did have a clear idea of the friendship groups at college, they seemed to mostly be based on which secondary school people previously attended rather than cultural ideologies or practices. Many participants downplayed cliquiness at the college and claimed that the distinctions between social groups had significantly weakened since secondary school.

It is ultimately not very surprising that most participants were not able to clearly delineate between specific friendship groups at college, since it would have been essentially impossible to know who is friends with whom for a student body of 2,000 (or even one year group of 1,000 individuals), especially when most people were only there for two years and came from a wide geographical area and many different

secondary schools. Instead, the most visible differences – ones that were in some way imposed from outside, like type of qualification studied and which school one attended before – were highlighted, rather than those related to personality traits and ideologies. For these reasons, I was not able to obtain micro-level data on the participants' membership of communities or constellations of practice at the state sixth-form college, unlike for the private school (see below). This reduces my ability to compare how sociolinguistic variation operates within both schools, but it is a natural consequence of the nature of social life at the college – large, diverse, temporary – and not because of issues with how I asked participants about it.

In terms of the demographic information of the participant sample, there was a reasonable degree of diversity in parental occupations and education, but the overall skew for the sample was towards the higher end of the spectrum, as expected given the characteristics of the East Hampshire area and of A-level students generally. Ten out of 26 participants did not have a parent who attended university, and six had parents whose occupations were classed in groups 4-7 of the NS-SEC system (the broadly 'working-class' categories). The average house price among the sample was 1.13 times the mean for the area but only six participants lived in postcodes that were not among the 30% least deprived in England. The gender split fell to a notable female majority: eight boys and 18 girls. This is not as balanced as it could be but is indicative of the participants who were willing to participate – that is, students of A-level English, which is female-dominated (Joint Council for Qualifications 2018). All informants identified as White except for one girl who identified as Mixed (White and Black Caribbean).

It would be reasonable to say, then, that the sample from this school was reasonably affluent, but a minority of participants could arguably be described as lower-middle or working class. This is, however, reflective of the demographics of much of the geographical area under study, which is more middle-class and less deprived than the average for England. For the remaining chapters of this thesis, the college is usually referred to as 'the state school' for simplicity and for comparison with the private school.

3.6.3 The private school

The private school is located in one of the main towns in East Hampshire and has around 850 students spread across seven year groups between age 11 and 18. The school was founded in the 18th century and is co-educational (mixed-sex), though boys made up about 60% of the student body the year before I visited. Some private institutions are boarding schools, but this particular school only takes day pupils. Students enter the sixth form at age 16 and study there for two years to sit A-level examinations. The sixth form is located on the same grounds as the rest of the school but has its own building with classrooms and recreational space. Many of the 215 students in the sixth form had attended the school together since age 11, or since an

even younger age at the sister junior school located in a nearby village. A minority of pupils entered at age 16, having originally attended local state or other private schools for their secondary education. The school's academic offering consists almost entirely of A-level qualifications, restricted to 24 subjects mostly encompassing traditional academic areas of study. At its most recent inspection, most aspects of the school were evaluated as 'good' – the second-highest level on a four-point scale. None of the pupils had English as an additional language while only a small handful were from an ethnic minority background.

The culture of the school was quite different to that of the state sixth-form college. Pupils addressed teachers using their titles and surnames or as 'Sir' or 'Miss', as in most secondary schools in the UK. A uniform including blazers and ties was enforced for Years 7 to 11, but upon entering the sixth form, students were able to wear their own clothes. However, this freedom to wear whatever one wanted was restricted to formal business-style clothing only – i.e. dark suits for boys and smart tops, skirts or trousers for girls. Students had full schedules throughout the day with only occasional free periods, which they were expected to use studying in the sixth-form centre rather than leaving school property. They were allowed to leave the grounds at lunch time, or mid-afternoon if their timetable finished early and they had permission, but they were generally required to be at school for the whole day. In addition, the small size of the sixth form (215 pupils) and the relatively narrow curriculum of traditional academic subjects meant that a student at the private school would likely be able to get to know the vast majority of people, if not everyone, in their year group of around 100 pupils. Those at the state school, in contrast, would struggle to become acquainted with even a fraction of a 1,000-strong cohort studying a wide range of qualifications from a number of feeder schools across Hampshire and Surrey. In summary, life at the sixth form in the private school was much closer to that of secondary school than at the state sixth-form college. While the separate building and the lack of uniform enabled sixth-formers to feel distinct from the rest of the school and gain a greater sense of autonomy and responsibility, this independence was limited compared to students at the state sixth-form college, who were entering a new and much larger institution than their secondary schools and for whom the structure of the day resembled a half-way house between school and university life.

Private schools in the UK are primarily funded by tuition fees, which can reach over £40,000 per pupil per year at some of the most exclusive institutions. The private school in my study, while a member of the prestigious Headmasters' and Headmistresses' Conference (HMC) group of top independent schools, did not charge the kind of fees that some of its elite contemporaries did. In the year I visited the school, tuition fees were £14,220 per pupil per year, which is towards the cheaper end of the scale in the sector, but still represents a large sum for many families, considering the median annual salary in South East England at the time was £29,432 before tax (Office for National Statistics 2016). This high cost of entry meant that the student body was from a fairly restricted segment of society, which is reflected in the socio-demographic data for my participant sample. Only two out of the 19 informants

did not have a parent who had not attended university or whose job was not classified in the top two brackets of the NS-SEC scale (Higher and Lower managerial, administrative and professional occupations). The mean house price among the sample was 1.64 times the average for the area and all but three students lived in neighbourhoods ranked in the 30% least deprived in England. All participants identified as White and there were 11 boys and eight girls.

The lack of variation in demographic characteristics at the school will of course have an influence on social life among the students. Without a wide range of socio-economic stratification in the school, it would be easy for a student to get the impression that the privileged material circumstances experienced by most pupils there is 'normal'. In addition, more subtle means of distinction may be required in order to cultivate a distinct identity at school. Given the tendency for young people to feel the need to express themselves in a culturally appropriate way that displays their individuality while also fitting in to social norms, identities related to certain demographic classes or ethnicities may be less easily available in this kind of socially homogenous environment. Participants frequently commented on the lack of diversity in the school during my conversations with them, particularly in relation to how it might mean that most people speak in an 'articulate' or 'educated' way as that is how they have been brought up:

MOLLY: I guess it's like (1) maybe s- (1) most people speak fairly similar here cause (.) we're all from fairly similar (1) backgrounds and (.) live in fairly (1) the same places a lot of us (1) so (.) I guess it's hard to put a difference (.) pronounciations or way of speaking

As a result, it is possible that semiotic and linguistic resources that do not overtly contradict this assumed 'articulate' default may be required for the construction of subversive or 'cool' social meaning and identities at the private school. This is reinforced by how participants talked about the main groups of friends or cliques at the school. Many previous studies (usually conducted in state schools) show the biggest social difference at school to be based around either class or orientation towards the school, the two of which are often related (e.g. Eckert 1989, 2000; Moore 2003; Kirkham 2013). That is, the individual cliques (or communities of practice), often referred to as 'jocks', 'geeks', etc., can be broadly defined along middle-class vs. working-class and / or pro-school vs. anti-school lines. Among the sixth-formers at the private school, however, this was not the case. It became clear from my conversations with pupils that the main social division in the sixth form was based on which of two rooms in the building they spent time in at break and lunch time. One room was where people who were variously described as 'loud', 'eccentric', 'popular' and 'outgoing' hung out. The users of the other room were referred to as 'quiet', 'less popular' and 'introverted'. Functionally, the rooms were more or less identical, as large spaces with chairs and tables arranged in a way to encourage socialising. This

division became apparent, however, in the first data collection session I conducted at the school and was discussed in all subsequent conversations. Some examples of how the participants described the two rooms are provided below.

ROSS: there's almost though (.) cause we've got two rooms in our (.) in our sixth-form area that we er stay in (.) there's kind of sort of like (.) this is generalising quite a bit but there's a more of a there's one room where the more outgoing people (.) are (.) then there's another room where the sort of like quieter a bit more withdrawn people are

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LEE: so we have the one room which is like the sort of the boisterous (.) more (1) considered to be outgoing sort of group (.) like you've got the (.) the classic like (.) the popular people (.) who're (.) generally more eccentric like (.) er more sporty (.) like more outgoing (2) and then we have the other group which is like the sort of more introvert people (.) so like me for example (.) and (.) people who (.) are sociable (1) but won't like go into the other room because they don't wanna sort of be rejected by them (.) sort of thing

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MOLLY: um (.) one (.) room is the kind of more (.) like (1) people who would (.) like have parties every weekend and be doing loads of social things (.) erm (.) and then the other room is more (.) a mix of people like (.) some people (.) are very social but (.) they're not (.) quite it's (.) slightly different and it will (.) have a lot of the like quieter people people who more like (1) focused on work or things like that

Most of the discussion of the rooms focused on the boys in the 'outgoing' room, whose members were talked about in terms of their adherence to various elements of traditional masculinity, such as playing sports, going to parties and engaging in laddish banter. The other room was less clearly defined and framed more as a mixture of different groups who were united by their rejection of the need to be 'popular'. In this thesis, I refer to the two rooms as the 'outgoing' and 'reserved' rooms. 'Outgoing' was frequently used by participants as a descriptor for the first room and avoids the implied stereotypical and negative connotations associated with the word 'popular', which was the main alternative term used among the sample. The word 'reserved' was not used in reference to the second room but I find it well-suited to the task of distinguishing from 'outgoing'. The words sometimes used by participants, such as 'quiet' and 'introverted', suggest that the individuals in this room were anti-social, but Lee and Molly's comments show that this is not the case – rather, they socialised in a different, less visible kind of way. Conversations with the participants suggested that not everyone in each room was good friends with all the other people in that room. Instead, the rooms were made up of several friendship groups who

shared certain similarities. Nor were the rooms completely exclusive – some people had friends in the other room or would sometimes go between the two places. However, all the participants I talked to identified themselves as belonging to one room or the other.

Analytically speaking, I argue that the two rooms form two constellations of practice (Wenger 1998), as they each contain a collection of individual friendship groups, or communities of practice, who share a physical space as well as certain dispositions, in opposition to the other room. Because I did not use ethnographic methods, I did not have the opportunity to gain a deep knowledge of each group of friends (each community of practice) and the individuals who formed them within the two rooms, yet I had detailed conversations with the participants about the nature of social life at school and it seemed clear to me from their comments that the CofP framework could be applied to this community. It would be tempting to label the two rooms as communities of practice themselves, but this would not match up with the way students described them to me. Not everyone in a room had close friendships with one another or did the same things together, but it was home to certain types of people with a shared disposition for either more sociable and mainstream activities or more solitary and alternative ones. This fulfils the criteria for a constellation of practice (Wenger 1998).

My sociological findings echo Drager's (2015) experience at an all-girls' school in New Zealand, in which she was able to classify the girls into two constellations of practice based on whether they ate their lunch in the common room or not. Groups of students in the common room were generally more 'mainstream', 'fashionable' and supportive of being 'normal' than the groups that hung out elsewhere on school grounds, who rejected this stance. Drager's ethnographic observations allowed her to identify individual communities of practice within these two constellations, but she also found common ideologies and practices that unified the various communities into two constellations, including linguistic practices. I would argue that the situation at the private school in my study is very similar – that there were various communities of practice in the form of small friendship groups, whose personal and cultural orientations could be broadly divided into 'outgoing' and 'reserved', which ended up becoming manifested in physical form via the tendency for groups of a certain disposition to congregate at break times in a space with other like-minded groups. These two constellations of practice within the private school were the primary social division in the sixth form and so are likely to be a key site of micro-level sociolinguistic variation. For this reason, constellation of practice (room) is used as an independent categorical variable in the quantitative analysis of speech production.

3.7 Measuring the variables

3.7.1 Measuring socio-economic class

Differences in language use between different socio-economic classes are one of the key findings of variationist sociolinguistics, yet it is not always clear in individual studies how class is defined or why it is measured in a given way (Block 2013). In this thesis, class can be defined as structural differences in material conditions formed by social relations in economic life (Chan & Goldthorpe 2007), based on differences in labour and production relations (i.e. occupation). These are closely connected to other factors such as education and property ownership, which are also considered as part of the operationalisation of class in this thesis. Accordingly, I measure class using two kinds of composite scores based primarily around labour relations and access to resources: social class scores and the Index of Multiple Deprivation (IMD). However, Bourdieu (1984) and others working with his theories have argued that class is about more than just economic concerns, but about social and cultural factors as well, conceptualised using the notions of economic, social and cultural capital (e.g. Bennett *et al.* 2009; Savage *et al.* 2015; see Chan & Goldthorpe 2004, 2007 for a critique). These are not explicitly dealt with using my methodology but are acknowledged as a crucial way in which class relations and identities are constructed and reproduced, and referred to in some of the interpretation of my results in Section 8.4.1. The next two sub-sections explain what social class scores and the IMD are and how they are measured.

Before moving on, however, it is worth noting that in this study, school itself can be interpreted as a measure of social class. Because the state school is free and the private school requires yearly tuition fees of approximately half the annual salary in the region, only those with the requisite financial capital are able to send their children to the latter. Considering cultural approaches, too, those who believe that a private education is worth paying for are those who might have certain ideologies or do certain practices (e.g. having gone to private school themselves), and / or who are part of a social network where this is expected or encouraged (Dearden *et al.* 2011). This suggests that the school attended by the participants (and the type of school they attended previously – see Section 3.7.2 below) can also be regarded as a less direct but equally revealing measure of socio-economic class. This is especially important in a community such as East Hampshire, where heterogeneity among traditional class lines (e.g. occupation) is weaker. Measuring class using occupation and education is still important and necessary in this thesis in order to make the results comparable to previous work in variationist sociolinguistics and because there is still some socio-economic variability in the participant sample. My approach of seeing school type as another form of class stratification aims to complement the traditional measures and make class more relevant given the community. Work in future could take this further by explicitly measuring cultural and social capital when operationalising class in sociolinguistics.

3.7.1.1 Social class score

The most traditional way of measuring socio-economic class that has been used in sociolinguistics is forming a social class score from a combination of three indices: education level, occupation and house price (Labov 1966, 2001; Eckert 2000; Moore 2011). The advantage of this over the IMD is its more easily quantifiable nature: while IMD data must be dealt with in terms of non-ordinal national rankings, inferred from opaque government neighbourhood data, social class scores are based on more 'visible' or 'measurable' criteria that the researcher can collect directly and are not as dependent on national standards. They allow for a composite score based on multiple indices and can be customised to fit the nature of the community, though this does mean that they less easily comparable across different studies and are open to subjectivity on the part of the researcher.

The method of social class scoring that I use here is adapted from Labov (2001) and Moore (2011). My participants were teenagers living at home with their parents, so the criteria are based on information about their parents, namely their education level, occupation and house price. This affects how much information one can glean from participants, as they may not know the precise details of their parents' qualifications or what they do for their job. While Labov (1966, 2001) uses a six-level system for education ranging from grade school (finishing education at age 14) to professional postgraduate qualifications, I use a three-way split based on whether one, both or neither parent attended university, as this is more appropriate for British people born in the 1970s-1980s (i.e. the parents of my respondents born in the late 1990s and early 2000s) and is easier for participants to respond to. Parental occupation level is based on the three-way reduced NS-SEC 2010 classification system. This collapses the full seven-tier NS-SEC scale referred to in Section 3.2.3 into three categories, which can be used when full information about an individual's place of employment is not known (ONS 2010). House price data was taken from the website Zoopla using its average house price feature for each postcode in September 2018.[12] These were organised into three groups of roughly equal size based on their relationship to the average house price for the area. Following previous research (e.g. Labov 2001; Moore 2011), each participant was given a social class score between 3 and 9 based on the criteria below. This method is not flawless: it could be argued, for instance, that the distinction between one and two parents attending university is smaller than one versus neither. However, this procedure was designed to capture some granularity within a generally homogenous and middle-class participant sample, rather than provide cast-iron 'objective' social class indicators (if such things even exist).

[12] Three participants did not supply their postcode, so the average house price for their village was collected.

Parents' education

Both parents attended university = 3

One parent attended university = 2

Neither parent attended university = 1

House price

House price greater than or equal to 2x the average for the area = 3

House price between 1x and 2x the average for the area = 2

House price less than the average for the area = 1

Highest parental occupation (NS-SEC 2010)

Managerial / professional = 3

Intermediate = 2

Routine = 1

3.7.1.2 Index of Multiple Deprivation

The other approach I use to measure social class is the 2015 Index of Multiple Deprivation (IMD), a UK government statistic encompassing various indicators of deprivation including income, crime and access to education and healthcare. This measurement has advantages over other quantifiers of class as it includes a broader range of indices to give a fuller picture of the social profile of local neighbourhoods. The ONS divides England into 32,844 'Lower-Layer Super-Output Areas' (LSOAs), also known as 'neighbourhoods', of approximately 1,600 inhabitants, which are ranked according to their IMD score. I collected the IMD for each participant by entering his / her postcode into the ONS's (2015) online database to find the corresponding neighbourhood.[13] To get a better picture of the relative deprivation within the local area, these national ranks were then converted into local ranks based only on those neighbourhoods found in the local authority districts in which my participants lived, comprising 502 neighbourhoods in total. Using measures of deprivation that are relative to the local area is important as it situates socio-economic status within the context of the community, which is markedly less deprived than England as a whole, as discussed in Section 3.2.3. IMD rankings are ordinal and not continuous – the fiftieth-most deprived area is not twice as deprived as the hundredth-

[13] For three participants who did not supply their postcode, I took the IMD score of one of the main representative residential neighbourhoods from their village.

most deprived, for example – and so it is necessary to categorise them into ranking groups, such as quartiles or deciles, for analytical purposes (the ONS do not make the raw IMD scores themselves available).

When conducting statistical modelling, it is important to only use one predictor for a particular characteristic, as this reduces collinearity and helps the models converge. It also makes sense from a conceptual point of view, since having multiple measurements for the same thing is arguably redundant and adds unnecessary complexity. I hence tested various heuristics based on the social class scores and IMD rankings discussed above to see which one worked most effectively in the models. These independent variables were:

- Continuous social class score from 3 to 9 (standardised using *z*-scores)
- Three discrete categories of social class score (3-4 = low; 5-7 = medium; 8-9 = high)
- The three measurements of social class score but as separate independent variables:
    - House price as a multiple of the local average (continuous, standardised using *z*-scores)
    - Parental education (three discrete groups as above)
    - Parental occupation (three discrete groups based on the NS-SEC categories as above)
- IMD local rank (terciles)
- IMD local rank (quartiles)

Separate models were fitted with each of these social class heuristics as the single measure for class to test their effectiveness as predictors for the /t/-glottalling and GOOSE-fronting data. The variable whose models showed the least collinearity (measured using variance inflation factors) and fewest convergence errors was selected for use in the final set of models. This turned out to be social class score (3-9, standardised). Continuous variables generally fare better than categorical ones in regression modelling, and this was the case here. While these scores are subject to some of the disadvantages discussed above such as being based on the researcher's own classifications, they are useful as they combine three class-related factors into one, can be adapted to suit the data, and, as shown here, can help produce better-fitting statistical models.

3.7.2 Measuring other variables

This section covers how I measured the other independent variables used in the statistical modelling. Some of these, such as age, gender, task type and number of syllables in a word, are self-explanatory and do not need further elaboration. Others require a little more detail and are dealt with in sub-sections below. I first explain the social factors, followed by the linguistic factors. The dependent variables for the /t/-

glottalling and GOOSE-fronting analyses are explained in depth in their corresponding chapters.

3.7.2.1 Previous school type

Some of the participants had recently moved from the private to the state sector and vice versa after finishing their GCSEs at age 16, so it was important to consider the school they had attended previously as well as their current school. Informants were asked which school(s) they had attended for their secondary education and these were collapsed into a binary split between state- and private-sector schools.

3.7.2.2 Settlement type

This variable refers to whether participants lived in a town or a village. This is important for sociolinguistic purposes since people who live in towns, with larger populations and better transport links, are more likely to come into contact with speakers of other accents than those in small, relatively isolated villages. For the purposes of the study, towns were defined as settlements with a population of at least 9,000 in the 2011 Census. This formed a binary categorical variable with two levels: town and village. None of the participants lived in a settlement that could be considered properly 'urban', i.e. a very large town or city.

3.7.2.3 Parents' geographical origin

Children typically speak with the accent of their parents until they start going to school, at which point they begin to accommodate to fit in with their peers (Labov 2001). However, parental regional accent may still affect young people's pronunciations, so this was measured and included in the study using two heuristics. Moore's (2011) study of teenagers in Bolton uses a three-way distinction between participants with at least one parent born in the town; at least one parent born in the north-west of England; and both parents from elsewhere. I take a similar approach, categorising participants into those with at least one parent born in East Hampshire or the surrounding area; those with at least one parent born in South East England; and those whose parents are both from elsewhere. I also tested models with an alternative measuring system based on how many of the participants' parents were from the East Hampshire area: both, one or neither. Testing these variables in the models, however, showed very high collinearity with other variables and a large degree of imbalance between the different groups, which meant that these variables were removed from the models at an early stage of data exploration in order to improve the model fit.

3.7.2.4 Discussion group size and gender composition

People are more likely to use informal speech styles when they are comfortable with those around them and when they perceive the situation itself to be informal (Labov 2001). The size of the discussion group will affect this, as a one-to-one or two-to-one conversation with a stranger may cause participants to be more self-conscious and thus use a more formal style than in a larger group of four students, where they comfortably outnumber the moderator. Similarly, the tendency for teenagers to form same-sex friendship groups and potentially have limited experience with extended opposite-sex interactions means that the nature of the conversation may vary depending on whether the group is all-male, all-female or mixed-gender. These factors were accounted for in my modelling using three predictors. The first two refer to the overall group composition: group size (continuous; 1-4, standardised using *z*-scores) and group gender make-up (categorical; all-male, all-female or mixed). The third predictor is also categorical, and its levels vary for each participant depending on whether their gender had the majority in the group. The four levels are: 'all' (i.e. the group members were all male or all female); 'equal' (there was an equal number of males and females in the group); 'majority' (the participant was in the majority in terms of gender in their conversation group); and 'minority' (the participant was in the minority for gender). All three variables were tested in the statistical models but only group size proved to be a useful predictor. The other two variables were imbalanced and caused convergence issues so were removed at an early stage of the modelling.

3.7.2.5 Word frequency

I measured word frequency by collecting the frequency per million words of each word in the data set from the spoken part of the most recent update to the British National Corpus, the BNC2014 (Love *et al.* 2017). Words that did not appear in the corpus were given a frequency value of zero. In order for this data to be processed correctly in R, each frequency value was increased by one before undergoing logarithmic ($\log_{10}$) transformation, as in Schleef (2013). Log values of word frequencies are said to better reflect how hearers process frequency information than raw values (Hay & Baayen 2002). While some studies place caps on highly frequent words, such as a maximum of 4 or 10 tokens per speaker (Straw & Patrick 2007; Smith & Holmes-Elliott 2018, respectively), I did not do this as such limits are arguably arbitrary and the advantage of mixed-effects models is that one can account for the uneven distribution of lexical items in the data set by including word as a random effect in a regression model.

3.7.2.6 Word class

In my data, tokens were coded for word class to form the following categories: noun, adjective, verb, adverb, conjunction, determiner, preposition, pronoun, interjection. Having a large number of (unbalanced) factors in linear mixed-effects models can cause convergence issues, so after testing, these categories were collapsed into a binary distinction between lexical words (noun, adjective, verb, adverb, interjection) and function words (conjunction, determiner, preposition, pronoun, together with certain function verbs and adverbs such as *might* and *not*) for modelling purposes.

4 Quantitative analysis of /t/-glottalling

4.1 Chapter overview

In this chapter, I begin by discussing previous findings in studies of /t/-glottalling and how this informs my analysis of this variable, including information on its sociolinguistic variation, its phonetic properties and how it interacts with salience and social meaning. The following sections show the methods and the results of the quantitative analysis, conducted with a generalised linear mixed-effects regression model and shown via graphs, before a brief summary concludes the chapter.

4.2 Background

4.2.1 The sociolinguistics of /t/-glottalling

/t/-glottalling refers to the phenomenon of non-word-initial /t/ being produced with a glottal realisation in many varieties of British English. Various terms such as '/t/-glottalling', '/t/-glottalisation' and 'glottal varieties of /t/' are used by different authors to refer to slightly different things, sometimes based on subtle differences in acoustics or articulation (Docherty & Foulkes 1999; Straw & Patrick 2007; Drummond 2011; see Section 4.3.1). Here, I use '/t/-glottalling' to refer broadly to any glottal pronunciation of /t/.

The geographical origins of /t/-glottalling are uncertain. The feature has long been documented in Scotland, where it is strongly associated with Glasgow speech and has since spread to other parts of that country (Andrésen 1968; Macaulay 1977; Macafee 1997; Foulkes & Docherty 1999; Schleef 2013). Glottal realisations of /t/ appear in Norfolk in the Survey of English Dialects (Orton & Dieth 1970), prompting Trudgill (1999b, p. 136) to claim that the phenomenon may have originated there, at least in England. Other studies have argued that /t/-glottalling is an innovation from working-class London (Cockney) speech which has, in recent decades, spread across South East England and beyond to many parts of Great Britain (Wells 1982; Altendorf & Watt 2004).

Whatever its origins, /t/-glottalling has spread widely and has been reported in numerous locations across the country, including Cardiff (Mees & Collins 1999), Leicester (Hughes *et al.* 2012), Derby (Docherty & Foulkes 1999), Nottingham (Flynn 2012), the West Midlands (Mathisen 1999), Liverpool and the Wirral (Newbrook 1986, 1999), Manchester (Drummond 2011; Baranowski & Turton 2015), Bolton (Moore & Podesva 2009), Sheffield (Stoddart *et al.* 1999), Hull (Williams & Kerswill 1999), Newcastle (Milroy *et al.* 1994; Docherty & Foulkes 1999), Glasgow (Stuart-Smith 1999), Edinburgh (Schleef 2013) and north-east Scotland (Smith & Holmes-Elliott 2018), earning its place as an 'unstoppable… [and] iconic British

variable' (Smith & Holmes-Elliott 2018, p. 1). This includes many varieties of South East England, including London (Tollfree 1999), Reading (Williams & Kerswill 1999), Milton Keynes (Williams & Kerswill 1999), Norwich (Trudgill 1974, 1988, 1999), Ipswich (Straw & Patrick 2007) and the Home Counties (Przedlacka 2002; Altendorf 2003). Its geographic diffusion has co-occurred with that of a group of other variables that are said to have originated in London and spread through the South East and beyond, which include TH-fronting, /l/ vocalisation and /ɹ/ labialisation, together forming a set of 'youth norms' or 'off-the-shelf changes' that may index youthfulness, casualness and trendiness (Williams & Kerswill 1999; Foulkes & Docherty 2001; Milroy 2007), sometimes known as 'Estuary English' (Rosewarne 1984; Przedlacka 2002; Altendorf 2016, 2017; see Section 2.5). /t/-glottalling is traditionally excluded from RP, England's prestigious standard accent based on educated southern speech, in all but very few phonological environments (Wells 1982). Yet research on younger speakers of this variety (sometimes now known as Standard Southern British English or SSBE) suggests that the feature is used in all non-word-initial contexts to varying extents, if not without some negative social associations (Fabricius 2000; Badia Barrera 2015).

This large body of work on /t/-glottalling has uncovered sociolinguistic patterns within speech communities showing variation according to social characteristics of speakers such as age, gender and socio-economic class, and in recent years, how language-internal factors such as word class and word frequency affect the use of this feature. Speaker age has been shown to be an important variable, with younger speakers using more glottal /t/ than older speakers in a number of the localities mentioned above (Docherty & Foulkes 1999; Stoddart *et al.* 1999; Stuart-Smith 1999; Flynn 2012; Badia Barrera 2015; Smith & Holmes-Elliott 2017). Gender and social class are often found to interact so that working-class men use more glottal stops (Docherty & Foulkes 1999; Kerswill 2003), though this may be restricted to older generations (Smith & Holmes-Elliott 2017). This is related to the notion that men orient towards working-class local norms for their covert prestige, while women tend to only use innovative variants if they are supra-regional rather than local (Trudgill 1972; Labov 2001). This explains an exception to the usual /t/-glottalling gender pattern in Newcastle: women use more glottal stops [ʔ], as they are part of a new supra-local northern variety, while men use more glottalised stops [tʔ] as a local Tyneside feature (Milroy *et al.* 1994; Docherty & Foulkes 1999; Schleef 2013).

4.2.2 Phonetic and phonological properties of /t/-glottalling

/t/-glottalling occurs in a limited set of phonological environments in most British English varieties. /t/ can be glottalled after a sonorant in coda position (*what*) or as a non-foot-initial onset (*whatever*) (Tollfree 1999). Previous studies have shown that the phonological context in which /t/ occurs – that is, the sound following the /t/ and its position in the word – have a strong effect on its realisation (Wells 1982; Altendorf

1999; Fabricius 2000; Badia Barrera 2015). Figure 4.1, adapted from Altendorf's (1999) investigation of Estuary English, demonstrates this clearly.

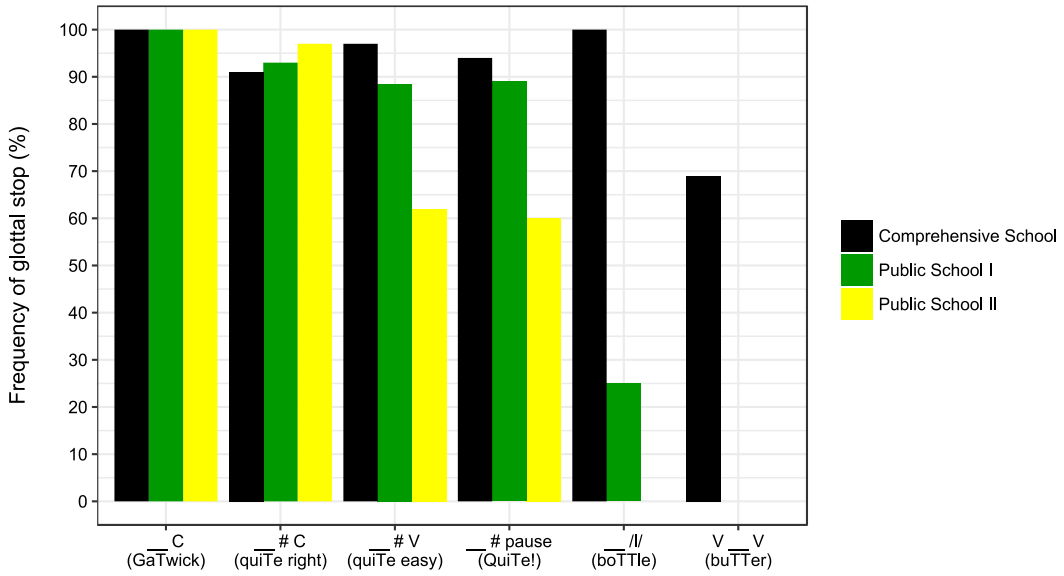

Figure 4.1: /t/-glottalling reading task results by phonological context from Altendorf (1999 p. 6), reproduced via digitisation of the original graph

The results show a hierarchy of likelihood of /t/-glottalling, with word-medial pre-consonantal contexts (e.g. *Gatwick*) showing the most glottalling and word-medial pre-vocalic contexts (e.g. *butter*) showing the least. Glottal /t/ before a word-medial syllabic consonant, particularly syllabic /l/ as in *little*, is also much rarer than in other environments, almost to the same degree as word-medially before a vowel. Generally speaking, /t/-glottalling is extremely common before a consonant with the exception of syllabic consonants, with socially stratified variation occurring in pre-vocalic and pre-pausal contexts. This robust PreC > PreP > PreV glottalling pattern is so prevalent that Straw and Patrick (2007 p. 390) refer to it as 'the diffusion pattern', as it holds for many of the areas in the South East purported to have gained the feature via diffusion from London (Mees & Collins 1999; Tollfree 1999; Williams & Kerswill 1999; Flynn 2012)[14].

The phonetic properties of glottal variants of /t/ vary. Previous studies have identified a continuum of glottal /t/ realisations, ranging from total replacement of /t/ with a glottal stop [ʔ], through glottalisation [tʔ], to creaky voice (Docherty & Foulkes 1999; Straw & Patrick 2007). In Straw and Patrick's (2007) acoustic analysis of glottal stops, the authors find that true glottal stops are much less frequent than they would seem from an auditory analysis, in which realisations involving some glottal closure such as creaky voice are often categorised as stops. For acoustic studies such as Straw and Patrick (2007) and Docherty and Foulkes (1999), differentiating these realisations

[14] Slightly different patterns in Newcastle and Scotland reinforce the theory that /t/-glottalling developed separately there (Milroy *et al.* 1994 p. 341; Stuart-Smith 1999 pp. 194-195).

in their analyses is important because it is relevant to the questions they are asking or to the communities being investigated. For example, Docherty and Foulkes' study of Newcastle speech shows that different forms of /t/-glottalisation are sociolinguistically stratified in Newcastle and can be identified through the close acoustic techniques they employ. Other research collapses the variants together or focuses on only one form, such as glottal replacement (Mees & Collins 1999; Tollfree 1999; Fabricius 2000).

It is also worth noting that non-word-initial /t/ may be produced with other realisations in addition to the standard alveolar stop [t] and the various glottal variants mentioned above. Alveolar taps [ɾ] and articulations without release [t˺] are also possible (Straw & Patrick 2007; Drummond 2011), but they have not been studied in depth in British English. The unreleased tokens in particular pose a dilemma, as they do not fit neatly into binary 'alveolar' or 'glottal' categories required for logistic regression modelling. Some studies combine unreleased / elided tokens together with alveolar realisations into one non-glottal category (Fabricius 2000; Roberts 2006), while others exclude them (and other relevant minority variants) from the data set (Straw & Patrick 2007; Kirkham & Moore 2016; Smith & Holmes-Elliott 2017). Schleef (2017a) points out that glottal variants could be one step in a wider process of debuccalisation of /t/ that may eventually result in its elision, which would imply that they should not be categorised together with alveolar variants. He finds that the presence or absence of these tokens can make a difference to the results of statistical modelling, as the grammatical category of words containing word-final /t/ becomes a significant predictor for his data in Schleef (2013, 2017a) when elided /t/ is excluded. He indicates that combining the unreleased tokens with the alveolar tokens as one 'non-glottal' category may ignore the proposed nature of the sound change towards deletion of /t/. It also runs the risk of inflating the 'non-glottal' category, which is otherwise made up of alveolar realisations (variants of [t] and [ɾ]), which are phonetically very different to elision. It is possible that variants like taps and unreleased /t/ have their own social meanings that can be used for identity work as alternatives to alveolar stops and glottal stops. The scope of this chapter is limited specifically to glottal /t/ and so will not address this question directly, but it is worth bearing in mind when considering variation in /t/ in British English. Taps in particular would benefit from detailed study, as it has been suggested that they may index their own particular social meanings (Badia Barrera 2015; Britain 2017).

4.2.3 Social meanings and salience of /t/-glottalling

In the previous sub-sections, we saw that research in language variation and change has found that /t/-glottalling is widespread across the UK, but is usually led by young working-class men in various communities in (South East) England, and is seen as part of a set of contemporary 'youth norms' (Williams & Kerswill 1999; Milroy 2007) which may overlap with the developments in accents of the South East sometimes known as Estuary English (Altendorf 2016, 2017).

More recent work in the third-wave tradition (Eckert 2012) has found that the variable's sociolinguistic patterns in speech production have an influence on how it may be used to construct identity in interaction. Kirkham and Moore (2016) study the use of /t/-glottalling in two speeches given by the former UK Labour Party leader, Ed Miliband. They not only find that his rate of glottal stop production differs depending on the audience of the speech (the Labour Party Conference vs. the Trade Union Congress), but that his deployment of /t/ variants is used to index social meaning appropriate for the interaction. The authors argue that the associations of the glottal stop with youthfulness, trendiness and working-class solidarity (reflecting its typical speakers) explain why Miliband uses it in words like *Britain* and *government* in the speech to the TUC to take on these qualities as part of his identity. In his speech to his party, however, he makes less use of glottal stops and more use of alveolar stops, which index opposing values such as professionalism and education, which are more appropriate for the audience.

These socio-indexical associations of the two main variants of /t/ in British English are also found in Schleef's (2014, 2017b) research on the perception of linguistic variables in Manchester English. Schleef (2014, p. 2) proposes indexical fields in a similar fashion to Eckert (2008) for glottal and alveolar /t/ based on the responses to the perception experiments; glottal stops are associated with meanings including more casual, more down-to-earth and more working-class, while alveolar stops are associated with characteristics such as richer, more snob-like and more articulate. This suggests that not only are the sociolinguistic patterns for /t/-glottalling used as a resource for identity construction, but that untrained listeners are to some extent aware of the social associations of glottal stops. Listening to metalinguistic commentary from public figures bears out this theory, as /t/-glottalling is often explicitly identified and discussed in journalistic reports on pronunciation in British English. That is to say, glottal stops are frequently condemned using terms such as 'sloppy' (Hoyle 2014), 'slovenly' (Littlejohn 2011) and 'ghastly estuary sludge' (Henderson 1999, quoted in BBC News 1999), particularly when the speaker is of a high social status or education level and therefore 'should know better' (Shariatmadari 2015) than to use pronunciation emblematic of the working class.

Listener awareness of glottal /t/ as an index of strong stereotypes also indicates that it is a highly salient linguistic variant. As discussed in Section 2.3, the concept of salience has a variety of different definitions, based on linguistic, cognitive and social factors. However, the literature suggests that /t/-glottalling matches many of the criteria for salience, regardless of how it is theorised. For example, glottal /t/ meets four out of five of Trudgill's (1986) criteria for salience and shows sociolinguistic variation and change, which is part of Kerswill and Williams' (2002) definition of salience. The cognitive salience of /t/-glottalling is more difficult to measure because this concept relies on corpus and psychological methods, but its relative rarity in word-medial pre-syllabic and pre-vocalic contexts in RP suggests that it has a high 'surprisal' value (Rácz 2013; Jaeger & Weatherholtz 2016), particularly if, to link the cognitive world to the social one, it is spoken by a highly educated person who

'should know better' (Shariatmadari 2015). In terms of the social salience of /t/-glottalling – its 'relative ability to evoke social meaning' (Levon & Fox 2014, p. 1) – we have already seen that this is the case in studies of speech production (Kirkham & Moore 2016) and perception (Schleef 2014, 2017b). What is less clear is whether glottal stops show the same social meanings and level of (social) salience for all speakers. Schleef's (2017b) research, which contrasts the seemingly highly salient /t/-glottalling with the less salient ING-IN contrast in Manchester, suggests that the social associations of very salient variables are more consistent than those for less salient ones as a result of the combination of exposure and attitude strength, though more work needs to be done in order to test how this operates within a single community. Similarly, the question remains whether the patterns of sociolinguistic variation in /t/-glottalling specific to a particular community, and their use in identity construction, are recognised in speakers' own perceptions of its social meanings. It is these issues that this thesis aims to address in order to improve our understanding of how social meanings and salience interact within the speech production and perception of a community.

4.3 Methods

4.3.1 /t/-glottalling in this study

In this analysis, I concentrate on four phonological contexts in which /t/-glottalling occurs: word-medial and word-final pre-vocalic /t/; pre-pausal /t/; and /t/ before syllabic consonants. /t/ before (sonorant) non-syllabic consonants is briefly dealt with for illustrative purposes at the start of the Results section, but it is not analysed as a main phonological context because of the lack of variation in this environment. /t/ when followed by a non-sonorant consonant (e.g. *get to*, *let's*, *kitbag*) was not included in the analysis at all, as this is almost always glottal or assimilated to the following consonant, having been described as a feature of RP for some time, and shows very little variation in previous work (Wells 1982; Flynn 2012; Smith & Holmes-Elliott 2017).

I consider all glottal variants as one category, in order to make my findings comparable to other studies such as those mentioned in Section 4.2, and because there is no evidence to suggest that different forms of /t/ glottalisation are accounted for perceptually by listeners. In addition, the glottal reinforcement identified in some locations such as Newcastle (Docherty & Foulkes 1999) was mostly absent in my data, with glottal replacement and creaky voice being the only main variants used by speakers. Creaky voice can vary in quality and duration (Drugman *et al.* 2014), but this can only be reliably measured using acoustic rather than auditory methods. Auditory methods were more suitable for this data than acoustic methods due to the purpose of the analysis, which was to examine the sociolinguistic distribution of /t/-glottalling, rather than its detailed phonetic properties (cf. Schleef 2013 p. 221; Smith & Holmes-Elliott 2017 pp. 7-8).

4.3.2 Recordings and participants

The tokens of /t/ analysed in this study were collected from recordings of 45 adolescents from two schools in East Hampshire, as discussed in more detail in Chapter 3. The recordings were done in small groups led by me and were made up of two tasks: a reading task (*The Boy Who Cried Wolf*) and a conversation task (discussion of perceptions of audio stimuli and life at school).

4.3.3 Auditory coding

All tokens of /t/ in the recordings that did not appear word-initially or before an obstruent were auditorily coded using the ELAN transcription software (Max Planck Institute for Psycholinguistics 2017), yielding 8,454 tokens of /t/ in total. They were coded according to the following categories:

- *Alveolar stop:* a [t] sound with audible stop closure and release at the alveolar ridge. As in Fabricius (2000), this includes variants such as aspirated [tʰ], often found pre-vocalically; affricated [tˢ], sometimes produced pre-pausally; nasally released [tⁿ] and laterally released [tˡ], sometimes used before syllabic nasals and laterals respectively (*n* = 1,513).
- *Glottal stop:* total replacement with a glottal stop [ʔ] or a notable period of creaky voice. Glottalised or glottally reinforced variants sometimes reported in other locations (Docherty & Foulkes 1999; Straw & Patrick 2007) were rare in the data but also included here (*n* = 5,994).
- *Alveolar tap:* a voiced tapped / flapped realisation [ɾ] (*n* = 281).
- *Unreleased:* elided or deleted tokens, with an absence of any kind of audible closure plus release. These took the form of silence, immediate production of the following sound, or exhalation (*n* = 653).
- *Other:* any realisation not conforming to any of the above categories (*n* = 13).

These categories are used to illustrate the range and distribution of the variants throughout the data at the beginning of the Results section, but in keeping with previous work (e.g. Roberts 2006; Drummond 2011; Schleef 2013), they are collapsed into a binary distinction in order to facilitate fitting generalised linear models to the data, which require a binary dependent variable. In this case, /t/ production was coded as either glottal or non-glottal (cf. Drummond 2011). The graphs in Section 4.4.3 reflect this binary categorisation. The glottal category is the same as the 'glottal stop' one above while the non-glottal category includes the alveolar stop and alveolar tap realisations. The preceding and following environments were coded phonemically and then collapsed into (syllabic) consonant or vowel categories as appropriate.

Unreleased and 'other' tokens, being phonetically different to alveolar and glottal realisations (see Section 4.2.2), were excluded from the main statistical analysis. I fitted regression models to the data both with and without the unreleased and 'other' tokens and did not find that their inclusion made an impact on the model predictions.

Similarly, tokens produced before non-syllabic consonants were excluded from the statistical analysis, as these were almost all glottal stops or unreleased. All these tokens are, however, shown in the initial visualisation of the distributions of the variants in the data set, where it is clear that they make up a small minority of tokens and do not exhibit a large degree of variation between groups of speakers (see Section 4.4.2). Tokens produced as part of imitations of other speakers or as demonstrations of a particular pronunciation were also excluded from the statistical analysis. The total number of excluded tokens amounted to 3,141, leaving 5,313 tokens that were included in the statistical modelling (speaker mean = 118; SD = 58).

4.3.4 Statistical analysis

4.3.4.1 Mixed-effects regression models

The quantitative analysis in this chapter was conducted by fitting generalised linear mixed-effects logistic regression models to the data using the glmer() function in the lme4 and lmerTest packages in R (Bates *et al.* 2015b; Kusnetsova *et al.* 2017; R Core Team 2018). Linear mixed-effects models (LMEMs) have become one of the standard statistical techniques in sociolinguistics in recent years as they allow for powerful analysis of the effects of various factors affecting language variation while taking into account random variation for variables such as word and speaker (Baayen 2008; Baayen, Davidson & Bates 2008). Generalised LMEMs are used to model variation where the dependent variable is binary and categorical using log odds (Jaeger 2008; Quené & van den Bergh 2008), which is appropriate for measuring the presence and absence of a feature such as /t/-glottalling. The main advantage of using mixed-effects modelling is that it accounts for variation between speakers and words within the same group by fitting random intercepts for each factor. In recent years, however, there has been some debate over the best way to specify the random effect structure in LMEMs. Barr *et al.* (2013) recommend that models should use a 'maximal' random effect structure which includes random intercepts and random slopes for all variables as appropriate for the data, as this reduces the likelihood of Type I errors (false positives). This argument has been critiqued with reference to the idea that a maximal random effect structure is overly conservative, increasing the likelihood of Type II errors (false negatives), and may not always be justified according to the structure of the data (Bates *et al.* 2015a; Matuschek *et al.* 2017). These problems are amplified in generalised LMEMs, which are prone to fail to converge when fitted with a large number of random intercepts and slopes. In light of this, some researchers suggest to avoid 'gold standards' such as 'keep it maximal' (Barr *et al.* 2013) and instead attempt to fit the most parsimonious model, which balances power and accuracy and will vary depending on the nature of the data and the research questions (Bates *et al.* 2015a; Baayen *et al.* 2017; Matuschek *et al.* 2017; Roettger *et al.* 2019).

The researcher's modelling strategy will also be informed by whether he or she is using confirmatory or exploratory data analysis. While the former sets out to use

statistics to answer specific hypotheses prompted by the literature and facilitated by the study design, the latter aims to identify the patterns in the data, which can be used to answer more general questions within the study or can be used as a launch pad to generate new hypotheses and further research (Baayen *et al.* 2017; Roettger *et al.* 2019). Much of the discussion on the best approach for the inclusion of random effects in LMEMs has been intended as recommendations for confirmatory studies, where the researcher has (ideally) constructed a tightly controlled investigation in which all the variables are known in advance. Notwithstanding the criticism mentioned above, Barr *et al.*'s (2013) call for maximal random-effects structures thus makes more sense in this context than for exploratory studies, which are less about testing hypotheses and more about observing patterns and relationships between variables. Roettger *et al.* (2019) argue that published work in phonetics has traditionally not been clear enough regarding what kind of analysis it is presenting, and that the general preference in journals for confirmatory studies answering original research questions has led to 'HARKing' (Hypothesising After Results are Known) and a general neglect of exploratory work.

It is in this spirit that I present my statistical analysis as exploratory, guided by predictions, rather than confirmatory. The aim of this quantitative analysis of /t/-glottalling is to identify the sociolinguistic variation in the data so that it can be studied in further detail for how it is used to construct social meaning in interaction and can be compared to the perception results to assess whether participants are aware of socio-indexical associations. I include parameters in the models which are informed by the literature and by expectations of variation in /t/-glottalling, yet I do not seek to test the significance of one or two specific critical variables to test a narrowly defined hypothesis as in confirmatory analysis. This has implications for my statistical methods. In confirmatory analysis, a researcher is, in essence, building one model as a single shot at testing his or her hypothesis. Any additional models he or she creates in order to examine further variation in the data would be classed as exploratory, as they are no longer specifically answering the research question using a structure that is constructed for that very purpose (Baayen *et al.* 2017; Roettger *et al.* 2019). In exploratory analysis, multiple models can be built, compared and tested in order to identify what effects are significant and what this might mean for further investigation. This is the approach I have taken, which I explain further below.

4.3.4.2 Model testing

In light of my presentation of this analysis as exploratory, the statistical procedure involved building multiple models with the aim of eventually reaching one that explained the most variation in the data as powerfully and accurately as possible. Random intercepts for word and speaker were included, which allows the models to fit lines at different intercepts for each speaker and each word. This is common in sociolinguistic research, where linguistic phenomena may vary as a result of random

variation between individual speakers and lexical items (Baayen 2008). I initially started with a model containing the maximum number of fixed effects, interactions and random slopes, yet such a model produces numerous convergence errors and so the random-effects structure had to be simplified. Testing revealed that the data set could only support up to two random slopes at a time. Adding random slopes usually produces more conservative results, so the choice of slope should be based on the most theoretically interesting parameters in order to reduce the chance of false positives. For this reason, school and previous school were included as random slopes by word, meaning that the lines fitted by the model are allowed to vary in slope for the two schools and previous school types within each lexical item. These slopes were included as they are highly theoretically relevant (i.e. two of the main social factors that may display sociolinguistic variation), and so the inclusion of an extra layer of conservatism in the statistics means that any significant results for these variables can be less easily ruled out as false positives. Other combinations of random slopes were tested, including random slopes for gender by word and random slopes for phonological context by speaker, but the school and previous school combination offered the best balance between theoretical considerations, model fit (as tested using the anova() function in R) and 'keeping it maximal' (Barr *et al.* 2013). The problem of convergence errors can also be dealt with by using Bayesian approaches (Eager & Roy 2017; Vasishth *et al.* 2018), but these represent a completely different way of thinking about statistics and have only very recently begun to be used in sociolinguistics and related fields. For these reasons, and the fact that Bayesian models require considerable computational resources to be run efficiently, I elected to use a frequentist LMEM approach despite the limitations on the random-effects structure.

All independent variables considered to be analytically and theoretically interesting were initially included as fixed effects in the model along with various relevant interactions. Variables in linguistic data can often have collinear relationships, which can cause problems for statistical modelling such as false negatives (Tomaschek *et al.* 2018). Collinearity is relatively hard to avoid in fieldwork-based sociolinguistic research, where tight control over balance within the sample is typically sacrificed in order to access more 'realistic' interactions than those usually produced in laboratory-based experiments. It can be mitigated, however, by centring and standardising all the continuous dependent variables (Tomaschek *et al.* 2018), which I did using z-scores. It is particularly prevalent when considering social factors, especially class-related ones, as it is likely that social class heuristics such as parental occupation, private school attendance and house price display collinear relationships. I tested collinearity among the social variables in my data using variance inflation functions (VIFs) and found the situation described above to be the case. Cut-off points for VIFs vary in the literature, with Montgomery and Peck (1992) suggesting removing variables with a VIF higher than 10, while Zuur *et al.* (2010) recommend a much more conservative threshold of 3. As described in Section 3.7.1, I tested various class heuristics and kept only social class score as it showed the least collinearity and integrated a combination

of different class heuristics (parental education, parental occupation and house price) into one variable. Other fixed effects with VIFs higher than 3 were also excluded, following the recommendations in Zuur *et al.* (2010).[15]

At this point, fixed effects and interactions were removed step-by-step if they did not reach statistical significance. Model comparisons using the anova() function were performed at each step to test whether the model without the term removed was a significantly better fit. This proceeded until all the parameters in the model were significant or very close to significance at the 95% level ($p < 0.05$).

In previous studies of /t/-glottalling, separate regression models are usually fitted to different phonological contexts under study (e.g. Flynn 2012; Schleef 2013; Badia Barrera 2015). This makes sense because we have already seen how variation in glottalling tends to show notably different patterns within different environments (see Section 4.2). However, in this thesis I use one model for the entire data set, while including phonological context as a fixed effect with interactions with social variables. This is because splitting the data into sub-sets based on phonological environment naturally reduces the size and complexity of each data set, which therefore necessitates a simpler random effect structure. Models with random slopes rely on large, reasonably balanced data sets in order to converge, which is not feasible for some of the sub-sets based on phonological context. The mixed-effects models shown in previous studies of /t/-glottalling have only included random intercepts and not random slopes, which explains their ability to fit separate models for each context, but it may potentially mean that some of these results could be false positives. I avoid this risk by using a more complex model structure with random slopes; this requires the entire data set but reduces the likelihood of Type I errors. I fitted separate models for each of the four phonological contexts for comparison's sake (not reported in this thesis) and only one of them could support the inclusion of random slopes without producing convergence errors. The results of the fixed effects were in any case similar between the full model and the sub-set models, but the gain in statistical power afforded by the full model with random slopes motivates its selection here.

4.3.4.3 Variables

The dependent variable is formed of a binary distinction between glottal and alveolar (stop + tap) tokens, with alveolar as the baseline (see Section 4.3.3 for further information on how the variants were coded). Positive estimates indicate a higher likelihood of /t/-glottalling, while negative estimates indicate a lower likelihood.

After removing the highly collinear variables as mentioned in the previous section, all the remaining independent variables considered to be analytically and theoretically interesting were included as fixed effects in the model (see Table 4.1) along with

[15] Including interaction terms greatly increases some VIFs if certain levels of the interaction terms are correlated with one another. Hence, the VIF cut-offs had to be based on models with no interactions.

various relevant interactions (see below), but non-significant predictors were removed step-by-step if they did not improve the model in model comparisons using analyses of variance (ANOVAs). All continuous variables were centred and standardised using z-scores.

Table 4.1: Independent variables included in /t/-glottalling model

Variable	Type	Baseline	Other levels
Social factors			
Age	Continuous		
Gender	Categorical	Female	Male
School	Categorical	State	Private
Previous school type	Categorical	State	Private
Social class score (standardised)	Continuous		
Settlement type	Categorical	Village	Town
Discussion group size (standardised)	Continuous		
Linguistic factors			
Phonological context	Categorical	Word-final pre-vocalic	Pre-pausal Pre-syllabic Word-medial pre-vocalic
Task type	Categorical	Conversation	Reading
Word class	Categorical	Content	Function
Preceding context	Categorical	Consonant	Vowel
Word frequency (log-transformed and standardised)	Continuous		
Number of syllables (standardised)	Continuous		

Interactions between the predictors were fitted as follows:

- Phonological context * gender
- Phonological context * school
- Phonological context * previous school type
- Phonological context * social class score
- Phonological context * word frequency
- Social class score * gender
- Social class score * school
- Social class score * previous school type
- Gender * school
- Gender * previous school type

The list above shows interactions between linguistic factors (such as phonological context) and social factors (such as gender and social class), the relative importance of

which has been much debated (Romaine 1995; Woods 2001). Some scholars have argued that it is only internal (i.e. linguistic) factors that truly drive language change (e.g. de Saussure 1916; Martinet 1952; Lass 1980), while for others, external (i.e. social) factors are the primary source of change (e.g. Meillet 1921; Thomason & Kaufman 1988; Milroy 1992). Even in work that has acknowledged the importance of both linguistic and social factors, there has been a tendency to treat the two as dichotomous entities that do not interact and should be kept separate (e.g. Weinreich *et al.* 1968; Labov 1994).

This separation of linguistic and social factors has been criticised (Traugott 1994; Romaine 1995; Woods 2001), and subsequent empirical work has suggested that the two interact. In particular, studies of phonetic changes in English in the context of regional dialect levelling in South East England (Torgersen & Kerswill 2004) and York (Haddican *et al.* 2013) have shown that social factors such as dialect contact and socio-indexical meanings of particular forms respectively can yield changes in vowel systems that sometimes contradict Labov's (1994) principles of language-internal change. This shows the importance of considering interactions between linguistic and social factors, especially for the present study, which, like that of Torgersen and Kerswill (2004), concerns regional dialect levelling in South East England.

Separate models were fitted for the private school data in order to study the effect of constellation of practice (room membership) in this school. This meant including room membership as a binary categorical fixed effect (outgoing vs. reserved) with interactions with phonological context and the other social variables. Room was also fitted as a random slope by word. However, room was not significant for /t/-glottalling, so these models are not reported.

4.4 Results

4.4.1 Overview

The first sub-section of this Results section will show the overall distribution of /t/-glottalling in different phonological environments in order to establish the reproduction of the pattern found in previous work. The following sub-sections show the results from the regression analysis and then look in more detail at the findings with graphs. The final sub-section summarises the main results.

4.4.2 Initial results

As discussed in Section 4.2, following phonological context is one of the most influential factors on the rate of /t/-glottalling. Hence, I begin the results section by looking at the overall distribution of /t/ variants according to the following sound, which are illustrated in Figure 4.2 below.

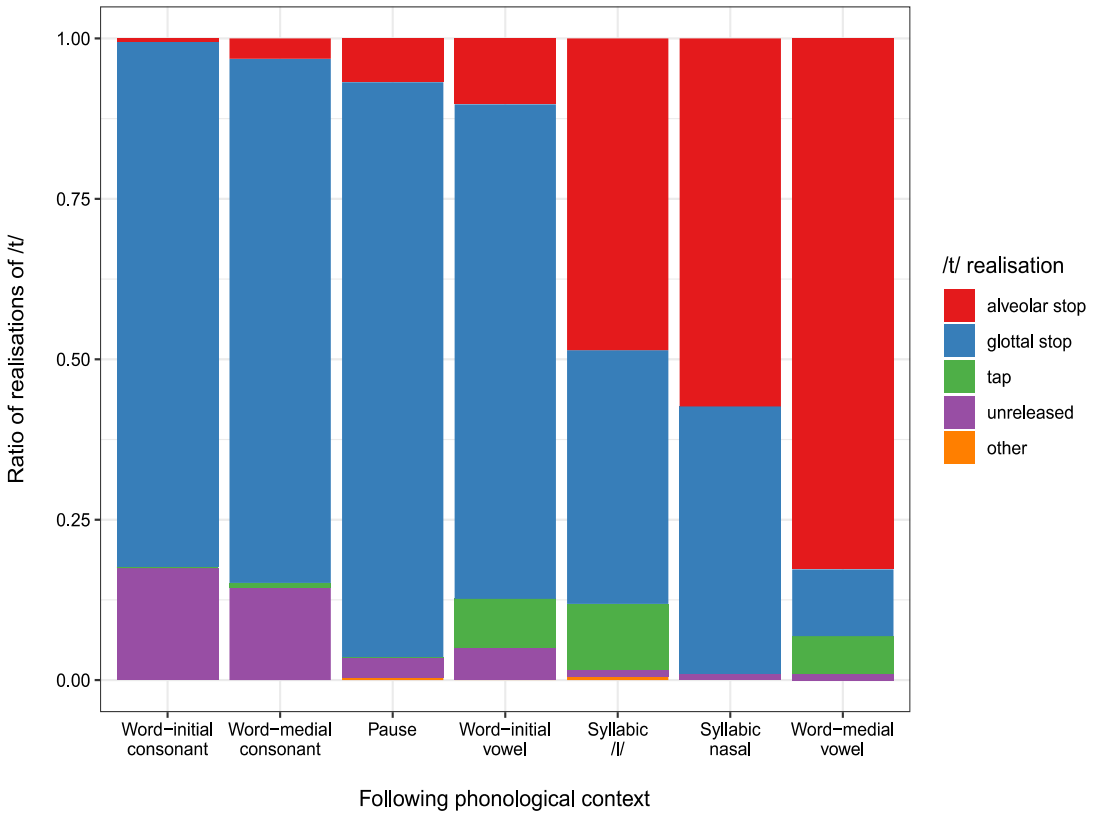

Figure 4.2: Realisations of /t/ for all speakers by following phonological context

The results follow a very similar pattern to that found in many previous studies of /t/-glottalling, as discussed in Section 4.2 (e.g. Altendorf 1999; Straw & Patrick 2007) – that is to say, glottal stops are found most frequently when /t/ precedes consonants and pauses compared to vowels. Word-final /t/ undergoes more glottalling than word-medial /t/, especially before vowels, with word-medial pre-vocalic /t/ being the most resistant environment to glottalling. An exception for the consonants applies to syllabic nasals and syllabic /l/, which are much less likely to be glottalled. Taps appear sporadically in the data before vowels and syllabic /l/. Unreleased tokens are a minority in pre-consonantal position but rare in other environments. It is clear from the graph that the sound change is essentially complete before non-syllabic consonants, as alveolar [t] only comprises a tiny proportion of the pre-consonantal tokens. Further investigation of the data shows very little inter-speaker variation in this context – hence pre-consonantal tokens serve an illustrative purpose here but will not be considered further in the analysis. The following sections will thus consider /t/-glottalling in only the most variable contexts: word-medially before a vowel; word-medially before a syllabic consonant; word-finally before a vowel; and word-finally before a pause.

4.4.3 Main results

Table 4.2 shows the output for the fixed effects from the generalised linear mixed-effects regression model discussed in Section 4.3.4 for the /t/-glottalling data set (*n* =

5,313). Table 4.3 shows the analysis of deviance (ANOVA) for the model. In this and the following sections, I use the mnemonics below in the style of Wells' (1982) lexical sets as a reading aid to refer to the phonological contexts in which /t/ was studied. Pairwise comparisons for these contexts can be found in Appendix F (i).

- Pre-pausal /t/: WHAT (*n* = 1,698)
- Word-final pre-vocalic /t/: SORT OF (*n* = 2,305)
- Pre-syllabic /t/: LITTLE (*n* = 369)
- Word-medial pre-vocalic /t/: BUTTER (*n* = 941)

*Table 4.2: Model output for /t/-glottalling data (*n *= 5,313). Positive* β *intercepts indicate a greater likelihood of a glottal stop.*

Fixed effects	***β***	**SE**	***z***	***p***	
(Intercept)	2.984	0.36	8.338	**<0.001**	***
Gender = male	-0.371	0.29	-1.288	0.198	
School = private	-0.571	0.42	-1.366	0.172	
Previous school = private	-0.515	0.40	-1.287	0.198	
Social class	0.052	0.16	0.318	0.751	
Context = WHAT	1.317	0.33	3.959	**<0.001**	***
Context = LITTLE	-1.541	0.70	-2.195	**0.028**	*
Context = BUTTER	-3.359	0.72	-4.678	**<0.001**	***
Task = reading	-1.977	0.19	-10.50	**<0.001**	***
Word frequency	0.004	0.22	0.020	0.984	
School = private * Context = WHAT	-1.594	0.43	-3.685	**<0.001**	***
School = private * Context = LITTLE	-0.736	0.62	-1.181	0.238	
School = private * Context = BUTTER	-1.341	0.69	-1.941	0.052	.
Gender = male * Context = WHAT	0.693	0.31	2.240	**0.025**	*
Gender = male * Context = LITTLE	1.042	0.36	2.856	**0.004**	**
Gender = male * Context = BUTTER	1.791	0.42	4.289	**<0.001**	***
Previous school = private * Context = WHAT	0.974	0.37	2.602	**0.009**	**
Previous school = private * Context = LITTLE	0.286	0.50	0.571	0.568	
Previous school = private * Context = BUTTER	-0.701	0.67	-1.047	0.295	
Word frequency * Context = WHAT	1.019	0.19	5.271	**<0.001**	***
Word frequency * Context = LITTLE	1.203	0.45	2.647	**0.008**	**
Word frequency * Context = BUTTER	2.226	0.52	4.255	**<0.001**	***
Social class * School = private	-0.497	0.28	-1.782	0.075	.
Social class * Gender = male	0.469	0.24	1.976	**0.048**	*

Table 4.3: Analysis of deviance (ANOVA) table for the /t/-glottalling model in Table 4.2, calculated using Type III Wald χ^2 tests

Model parameters	χ^2	**DF**	p	
(Intercept)	69.373	1	<0.001	***
Gender	1.628	1	0.202	
School	1.775	1	0.183	
Previous school	1.708	1	0.191	
Social class	0.083	1	0.773	
Context	46.312	3	<0.001	***
Task	109.973	1	<0.001	***
Word frequency	0.003	1	0.953	
School * Context	15.429	3	0.001	**
Gender * Context	24.560	3	<0.001	***
Previous school * Context	9.040	3	0.029	*
Word frequency * Context	38.000	3	<0.001	***
Social class * School	3.080	1	0.079	.
Social class * Gender	3.904	1	0.048	*

The results from the regression model show several significant interactions between phonological context and other factors, namely gender, school, previous school type and word frequency. This suggests that /t/-glottalling varies along social dimensions, but that this variation may be stronger in certain environments than in others. Task type is also a significant fixed effect – /t/-glottalling is significantly less likely to occur in the reading task compared to the conversation task (β = -1.977, $p < 0.001$). Two interactions involving social class score emerge as significant or near-significant, with gender (β = 0.469, p = 0.048) and school (β = -0.497, p = 0.075) respectively.

The interaction between school and phonological context is significant (β = -1.6, $p <$ 0.001). These results are shown in the bee-swarm plot in Figure 4.3 below. Bee-swarm plots are useful to visualise these data as they allow each speaker to be plotted as an individual point while also showing the overall distribution of the data between groups and their means. Each point on the graph represents one speaker's percentage of /t/-glottalling. The points are spaced out slightly along the x-axis to minimise overlap. The crosses represent the mean values for each group.

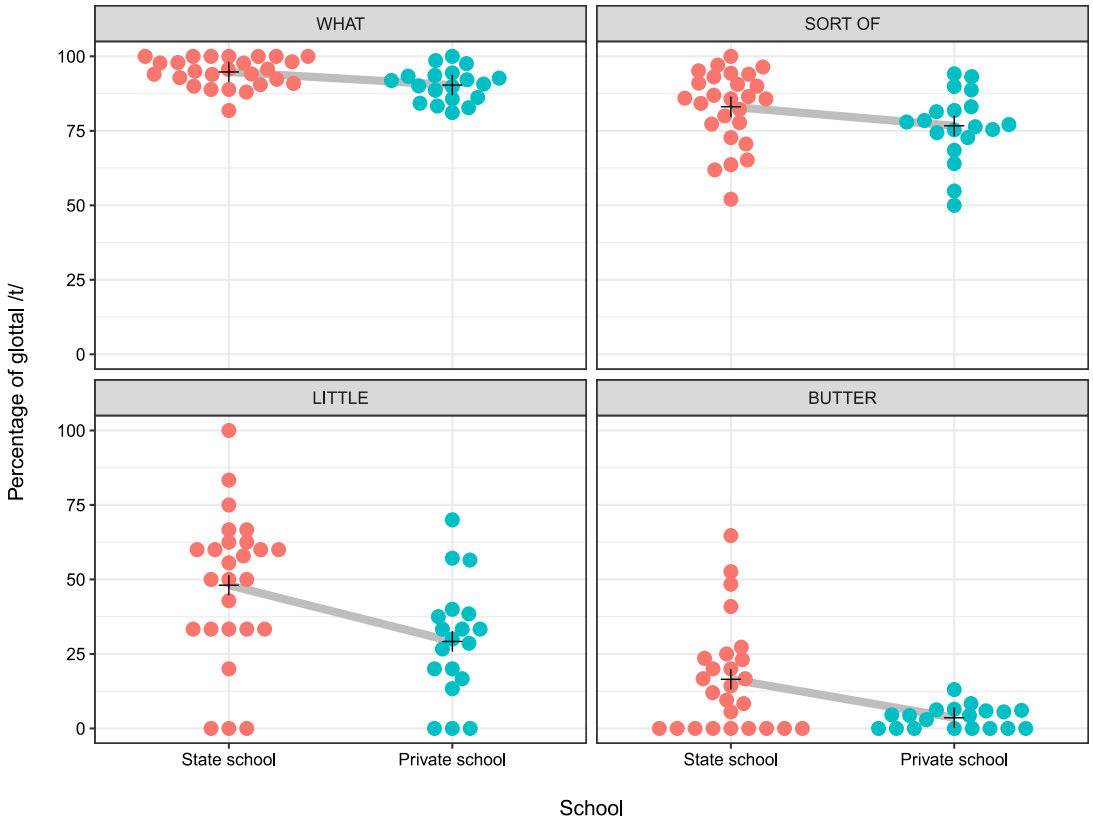

Figure 4.3: Rate of /t/-glottalling by school and phonological context

As discussed earlier, there is clear variation between the four phonological contexts, matching previous research. The graph shows that in all contexts, however, state school speakers use more /t/-glottalling than private school speakers. The biggest range of individual percentages and the most dramatic difference between the two schools' mean results are found in the LITTLE context, but this is partly down to the relatively small number of tokens in this environment. In the much more common WHAT context, all speakers here produce a glottal stop at least 81% of the time. Yet seven of the 26 state school speakers categorically use a glottal stop in word-final pre-vocalic position, whereas this is true of only one of the private school speakers. Within the BUTTER context, the majority of the speakers in the two schools use roughly comparable rates of glottalling, including 17 out of 45 who never use it in this environment. In the state school, however, there are four outliers who use much higher rates of word-medial pre-vocalic glottal stops (40% or higher) compared to the rest of the sample.

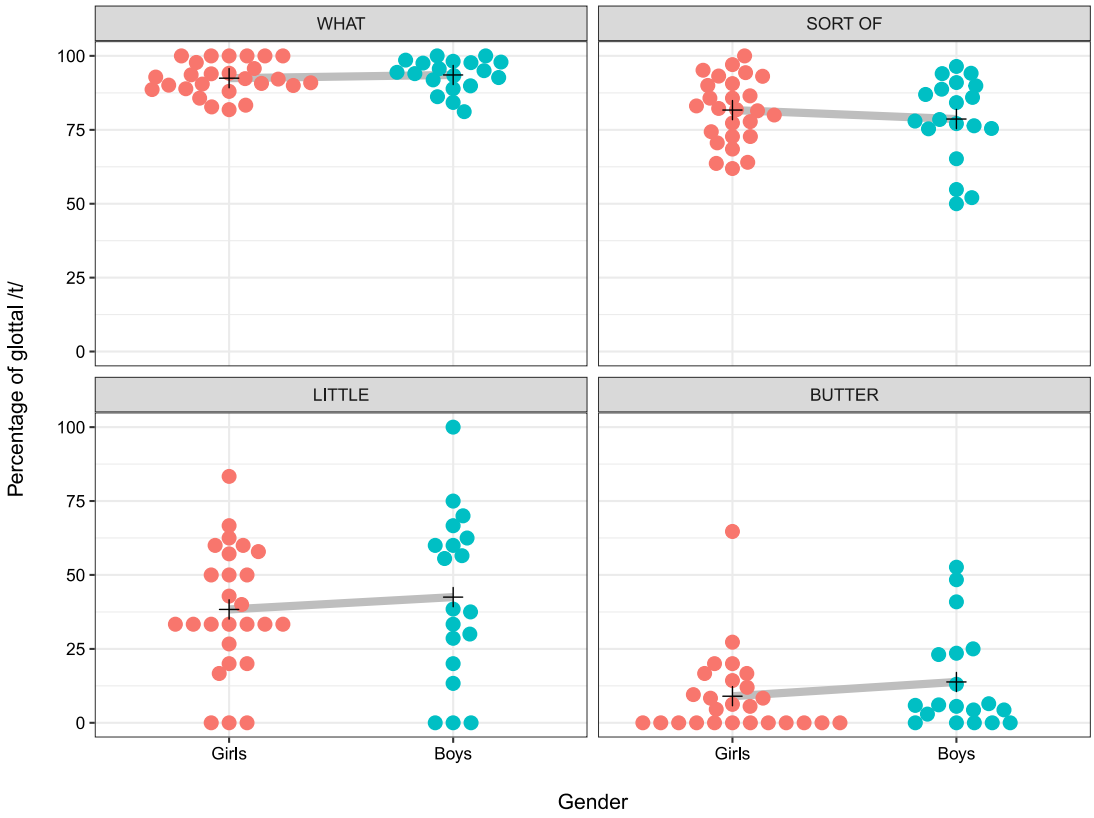

Figure 4.4: Rate of /t/-glottalling by gender and phonological context

Figure 4.4 shows a similar graph for the significant interaction between speaker gender and phonological context. Boys use slightly more /t/-glottalling than girls in all contexts except in the SORT OF environment, where a small cluster of boys show a reduced rate of glottalling compared to their peers. For BUTTER, among the girls, 11 of the 24 participants are clustered at zero, showing that these speakers did not use glottal /t/ here at all, whereas only five of the 19 boys did the same. There is one female speaker who uses an exceptionally high rate of glottalling, with 64.7% glottal usage in this context. This is the highest in the sample, at over double the rate of the girl with the next-highest percentage of glottalling (27.3%) and over 12% higher than the boy with the highest rate of glottalling (52.6%). She is one of only two speakers to use a glottal stop in this environment more than half of the time. These results indicate that /t/-glottalling in word-medial position may be more likely to be available for male stylistic practice, though girls are not excluded from doing so. An interaction between school and gender was tested but was not significant, which indicates that the gender patterns at work here do not substantially differ between the two schools.

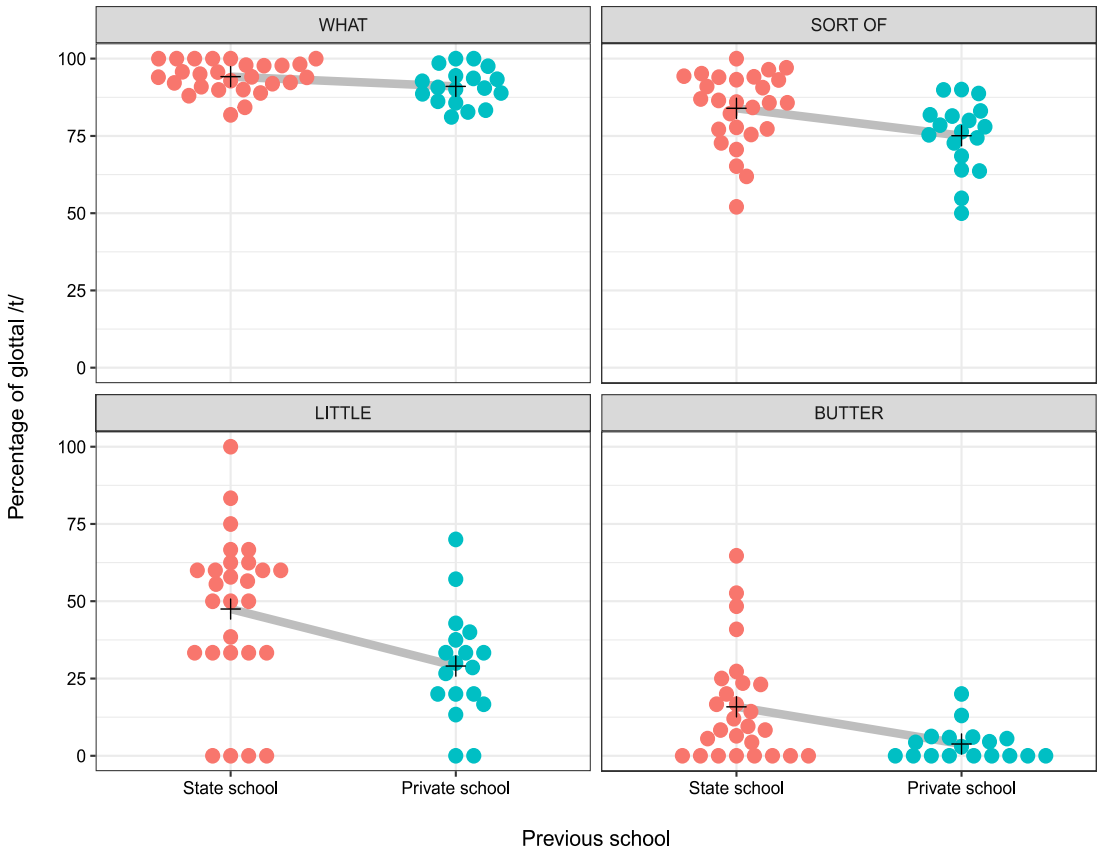

Figure 4.5: Rate of /t/-glottalling by previous school and phonological context

Figure 4.5 shows that there is a significant interaction between the phonological context and the type of school previously attended by the participants (private or state), whereby those who previously attended a state school were more likely to use /t/-glottalling. The results here are very similar to those for current school, but the effect is slightly weaker for previous school.

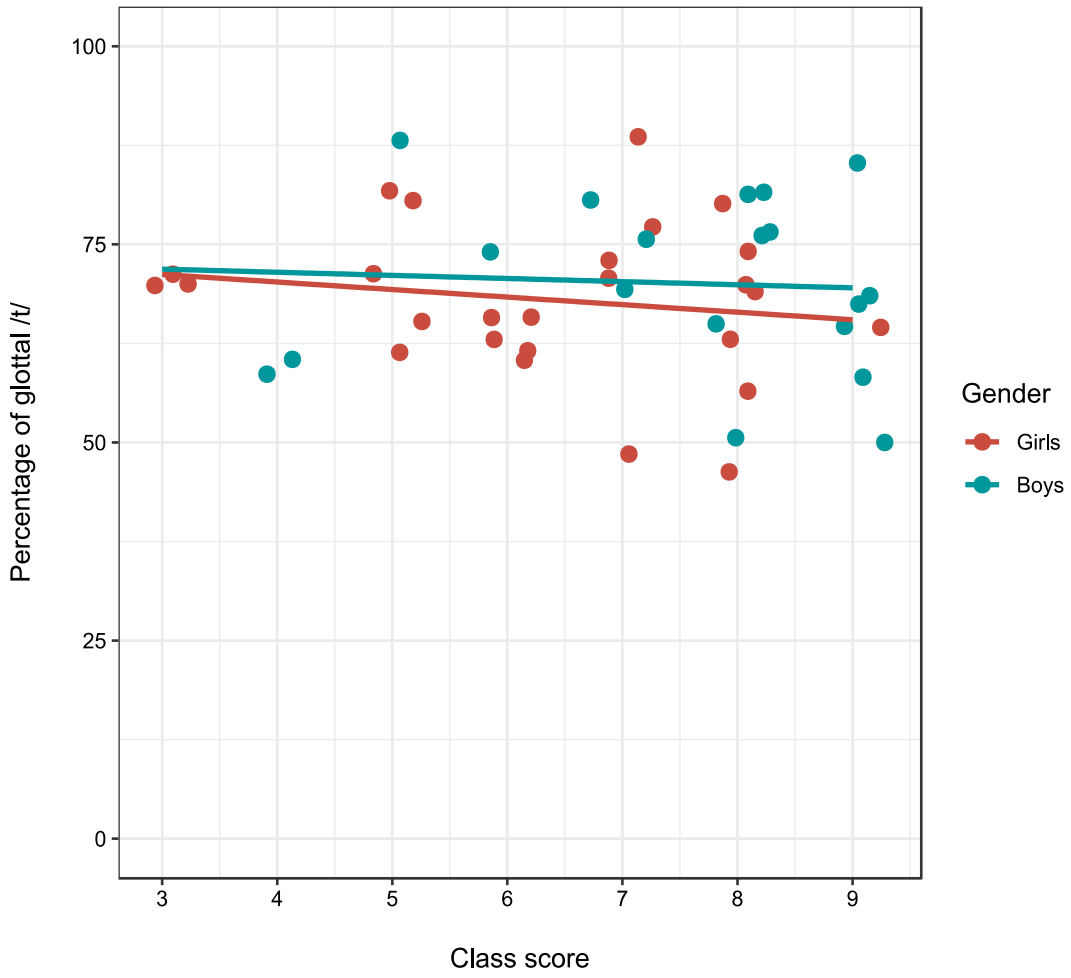

Figure 4.6: Rate of /t/-glottalling by gender and social class

The interaction between gender and social class is illustrated in Figure 4.6 (β = 0.469, p = 0.048). All speakers' class scores are integers, but they are jittered slightly along the x-axis to avoid overlap. Speakers with more expensive postcodes and whose parents attended university and work in higher-status jobs according to the NS-SEC classification system are allocated higher class scores (see Section 3.7.1.1). The results show that while the rate of /t/-glottalling for the boys remains relatively stable as social class score increases, the percentage of glottal stops for the girls takes a slightly more downward trajectory. Observation of the points in the graph reveals that this is particularly the case in the middle section of the x-axis, where the male speakers with class scores between 5 and 8 generally use more /t/-glottalling than the corresponding female speakers. This result ought to be considered with caution, however, as the overall distribution of class scores (and the gender of the speakers) is somewhat imbalanced. There are relatively few speakers towards the lower end of the class spectrum when compared to the higher end, and these are not well-balanced according to gender, with no boys having a score of 3 and no girls with a score of 4. While school attendance is not taken into account in this graph, this will also affect the results, as the private school speakers generally have higher class scores than the state school speakers, and the gender balance within the samples from each school is

skewed in opposite directions (more girls from the state school; more boys from the private school). It is possible that a more balanced sample would not have yielded the same finding, yet it is also possible that it is of genuine sociolinguistic significance.

4.5 Chapter summary

The results of the analysis show that /t/-glottalling varies along various dimensions in the speech of the young people who participated in the study. Glottal stops are more likely to be produced in the conversation task, in word-final contexts and in more frequent words. They are also more likely to be used by boys and by those whose current school and previous school was part of the state system. The effect of social class is limited, with girls showing greater class stratification in /t/-glottalling than boys.

Many of the findings from this analysis reflect those found in previous literature. One of the clearest patterns in the data is the variation in /t/-glottalling between the four phonological contexts, with the two word-final contexts, WHAT and SORT OF, showing considerably more glottal stops than the two word-medial contexts, LITTLE and BUTTER. This pattern is found in almost all studies of /t/-glottalling in southern England (e.g. Wells 1982; Altendorf 1999; Fabricius 2000; Badia Barrera 2015). Wells (1994, 1997) describes word-medial pre-vocalic /t/-glottalling as categorically excluded from RP and Altendorf (2003) also finds no glottal stops in word-medial pre-vocalic position. My data indicate that times have changed since these earlier studies were carried out, as glottal stops in the BUTTER context were produced 11.4% of the time (see Badia Barrera 2015 for similar findings). However, word-medial pre-vocalic glottal /t/ is very rare in reading style, supporting the view that glottal stops are not 'acceptable' for many middle-class southern English speakers in this position in 'educated' speech (Wells 1982; Fabricius 2000). The increased use of glottal /t/ by males and those from lower social class backgrounds (here manifested through current or previous attendance of a state school) is also well-attested in previous work (Altendorf 1999; Docherty & Foulkes 1999; Fabricius 2000; Kerswill 2003; Badia Barrera 2015).

The interpretation of these statistical patterns is provided in Chapter 8, where they can be compared to how glottal /t/ is used in interaction and perception. In particular, I consider whether the tendency for boys and for state school students to use glottal stops has an influence on how the feature is used for identity construction in interaction (Chapter 6) and on whether listeners notice the feature or imbue it with related social associations in perception (Chapter 7).

5 Quantitative analysis of GOOSE-fronting

5.1 Chapter overview

This chapter begins with a detailed look at the properties of GOOSE-fronting, starting with its sociolinguistic patterns, followed by its phonetic and phonological characteristics, and finally its capacity to evoke social meaning and its relation to salience. I then explain how I conducted the analysis, with particular detail on the acoustic methods and the statistical procedure. The results are then presented, first dealing with the main findings from the whole data set before testing the school-specific effect of constellation of practice in the private school. The findings are briefly summarised and concluded.

5.2 Background

5.2.1 The sociolinguistics of GOOSE-fronting

The /uː/ vowel in English, also known as the GOOSE vowel in Wells' (1982) lexical sets, is traditionally described as a high back vowel. However, over the course of the 20th century, the realisation of GOOSE for many speakers was increasingly made further forward in the vowel space, typically taking a high central position [ʉː] (Wells 1982). For some speakers, it has now advanced so far as to overlap with the space usually reserved for the high front vowel FLEECE /iː/ (Williams & Kerswill 1999). This phenomenon is known as GOOSE-fronting.

GOOSE-fronting has been observed all over the Anglophone world, including the United States (Labov *et al.* 2006; Fridland & Macrae 2008; Wong 2014), Canada (Boberg 2011), Australia (Cox 1999), New Zealand (Maclagan *et al.* 2009) and South Africa (Mesthrie 2010). In England, GOOSE-fronting has been studied in various locations, including Nottingham (Flynn 2012), York (Haddican *et al.* 2013; Lawrence 2017), Manchester (Baranowski 2017), Derby (Sóskuthy *et al.* 2018) and Carlisle (Jansen 2019). GOOSE-fronting has been particularly well-studied in RP and Standard Southern British English (Henton 1983; Hawkins & Midgley 2005; Harrington *et al.* 2008, 2011; McDougall & Nolan 2007; Trudgill 2008; Ferragne & Pellegrino 2010; Chládková & Hamann 2011; Williams & Escudero 2014; Chládková *et al.* 2017; Strycharczuk & Scobbie 2017a, 2017b) and related varieties of South East England such as London (Tollfree 1999; Cheshire *et al.* 2011), Reading and Milton Keynes (Williams & Kerswill 1999), Hastings (Holmes-Elliott 2015) and the Home Counties (Torgersen 1997; Przedlacka 2001, 2002; Altendorf 2003). The change has even taken place over the lifespan of individual conservative RP speakers such as Queen Elizabeth II (Harrington 2007).

Similarly to /t/-glottalling, GOOSE has been front for a long time in many Scottish varieties as well as in some traditional dialects of England, such as in the West Country (Altendorf & Watt 2004). In recent times, however, it has been studied as part of a set of linguistic changes said to be spreading from London and the South East across the UK. It is a member of the collection of 'youth norms' (Williams & Kerswill 1999) that can supposedly be used to index a cool, relaxed persona, and is also part of the inventory of the so-called Estuary English accent supposedly increasing in usage among young people in the South East (Przedlacka 2002; Altendorf 2003, 2017). Some research has investigated GOOSE-fronting in conjunction with the fronting of GOAT (Watt & Tillotson 2001; Haddican *et al.* 2013; Baranowski 2017; Lawrence 2017; Jansen 2019) and FOOT (Torgersen 1997; Ferragne & Pellegrino 2010; Harrington *et al.* 2011; Jansen 2019), which also occurs in southern accents of English. This reflects one of Labov's (1994) principles of language change, that back vowels are likely to be fronted over time.

Part of the reason that GOOSE-fronting is included in the set of 'youth norms', or features of the 'new variety' of Estuary English, is that fronter tokens of GOOSE are consistently produced by younger speakers of British English compared to older speakers (Hawkins & Midgley 2005; Harrington *et al.*, 2008; Flynn 2012; Haddican *et al.* 2013; Holmes-Elliott 2015; Lawrence 2017; Jansen 2019). Age is usually the strongest social predictor in studies of GOOSE-fronting, where more mixed results are found for other social variables such as gender and socio-economic class. Women lead the change in Williams and Kerswill (1999), Flynn (2012) and Jansen (2019), but these effects are limited to sub-sets of the sample based on location, age and preceding phonological context respectively. Holmes-Elliott (2015 p. 206) finds that women in her younger and older age groups in Hastings show significantly more GOOSE-fronting than men, but that the direction is reversed for middle-aged speakers.

In terms of socio-economic class, Flynn (2012) finds complex interactions between sex, age and class in Nottingham whereby middle-class speakers use significantly more fronting than working-class speakers only among the older age group, while working-class males of both age groups use the least GOOSE-fronting compared to their female and middle-class peers. Similar results are obtained in Jansen (2019 p. 16), whose middle-class speakers in Carlisle also lead GOOSE-fronting, particularly in environments following /j/. In contrast, Altendorf (2003 pp. 109-112) finds that GOOSE-fronting is consistent across all social classes in the Home Counties, but unrounded variants such as [ɪː] are most frequently used by upper-middle-class speakers. Przedlacka's (2002 pp. 90-93) research in the same area finds GOOSE-fronting to be led by working-class women. Other studies (e.g. Howley 2015; Baranowski 2017; Lawrence 2017) find no gender or class stratification for GOOSE-fronting. It is possible that regional differences may explain some of the variability in these sociolinguistic patterns, which can be seen in some studies of the vowels of different accents of English (e.g. Ferragne & Pellegrino 2010; Williams & Escudero 2014), whereby GOOSE-fronting seems to be more advanced in southern accents compared to northern ones.

In summary, GOOSE-fronting as a sound change in accents of (South East) England is said to be a feature that has only relatively recently taken hold, as shown by the consistent finding in previous research that younger people produce fronter GOOSE than older people. While the trend in some studies is that the change is led by women and by people from middle-class backgrounds, these findings vary in different locations. These results have implications for the potential social meanings of this variable, which are discussed in Section 5.2.3.

5.2.2 Phonetic and phonological properties of GOOSE-fronting

The phonetic causes of GOOSE-fronting are argued primarily to be a consequence of a lack of compensation for co-articulation, in addition to the tendency for back vowels to front over time (Labov 1994). In Harrington (2007) and Harrington *et al.* (2008), the authors claim that the prevalence of GOOSE in post-palatal environments in British English (i.e. in the combination [ju], as in *you*, *few*, *new*, etc.) and post-coronal environments (e.g. *soon*, *noon*, *too*, etc.), which have high type and token frequencies, has led to the vowel increasingly being produced with an advanced tongue position as a result of the influence of the preceding consonant. Drawing on Ohala's (1981) theory of sound change, the authors argue that listeners fail to compensate for this co-articulation in perception and thus the fronter tongue and higher F2 are transferred from the consonant to the vowel. The earliest written records of GOOSE-fronting would indeed suggest that post-palatal contexts have always led the change (e.g. Jones 1932).

The phonetic origins of GOOSE-fronting affect its allophonic distribution. Previous work has established a clear pattern – that fronting is most likely to occur after the palatal glide /j/ in words like *you*, followed by contexts following coronal consonants such as /t, d, n, s, z, ʃ, ʒ, tʃ, dʒ/ as a result of the tongue's fronter position for these sounds leading to co-articulation (e.g. Flynn 2012; Jansen 2019). Fronting is less likely when GOOSE is preceded by a non-coronal consonant or a non-palatal approximant /l, ɹ, w/[16], but is almost completely blocked before coda /l/ in most varieties. Hence, for most SSBE speakers, fronting may occur in *hula* [hʉ.lə], but not in *fooling* [ful.ɪŋ] (see Strycharczuk & Scobbie 2017b for a comprehensive morpho-phonological analysis). It is worth noting that these phonological patterns are not uniform throughout the English-speaking world. The absence of the GOOSE-FOOT split in some varieties of Scottish English has led to different patterns of GOOSE-fronting there (Scobbie *et al.* 2012) while GOOSE preceding coda /l/ can be fronted in some northern English accents such as Manchester (Turton & Baranowski 2014). GOOSE-fronting has also been found to interact with /j/-dropping in Derby (Sóskuthy *et al.* 2018). However, the pattern reported above, with a fronting hierarchy of post-palatal > post-coronal > post-non-coronal > post-approximant > pre-coda lateral, is present

[16] /l/ is a coronal consonant but the movement in formants it causes means that it usually inhibits fronting relative to other contexts (Flynn 2012; Holmes-Elliott 2015; Ladefoged & Johnson 2015).

for most British varieties, including southern English accents (e.g. Holmes-Elliott 2015).

In acoustic phonetics, the resonant frequencies of the speech signal can be measured using formants, identified as dark bars on a spectrogram. The frequency of the second formant (F2) is interpreted to correspond to vowel frontness, so that a higher F2 represents a fronter tongue (Ladefoged & Johnson 2015). In terms of the acoustic and articulatory properties of GOOSE-fronting, it is generally accepted that the tongue position is advanced, leading to a rise in F2, to the point that for some speakers, it overlaps with the space of the high front vowel FLEECE /i/ (Harrington *et al.* 2011). What differentiates FLEECE and GOOSE appears to be F2 slope and lip rounding (Chládková *et al.* 2011, 2017; Harrington *et al.* 2011), though lip unrounding has been reported in some studies and may be regionally stratified (Altendorf & Watt 2004; Foulkes & Docherty 2007; Docherty 2010). The close theoretical acoustic-articulatory relationship between advanced tongue position and higher F2 for GOOSE-fronting is largely supported empirically in Strycharczuk and Scobbie's (2017a) study of the two, though they find that for tokens preceding coda /l/ (e.g. *fool*), a low F2 masks what is actually a relatively front tongue position. The notion of GOOSE as a monophthong has also been questioned in some studies that find diphthongal variants, including in Sheffield (Stoddart *et al.* 1999), Norwich (Trudgill 1999b) and London (Altendorf & Watt 2004), among others. In SSBE and related varieties, some diphthongisation has been reported (Altendorf & Watt 2004), though monophthongal fronting seems to be more common compared to northern accents (Ferragne & Pellegrino 2010; Williams & Escudero 2014).

The methods used to measure and analyse GOOSE-fronting have varied and changed together with the development of acoustic techniques and statistical procedures. Early work uses auditory methods, coding GOOSE tokens into discrete variants such as fronted, backed, diphthongised, unrounded and so on (e.g. Torgersen 1997; Tollfree 1999; Przedlacka 2002; Altendorf 2003), though this has gradually been supplanted by acoustic analysis of vowel formants as the technology for doing so has become more easily available. Many acoustic studies take one or more time-points along the duration of the vowel formants and measure speakers' GOOSE production (e.g. Haddican *et al.* 2013; Holmes-Elliott 2015; Baranowski 2017; Jansen 2019). These techniques allow for more objective and fine-grained analysis than auditory methods, obtaining continuous F1, F2 and F3 measurements that can be subjected to vowel normalisation and linear regression modelling. Some of the latest sociophonetic work (e.g. Sóskuthy *et al.* 2018) has used the entire vowel formant curve as the variable under measurement, which can be statistically analysed using generalised additive mixed models (GAMMs). This is particularly useful for varieties where GOOSE is liable to be diphthongised, as GAMMs are able to dynamically process the curvature of the whole formant trajectory, which may be missed by only taking a limited number of measurements at certain points along the duration of the vowel. Some studies have also analysed the articulatory properties of GOOSE-fronting using methods such as electromagnetic articulometry (EMA) and ultrasound tongue

imaging (e.g. Harrington *et al.* 2011; Lawson *et al.* 2015; Strycharczuk & Scobbie 2017a).

5.2.3 Social meanings and salience of GOOSE-fronting

In Section 5.2.1, we saw that traditional variationist research has found that GOOSE-fronting consistently varies by age across England. This has led to its inclusion, together with /t/-glottalling and other features, in a constellation of 'youth norms' supposedly emblematic of a non-localisable but trendy and youthful style emanating from London and South East England (Williams & Kerswill 1999; Milroy 2007). However, while /t/-glottalling has frequently been found to be led by working-class men in various communities, gender and class differences are weaker for GOOSE-fronting. If anything, it seems to be middle-class women who lead the change, though these patterns vary around the country. It would seem, then, that the two features share similar sociolinguistic characteristics, but with some key differences. These differences become most apparent when we consider the social meanings and salience of GOOSE-fronting in comparison to those of /t/-glottalling.

Despite the large body of work on GOOSE-fronting in studies of language variation and change, there has been relatively little third-wave research (Eckert 2012) examining how this feature is used in interaction to construct identity and index social meaning, particularly in British English. Studies in the United States, where GOOSE-fronting is more advanced in the southern and western states (Labov *et al.* 2006; Koops 2010; Kennedy & Grama 2012; Fridland *et al.* 2016), have suggested that the change is now so widespread that it does not index any social information despite its regional variation, unlike other vocalic changes such as PRICE monophthongisation (Fridland 2008; 2012). Some work has even indicated that it is now backed variants of GOOSE that are more socially meaningful in speech production (Wagner 2008; Hall-Lew 2009). Sociolinguistic variation in California English has been particularly widely studied, where GOOSE-fronting has been present for some time and has been linked to the local stereotypical persona of the Valley Girl (Hinton *et al.* 1987). The importance of micro-level local categories in relation to GOOSE-fronting in California is highlighted in Fought (1999), who shows that the sound change among Chicano English speakers is mediated by a complex interplay between gender, social class and gang affiliation. Similarly, Hall-Lew (2005) argues that GOOSE-fronting is used by different social groups in northern Arizona to index modern urban sophistication or traditional rural ranch culture, as it is a feature of incoming changes from both urban California and rural Texas. It is unclear, however, whether American listeners are able to link variants of GOOSE to regional or persona-based social information in their perception, since some studies of the perception of this variable provide evidence for this listener awareness (Torbert 2004; Villarreal 2018), while others do not (Fridland *et al.* 2004, 2005).

In the UK, too, it is unclear whether GOOSE-fronting is able to act as a socio-indexical cue to a speaker's identity. Altendorf's (2003) research on Estuary English uses Le Page's (1986) 'acts of identity' framework to argue that GOOSE-fronting is used by young people in the South East to construct a 'trendy', 'modern' and 'chic' identity in opposition to a 'boring' one associated with backed and diphthongal variants. More recently, an ethnographic study of Roma adolescent migrants in Manchester by Howley (2015) reports that speakers whose peer groups at school are exclusively made up of fellow Roma lag behind in the use of GOOSE-fronting compared to those who hang out in more ethnically diverse friendship groups. Haddican *et al.* (2013) find that in York, variants of FACE and GOAT index local stereotypical personae, such as the anti-social young working-class figure of the 'chav', whereas variants of GOOSE do not. GOOSE-fronting is used more in production by participants who do not strongly identify with York, but this effect is much weaker than for FACE and GOAT diphthongisation. The authors argue that while both changes are externally motivated, originating from the south of England, changes in GOOSE are more recent and more widespread around the country, whereas diphthongal FACE and GOAT compete with monophthongal variants that are emblematic of a local Yorkshire identity. They believe that this goes some way to explaining the differences in social meanings between the variables.

Lawrence's (2017) study in the same city, however, finds that GOOSE-fronting is not socially stratified in speech production beyond the effect of age, yet in perception, the social meanings of GOOSE varied between groups of people in his sample. For younger and more geographically mobile participants, GOOSE-fronting is perceptually linked to middle-class speakers, while backed and diphthongal local variants are associated with a working-class identity as well as with 'chavs'. For older and less mobile participants, on the other hand, this is not the case. Similarly, I have previously found that listeners may not be sensitive to speaker gender when primed with visual information while categorising tokens along a FLEECE-GOOSE continuum in SSBE (Alderton 2015). This research has important implications for the production-perception relationship, suggesting that there may not be a one-to-one match between production and perception and that the social meanings of a variant may vary for different groups in a community (see Section 2.2.3). This latter point has been argued by several recent studies of speech perception, particularly for sociolinguistic variables which are not socially salient (Levon & Fox 2014; Juskan 2016; Llamas *et al.* 2016; Schleef 2017b).

This is highly relevant for GOOSE-fronting because this sound change generally fails to meet the criteria for salience established in previous research (see Section 2.3). It is a phonetically gradient change that is not reflected in orthography and does not violate a phonological contrast – despite its overlap with the vowel space and tongue position of FLEECE, fronted GOOSE has different F2 slopes and lip rounding to FLEECE and is perceived as distinct (Harrington *et al.* 2008, 2011; Chládková 2011, 2017) – thus not fulfilling most of Trudgill's (1986) criteria for salience. GOOSE-fronting does display sociolinguistic stratification, which is one of Kerswill and Williams' (2002)

requirements, but these are mostly age-related; gender and class-based patterns are less consistent and possibly limited to certain regional varieties. Measuring the surprisal value of GOOSE-fronting, as in more cognitively-based conceptions of salience (e.g. Rácz 2013; Jaeger & Weatherholtz 2016), is challenging, but it would be reasonable to suggest that GOOSE-fronting is not very 'surprising' or 'prominent' compared to surrounding sounds because of a number of factors. These include its widespread regional distribution, its phonetic gradience and its purported natural occurrence as a result of co-articulation in the highly frequent post-palatal and post-coronal environments. The production studies cited earlier (e.g. Fridland 2008; Harrington *et al.* 2013; Lawrence 2017) indicate that in terms of its 'relative ability to evoke social meaning' (Levon & Fox 2014 p. 1), GOOSE-fronting is not very socially salient compared to other vocalic changes in the varieties studied, such as PRICE monophthongisation in the US and variants of FACE and GOAT in York.

Overall, then, assessing GOOSE-fronting against the criteria involved in existing conceptions of salience would lead to the conclusion that it is a much less salient sociolinguistic variable than /t/-glottalling. The contrasting salience between these two variables, despite their co-membership of the well-studied set of changes taking place in young people's speech in South East England, therefore, makes them ideal variables for testing questions relating to sociolinguistic salience and social meaning among speakers in this region.

5.3 Methods

5.3.1 Recordings and participants

As with the /t/-glottalling data, the tokens of GOOSE were taken from interviews conducted in small groups with 45 adolescents from two schools in Hampshire (see Chapter 3). In addition to the conversation task and short story reading task, participants also read out a list of hVd words for the monophthongs of English (e.g. *hid, head, had*, etc.), from which GOOSE tokens in the word *who'd* were produced (see Appendix B). These word list tokens are merged with the reading task as their small number precluded considering them as a separate category. The recordings were collected using Zoom H1 and H4N digital voice recorders and Audio Technica lavalier microphones at a 16-bit sampling rate of 44.1 kHz.

5.3.2 Acoustic analysis

Acoustic methods were used to analyse the GOOSE data as they offer a more fine-grained source of measurement than auditory methods and are comparable with other recent work. Articulatory methods were not appropriate for this study as their reliance on equipment which can be bulky, intimidating or intrusive such as ultrasound or EMA was not practical for taking to a school.

The tokens of GOOSE in this study were initially identified and coded in ELAN (Max Planck Institute for Psycholinguistics 2017) before undergoing further processing in Praat (Boersma & Weenink 2017) and emuR (Winkelmann *et al.* 2019). Precise vowel durations were manually labelled in Praat and scripts were used to create separate files for each token and collect formant values for F1 and F2. The onset of the vowel was placed at the point at which resonance began with dark bars for F1, F2 and F3 on the spectrogram. The offset was placed at the point at which this ceased. In some contexts, especially after preceding /j/, there is no change in the waveform or spectrogram between the /j/ and the /uː/. Some studies overcome this issue by including the whole /juː/ sequence within the labelled portion (e.g. Harrington 2007), but this means that the vowel duration for these tokens will not be comparable to those in other environments. For this reason, I made use of auditory information to determine the point at which the vowel began if the visual information was not clear enough.

Observation of the spectrograms for the GOOSE data revealed that Praat's automatic format measurements were frequently erroneous – that is, the software had not taken a measurement from a point on the spectrogram where the dark bar was. As a result, I hand-corrected the formant tracking using emuR. After correction, F1, F2 and F3 values were extracted at the 50% time-point of each vowel in order to minimise the effect of co-articulation with the surrounding consonants, which usually have the greatest influence on the beginning and end of the vowel. Taking only one measurement point simplifies the data, which is not a major problem for monophthongs as they do not vary in frequency very much over time. If diphthongisation is present, however, multiple measurement points or smooth lines are required. The speakers in this study produced tokens of GOOSE which were almost exclusively acoustically monophthongal, and so multiple measurement points were not necessary. The only tokens which showed substantial movement in F2 were those preceding or following approximants such as /l/, /ɹ/ and /w/ as a result of co-articulation. Taking the measurement half-way through the duration of the vowel, however, meant that the influence of these surrounding consonants was minimised.

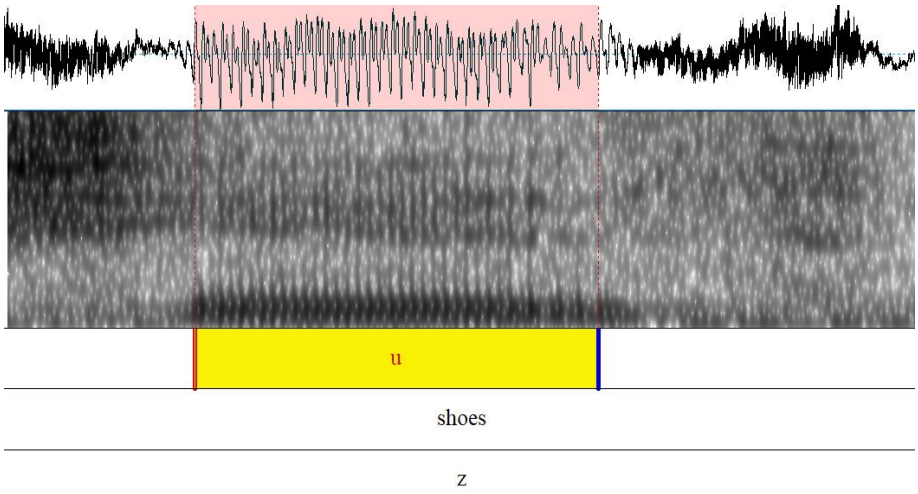

Figure 5.1: Labelled waveform and spectrogram for a token of 'shoes' (Katrina)

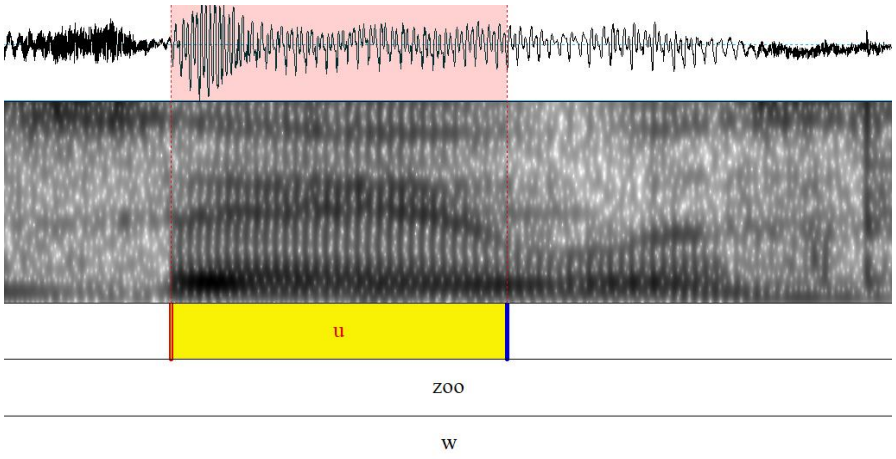

Figure 5.2: Labelled waveform and spectrogram for a token of 'zoo' (Cath)

Figures 5.1 and 5.2 illustrate two examples of GOOSE tokens. The first one, in Figure 5.1, shows a token of *shoes*, where GOOSE is situated between two voiceless consonants. It is clear here that there is little movement in the formants and that the vowel label boundaries have been placed at the onset and offset of the visible formant bars for F2 and F3. There is also considerable overlap with the large, regular periodic waves in the waveform. Figure 5.2 shows a token of *zoo*, where GOOSE is followed by a [w] glide. There is a clear downward trajectory in F2 towards the end of the vowel, which has been labelled here where the dark bars for F2 and F3 fade away. This curved trajectory, however, does not affect the measurement of F2, since the 50% point is comfortably within the steady-state portion of the vowel, which is not influenced by co-articulation. These examples show that taking 50% time-points for GOOSE in this study is appropriate for the data.

Raw formant values measured in Hertz (Hz) allow the researcher to measure the estimated resonant frequencies of human speech, yet they are not typically used when comparing speakers in sociophonetic studies because they are affected by the size and shape of the vocal tract, which is different in every individual. In particular, adults have longer vocal tracts than children and adult males tend to have longer vocal tracts than adult females, which will affect speakers' fundamental frequencies and resonant frequencies (Simpson 2009), although the extent of these differences has been found to vary between languages (Henton 1995). In order to account for these physiological differences between speakers, mathematical formulae can be applied to the formant values in order to normalise them and in theory leave only the sociolinguistic differences between speakers and the phonological differences between vowels. Various vowel normalisation techniques have been developed and tested, using different formulae and different configurations of required information for speakers, vowels and formants (Watt *et al.* 2011). I normalised the vowel formants using the Lobanov normalisation technique (Lobanov 1971), which is a speaker-intrinsic, vowel-extrinsic and formant-intrinsic method. Techniques with this configuration of characteristics, including Lobanov's, are typically the best-performing ones in comparative studies of vowel normalisation (e.g. Disner 1980; Adank *et al.* 2004; Clopper 2009; Fabricius *et al.* 2009; Flynn 2012). This method uses a z-score transformation for each formant for each speaker, so that the vowel space is contained within approximately ±2 standard deviations of the mean for each formant. This is shown in the equation below, where z is the normalised formant frequency, f is the original formant frequency in Hertz, μ is the mean for that formant across all vowel tokens for that speaker, and σ is the standard deviation for that formant across all vowel tokens for that speaker (Clopper 2009 p. 1438):

$$z = \frac{f - \mu}{\sigma}$$

Since this technique requires formant values for all the monophthongs in the vowel space, I applied the formula to the GOOSE tokens together with each speaker's hVd word list pronunciation of the other ten vowels of English (see Appendix B). In order to measure each speaker's degree of GOOSE-fronting, the F2-F1 Euclidean distance between every normalised GOOSE token and the speaker's corresponding normalised FLEECE vowel was taken, based on the fact that fronter tokens of GOOSE inhabit the high front part of the vowel space, closer to FLEECE (Harrington *et al.* 2008). The normalised F2-F1 Euclidean distances were used as the outcome variable in the statistical analysis. Tokens of GOOSE in which the /uː/ vowel was unstressed or whose formants were affected by overlapping speech, laughing and noise were excluded. Tokens produced as part of imitations or performances were also excluded from the quantitative analysis. Tokens in the phrase *who used* from the reading task were also removed, as these were extremely fronted and had a strong influence on the effect of task type. This amounted to 702 excluded tokens in total, leaving 2,143 tokens of GOOSE to be included in the statistical modelling (speaker mean = 48; SD = 22).

5.3.3 Statistical analysis

5.3.3.1 Mixed-effects regression models and model testing

The quantitative analysis in this chapter is done using linear mixed-effects models (LMEMs). Whereas the /t/-glottalling data requires generalised LMEMs by virtue of its discrete dependent variable (glottal or alveolar /t/), standard LMEMs using the lmer() function in the lme4 and lmerTest packages in R (Bates *et al.* 2015b; Kusnetsova *et al.* 2017; R Core Team 2018) were used for the GOOSE data as the dependent variable here is continuous (the normalised F2-F1 Euclidean distance between GOOSE and FLEECE). Similarly to the previous chapter, the analysis in this chapter is an exploratory analysis rather than a confirmatory analysis. That is to say, the analysis seeks to identify the patterns of sociolinguistic variation in GOOSE-fronting so that it can be examined in further detail in interaction and in the perception data, rather than testing specific pre-determined hypotheses (Baayen *et al.* 2017; Roettger *et al.* 2019). The theory behind this is discussed in further detail in Section 4.3.4.

As with the /t/-glottalling data, I strove to fit models that balanced statistical power with practical and theoretical considerations. The continuous dependent variables were centred and standardised using z-scores, and the variance inflation factors (VIFs) for each fixed effect were obtained and removed if over 3 in order to reduce collinearity (Zuur *et al.* 2010). The maximal random-effects structure that was theoretically appropriate and could be justified by the data was included in the models (Bates *et al.* 2015a; Baayen *et al.* 2017; Matuschek *et al.* 2017; Roettger *et al.* 2019). This meant that word and speaker were fitted as random intercepts and previous school type was fitted as a random slope by word. Other combinations of random slopes were tested, including random slopes for gender, school and age by word, and random slopes for vowel duration by speaker. The selected random-effects structure offered the best balance between good fit in model comparisons and an absence of convergence errors, while also reflecting findings from previous work suggesting that class (here operationalised as previous school type) may have an effect on GOOSE-fronting (Przedlacka 2002; Altendorf 2003; Flynn 2012; Jansen 2019). For the models examining the role of constellation of practice (room membership) at the private school, room membership was included as a random slope by word as it is the main variable of interest here. The models were initially fitted with all theoretically motivated fixed effects and interactions (see below), which were removed step by step if they did not reach significance until only effects that were significant or near-significant at the level of $p < 0.05$ remained. Model comparisons using the anova() function were implemented at each step to test whether removing the effect significantly improved the model.

Some studies of GOOSE-fronting exclude pre-lateral tokens from parts of their quantitative analyses (e.g. Holmes-Elliott 2015) or put them into separate models (e.g. Sóskuthy *et al.* 2018) because they consistently resist fronting in most varieties of

English, and so may not be subject to sociolinguistic variation in the same way as GOOSE in other environments. However, they are retained in my statistical analysis since they can be accounted for in the model by including the presence or absence of a following /l/ as a binary categorical fixed effect. I tested versions of the models both with and without the pre-lateral tokens and the results showed minimal differences. Some of the plots in the Results section, however, have these tokens removed to make them easier to read.

5.3.3.2 Variables

The dependent variable in this analysis is the F2-F1 Euclidean distance between the mid-point of every GOOSE token and that of the speaker's corresponding FLEECE vowel after having undergone Lobanov normalisation (see Section 5.3.2). This is measured on a continuous scale, with lower values indicating a smaller distance between FLEECE and GOOSE (i.e. more fronting). Other studies have used normalised F2 as the dependent variable, but the Euclidean distance of F1 and F2 between each speaker's FLEECE and GOOSE vowels offers more detail by considering the space in two dimensions rather than one, and by better taking into account individual variation in speech production.

Preceding sounds were initially coded phonemically and then collapsed into four categories: coronal; non-coronal; palatal (/j/); liquid. Previous studies have shown that GOOSE following a coronal consonant is more likely to be fronted than that following a non-coronal consonant (Harrington *et al.* 2008; see Section 5.2.2). Fronting is particularly likely when preceded by the palatal approximant /j/. GOOSE following the liquids /l, ɹ/[17] was coded separately, as in Flynn (2012) and Holmes-Elliott (2015), as these sounds often cause additional movement in the formants (Ladefoged & Johnson 2015).

Table 5.1 shows the independent variables included in the models after highly collinear predictors were removed. Variables that failed to reach statistical significance were removed at each step until only (near-)significant predictors remained.

[17] Tokens of GOOSE following the approximant /w/ exhibit the same patterns as /l, ɹ/ in other studies, but none of the tokens in the present data set were preceded by /w/.

Table 5.1: Independent variables included in GOOSE-fronting model

Variable	Type	Baseline	Other levels
Social factors			
Age	Continuous		
Gender	Categorical	Female	Male
School	Categorical	State	Private
Previous school type	Categorical	State	Private
Social class score (standardised)	Continuous		
Settlement type	Categorical	Village	Town
Discussion group size (standardised)	Continuous		
Linguistic factors			
Duration (ms, standardised)	Continuous		
Preceding context	Categorical	Non-coronal	Coronal
			Palatal
			Liquid
Task type	Categorical	Conversation	Reading
Word class	Categorical	Content	Function
Following coda /l/	Categorical	Absent	Present
Word frequency (log-transformed and standardised)	Continuous		
Number of syllables (standardised)	Continuous		
FLEECE competitor	Categorical	Absent	Present

The variables here are largely the same as those used in the /t/-glottalling models. Interactions between linguistic and social factors are included here as these have been shown to play a role in vocalic changes in varieties of British English in previous work (e.g. Torgersen & Kerswill 2004; Haddican *et al.* 2013), as discussed in Section 4.3.4.3. Two additional fixed effects in the GOOSE-fronting models, however, are duration and FLEECE competitor. Vowel duration was tested in Sóskuthy *et al.* (2018) but was not significant. GOOSE duration was measured in Praat and extracted in emuR as the period of time between the onset and offset of each vowel, labelled according to the method described in Section 5.3.2. The 'FLEECE competitor' variable refers to whether the GOOSE word forms a minimal pair with FLEECE (e.g. *food* and *feed*). Hay *et al.* (2010) suggest that vowels in words with a minimal pair competitor are less likely to be undergo change in order to avoid confusion with the competitor word, which is borne out in Flynn's (2012 pp. 391-392) results for GOOSE produced by younger speakers. If the GOOSE word had a minimal pair with an extremely rare FLEECE word (e.g. *you* and *ye*), it was not coded as having a FLEECE competitor.

Interactions between the predictors were fitted as follows:

- Preceding context * gender
- Preceding context * school
- Preceding context * age

- Preceding context * previous school type
- Preceding context * social class score
- Preceding context * word frequency
- Preceding context * task type
- Preceding context * duration
- Social class score * gender
- Social class score * school
- Social class score * previous school type
- Gender * school
- Gender * previous school type

Separate models were fitted for the private school data in order to study the effect of constellation of practice (room membership) in this school. This meant including room membership as a binary categorical fixed effect (outgoing vs. reserved) with interactions with phonological context and the other social variables, and as a random slope by word. Previous school and age were not included in these models as they showed relatively little variability in the private school.

5.4 Results

5.4.1 Overview

In this section, I begin by outlining the relative position of GOOSE in the vowel space for the data set overall, before presenting the results from the statistical analysis with graphs. The following section looks specifically at the findings for the private school, where constellation of practice (membership of the 'outgoing' or 'reserved' rooms) is tested as a variable in a separate model alongside other social factors.

5.4.2 Main results

Before getting into the details of the sociolinguistic variation in GOOSE-fronting, it is helpful to visualise the overall distribution of GOOSE in relation to other vowels by means of the normalised vowel plot in Figure 5.3. All speakers' GOOSE tokens included in the model are displayed here, split into those that precede coda /l/ (GHOUL) and those that do not (GOOSE), in order to highlight the strong phonetic differences between these two environments (see Section 5.2.2). The participants' FLEECE, TRAP and START vowels taken from hVd words are also shown in order to give shape to the whole vowel space. It is clear that the majority of the GOOSE tokens are produced in a high front-central area closer to FLEECE than GHOUL. While only a relatively small number of GOOSE tokens occur in the same space as GHOUL, there is a fair amount of overlap between the FLEECE and GOOSE ellipses, even if these highly fronted GOOSE tokens still represent just a minority of the total. The large amount of variation in GOOSE frontness suggests, however, that GOOSE-fronting does not occur for every

speaker in every context, which means that statistical modelling ought to be used to identify any patterns in this variation. Table 5.2 below shows the output of the linear mixed-effects regression model for the GOOSE data set as outlined in Section 5.3.3. Table 5.3 shows the accompanying analysis of variance (ANOVA) table for the model. Pairwise comparisons for the preceding contexts are available in Appendix F (ii).

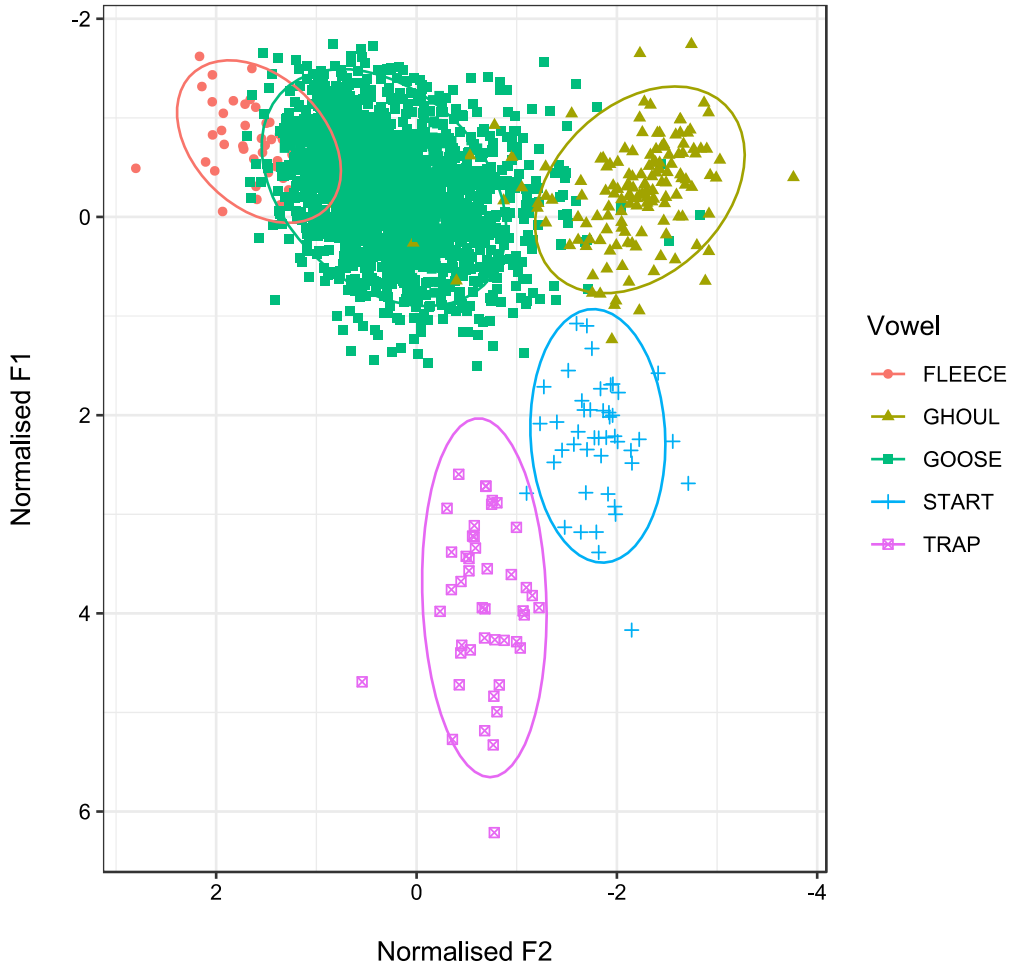

Figure 5.3: Normalised vowel plot for all speakers

Table 5.2: Model output for GOOSE-fronting data (n = 2,143). Positive β intercepts indicate backer tokens (i.e. a greater Euclidean distance from FLEECE).

Fixed effects	***β***	**SE**	***t***	***p***	
(Intercept)	1.79	0.16	11.54	**<0.001**	***
Gender = male	0.08	0.14	0.57	0.569	
Previous school = private	-0.08	0.15	-0.51	0.609	
Settlement = town	0.08	0.14	0.57	0.569	
Preceding context = coronal	-0.34	0.12	-2.73	**0.007**	**
Preceding context = palatal	-0.54	0.12	-4.44	**<0.001**	***
Preceding context = liquid	0.37	0.13	2.78	**0.006**	**
Coda /l/ = present	1.38	0.14	10.2	**<0.001**	***
Task = reading	-0.28	0.15	-1.81	0.072	.
Duration	0.05	0.02	2.01	**0.044**	*
Gender = male * Preceding context = coronal	-0.14	0.07	-2.05	**0.04**	*
Gender = male * Preceding context = palatal	-0.22	0.07	-3.3	**0.001**	***
Gender = male * Preceding context = liquid	-0.18	0.08	-2.21	**0.027**	*
Previous school = private * Preceding context = coronal	0.2	0.08	2.50	**0.017**	*
Previous school = private * Preceding context = palatal	0.18	0.08	2.14	**0.038**	*
Previous school = private * Preceding context = liquid	0.01	0.1	0.06	0.95	
Settlement = town * Preceding context = coronal	-0.12	0.07	-1.76	0.078	.
Settlement = town * Preceding context = palatal	-0.17	0.07	-2.4	**0.016**	*
Settlement = town * Preceding context = liquid	-0.09	0.08	-1.08	0.279	
Task = reading * Preceding context = coronal	0.43	0.17	2.59	**0.01**	**
Task = reading * Preceding context = palatal	0.24	0.17	1.44	0.15	
Task = reading * Preceding context = liquid	0.75	0.41	1.83	0.068	.
Duration * Preceding context = coronal	-0.2	0.03	-6.24	**<0.001**	***
Duration * Preceding context = palatal	-0.04	0.03	-1.16	0.247	
Duration * Preceding context = liquid	-0.15	0.05	-3.03	**0.002**	**

Table 5.3: Analysis of variance (ANOVA) table for the GOOSE-fronting model in Table 5.2, calculated using Satterthwaite's method

Model parameters	Sum of squares	Mean square	DF	Den DF	F	*p*	
Gender	0.04	0.040	1	41.51	0.179	0.674	
Previous school	0.006	0.006	1	42.70	0.026	0.874	
Settlement	0.002	0.002	1	41.66	0.009	0.927	
Preceding context	10.852	3.617	3	287.00	16.414	<0.001	***
Coda /l/	22.922	22.922	1	148.85	104.014	<0.001	***
Task	0.123	0.123	1	825.07	0.556	0.456	
Duration	2.299	2.299	1	2072.94	10.431	0.001	**
Gender * Preceding context	2.490	0.830	3	2010.09	3.766	0.010	*
Previous school * Preceding context	2.288	0.763	3	36.18	3.461	0.026	*
Settlement * Preceding context	1.315	0.438	3	2008.12	1.988	0.114	
Task * Preceding context	2.182	0.727	3	702.63	3.301	0.020	*
Duration * Preceding context	10.422	3.474	3	2069.74	15.763	<0.001	***

The regression output shows a significant fixed effect for the presence of following coda /l/, which accompanies much backer tokens of GOOSE (β = 1.38; p <0.001). There are also several significant interactions for preceding context, with previous school, settlement, task type and vowel duration. These will be dealt with in turn and illustrated using box plots. Box plots are useful to visualise these data as they are easier to read than a bee-swarm plot with thousands of data points representing all GOOSE tokens within each group. More fronted tokens appear at the bottom of the plot (i.e. closer to zero), as they have a smaller F2-F1 Euclidean distance between FLEECE and GOOSE.

The effect of following coda /l/ is the most significant parameter in the model and is unsurprising given that this tendency is reported in almost every study of GOOSE-fronting in Section 5.2.2. This is illustrated in the box plot in Figure 5.4, which again uses the mnemonics GHOUL and GOOSE as shorthand for tokens that do and do not precede coda /l/ respectively. It is clear that the Euclidean distance between GOOSE and FLEECE is much greater overall for the GHOUL (pre-coda /l/) tokens than for the other GOOSE tokens.

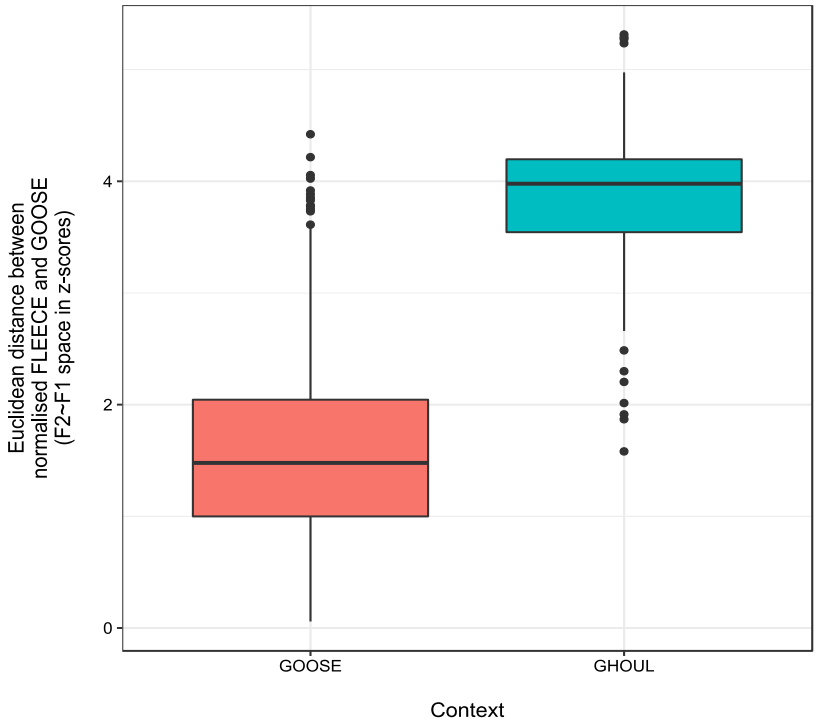

Figure 5.4: Rate of GOOSE-fronting by following context (coda /l/)

There is a significant interaction between gender and preceding context, which is shown in Figure 5.5. In this and the remaining box plots in this chapter, the tokens preceding coda /l/ (GHOUL) are removed in order to reduce the number of outliers in the plots and make them easier to read.

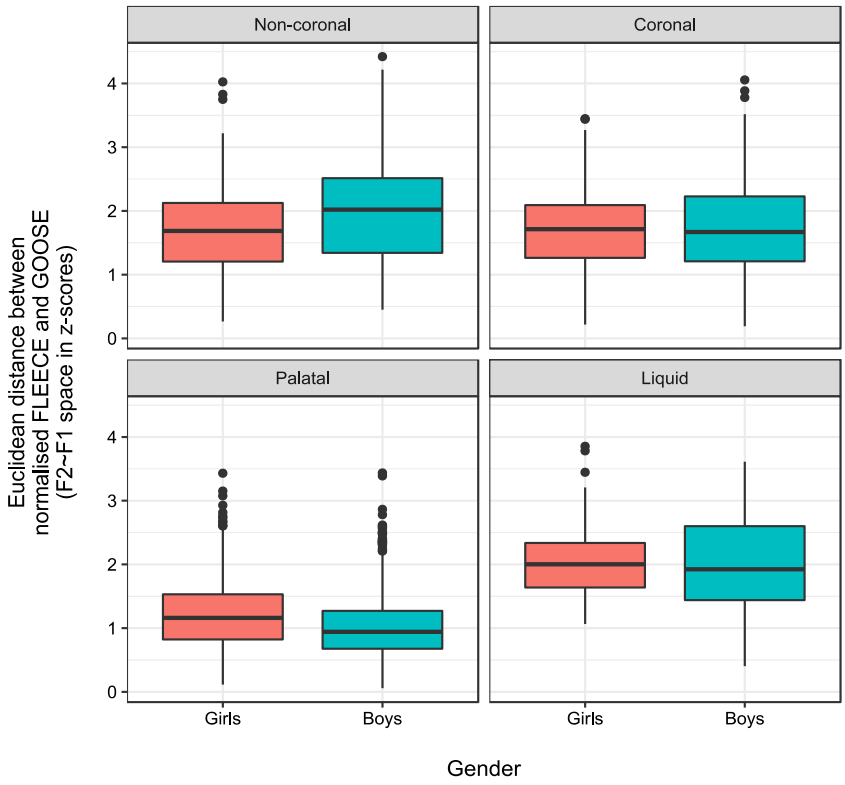

Figure 5.5: Rate of GOOSE-fronting by gender and preceding context

The clearest differences here are between the preceding contexts, which is unsurprising in light of previous research. The post-palatal tokens clearly show the smallest Euclidean distances from FLEECE (i.e. the most fronting), though the differences between the coronal, non-coronal and liquid contexts are less obvious. While the boys' degree of fronting does not vary a great deal between the non-coronal and liquid contexts, the girls use relatively fronter tokens in the non-coronal context compared to when GOOSE follows a liquid. On the other hand, the girls' GOOSE realisations are similar when following a non-coronal or coronal consonant, whereas the boys' tokens are backer in the non-coronal context. The boys lead fronting in post-palatal environments, but the opposite is true in the non-coronal context. The plot therefore shows a gender pattern that is weaker and more variable than for /t/-glottalling (see Section 4.4.3).

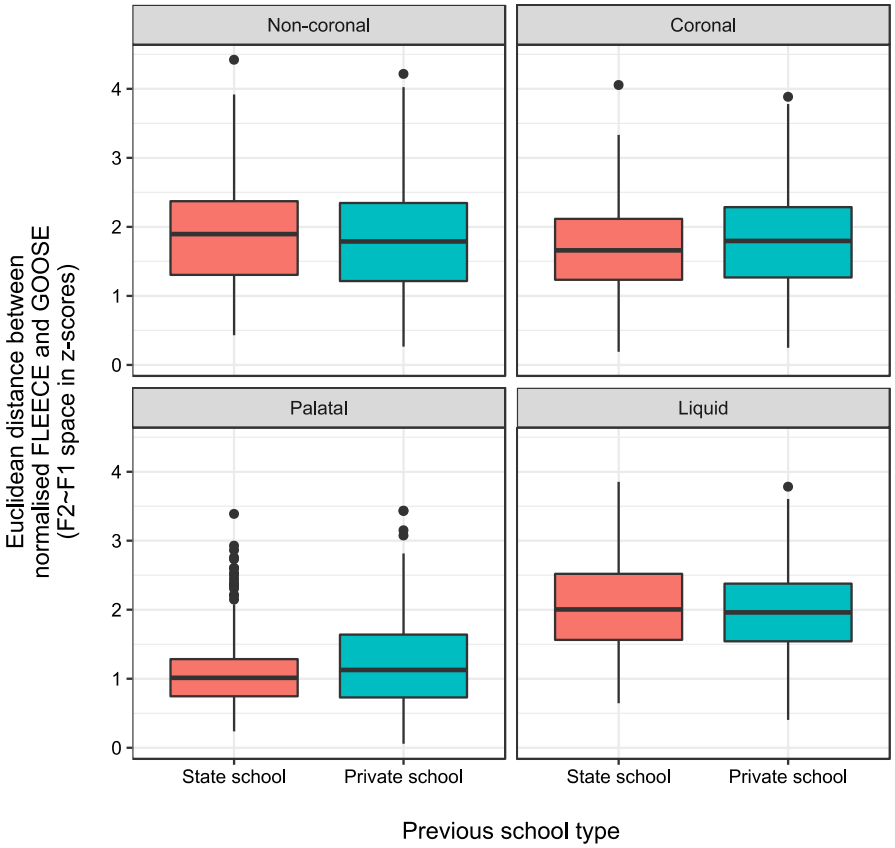

Figure 5.6: Rate of GOOSE-fronting by previous school type and preceding context

In Figure 5.6, the interaction between preceding context and the type of school previously attended by the participant is displayed. For participants who previously attended a state school, there is greater clustering of post-palatal GOOSE tokens around an F2-F1 Euclidean distance between FLEECE and GOOSE of 1, with a handful of backer tokens falling outside the maximum. For those who attended private school, however, GOOSE is more spread out across the vowel space. The other phonological environments show very little variation by previous school and it is not the same group that leads in all environments. The differences between the contexts themselves, however, are clearer, reflecting the palatal > coronal > non-coronal > liquid hierarchy from previous research.

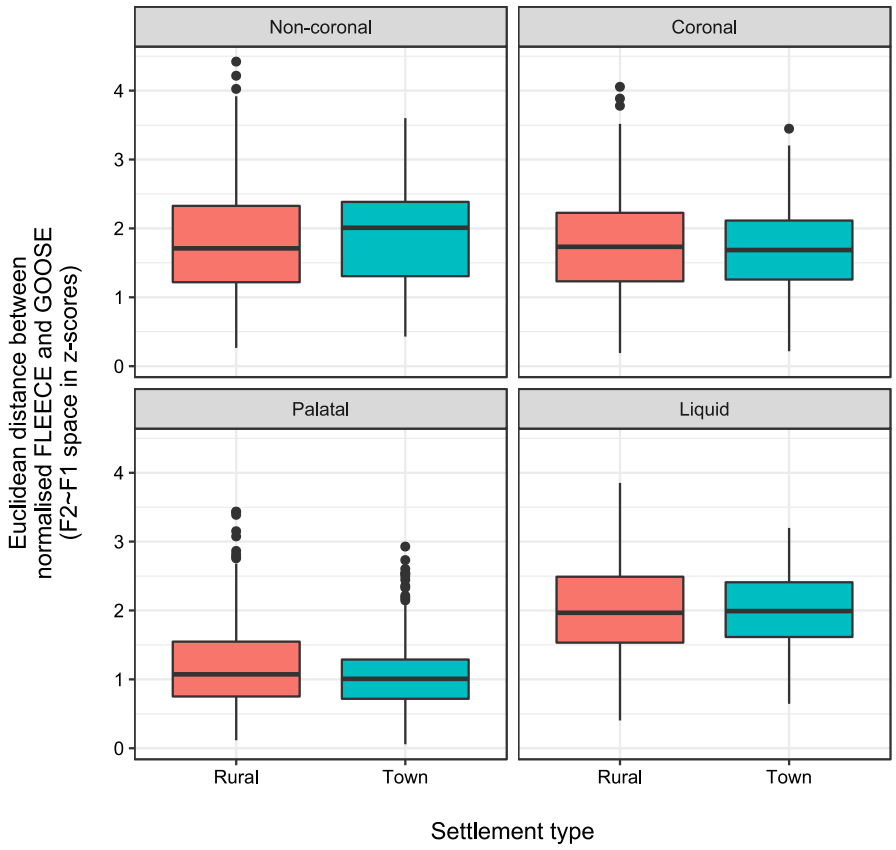

Figure 5.7: Rate of GOOSE-fronting by settlement type and preceding context

Figure 5.7 shows the interaction between preceding context and settlement type. For post-coronal and post-liquid environments, there is very little difference between participants who live in a town versus those who live in a rural area. GOOSE-fronting is slightly more advanced for the town speakers in post-palatal contexts, though the opposite is the case in tokens following a non-coronal consonant. The significance of the interaction here again comes primarily from the differing rates of GOOSE-fronting between the contexts (i.e. palatal vs. non-coronal) rather than from differences between the two types of settlements.

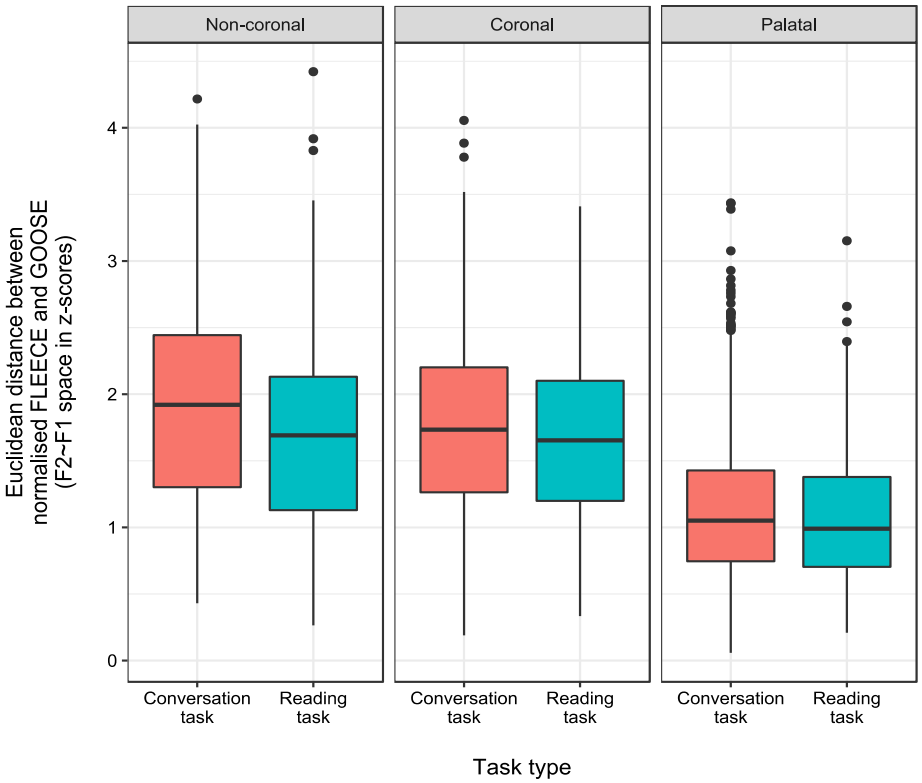

Figure 5.8: Rate of GOOSE*-fronting by task type and preceding context*

The interaction between preceding context and task type is displayed in Figure 5.8. Post-liquid tokens are excluded from this plot as they are almost completely absent from the reading task. Fronting is greater in the reading task when GOOSE follows non-coronal consonants, though the differences are much smaller in post-coronal and post-palatal environments.

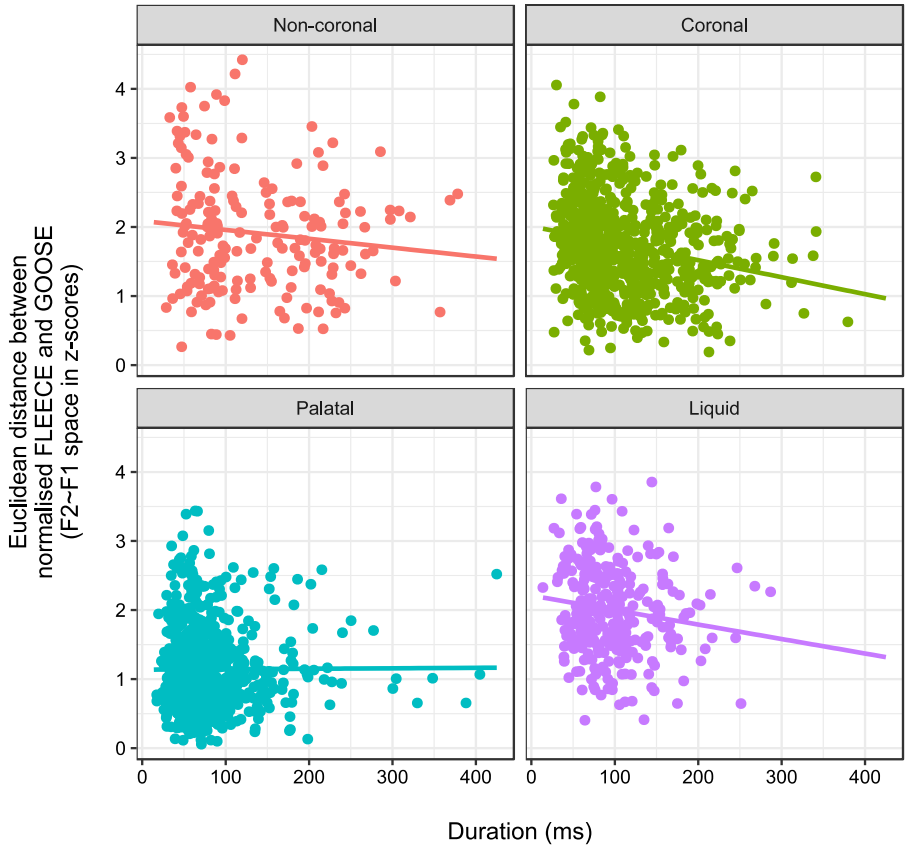

Figure 5.9: Rate of GOOSE-fronting by vowel duration and preceding context

The interaction between preceding context and vowel duration is illustrated in Figure 5.9 using a scatterplot, which is appropriate for visualising data for which both the dependent and independent variables are continuous. The most important result from the plot is that the F2-F1 Euclidean distance between GOOSE and FLEECE gradually decreases as vowel duration increases for GOOSE tokens following non-coronal, coronal and liquid environments, but for post-palatal tokens, the relationship between the two variables is relatively flat. It may be possible that this is because post-palatal GOOSE tokens are strongly fronted overall, and so any further fronting would be unnatural, though observation of the bottom-left-hand corner of the plot shows a number of extremely front and short GOOSE tokens which start to disappear as one progresses along the x-axis. The overall rarity of vowels longer than 250ms, however (especially when preceded by a liquid), means that this finding should be considered with caution.

To summarise the main results, then, the biggest sources of variation in GOOSE-fronting in the data set are based on linguistic rather than social factors. As expected from previous research, the presence of a following coda /l/ dramatically reduces the likelihood of fronting, while there is also a clear effect of preceding context – post-palatal tokens are most likely to be fronted, followed by post-coronal, post-non-coronal and then post-liquid tokens of GOOSE. Vowels produced with a longer duration are also more likely to be fronted except for those in post-palatal contexts.

The interactions between preceding context and social factors such as gender, previous school type and settlement type show that the influence of these variables on GOOSE-fronting is very limited, often restricted to certain preceding contexts. The following section presents the results of constellation of practice in the private school.

5.4.3 Results for constellation of practice

As discussed in Section 3.6.3, over the course of the recorded conversations with participants, I was able to obtain information on the locally meaningful social categories and their memberships among the students at the private school, which I argued formed constellations of practice (Wenger 1998). These constellations were organised into two rooms in the sixth-form building in which students spent their break and lunch times, which were described to me as an 'outgoing' room and a 'reserved' room. Previous work has shown these kinds of school-specific groupings to be socially meaningful with respect to speech production and perception (Eckert 2000; Moore 2003; Kirkham 2013; Drager 2015), and so it was important to test constellation of practice as a variable in the statistical analysis. This required making separate regression models for the private school, as this information was not available or comparable for the state school. In Section 4.3.4.3, I reported that when I did this for the /t/-glottalling data, constellation of practice did not emerge as a significant predictor. The situation for GOOSE-fronting is different, however, and so the output of a linear mixed-effects model for the private school data, with room membership as a random slope by word, is shown in Table 5.4. An ANOVA table for the model is shown in Table 5.5 and pairwise comparisons for the preceding contexts are shown in Appendix F (iii).

*Table 5.4: Model output for private school GOOSE-fronting data (*n *= 1,118). Positive* β *intercepts indicate backer tokens (i.e. a greater Euclidean distance from FLEECE).*

Fixed effects	***β***	**SE**	***t***	***p***	
(Intercept)	1.48	0.19	7.72	**<0.001**	***
Room = reserved	0.47	0.20	2.36	**0.031**	*
Settlement = town	0.11	0.22	0.47	0.641	
Preceding context = coronal	-0.04	0.11	-0.40	0.693	
Preceding context = palatal	-0.52	0.11	-4.92	**<0.001**	***
Preceding context = liquid	0.17	0.12	1.47	0.143	
Coda /l/ = present	1.96	0.14	14.21	**<0.001**	***
Duration	0.01	0.03	0.17	0.862	
Duration * Preceding context = coronal	-0.15	0.04	-3.36	**0.001**	***
Duration * Preceding context = palatal	0.00	0.05	0.08	0.935	
Duration * Preceding context = liquid	-0.09	0.07	-1.19	0.236	
Settlement = town * Preceding context = coronal	-0.17	0.10	-1.61	0.107	
Settlement = town * Preceding context = palatal	-0.24	0.10	-2.29	**0.022**	*
Settlement = town * Preceding context = liquid	-0.04	0.12	-0.29	0.772	

Table 5.5: Analysis of variance (ANOVA) table for the private school GOOSE-fronting model in Table 5.4, calculated using Satterthwaite's method

Model parameters	**Sum of squares**	**Mean square**	**DF**	**Den DF**	**F**	***p***	
Room	1.439	1.439	1	16.50	5.561	0.031	*
Settlement	0.000	0.000	1	16.14	0.001	0.982	
Preceding context	23.526	7.842	3	49.60	30.308	<0.001	***
Coda /l/	52.209	52.209	1	54.22	201.779	<0.001	***
Duration	1.363	1.363	1	1067.30	5.269	0.029	*
Duration * Preceding context	3.973	1.324	3	1059.85	5.118	0.002	**
Settlement * Preceding context	1.901	0.634	3	1040.78	2.449	0.062	.

The fixed effects in the private-school-only model show a reasonable degree of overlap with the main model for the whole data set reported in the previous sub-section, as there are significant interactions between preceding context and vowel duration, and between preceding context and settlement type. Tokens preceding coda /l/ are also significantly less likely to be fronted (β = 1.96, p < 0.001). The main addition here is the new parameter of room, which shows that speakers in the reserved room are significantly more likely to use backer tokens than those in the outgoing room (β = 0.47, p = 0.031). This finding is illustrated clearly in Figure 5.10.

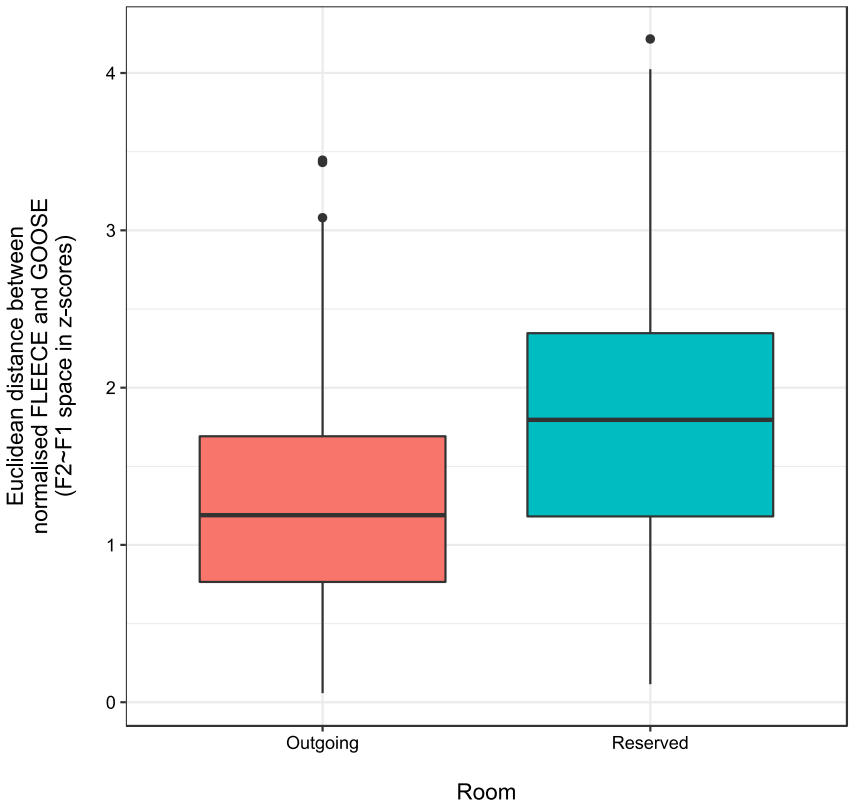

Figure 5.10: Rate of GOOSE-fronting in the private school by constellation of practice (room)

5.5 Chapter summary

In this chapter, I have investigated the sociolinguistic variation in GOOSE-fronting among adolescents in Hampshire using an acoustic analysis of the FLEECE-GOOSE Euclidean distance in their speech production, modelled using linear mixed-effects regression. The findings showed influential effects of linguistic variables such as preceding and following phonological context, reflecting previous work. Macro-social demographic categories such as gender, social class and settlement type show limited variation in GOOSE-fronting within certain phonological contexts, which is hard to generalise as a clear consequence of social stratification. A separate regression analysis conducted on the private school speakers revealed that GOOSE-fronting varied significantly between two constellations of practice at the school – members of the 'outgoing' room and the 'reserved' room in the sixth-form building.

Some of the statistical patterns identified in this chapter align with results from previous studies of GOOSE-fronting, particularly regarding the tendency for GOOSE to be backed when preceding coda /l/ (e.g. Strycharczuk & Scobbie 2017b). The effect of preceding context is also clear, with preceding palatal contexts leading the change, followed by coronal contexts and non-coronal contexts, leaving post-liquid contexts as the most conservative. The difference between following coronal and non-coronal contexts is arguably less dramatic than in previous studies (cf. the visible differences between the two contexts in Holmes-Elliott 2015) but the advancement of GOOSE after /j/ and its retraction after /l, ɹ/ are clear to see in my data, reflecting the tongue

movement and positions required for these sounds being transferred to the vowel in co-articulation (Harrington *et al.* 2008). The actual phonetic extent of GOOSE-fronting is more difficult to compare to previous research than for /t/-glottalling (which often uses simple percentages) because different studies use different methods of vowel measurement and normalisation, but the positions of GOOSE in the vowel space in Figure 5.3 are similar to those in other acoustic studies of southern British English (e.g. Hawkins & Midgley 2005; Ferragne & Pellegrino 2010; Williams & Escudero 2014).

Previous work offers a mixed picture regarding the effect of social factors on GOOSE-fronting, however, which is reflected in the current results. Gender and social class are significant in sub-sets of the sample in Williams and Kerswill (1999), Flynn (2012) and Jansen (2019), which is similar to the predictions of the model in Section 5.4.2 showing weak differences for gender, previous school type and settlement type in certain phonological contexts. The general pattern from the literature (with some exceptions) is that GOOSE-fronting is led by young middle-class women as an urban 'youth norm' (Williams & Kerswill 1999). In the findings above, girls only weakly lead fronting in post-non-coronal contexts, while this is reversed in post-palatal contexts, and the differences between private school and state school speakers and town and village speakers are very minimal. Previous research also shows that GOOSE-fronting does seem to have some capacity to index micro-level social meaning in regard to locally specific identities (Fought 1999; Hall-Lew 2005; Villarreal 2018), which ties in with the result in my data for constellation of practice. Whether this sociolinguistic patterning extents to how fronted GOOSE is used in interaction or how it is perceived by these same participants will be explored in subsequent chapters.

6 Interaction analysis

6.1 Chapter overview

In this chapter, I examine the extent to which the patterns found in the quantitative analysis of speech production are reflected in how the young people in the study use language to take stances and construct identity using indexical meaning. I start by giving some background information on interactional approaches to identity in sociolinguistics and explaining the framework used for this analysis. I then analyse how /t/-glottalling and GOOSE-fronting are used in interaction for stance and identity work by four speakers who use extremely high and low rates, and acoustically extreme realisations, of the two variables, as tokens produced in these conditions are likely to be the most strongly enregistered with social meaning. The interaction analysis enables me to build a holistic picture of the social meanings of /t/-glottalling and GOOSE-fronting in speech production, the implications of which, and their relationship to the perception results and other factors such as salience, will be further explored in Chapter 9.

6.2 Background

6.2.1 Identity in interaction

Identity in variationist sociolinguistics, and in wider thinking, has traditionally been considered to be a stable entity that emanates from people's own internal view of themselves in relation to others – an awareness of one's group membership characteristics based on fixed social categories located within the individual psyche (Bucholtz & Hall 2005). This is reflected in early studies' focus on macro-sociological categories such as gender, age, ethnicity and social class (e.g. Labov 1966). In this view, an individual is always a member of a given group within these categories. For example, one's chronological age in years is a pre-determined characteristic that only changes once per year based on one's date of birth. In sociolinguistic studies, age is often categorised into discrete 'bins' such as 'older', 'middle-aged' and 'younger'. People are aware of their group memberships, and thus their identity is formed; they replicate the behaviours of their identity groups accordingly. Hence, identity stems from the individual mind and linguistic variation between groups reflects these mental identity conceptions (Bucholtz & Hall 2005).

A different approach is taken by some sociolinguists, who argue that identity is formed in interaction. For them, identity is the product of socio-cultural practices, especially linguistic interaction, and is not based solely around macro-sociological categories but also local culturally relevant groups as well as temporary stances and roles taken up by those involved in a given interaction (Bucholtz & Hall 2005; Coupland 2007). Identity emerges in interaction through various indexical processes,

such as overtly mentioning category labels, presupposing individuals' identity positions, taking particular stances and using linguistic features that are associated with certain styles or personae, all of which imbue interaction with social meaning and thus identity takes shape (Bucholtz & Hall 2005). This way of thinking about identity fits well with third-wave sociolinguistics as it puts the focus on concepts such as indexicality, stance and personae. For example, Podesva's (2007) research on the speech of one person in different social contexts shows that his subject uses various linguistic techniques to construct a gay diva persona, including phonetic features such as falsetto alongside discourse practices such as praising himself, presenting every statement as the truth and stealing the limelight. This diva identity is displayed and lived out by the speaker through interaction.

Bucholtz and Hall (2004, 2005) propose a framework for studying identity in interaction that involves three paired components, known as 'tactics of intersubjectivity'. The first pair, 'adequation' and 'distinction', refer to when speakers frame something or someone as the same or different to another. The latter term is generalised from Bourdieu's (1984) work, in which 'distinction' describes how the elite social classes differentiate their aesthetic tastes from those of lower classes. Adequation and distinction often take place via two related processes – 'erasure' (Irvine & Gal 2000) and 'highlighting' – that is, making something invisible or directing attention to it respectively. The second pair of tactics of intersubjectivity are 'authentication' and 'denaturalisation', which are invoked when speakers claim something to be 'true' or 'real' versus 'false' or 'artificial'. The third pair, 'authorisation' and 'illegitimation', refer to when speakers validate an object as legitimate versus when they revoke or deny its legitimacy. The authors apply these tactics in their interpretation of various interactions involving talk around gender, which may also include sociolinguistic variation, such as the use of standard quotative forms by 'nerds' at school that reinforce the speakers' authorisation of intelligence and the illegitimation of mainstream trends in discourse at school (Bucholtz & Hall 2004, 2005).

It is worth pointing out that these interactional approaches to identity are not without criticism. Coupland (2001) argues that they can run the risk of treating identity as if all options or 'resources' are equally plausible and available from a clear repertoire to be selected by anyone at will. Instead, he states that identities are to some extent 'essential', in the sense that they often represent where an individual really does stand developmentally – the culmination of their life experience so far – especially when it comes to macro-sociological categories such as age, gender, ethnicity and socio-economic class. Similarly, Rampton (2006) warns that interactional approaches can exaggerate the power of individuals to make identity choices, and that identity work realised through linguistic variation ultimately reflects social variation.

I would suggest that an interactional approach to identity does not account for all aspects of the concept, as stated above, but it does prove useful for analysing how

speakers project themselves in particular extracts of conversation using linguistic resources, including phonetic variation.

6.2.2 Phonetic variation and interaction

Previous work in third-wave sociolinguistics has shown the importance of analysing social meaning in terms of how a linguistic feature is used to construct identity in interaction (e.g. Bucholtz 1999; Podesva 2007, 2011; Kirkham 2013). This involves locating specific uses of the variable in question in recordings of speech and studying how it is used in conjunction with the context of the interaction to reinforce or qualify the meaning being made through the content of utterances. For instance, the local Yorkshire feature of a lax happY vowel is used to index authenticity and support for locality by a teenage girl in Sheffield when discussing the accent of the city in Kirkham (2015). Examining how a feature is used for meaning-making in specific interactional moments allows for a deeper and more subtle understanding of its social associations. However, since sociolinguistic studies typically collect a vast number of tokens to enable robust statistical analysis, it can be difficult to work out how to select tokens for an interactional analysis. It is practically impossible to conduct a detailed discourse analysis of thousands of tokens, nor would it be very interesting to read. Hence similar studies choose a sub-section of the data to subject to qualitative analysis. The problem lies in deciding what to include. The analyst, as the person who is most familiar with the data, is typically best placed to make a judgement as to which extracts best represent the patterns in the sample or are most interesting to discuss. However, if this is done on a purely subjective basis, accusations can be made that the researcher is cherry-picking the data to fit his or her narrative.

This has prompted some studies to attempt a more objective method of selecting tokens and interactional moments for qualitative analysis. For example, Kiesling (2009) uses a coding system for different discourse contexts or 'speech activities', such as gossiping and assisting, to show that certain linguistic variables occur more often in specific speech activities. This suits his stance-based framework well as it allows him to interpret his findings in terms of how stances represent speech activities. Other work (e.g. Podesva 2007, 2011; Kirkham 2013) identifies and analyses phonetically extreme tokens using acoustic methods, based on the idea that the most acoustically extreme tokens are the strongest indicators of social meaning. This avoids some of the subjectivity involved in choosing what interactions to analyse while also being primarily driven by phonetic (i.e. data-driven) concerns. This is not to say that the relationship between phonetic variation and social meaning operates on a linear scale, i.e. that tokens at one end of the acoustic continuum will always index 'more' meaning than those in the middle or at the other end (Podesva 2011; Kirkham 2013). Yet what we can perhaps expect is that the most acoustically extreme tokens may be used as part of stylised performances, or at least have been produced in that way for reasons other than those related solely to acoustic-articulatory mechanisms. Podesva (2011) argues that these acoustically extreme tokens may also be more

salient as they involve greater phonetic distance from the average (cf. Trudgill 1986; see Section 2.3). It is this approach that I use in this analysis.

Before moving on to the methods, it is worth noting that if a linguistic variable appears in a particularly identity-laden moment of an interaction, it does not necessarily follow that the feature is being used for a corresponding identity-related purpose. The oft-held assumption to the contrary is a drawback of interactional sociolinguistics that is sometimes difficult to overcome, because it is not generally possible to access speakers' thoughts in the moment as they make utterances. Theories of social meaning that regard the mere co-occurrence of phonetic features with identity construction strategies as evidence for their meanings may be overly mechanistic and may place too much focus on speakers' desires and intentions to 'do' identity (e.g. Cameron & Kulick 2003; Eckert 2008). Part of this may be a result of confusion regarding how consciously 'intentional' an identity-related claim has to be. For instance, Cameron and Kulick (2003) prefer the term 'identification' to 'identity', as they argue that the latter refers to a conscious claiming or rejection of a specific social category or position (Levon & Mendes 2016). However, speakers' ability to make identity-related linguistic choices does not necessarily mean that they are consciously 'aware' that they are doing so; in other words, agency does not equal awareness (Bucholtz & Hall 2005; Eckert 2016). A view of indexicality that focuses on the emergence of social meanings from stances (Eckert 2008; Kiesling 2009; see Section 2.2) is helpful, as stances can be more easily ascribed to speaker intentions and can be reinterpreted as indicative of personae and stereotypes (Silverstein 2003). My analysis in this chapter hence seeks primarily to identify the potential social meanings of /t/-glottalling and GOOSE-fronting in terms of how they may be used to evoke particular stances, which may be connected to higher-order indexical meanings. While doing so, I identify interactional moments using Bucholtz and Hall's (2004, 2005) framework in order to help with the qualitative interpretation of the overall interaction, rather than to mechanistically connect identity processes to phonetic features.

6.3 Methods

In my data, /t/-glottalling was subjected to an auditory analysis, while GOOSE-fronting was measured acoustically based on formant structure. This means that it is easily feasible to locate the most phonetically extreme tokens for GOOSE, but this is not the case for /t/, where it is impossible to distinguish between glottal stops on a gradient scale without conducting further acoustic analysis (e.g. Docherty & Foulkes 1999). In comparable work, Kirkham and Moore (2016) use conditional inference trees to help overcome this issue and identify the main contexts in which /t/ varies in two speeches produced by one speaker. I take a slightly different approach which involves restricting my sample to participants who use extreme rates of /t/-glottalling (either very high or very low) for particular phonological contexts. I then focus on

interactions which feature words with glottal or alveolar realisations that are unexpected compared to the average rates of production. For example, if a particular speaker uses a much higher rate of /t/-glottalling in word-medial pre-vocalic environments (i.e. where glottal stops are least likely to appear) than most of the other participants, I locate the instances in which he or she produces a glottal stop in this position to see how these are being used for social meaning-making. It offers a reasonable attempt to keep the selection process as objective as possible while accounting for the fact that it is not possible to look at phonetically extreme tokens in an auditory analysis.

For the GOOSE data, I examine acoustically extreme tokens in a similar way to Kirkham (2013) by isolating the top and bottom deciles along the GOOSE acoustic continuum, measured by the FLEECE-GOOSE F2-F1 Euclidean distance, and observing which participants had the most tokens in these top and bottom deciles. I also measured the mean level of fronting for each participant and listened to the conversations to gain auditory impressions of the individual GOOSE realisations. My choice of tokens to focus on this section was based, then, on several factors: the use of high and very low levels of fronting in terms of the percentage of tokens in the top and bottom deciles in the sample; having very high or very low overall fronting means; and having GOOSE tokens that sounded very front or very back upon auditory inspection. Tables of participants' acoustically extreme tokens are provided together with the discourse context they occur in.

As with any research that revolves around case studies or extracts of interactions, it is difficult to claim that the chosen cases are representative of what all speakers do (or even what one speaker does all the time). In addition, using extreme values has the potential to ignore what the 'average' speaker does. However, Coupland (2007) argues that case studies are important for the study of stylistic variation in sociolinguistics because aggregated quantitative data do not take the context of the interaction into account, particularly regarding speakers' goals, stances and ideologies that pertain to the interaction. He is less concerned with the generalisability of case studies as representative of what speakers typically do, but rather as examples of what is 'stylistically possible' to do (Coupland 2007 p. 28). It is with this in mind that I present my analysis here as an insight into the kinds of identity work that young people in Hampshire may be able to do with /t/-glottalling and GOOSE-fronting rather than what they always or usually do. This ties in with broader notions of social meaning being variable and dependent on context (Eckert 2008; Schleef 2017b). The idea that phonetically extreme cases or extreme rates of usage are most likely to be produced for stylistic performances (Podesva 2011; Kirkham 2013) thus makes a case study approach useful for the study of the potential social meanings of phonetic variables.

The qualitative analysis is thus conducted on selected transcripts of the conversation containing the phonetically extreme tokens as identified above. I discuss the findings with reference to theories of indexicality (e.g. Silverstein 2003) and identity in

interaction (e.g. Bucholtz & Hall 2005). A key for the symbols used in the transcripts is found in Appendix E.

6.4 /t/-glottalling in interaction

I begin this section by reproducing one of the production graphs from Section 4.4.3 (Figure 4.3, here reproduced as Figure 6.1), which shows each speaker's rate of /t/-glottalling for the four phonological contexts, split up by school attended. This is so that individual speakers can be easily identified who use very high or low rates of /t/-glottalling compared to the rest of the sample.

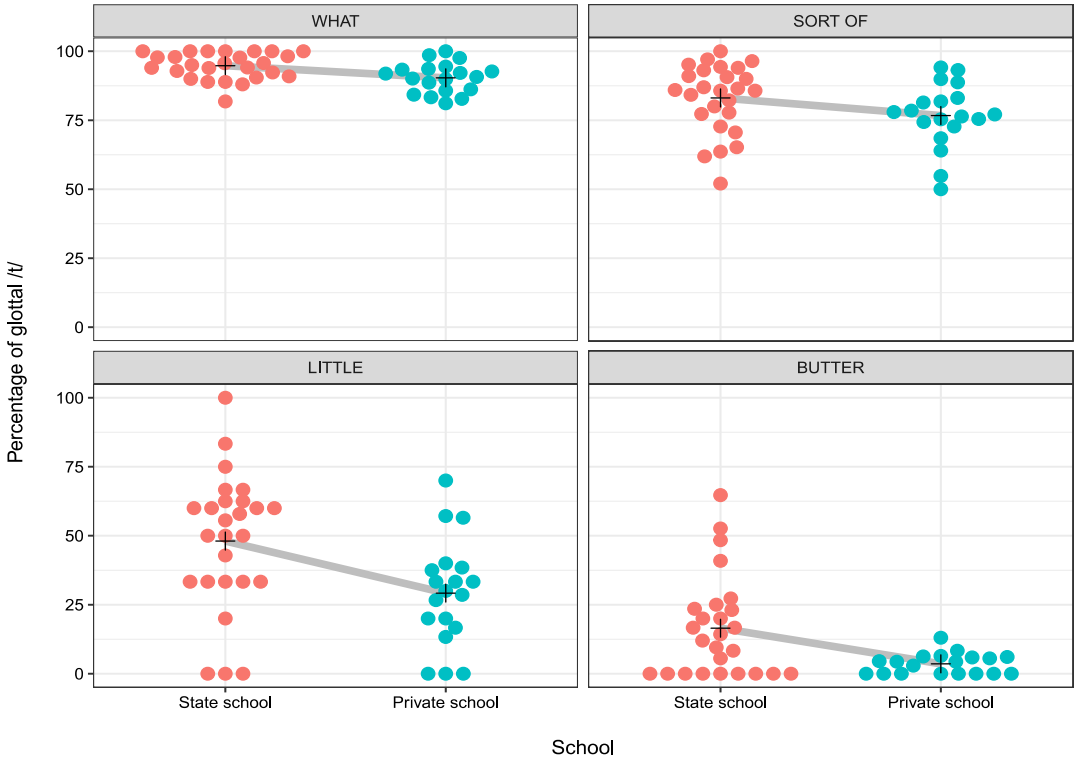

Figure 6.1: Rate of /t/-glottalling by school and phonological context

The clearest examples of extreme users of /t/-glottalling can be found in the word-medial pre-vocalic (BUTTER) context. There are four state school students whose rate of glottalling is notably higher than that of the rest of the sample, with over 40% of tokens glottalled. The rest of the participants have a rate no higher than 28%, with an overall mean for the whole sample of 11%, including 17 speakers who never produce a glottal stop here. Since this environment is that which most resists glottalling, the use of a glottal stop in this context is the most unexpected. This can be interpreted as the most cognitively salient context (Rácz 2013; Jaeger & Weatherholtz 2016) and hence potentially the most likely to be used for social meaning-making. The word-medial pre-syllabic (LITTLE) context shows the greatest inter-speaker variation because of its low token count, all the way from 0%-100% glottalling, so it is perhaps more difficult to identify individuals as 'extreme' here. Both word-final contexts

show high overall glottal usage (overall means of 93% and 80% for the WHAT and SORT OF environments respectively), and so identifying speakers with extremely high rates of glottalling is impossible. Instead, there are a handful of participants with notably low rates of glottal stop usage in these environments, particularly three individuals who use glottal /t/ less than 60% of the time in the SORT OF context. For these speakers, their maintenance of alveolar /t/ even when glottalling is phonologically favoured overall may prove socially meaningful, so this will also be discussed in this section.

As a result of the patterns described above, I will focus on the use of /t/-glottalling in the speech of two participants in this section – one who uses a very high rate of glottal stops in the BUTTER context (i.e. a very innovative speaker) and one who uses a very low rate of glottal stops in the SORT OF context (i.e. a very conservative speaker). This allows me to assess the social meanings invoked by both presence and absence of /t/-glottalling, or to put it another way, glottal stops and alveolar stops. The two participants are Kim, the innovative speaker, and John, the conservative speaker. Kim is a 16-year-old girl who attends the state sixth-form college. Her parents are both university-educated and are employed in professional occupations, though the average house price of her postcode is somewhat lower than the mean for the area. She enjoys playing karate and video games and wants to train to become a primary school teacher after completing her A-levels. John is a 17-year-old boy who also attends the state school. He lives in rented accommodation in a postcode which is much cheaper than the average for the area. His father works for the police and neither of his parents attended university, though he wants to study for a degree in English after leaving college. He is a member of the college's creative writing club and is involved in theatrical productions outside of school. These participants were chosen out of the handful of 'extreme' speakers identified above as they are among the most extreme of all such speakers, as well as for other reasons listed in greater detail during the analyses of the individuals' speech in the sub-sections below.

6.4.1 Innovative speaker

The extract below shows one of the parts of the conversation that features the most /t/-glottalling in Kim's speech, particularly word-medial pre-vocalic glottalling. Kim produces more glottal stops in this environment than any other participant at 65%, even considering that in the quantitative results, boys used more of the variant overall than girls (the next highest girl has a rate of 27%). She is also the only participant to have categorical 100% glottalling in word-final pre-vocalic contexts. Each word uttered by any speaker that displays potentially variable /t/-glottalling (i.e. in the phonological contexts studied in Chapter 4) is underlined and the realisation of /t/ ([t], [ɾ] or [ʔ]) is given afterwards.

KIM: I think with my um (.) I do A-level Health and Social Care **but [ʔ]** I've (.) **pretty [ʔ]** sure it's one of the only classes and then (.) opposite normally there's the BTEC Health and Social Care (.) and they seem to be like (1) act a lot different (.) like (.) they kind of (.) I don't know they're a l- (.) a lot louder and they'll kind of think that they (.) just cause they do (.) B- Health and Social Care all the time they kind of think they're like they like own the whole **bit [ʔ]** and you're like well it's literally just the hallway um

(all laugh)

KIM: and when you're like **waiting [ʔ]** there and they kind of (.) look **at [ʔ]** us a bit weirdly and we're like (.) sorry (laughs) but yeah there is and then you hear **about [ʔ]** (.) stuff that they do (.) and then to compare to us and we're like (.) and then it's just kinda sounds (.) I dunno (.) they just (.) **don't [ʔ]** (.) it's stound like they doesn't care as much (.) that's why they've (.) [kind of (.) yeah]

IMOGEN: [yeah that's like in Drama] (.) I **completely [ʔ]** agree with **[that] [ʔ]**

MICHAEL: [um] (.) in Music as well (.) it's similar

This extract is part of an extended conversation in which the participants are discussing the different social groups at college. Just before this, Imogen claims that the split between the A-level and BTEC students[18] is the biggest social division at the college, and so Kim adds to this with her own anecdote. Throughout the monologue, she uses glottal stops in all possible environments, including in word-medial pre-vocalic position in *pretty* and *waiting*. Kim explains how she studies A-level Health and Social Care, but that this class shares the same corridor with the much more numerous BTEC Health and Social Care cohort. Her story serves the purpose of 'highlighting' (Bucholtz & Hall 2004) the BTEC students and uses numerous examples of 'distinction' to frame them in opposition to her own group (the A-level students), including her interlocutors. This includes the use of the first- and third-person pronouns 'us' and 'them', emphasising their differences ('they're a lot louder'; 'they seem to act a lot different') and specifically locating them as 'opposite' in physical space. She makes them out to be petty and parochial ('illegitimation') when she says that they 'think they own the whole bit', with a glottal stop at the end of the final word, when the object of their concern is 'literally just the hallway'. The use of the inclusive second-person pronoun in 'you're like well…' builds rapport by

[18] The General Certificate of Education Advanced Level or 'A-level' and the Business and Technology Education Council Diploma or 'BTEC' /biːtɛk/ are two types of educational qualification taken by 16-18-year-olds in England, Wales and Northern Ireland. A-levels are available in a range of subjects and are regarded as the main qualification needed to gain a place at university. BTECs are vocational courses that primarily provide access to a direct route into a specific trade, though they are also accepted for entry by many universities.

discursively sharing the experience of uttering 'well it's literally just the hallway' with me and the rest of the group, inviting us to be in her position and assuming that we would agree with her ('adequation'). The filler 'um' afterwards signals an opportunity for the rest of the group to respond (in laughter) at her funny story.

The distinction and illegitimation of the BTEC students continues in the second section with 'to compare to us' and subtly pejorative language such as 'they kind of look at us weirdly' and 'you hear about the stuff that they do', lending them an air of mysterious but transgressive strangeness. She concludes by tying the students' behaviour to their attitude – 'it sounds like they don't care as much'.[19] This link follows a well-trodden ideological path in British society that views A-levels, as qualifications that are usually more academically focused and conventionally lead to university study, as superior to the vocational BTEC courses (Leathwood & Hutchings 2003). By implication, the supposed 'quality' of the qualifications transfers to the students who take them. Since BTECs are usually taken by less academic students who enter sixth form with lower grades at GCSE, the pupils are described as 'not caring as much', presumably about education, but, through Kim's comments, also perhaps about being polite and friendly to other people. It is clear that Kim is building an identity that contrasts herself, as an A-level student, to other pupils whom she constructs as loud, arrogant, weird and uncaring. By using the language of distinction (Bucholtz & Hall 2004), Kim hence implies that she does not share these qualities or is indeed the opposite of them. Her inclusive language towards her listeners allows the rest of the group to share in not having these negative characteristics (adequation); since they all also study A-levels, it is assumed that they can easily empathise with her experience (which is confirmed by Imogen and Michael's affirmations in subsequent turns). I as the moderator was not a college student and so perhaps was not the object of this invitation to share the experience. However, the participants' knowledge that I was a PhD researcher at a university and a former student of the college would have perhaps elicited assumptions that I had studied A-levels and care about education, and so would also see eye-to-eye with Kim's point of view.

Kim's discussion draws on social meanings at multiple levels of the indexical order (Silverstein 2003). 'You're like it's literally just the hallway' evokes a stance of indignation and amusement at the BTEC students' behaviour. The students themselves are attributed with the stance of 'loud' and the characteristics of 'they act a lot different' and 'they don't care as much'. She does not label them in terms explicitly resembling a persona or stereotype, but as explained below, the combination of traits ties in to ideologies surrounding the 'chav' character – a stereotypical figure from British popular culture evoking an image of a brash, loutish young person from a working-class background (OED 2018).

[19] Kim originally says, 'it's stound like they doesn't care as much'. These are most likely accidental disfluencies as a result of speaking quickly rather than a vernacular use of non-standard grammatical features.

The categorical use of glottal stops in all possible positions in this extract is interesting because on paper, it perhaps seems bizarre that Kim is using so much /t/-glottalling. Research has established that glottal stops are 'stigmatised' and seen as 'slovenly' and part of 'chav speech' (Wells 1982; Fabricius 2000; Littlejohn 2011; Bennett 2012). While Kim never explicitly labels the BTEC students as chavs or with any overtly insulting terms, some of the comments that she makes tap into a similar ideological space – that they are 'loud', 'look at people weirdly' (potentially a euphemism for 'aggressively') and 'don't care' (see Section 7.3.2.2 for evidence from the perception data that these kinds of concepts are regularly invoked by participants in response to /t/-glottalling and linked to chavs). Since she is so keen throughout her anecdote to emphasise the differences between her (alongside the rest of the group) and the BTEC students, one would not expect her to be making frequent use of a phonetic feature that indexes many of the stances, characteristics and personae that she is tacitly condemning in others, especially one that is so highly enregistered with these meanings that it can be pointed out in metalinguistic commentary (see Section 7.3.2.1).

Instead, Kim's frequent use of glottal /t/ may be performing a different social function. Recent research finds that /t/-glottalling may index positive stances and characteristics in addition to the negative ones listed above, which include solidarity, youthfulness and trendiness (Schleef 2014, 2017b; Kirkham & Moore 2016). These may have developed as indexical reinterpretations of the traditional pattern of production, whereby young working-class speakers led in the use of glottal variants (Kerswill 2003). In other words, as /t/-glottalling spread and became established in more speakers' repertoires, it gained *n*+1st order indexicality of solidarity and youthfulness that evolved from the stereotypical young working-class associations. As I have already noted, Kim takes many opportunities to put the other participants and me into her shoes by using inclusive pronouns like 'you' and 'us' and offering shared hypothetical utterances such as 'you're like well it's literally just a hallway' that we are invited to laugh along with. In addition, the extract presented above is part of a larger conversation in which all four participants share their experiences of the alleged A-level–BTEC divide at the college. It may be that Kim's use of /t/-glottalling here indexes a stance of solidarity, both empathising with her peers and inviting them to do the same for her, as they engage in a collective construction of identity as conscientious and friendly young people in opposition to the supposedly uncaring and exclusionary BTEC students. This echoes findings obtained in Kirkham and Moore (2016), in which former UK Labour Party leader Ed Miliband's use of glottal stops when addressing the Trade Union Congress is interpreted to index the same stances in an effort to show that his values and goals are aligned with those of his audience. I did not quantitatively measure any of Kim's other features, but from listening to her I noticed that she used much more alveolar ING than other participants as well. It is possible that both glottal /t/ and alveolar ING served a similar social function in this regard, clustering together to form a style of youthful openness and solidarity (cf. Levon & Fox 2014; Schleef 2017b).

6.4.2 Conservative speaker

I now turn to the other end of the scale by examining the language of one of the speakers who uses the fewest glottal stops for /t/, John, who also attends the state school. This speaker never uses glottal stops in the LITTLE or BUTTER environments and only 52% of the time in the SORT OF context, which is the second-lowest rate in the sample compared to a mean of 80% word-final pre-vocalic glottal usage. In Section 4.5, we saw that boys and students from the state school were significantly more likely to use glottal stops than girls and pupils from the private school. As a male participant from the state school, John is an outlier compared to the other participants in this demographic. In addition, his postcode is in the most deprived area out of all 45 participants in the data set and he has a social class score that is below average. His quantitative production results, therefore, are surprising considering the traditional pattern of increased /t/-glottalling for those from lower social class backgrounds. Hence it may be useful to examine how John uses /t/ in order to try and gain further understanding of how glottalling (or the absence thereof) is used to make social meaning.

In the transcript below, the participants have been discussing which social group at school one of the speakers in the perception task (Luke) would fit into (see Section 7.2.1 for further information). Some of the group were unsure and did not feel able to allocate the stimulus voice to a label such as popular, sporty, arty, etc., so I asked them if there were any groups that the speaker would *not* be in based on his speech.

ROY: OK (.) is there any group that he definitely wouldn't be [in?]

JOHN: [geek]

ROY: [geek?]

JOHN: [he] (.) no (laughs) [just don't think so]

ROY: [OK (.) why why'd you say that?] (2)

JOHN: personally I just (.) think (.) cause I'd say I'm one of the geeks (.) like we tend to **<u>concentrate</u> [ʔ]** (.) on reading (.) a lot more (.) most of us (.) read a lot so (.) we wouldn't read like **<u>that</u> [ʔ]**

ROY: OK (.) right (1) um as in you'd read more **<u>confidently</u> [ʔ]** and **[<u>fluently</u>] [ʔ]**?

JOHN: [yep]

ROY: OK (.) what about um pronunciation do you think (.) he he would **<u>fit</u> [ʔ]** (.) hi- his (.) like you know his accent was particularly ungeeky or erm?

JOHN: it was one of those (.) voices where it could kind of **fit [t]** in with anything (.) to be honest

Before I have even finished speaking, John answers my question with 'geek'. When I ask him to elaborate, he explains that he himself is 'one of the geeks' and that because 'we tend to concentrate on reading a lot more' and 'most of us read a lot…, we wouldn't read like that'. He contrasts the stimulus speaker Luke's perceived lack of reading ability with his and his fellow geeks', suggesting that Luke would not be one of 'us' because he does not read confidently or fluently enough (Bucholtz and Hall's 'distinction' and 'illegitimation'). Similarly to Kim above, John's use of pronouns forms a distinction between 'us' geeks and Luke. John's statement that 'I'd say I'm one of the geeks' ('authentication') is a strong declaration of identity for himself which is unusual in many school contexts, especially as being a geek has some negative connotations such as being perceived as weird, obsessive or uncool (see Section 7.2.2 for evidence of this in the perception data). It indicates that John feels a strong attachment to the geek label as part of his identity, which he is to some extent protecting from its attribution to a speaker whom he deems as not good enough at reading to qualify for geek status. When I ask about whether there any aspects of Luke's pronunciation that made him sound 'ungeeky', John indirectly answers by claiming that it was the kind of voice that 'could fit in with anything' (a kind of erasure of any specific group characteristic). His responses as a whole suggest that Luke's speech could fit into any of the social groups at school with the exception of the geeks, which, as a self-identified geek himself, John is keen not to attribute to someone with a perceived lack of confidence at reading. This extract does not feature many instances of possible /t/-glottalling; there are two word-final pre-vocalic tokens here, one of which is glottalled (*concentrate on*) and one of which is not (*fit in*), reflecting the near 50-50 distribution in his speech overall. However, I have presented this transcript in order to demonstrate John's strong geek identity through his overt claiming and gate-keeping behaviour towards the geek label. In the following transcript, the implications of geekiness are indirectly explored, and indexed via phonetic variation in /t/.

JOHN: see I mean (.) like (.) with me at home (.) um (.) there's **quite [ʔ]** a divide (.) because I've (.) done (.) **totally [t]** different subjects (.) and I think that has shaped how I speak (.) my parents speak completely different to me (.) erm [er]

ROY: [is] it cause of Drama or?

JOHN: I don't think so (.) I think (.) like I did a **lot [t]** of reading (.) -focused things so I had to get used to speaking (.) like we did loads of presentations **at [ʔ]** English GCSE (.) it just got to the point where I had to speak in **front [t]** of lots of people so I tried to (.) articulate myself (.) less of a g-

ROY: OK (.) so you think your accent's become more posh [over time?] in a **sort [ʔ]** of (.) [to **put [t] it [ʔ]** in a very **sort [ʔ]** of] simple

JOHN: [I **wouldn't [ʔ]**] (1) [would you guys call it posh?] (1) I don't [call it **that] [ʔ]**

ROY: [I don't kn- n- no- if] not posh then how what would you call **it [ʔ]**? I was just I was just [coming up with an example]

JOHN: [I've never really **thought [t] about [t] it**] **[ʔ]**

ROY: OK [fair enough]

JOHN: [**but [ʔ]** um] (.) in fairness the (.) chavvy kids in my History group at school used to call me posh and (.) we had an **argument [ʔ]** on an aeroplane once **about [t] it [ʔ]**

(laughter)

JOHN: and my teacher had to separate two people (.) cause (.) they were tapping me on the head and calling me posh so (laughs)

The extract above comes as part of a wider conversation about what social factors have an influence on how people speak. John explains that he speaks very differently to his parents as a result of his academic experiences, particularly because the subjects he has chosen to study at GCSE and A-level, such as English and Drama (the latter originally referred to earlier in the conversation), have involved lots of reading and group presentations. These learning experiences led him to 'try to articulate himself' to succeed. The mention here of reading, particularly in a school environment, links back to John's comments on being a geek in the first transcript, for which it seems a pre-requisite is being able to read well. While geekiness is not referred to specifically in this second extract, the link between reading, participating in education and being 'articulate' as a set of geeky qualities and practices that John values highly is clear.

My question on whether John thinks his accent has become posher over time was aimed at getting him to discuss these ideas further, but it is unfortunately worded as he disagrees with the term 'posh' as a descriptor of his speech. Had I used the word 'articulate' or even 'geeky', I may have elicited clearer comments from him on the link between his speech as developed through educational activity and his geek identity. However, John then tells a story which contrasts the 'chavvy kids' in his class to himself (distinction), whom they taunt and label as 'posh'. In his anecdote, he relies on the teacher as the institutional school authority to break up an incident that could be described as a form of bullying that takes place outside school grounds in a public place (on an aeroplane, presumably on a school trip). John's framing of himself as the victim of the bullying of 'chavs' and his appeal to school authority even outside of school property ties into stereotypes surrounding 'geeks' – that they are picked on by other students and they seek excessive favour with teachers. For many young people, recounting such a story in front of peers at school and a stranger with a

recording device would likely be far too embarrassing and would risk losing social credibility. However, John is proud of his geek identity (as seen in the first transcript) because it captures his enjoyment of school work and his desire to achieve well and come across as articulate, unlike his parents, who he says speak completely differently to him[20] and would appear to be of relatively modest means relative to his peers at college and the wider region. This would suggest that for John, being a geek and all it entails – good reading ability, articulateness, and even being bullied by the chavs – is part of his identity at school and is nothing to be ashamed of as it represents his aspiration to rise out of his relatively deprived circumstances and study English at university.

In terms of how this is related to John's phonetic variation, he produces nine word-final pre-vocalic tokens of /t/ in this extract, of which only four are produced with a glottal stop, the other five being realised as alveolar stops. This is a very low rate of glottalling compared to the rest of the sample and is among the lowest in segments of conversation featuring John. The presence of alveolar tokens and relative lack of glottal realisations here reinforce his desire to sound 'articulate' and educated, which is also seen in Kirkham and Moore's (2016) analysis of Ed Miliband's speech to the Labour Party Conference. This speech features fewer glottal tokens than his address to the Trade Union Congress, which the authors argue is because it is in Miliband's interest to project a professional, educated image to his party, in contrast to the display of working-class solidarity needed to appeal to trade unionists. For John, avoiding glottal stops may not necessarily come from a desire to give off a positive image to his audience, but the indexical meanings of alveolar [t] – education, articulateness, supportive of institutional authority – can be used to construct an identity of geekiness in contrast to chavs. The link between [t] release and geekiness is present in Bucholtz's (2001) work on female peer groups in California, where hyper-released /t/ forms part of a nerd style together with other forms of 'super-standard' language such as an avoidance of youth slang and use of formal lexis. Throughout the conversation, John uses other examples of 'super-standard' speech, including long forms of commonly abbreviated words (e.g. *television* for *TV*, *university* for *uni* and *Conservative* for *Tory*) and occasional hyper-correction (e.g. using BATH instead of TRAP in *passive*, realised as [pɑːsɪv]). This provides evidence that alveolar /t/ forms part of a super-standard style that John uses to index his geek identity.

Examining how /t/-glottalling is used in interaction in the speech of Kim and John has allowed me to explore its socio-indexical meanings. The analysis of Kim's conversation showed how glottal /t/ can be used to index solidarity and inclusiveness even when the speaker is condemning traits that are associated with those from a lower social class background, who previous research has found are traditionally the

[20] John's father is from the North East of England and so presumably does speak with a very different accent to him, but his mother is from Hampshire and so would be expected to share many phonetic similarities with him. He does not elaborate further on any specific linguistic differences in the rest of the conversation.

leaders of the spread of /t/-glottalling. The extracts of John's interactions show how using relatively low rates of /t/-glottalling may index geekiness, which may carry some social risk in a school environment but is appropriate for the speaker in question because of the identity he wishes to construct. The results support previous interactional analyses of /t/-glottalling that find that it can evoke social meanings of openness and solidarity, while its absence (and thus the presence of alveolar [t]) can index articulateness and education (Kirkham & Moore 2016). The findings shown here are of course selective; however, they illustrate well how the presence and absence of glottal /t/ in speakers who use very high and low rates of the feature relative to their peers can make social meaning for identity construction.

6.5 GOOSE-fronting in interaction

In this section, I focus on how GOOSE-fronting is used in interaction by two participants who produce GOOSE tokens at the extreme ends of the acoustic continuum as measured using the Euclidean distance of F2-F1 between participants' FLEECE and GOOSE realisations. I concentrate this discussion on private school participants in an attempt to interpret the variation in this school between the two constellations of practice in terms of their GOOSE production, as seen in Section 5.4.3. That is, GOOSE-fronting was used significantly more by speakers who hung out in the outgoing room at lunch time verses those who spent time in the reserved room at the private school. The first participant I discuss is Jonah, who uses extremely fronted GOOSE. His realisations of GOOSE immediately stood out to me as very front in auditory terms when listening to the recordings, with several instances of vowels resembling high front [y]. The mean level of GOOSE-fronting in his speech is the third-highest among the private school pupils in the study and 46% of his GOOSE tokens appear in the top decile across the sample.

The second participant is Hugh, who uses the most extreme back tokens. It is worth pointing out that, as seen in Section 5.4.1, the production of GOOSE across the entire sample was mostly in a high central part of the vowel space (with the exception of pre-lateral tokens, i.e. the GHOUL sub-set). This means that these 'back' tokens are not acoustically back in the sense that they overlap with the space occupied by GHOUL; rather, they are central, in contrast to front tokens that overlap with FLEECE. Perceptually, too, these realisations do not sound like the traditional [u] of conservative 20th-century varieties of English – this kind of pronunciation is wholly limited to GHOUL tokens among the sample. My auditory impression of most of these 'backed' tokens is more akin to [ʉ] or [ʉ̟], whereas the extremely front tokens better match the label 'front' by resembling [y] or [ʏ]. This means that the label 'back' can perhaps better be interpreted as 'non-front', although this does not mean that Hugh's productions were not extreme. His mean level of fronting is by far the lowest in the data set and 39% of his GOOSE tokens appear in the bottom decile.

6.5.1 Innovative speaker

Jonah is 17 years old and attends the private school, where he hangs out in the outgoing room. His parents are both medical practitioners and the average house price in his postcode is over three times the mean for the area and is the highest in the data set. He plays for a local rugby club and competes for the school in three sports while he plans to study geography at university after leaving school. Table 6.1 lists Jonah's 10 frontest productions of GOOSE. The range in the entire data set for tokens that do not precede coda /l/ (which blocks fronting) spans from a distance of 0.05 to 4.42.

Table 6.1: Top 10 frontest GOOSE tokens produced by Jonah

FLEECE-GOOSE normalised F2-F1 Euclidean distance	**Word**	**Topic**
0.32	new	How one might change one's language use depending on the situation
0.34	uni	Discussing hobbies and future plans
0.38	music	Discussing hobbies and future plans
0.53	use	How one might change one's language use depending on the situation
0.56	noon	Imitating my demonstration of GOOSE-fronting
0.58	you'd	How one might change one's language use depending on the situation
0.62	do	Discussing hobbies and future plans
0.64	you	Popularity at school
0.67	groups	Social groups at school
0.72	you	Popularity at school

The table shows that Jonah's frontest tokens of GOOSE mostly appear after /j/, which is unsurprising given this context's tendency to favour fronting. However, this is not the case for all 10 tokens, with one (*groups*) appearing in the disfavouring post-liquid context. The tokens tend to appear in two situations: during a discussion of hobbies and future plans and during a conversation about how the group adapt their speech to suit the situation and the audience. Extracts from these two interactions are reproduced below, with Jonah's tokens of GOOSE underlined. Those included in Table 6.1 are labelled with an asterisk (*) in the transcript.

ROY: are you a member of any clubs or whatever at college?

JONAH: I **do** rugby and hockey and rowing as well

ROY: and outside of school?

JONAH: um (1) I **do*** (.) rugby (.) and (.) yeah I guess (.) that's about it (1) yep

ROY: OK (.) and what do you do in your free time?

JONAH: listen to **music*** and (2) er (.) rugby I guess as well

ROY: and what are you planning to do after leaving school?

JONAH: probably **uni*** then a gap year

ROY: is there anything else (.) that you would do?

EDDIE: um

ROSS: you can use different vocabulary [with different pronunc-]

JONAH: [yeah I was just about to say that **you** can probably limit your vocabulary a bit if you're gonna]

EDDIE: [yeah different vocab]

ROSS: like if you're more comf- more comfortable with someone you know you might (.) say things which're a bit (.) less PC than someone you don't really know and stuff like [that]

JONAH: [yeah]

EDDIE: [and] (.) obviously you do it sometimes do it the other way as well (1)

JONAH: yeah

ROY: what do you mean [sorry?]

EDDIE: [like] try and act (.) like talk better (.) than you would naturally

ROY: yeah

JONAH: so it's (.) li- just like your first (.) meet- like (.) lesson with a teacher (.) with a **new*** teacher [say]

EDDIE: [or if] you like you get interviewed by the headmaster (.) [some- (.) something like that]

JONAH: [yeah exactly (.) yeah]

ROSS: yeah you try and [act like confident more]

JONAH: [**you'd* use*** better] vocabulary wouldn't **you**?

EDDIE: yeah

The first extract is framed as a series of questions and answers about some of Jonah's interests and future plans, which I conducted at the beginning of the conversation to collect useful information about the participants and help get to know them a little and break the ice. While some participants went into a lot of detail about their lives while laughing and joking with the rest of the group, Jonah gives fairly minimal factual responses as if it were a formal interview situation. The tokens of GOOSE in words such as 'do' and 'uni' (university) are highly fronted, to a similar degree as some of those he produces in the reading task, which are very front (not included in the table). It is likely that Jonah interprets this segment of the conversation in a similar way to that of the reading task – that it is formal and a little awkward – and so it is perhaps unsurprising to see similar pronunciations used in both contexts.

The second transcript provided above takes place in a more relaxed moment of the conversation during which all the speakers are happy to provide detailed contributions and interrupt one another. The topic is how the group might change their pronunciation (consciously or subconsciously) depending on whom they're speaking to. After they mention that they might use less /t/-glottalling in formal situations, I ask if there is anything else in their speech that they would change. The boys refer to the deployment of alternative vocabulary in different contexts – that it might be 'limited' in formal settings and 'less PC' (politically correct) when one is comfortable with the interlocutor. The former idea is expanded upon with comments that you might 'talk better than you would naturally' when being speaking to the headmaster or meeting a new teacher. Jonah uses extremely front realisations of GOOSE throughout this exchange, such as in the phrases 'new teacher' and 'you'd use better vocabulary, wouldn't you?' While the interaction itself here is not formal, the focus of the boys' discussion is how they would adjust their speech in formal situations. In combination with the extremely front GOOSE tokens in the reading passage and the questioning about his life, it is possible that Jonah's use of fronted GOOSE indexes some kind of awareness of formality or attention to speech (Labov 1972). This could further index the persona of an adept language user who knows when certain linguistic forms are or are not appropriate, but this interpretation ought to be considered with caution, since fronted GOOSE has not been found to index formality in any previous research and if anything, it is seen as indexical of youthful, relaxed or working-class characteristics, if anything at all (see Section 5.2.3). However, it would seem from the use of the most extremely fronted GOOSE by one of the speakers who uses it the most that these acoustically extreme tokens cluster in interactional contexts that suggest an awareness of formality.

6.5.2 Conservative speaker

Hugh is a 16-year-old boy who attends the private school and hangs out in the reserved room. He is a member of a local hang-gliding group and wants to join the Royal Air Force after leaving school. Both of his parents attended university and have professional occupations. The average house price in his postcode is over twice that of the mean for the area. Table 6.2 lists Hugh's backest tokens of GOOSE (excluding pre-lateral and pre-vocalic tokens) alongside their discourse contexts. Ellie, Luke, Amy and Chris are pseudonyms for the stimulus voices used in the perception tasks (see Section 7.2.1).

Table 6.2: Top 10 backest GOOSE tokens produced by Hugh

FLEECE-GOOSE normalised F2-F1 Euclidean distance	**Word**	**Topic**
3.44	you	Judging Ellie's speech and questioning where she would live
3.43	Luke	Judging Luke's speech and comparing him to chavs
3.41	two	While completing the reading task
3.25	afternoon	Mocking Luke's speech
3.24	doing	Judging Amy's speech and questioning her social class background
3.19	true	Judging another student
3.17	absolutely	Whether he would be friends with Chris
3.16	noon	Mocking Luke's speech
2.99	to	Judging Chris's speech and questioning where he would live
2.96	absolutely	Whether he would be friends with Chris

The table shows that Hugh's backest tokens of GOOSE occur in various phonological contexts – including one instance after /j/ (the backest in his recording) and five after coronal consonants, which is surprising as these environments favour fronting. It also shows that they tend to appear in situations in which he is judging or mocking the stimuli. The fact that this happens for all four stimulus speakers indicates that it is unlikely that a particular stimulus is having a priming effect on his production. Throughout the interview, he frequently engages in harsh criticism of the speakers' recordings and of other students at school. He and his friend Fred, whose mean level of backing is second only to Hugh's, seem to see the conversation task as an opportunity to make outrageous and often derogatory remarks about individuals and groups who were not present while protected by participant confidentiality. These comments were usually intended in a light-hearted and somewhat ironic way, often punctuated by laughter and phrases such as 'just kidding' intended to distance themselves from their insults, but some of their remarks were sufficiently offensive to cause their fellow group member, Heather, to express shock at their behaviour. Three

examples of such interactional moments that include some of the highly backed GOOSE tokens in Table 6.2 are given below.

ROY: where do you think she was from (.) and her family background?

FRED: wealthy (.) [definitely]

HEATHER: [wealthy]

ROY: wealthy

HEATHER: mm-hmm yeah

HUGH: I would say Winchester but it's not on here

ROY: ri- OK Winchester

HUGH: but that (.) **you** probably haven't surveyed Winchester

---

HUGH: she's quite Jane Brown (.) I reckon

FRED: yes

ROY: she's what sorry?

HUGH: [she's a girl from you know] (.) she sa-

HEATHER: [no: I don't]

FRED: [she sounds (.) she sounds] more innocent

HUGH: yeah no

FRED: [Jane Brown's a snake] (.) (laughs) [I'm joking she's not that bad]

HUGH: [Jane Jane Jane Brown's] a bit (.) [more snaky but er]

HEATHER: [oh Go-]

HUGH: [no no] (.) you're not joking I mean it's **true** (.) (laughs)

ROY: someone you would be friends [with?]

HUGH: [**absolutely** not] (laughs)

FRED: [no:]

ROY: avoid?

HUGH: [**absolutely**] yes (laughs)

FRED: [avoid] (1) he's either a complete social outcast (.) or he just tries to be cool

Hugh's backest token appears in the first extract, during which the participants are assessing Ellie's speech (see Section 7.2.1 for further information on the stimuli). The comments here are not particularly derogatory, but they are decisive and based on strong stereotypes. Fred and Heather immediately respond to my question on Ellie's background and home town with 'wealthy', while Hugh suggests that she lives in Winchester. This city is known for being very prosperous and is regarded as 'posh' in the local area. His backed token of GOOSE appears in the word 'you', which here refers specifically to me, unlike most 'you' items in the data set, that refer to a hypothetical person. The very backed realisation of GOOSE here is especially noteworthy given that post-palatal GOOSE tends to be realised in the frontest positions because of co-articulation (e.g. Sóskuthy *et al.* 2018). He speculates why I did not include the term 'Winchester' in the survey but does not need to clarify why he thought of the city when commenting on Ellie's speech, since it is assumed that I am familiar with the local stereotypes of the region. Elsewhere in the interview, Hugh shows deep knowledge of which towns in the area are supposedly 'posh' and which are supposed to be 'chavvy'. He is clearly confident in his perceptions and has no qualms about sharing them with me and with his fellow group members, assuming that we are as familiar with local stereotypes as he is and will agree with his verdicts.

Hugh's strongly opinionated persona comes out more strongly in the other two transcripts. He uses a fellow student's name in an attributive fashion to describe Ellie's speech in 'she's quite Jane Brown, I reckon' (Bucholtz and Hall's 'distinction'), again presuming that his interlocutors know whom he is talking about and what exactly she represents that can be perceived in Ellie's voice. When I ask what he is referring to, Fred insultingly describes the student as 'a snake', much to Heather's shock ('Oh Go-'), before laughing it off and claiming he was joking. Hugh then disagrees with Fred's retraction and claims that his original statement is true. This exchange highlights how Hugh and Fred enjoy making disparaging remarks about other students at school in a comical way as part of their explanations of their perceptions of the stimuli. The word 'true' contains a very back GOOSE vowel, as do both tokens of 'absolutely' in the third extract, given in response to a question on whether the listeners would be friends with Chris. Fred's comment at the end summarises the participants' thoughts about Chris in colourful terms, where they use Bucholtz and Hall's (2004) 'distinction' and 'illegitimation' tactics to label him as a 'complete social outcast' who fails in his efforts to be 'cool'.

It would seem from Hugh's use of extremely back GOOSE vowels in the conversation that the use of this feature may fulfil some kind of social function in reinforcing a persona of someone who confidently and authoritatively judges and categorises other people and who is not concerned with what other people think. Fred, who also uses much less GOOSE-fronting than many other speakers, joins in with the performance of this kind of identity in the conversation. These social meanings may be related to how older people, who usually occupy roles of authorities and custodians of tradition and acceptance into social institutions, lag behind in the use of GOOSE-fronting compared to younger people. Alternatively, these backed realisations may be a way of avoiding

the attention to speech or awareness of formality indexed by fronted GOOSE as in Jonah's speech, thus allowing the speakers to position themselves as rebellious and non-submissive to societal expectations. These interpretations are suggested cautiously, however, since no similar meanings have been identified in previous work, nor are they hinted at in the perception results (see Section 7.3.2.3). In addition, it is difficult to interpret this in relation to the difference in production of GOOSE-fronting between the outgoing and reserved rooms at the private school. The outgoing room is characterised by its wealthy male members who orient towards 'laddishness' (see Section 3.6.3), but this has no clear link to Jonah's (outgoing room) attention to speech or submission to mainstream formality. The reserved room's rejection of normative brash masculinity may be associated with the judgemental and alternative stances Hugh and Fred (reserved room) take in interaction, but the connection is indirect and less distinct when compared to the social meanings surrounding glottal and alveolar variants of /t/.

It is worth mentioning that given the nature of the conversation task, it is in many ways not surprising that the participants are positioning themselves as judges when evaluating the stimuli, since that is what the task required of them. However, there was a lot of variation in how listeners took to this endeavour – while some, such as Hugh and Fred, relished the opportunity to make stereotypical and pejorative remarks about the speakers without fear of consequences, others were much more reluctant to do so and were keen to stress how their responses were based on generalisations that may have had no relation to the speakers' actual demographic characteristics. The data examined in this section has necessarily been limited, but it would seem from studying the most extremely back tokens in the recording of the speaker who uses the backest tokens overall that non-fronted GOOSE may index a type of rejection of mainstream norms and expectations in certain contexts.

6.6 Chapter summary

In this chapter, I have investigated the social meanings associated with /t/-glottalling and GOOSE-fronting in speech production using an interactional analysis of qualitative conversation data. I have shown that these variables can be used for stance-taking and identity construction in the speech of the young people in the sample by looking at speakers with extreme rates of usage and acoustically extreme tokens. A high rate of glottal /t/ in Kim's speech may be used to evoke solidarity and openness while John's high alveolar /t/ usage seems to be part of an articulate and educated persona, supporting findings in Kirkham and Moore (2016). It is possible that these indexical meanings are *n*+1st meanings originally stemming from the greater use of glottal stops by working-class speakers.

Acoustically extreme tokens of fronted GOOSE may be used to construct an identity that is aware of and responsive to (formal) situations in Jonah's speech, while extremely non-fronted tokens may reinforce Hugh's judgemental and rebellious

persona. The latter findings are presented more tentatively given the minimal previous research on GOOSE-fronting in interaction and the mixed findings on its social meanings. They do, however, perhaps support the notion that the social meanings of GOOSE-fronting, as a low-salience variable, are not fixed at all but vary substantially depending on the situation and the community. The next chapter builds on this by investigating whether participants are aware of the social associations of the two variables and how they respond to them in the speech of others.

7 Speech perception analysis

7.1 Chapter overview

In this chapter, I study the extent to which the participants are sensitive to the socio-indexical meanings of /t/-glottalling and GOOSE-fronting, as found in the three preceding chapters, in how they perceive the speech of others. I examine the results of two perception tasks, namely a speaker judgement survey and a group conversation. The survey results compare how the speakers in the four stimuli, who use different rates of /t/-glottalling and GOOSE-fronting, were perceived by listeners in terms of their social characteristics. Extracts of the conversations are used to assess the extent to which listeners noticed the two features in the stimuli and whether they associated them with a speaker's social traits. This allows me to access the social information listeners link to phonetic variation as well as the noticeability and social salience of the two variables.

7.2 Survey task

7.2.1 Methods

This section explains the details of the methods used for the perception analysis. A justification for the approach that I take with this analysis is given in Section 3.4. For the survey task, listeners were presented with four audio stimuli, featuring the voices of four adolescents from another school in East Hampshire reading a 30-second extract of *The Boy Who Cried Wolf* (Deterding 2006). Listeners heard each stimulus three times and gave their responses while listening to the recordings, with an additional 30 seconds or so to complete the questions. The responses were collected via an attitude judgement survey distributed on paper sheets, a blank example of which is presented in Appendix C. The survey asked listeners to categorise the speakers according to various characteristics, which are summarised below:

1. Personality traits (42 options)
2. Moods (18 options)
3. Hypothetical friendship level (5 options)
4. Social group at school (5 options)
5. Home town (12 or 14 options)[21]
6. Type of settlement of home town (5 options)
7. Class background (3 options)
8. Any other thoughts about the speaker (free-choice option)

[21] The two schools in the study were in separate towns in East Hampshire with slightly different catchment areas, so the available responses for the question in the survey on the speakers' home towns differed slightly depending on the school.

All questions apart from the third also included an 'other' option with space for participants to write their own answer if they wished, which they occasionally did. For Questions 1 and 2, participants were encouraged to circle as many answers as they wished. The other questions tacitly encouraged one option to be circled but some participants selected multiple responses. In theory, this may have the effect of skewing the results somewhat if some participants chose two options while others chose one, with the former individuals having an undue influence on the overall totals. There is very little the analyst can do about this other than excluding these instances from the data set, but this is arguably a worse decision since it removes a participant's legitimate perceptions from the pool of responses. Since the analysis does not involve any complex statistical methods (see below), the issue of multiple responses does not pose very much of a problem and is therefore left as it is. An option to 'Tick the following box if you recognise the speaker's voice' was also included in the event that a listener was acquainted with one of the speakers, though this did not turn out to be the case for any of the participants.

The analysis of the survey responses is based on reasonably simple descriptive statistics and is not subject to the kind of powerful statistical modelling used for the speech production data. This is because the survey responses, being selections of options from a menu of fixed-choice lexical items, are less amenable to quantitative analysis than other perception tasks such as Likert scales or word categorisation. Poisson regression models can be used to analyse count data (as in counts of items selected), but they are not appropriate for these data as every count here corresponds to a different question and response, causing problems for the operationalisation of the dependent variable in the regression modelling. Simpler statistical tests such as χ^2 tests can be used to compare multiple groups, but the fairly small number of subjects means that false positives are likely to occur. In order to facilitate the interpretation of the differences in perceptions between the state and private school students, I provide the results of χ^2 tests comparing the results of the two schools. However, in general, listener responses are discussed in a more holistic manner in order to unpack the broad social meanings associated with the stimulus voices and particular pronunciations of /t/ and GOOSE, complementing the more fine-grained statistical analysis of speech production in Chapters 4 and 5 and the qualitative analysis of interactions in Chapter 6.

The four speakers whose voices were used for the audio stimuli were given pseudonyms that were made known to the participants and were used to refer to the individual voices. The speakers were chosen from a total of 26 recorded as part of the pilot study, as they used different rates of the features commonly listed as part of the 'youth norms' supposedly spreading from London, also known as 'Estuary English'. These include /t/-glottalling and GOOSE-fronting as well as other variables such as TH-fronting. Two boys and two girls were used for the stimuli in order to assess whether speaker gender played a role in mediating listener perceptions. Some demographic information for the speakers is provided in Table 7.1.

Ideally, a larger number of stimulus voices representing different configurations of /t/-glottalling, GOOSE-fronting and other phonetic and social variables could have been used. For example, Campbell-Kibler (2007) uses eight voices in her study of the perception of ING in American English. However, this would have meant either simplifying the survey and conversation tasks or spending longer with the participants. The former would not have yielded as rich quantitative and qualitative data, while the latter was not possible given the constraints of conducting recordings with participants during one-hour periods of the school timetable. Hence, four speakers were considered to be sufficient to be able to capture the range of phonetic and social characteristics referred to above, while also being few enough so that each speaker's voice could be evaluated and discussed in good detail with each set of listeners via the survey and conversation tasks.

Table 7.1: Demographic information for stimulus speakers

Speaker	**Gender**	**Age**	**Ethnicity**	**Postcode house price vs. mean**	**Parents who attended university**	**Parental occupation type**	**Social class score (3-9)**
Amy	Female	14	White	1.002	Neither	Manual	4
Chris	Male	14	White	0.674	Both	Professional	7
Ellie	Female	15	White	0.995	One	Professional	6
Luke	Male	13	White	1.109	One	Intermediate	5

Table 7.2: Realisations of /t/ in the four stimuli. The words are listed in the order in which they appear in the passage.

	Speaker			
Lexical environment	**Chris**	**Ellie**	**Luke**	**Amy**
foot of	alveolar	alveolar	***glottal***	***glottal***
mountain	alveolar	alveolar	alveolar	alveolar
hot afternoon	alveolar	alveolar	***glottal***	***glottal***
thought up	alveolar	alveolar	alveolar	***glottal***
get some	alveolar	***glottal***	***glottal***	***glottal***
little	alveolar	alveolar	alveolar	***glottal***
out even	alveolar	***glottal***	***glottal***	***glottal***
unfortunately	***glottal***	***glottal***	***glottal***	***glottal***
that he	alveolar	***glottal***	***glottal***	***glottal***
don't bother	***glottal***	***glottal***	***glottal***	***glottal***
Total glottal tokens out of 10	2	5	7	9

Table 7.2 shows how each stimulus speaker realised the 10 relevant tokens of /t/ in the extract of the reading passage that was played to listeners. The tokens were coded in the same way as for the quantitative analysis in Section 4.3.3 (none were produced as taps). All tokens of /t/ that could be glottalled are included here, even those that appear before non-syllabic consonants (e.g. *get some* and *don't bother*), which are normally glottalled in most accents, including RP, and are not included in the quantitative analysis. This is because Chris, who displays the least /t/-glottalling (two out of 10 tokens), uses an alveolar pronunciation in the phrase *get some*, where a glottal realisation might be more expected even in formal speech. He only makes a glottal production in the other pre-consonantal environments *unfortunately* and *don't bother*, which are never glottalled by any of the participants. Ellie glottals her /t/ in these three words but also in *out even* and *that he*. The former is word-final pre-vocalic while the latter varies depending on whether the participants also drop the [h] in *he*. Luke uses glottal tokens in the same environments as Ellie, as well as in the other word-final pre-vocalic environments, *foot of* and *hot afternoon*. Amy uses glottal tokens in nine out of 10 possible instances, adding *thought up* and *little* to the set of glottalled words, the latter being notable for being in word-medial pre-syllabic position, which tends to resist glottalling in previous studies (e.g. Altendorf 1999). The token *mountain* is produced with an alveolar stop by all participants, which is unsurprising given that it is an example of a word-medial pre-vocalic /t/, which is most resistant to glottalling. None of the 26 participants I recorded for the pilot study used a glottal stop in this word, so Amy best represented the high-usage end of the spectrum of glottalling. It is clear that the four speakers exhibit a wide range of /t/-glottalling usage.

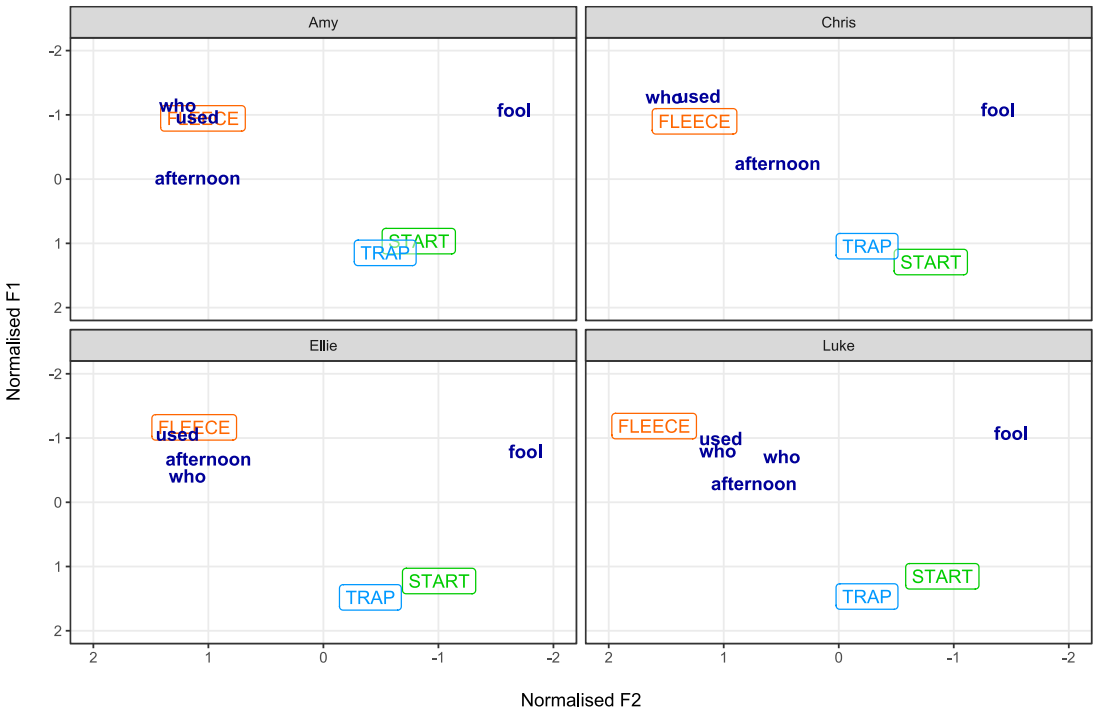

Figure 7.1: Vowel plots of each speaker's GOOSE tokens heard in the stimuli (normalised using the Lobanov method)

The distribution of realisations of GOOSE in the stimulus voices is shown in Figure 7.1. Tokens of all monophthongs from the reading and word list tasks were used to normalise the data with the Lobanov (1971) method (see Section 5.3.2) and produce mean values for each vowel for each speaker, but only FLEECE, TRAP and START are shown here for simplicity. The GOOSE tokens shown are those that listeners heard in the extracts of *The Boy Who Cried Wolf* used as stimuli. The /uː/ phoneme is less common than /t/, so there were only four tokens of GOOSE included in the extract heard by listeners – *afternoon*, *who*, *used* and *fool*.[22] The GOOSE vowel in *fool* precedes a coda /l/, so it is produced in a back position by all speakers. Two of the words appear together in the phrase 'there was once a poor shepherd boy who used to watch his flocks…'. Because the two GOOSE tokens appear either side of a palatal glide, both show quite front realisations for all speakers. However, the speakers vary in their overall degree of fronting – Luke is the most conservative, with no overlap between GOOSE and FLEECE, while all of Amy's tokens are highly fronted. Ellie's realisation of *afternoon* is fronted, while Chris's is not.

In summary, the four voices used for the stimuli show a good deal of variation in their use of /t/-glottalling and GOOSE-fronting, making them suitable for the perception study. Amy is the most innovative speaker, with a high rate of both features. Chris is very conservative in his rate of /t/-glottalling and shows moderate GOOSE-fronting. Ellie's GOOSE is fronted but she does not use much /t/-glottalling, while Luke displays

[22] Luke says the word *who* twice in his reading of the text.

the opposite pattern. Part of the task for listeners was to see if they could identify this linguistic variation and discuss whether these quantitative differences in pronunciation evoked different social meanings for each speaker.

7.2.2 Results

In this section, I will discuss the most interesting and relevant findings from the survey. An exhaustive breakdown of every question in the survey by various social factors would not be particularly informative, so I have necessarily been selective in what results to report. I will begin by showing the most frequently selected responses for the first question (on personality traits) before comparing the perception results between the two schools for three of the other questions.

7.2.2.1 Personality traits

The first set of responses to be examined are the results of the first question, on personality traits. Participants were instructed to circle as many of the 42 options as they wished, and there was also space for them to write their own suggestions. The words and phrases included here were based on the findings of the pilot study (see Section 3.5.2) and those characteristics typically included in previous studies (e.g. Campbell-Kibler 2007). The large number of possible responses means that the best way of showing these results is in the form of word clouds, where words that were chosen more frequently are displayed in a larger font. Words that were rarely selected are shown in a very small font, while those that were never circled for a particular stimulus voice are not shown in the corresponding word cloud. Figures 7.2-7.5 show the findings for Luke, Ellie, Chris and Amy respectively. The raw figures that were used to create the word clouds are presented in table form in Appendix G.

By their very nature, these results are to a degree impressionistic – that is to say, they show the general impressions participants got from the speakers after listening to them read the text. It is impossible to say simply from these responses whether listeners attributed their selections to particular pronunciations, such as the speakers' realisations of /t/ and GOOSE. This will have to be left to the conversation task. However, the survey does allow us to efficiently gather and analyse information on the social meanings associated with young people's speech which varies according to patterns of /t/-glottalling and GOOSE-fronting. They also offer an opportunity to acquire listeners' perceptions at a lower level of conscious awareness than for the conversation task. The method is not as indirect or subtle as, say, a sociolinguistic priming experiment (e.g. Hay *et al.* 2006a; Drager 2011; Walker *et al.* 2019) or an implicit association test (Campbell-Kibler 2012), but it does not rely on participants' ability to conceptualise, filter and articulate their thoughts on speakers' pronunciation with metalinguistic terminology as in the conversation task. Moreover, the survey is time-limited and instantaneous – listeners were instructed to circle answers quickly

while the stimuli were still playing – and so they ended up selecting traits as immediate 'gut reactions' without spending a long time thinking about them. The listeners were of course aware that they were being asked to form judgements based on short extracts of speech, but the time-limited and simple nature of the task (circling words) meant that they could give immediate impressions without the complexity of having to explain or justify them straight away. Some participants later critiqued the survey for its crudeness, yet they also acknowledged that the kinds of judgements they were encouraged to make by selecting social characteristics after hearing a short speech sample did reflect how language users do tend to rapidly form social conclusions about people after hearing them speak for a short period of time.

Figure 7.2: Traits associated with Luke's speech (high /t/-glottalling, low GOOSE-fronting)

The traits associated with Luke tend to fall into two categories. First, there is a set of frequently selected words that are largely negative and suggest a timid, awkward persona – *lonely*, *boring*, *weak*, *sensible*, *geeky*, *modest* and most of all, *shy*, which was selected by 30 of the participants. However, there is another set of characteristics that appear to contradict this impression. These consist of words like *uneducated*, *chavvy*, *troublemaker*, *relaxed*, *lazy*, *laddish*, *casual* and *masculine*. The impression here is of someone who performs a particular kind of masculinity associated with not caring about education and a tendency to get into trouble. These words do not dominate the word cloud in quite the same way as *shy*, but they form a strong cluster of related social meanings that colour listeners' perceptions to a similar degree to the first set of words. It is unclear at this point whether certain participants associate

Luke's speech with either one or the other set of meanings, or whether both clusters of characteristics co-exist together in the same individuals' perceptions.

Figure 7.3: Traits associated with Ellie's speech (low /t/-glottalling, medium GOOSE-fronting)

The most frequent words associated with Ellie's speech are *confident, educated, articulate* and *sensible* (selected by at least 20 participants), together forming an impression of a young person who takes schoolwork seriously and is a high achiever. This core set is complemented by several other characteristics that are selected at least 10 times – *hardworking, posh, relaxed, feminine, friendly* and *attractive*. The word *posh* can be read as a slightly pejorative term to refer to having a privileged upbringing, possibly suggesting that Ellie's 'articulateness' and 'sensibility' may be a result of orienting towards the elite. However, the majority of the other words are neutral or positive, such as *relaxed* and *friendly*. In particular, the frequent selection of *feminine* and *attractive* is interesting, as these are terms usually used to refer to physical appearance, not purely vocal quality. The survey does not allow us to delve into whether these words are interpreted to mean that Ellie's voice itself is perceived as feminine and attractive, or alternatively that listeners get the impression from her voice that she looks, acts or dresses in a feminine and attractive way. This can potentially be further examined in the conversation results.

Figure 7.4: Traits associated with Chris's speech (low /t/-glottalling, medium GOOSE-fronting)

The characteristics most commonly associated with Chris's speech (more than 10 times) were as follows: *geeky, sensible, formal, educated, confident, hardworking, articulate, weird, friendly* and *posh.* While he shares some traits such as *geeky* and *sensible* with Luke, Chris is less likely to be labelled as *shy* or *lonely* – instead, he is *confident* and *friendly*. He also shares some of the pro-school and pro-establishment traits associated with Ellie, such as *educated, hardworking, articulate* and *posh*. The combination of these together with *geeky* and *weird*, however, evoke a slightly more negative image of someone who does not fit in the social mainstream at school and is perhaps too academic and intellectual. In other words, while Ellie is *educated* but *attractive* and *feminine*, Chris is *educated* but *geeky* and *weird.* This could be due to differences in speech, but it could also be a result of differing norms and expectations regarding gender, in that sounding educated and sensible may be more acceptable and desirable for girls than for boys in contemporary British society.

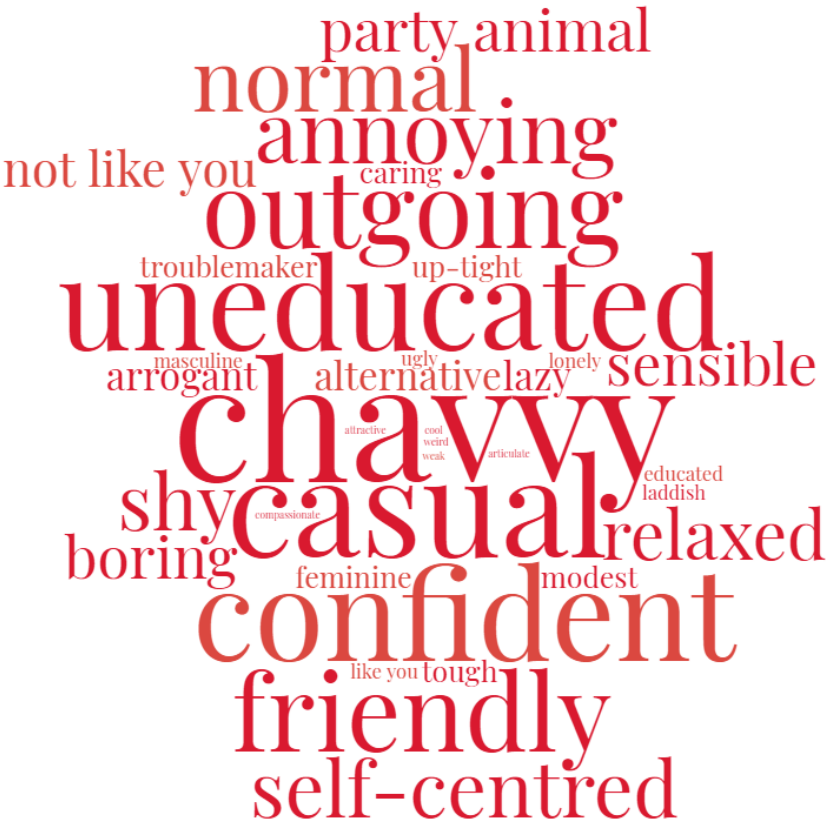

Figure 7.5: Traits associated with Amy's speech (high /t/-glottalling, high GOOSE-fronting)

The traits associated with Amy are less strongly uniform than for the other participants, as there are no words circled more than 17 times. The most common word selected is *chavvy*, followed by *casual*, *uneducated*, *confident*, *outgoing* and *friendly*. *Chavvy* refers to the term 'chav', a stereotypical figure in British popular culture of a young person involved in anti-social behaviour, typically dressed in sportswear and gawdy 'bling' jewellery. The term is almost exclusively used pejoratively and is never claimed as part of an individual's own identity, but only attributed to others. Chavviness is reinforced by *casual* and *uneducated*, and possibly by certain interpretations of *confident* and *outgoing* even though the latter two are typically used positively. The next tier of traits consists of *normal, annoying, self-centred* and *party animal*. While *annoying* and *self-centred* are no doubt negative judgements, it is not clear whether these are tied to the *chavvy* or *uneducated* pejorative labels. In combination with *party animal*, the overall picture is of someone who does not take schoolwork seriously and prefers potentially engaging in risky behaviour in the teenage context (anti-sociality and violence in the case of chavs, or alcohol consumption and general debauchery at parties). Yet the term *normal* suggests a different interpretation – that Amy may be more representative of the average teenager, unlike, say, Ellie and Chris, who are *posh*. This difference in perceptions may reflect the contrasting experiences of those of different class, school or friendship-based backgrounds among the participant sample.

The next set of questions can be analysed in a little more detail since there are much fewer options for participants to choose from. These questions relate to the perceived social class, social group and hypothetical relationship of the stimuli. For these data, the results from the two schools are compared since the nature of social groups, friendship and class is likely to operate differently in contrasting constellations of practice.

7.2.2.2 Social class

First, I consider the results for the question on social class. For this question, worded as 'What do you think the speaker's background is?', there were only three possible answers: *wealthy background*, *middle-class background* and *working-class background*. The term 'wealthy' was used instead of 'upper-class' as the latter is generally understood in the UK to refer to the nobility, who make up a tiny fraction of the population. Another option would have been 'the elite', which is sometimes used in sociological studies of stratification (e.g. Savage *et al.* 2015), but not very often in the everyday speech of young people. 'Wealthy' offers a balance between being a familiar word to participants while also getting across the idea of being at the top of the economic spectrum, even if it seemingly neglects the social and cultural advantages enjoyed by those at the apex of society. On a broader note, it is debatable whether all the participants shared the same level of understanding of the concept of social class. By age 16, it is reasonable to expect someone to have some experience of the social stratification inherent to society, particularly in the UK, where class is often discussed in the media or as part of everyday conversation, even if indirectly through language like 'posh' and 'chavs'. However, a term like 'middle-class' may be understood in different ways – does it refer to those around the median of the income continuum, or is it more about socio-cultural factors like an attitude of aspiration or going to museums and art galleries (Savage *et al.* 2015)? This confusion might be especially the case in the part of the country where the study took place, as its relatively low levels of deprivation can make it seem to those who live there that everyone is more or less the same. In this kind of environment, local class distinctions may be subtler, more gradient and less easily identifiable. In this sense, it is worth bearing in mind that talking about class may be difficult for the teenagers in the study and may vary depending on their levels of experience with social stratification and with discourses of class. In the end, the term 'wealthy background' in the survey may have primed participants to focus primarily on the economic aspects of class, but the group conversations revealed complex and nuanced understandings of the concept among many of the young people.

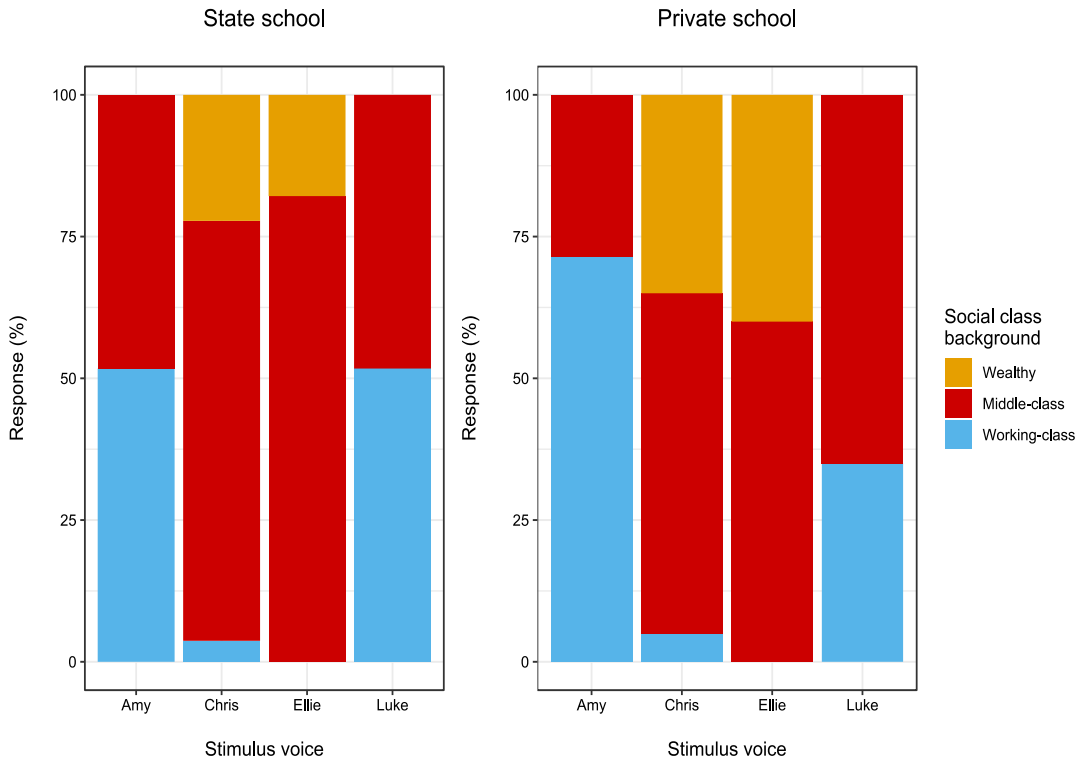

Figure 7.6: Perception responses for social class background by school

The results for the question on the social class background of the speaker are shown in Figure 7.6. The vast majority of participants circled one answer for this question, but a small number chose two options and explained their decision in the conversation task. Amy and Luke are both labelled as either middle- or working-class, with an almost 50-50 split among the state school listeners for both stimuli. For the participants from the private school, Amy is mostly perceived to be from a working-class background while the majority of the responses for Luke categorise him as middle-class. Neither of these two speakers are regarded as from wealthy backgrounds by any of the participants. In production, both of these speakers use relatively high rates of /t/-glottalling but diverge in terms of their GOOSE-fronting. This potentially suggests that their use of glottal /t/ may be part of a style that is emblematic of a relatively middle or low tier of socio-economic status. In contrast, Ellie is universally categorised as wealthy or middle class, and Chris only has a very small minority of working-class responses. These two speakers use the least /t/-glottalling and medium rates of GOOSE-fronting. This would seem to support previous work that finds that /t/-glottalling is associated with lower class backgrounds, and by implication, that alveolar /t/ production is indicative of higher socio-economic status (e.g. Fabricius 2000; Badia Barrera 2015). The pattern is less clear for GOOSE-fronting.

Also of interest is the overall similarity between the responses of the state school participants in comparison to those of the private school listeners; χ^2 (49, N = 45) = 63, p = 0.086. The latter group are slightly more likely to label Chris and Ellie as wealthy, and their perceptions of Amy and Luke are a little further away from the

mid-point than those from the state school, but the overall picture is quite similar for the two schools. The differences that do exist may be indicative of different attitudes or cultures within the schools as constellations of practice, but drawing such conclusions based on these small numbers would be premature.

7.2.2.3 Social group

The next question concerns which social group at school listeners thought the speakers would belong to. The five possible answers for this question were derived from data from the pilot study, where I asked participants what the main social groups at school were and what they were like. The school attended by the pilot participants was not the same as those attended by the main study participants, but the students' responses were generalisable enough to apply to many schools in the UK. Any school-specific group labels were discarded or interpreted in a general way, eventually leading to the inclusion of five labels in the survey: *the arty group*, *the chavs*, *the geeks*, *the popular group* and *the sporty group*. An 'other' option with space for participants to write in their own label(s) was also included. This was occasionally made use of by listeners but is not included in the graph in Figure 7.7 as it was selected only very rarely. For this question, most participants selected one of the five options, but a minority circled multiple answers or did not circle any (the graph simply shows the counts for each response regardless). This was elaborated on in the conversations as students explained that sometimes they felt that the speaker could fit into more than one group.

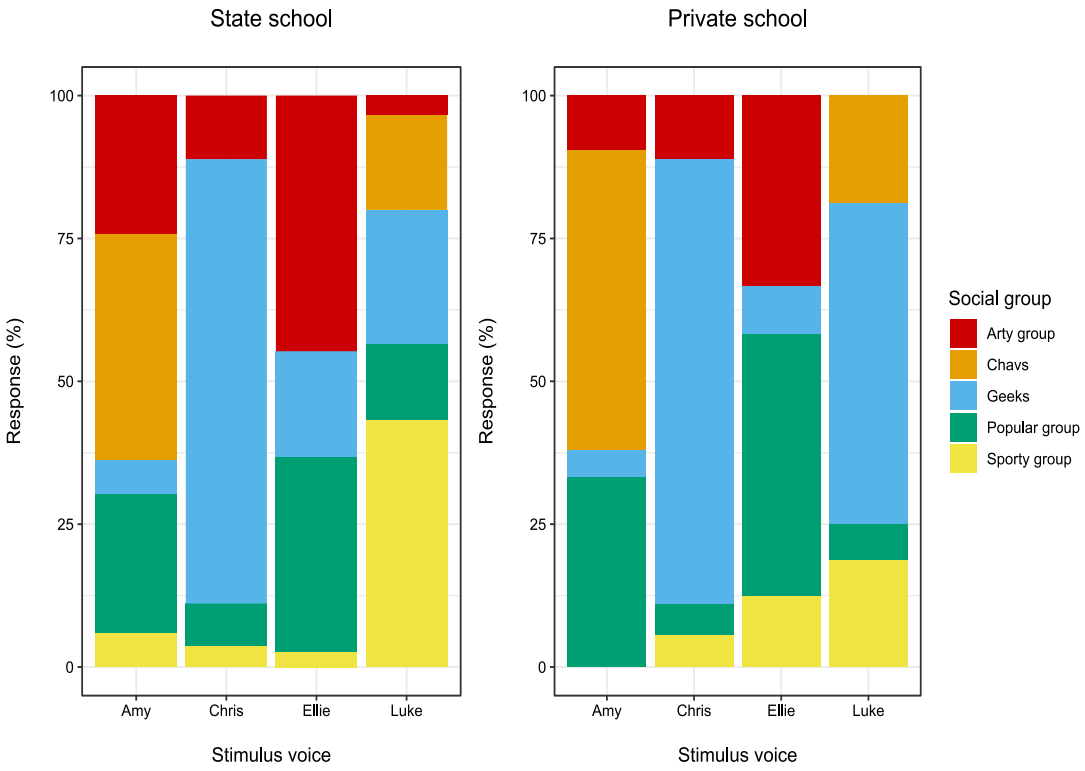

Figure 7.7: Perception responses for social group by school

Figure 7.7 shows the results for each stimulus voice in terms of their perceived social group at school. The stimulus voice with the clearest and most consistent ratings is Chris, who was categorised as belonging to the geeks by 78% of participants in both schools, with minority selections for the arty, popular and sporty groups. This echoes the results for the personality trait question, in which characteristics associated with the geeks – *educated*, *sensible*, *weird* and *geeky* – were attributed to Chris. His lack of glottal /t/ realisations and frequent use of alveolar variants has some similarities with work in the United States by Bucholtz (2010) that finds hyper-realised alveolar [t] as a sociolinguistic resource used by a group of teenage girls in California to index a 'nerd' identity. Hyper-realisation of alveolar [t] is not exactly the same as the absence of glottal /t/, of course, and the manifestation of geekiness / nerdiness is likely to operate differently for boys versus girls, but the phenomena are similar and are linked in social meaning to equivalent school personae.[23]

While Ellie also uses relatively little /t/-glottalling, her social group perceptions are somewhat different to Chris's. The geeky group is a minority result for Ellie, with the most frequently selected options being the arty group for the state school listeners and the popular group for the private school participants, whose proportions are approximately reversed for the other school. Discussions with participants suggested that both the arty and popular groups are pro-school and high-achieving, reflecting the

[23] There is some debate over whether *geek* and *nerd* are synonyms, but both are generally accepted as terms for people who are perceived as overly studious, not socially mainstream and who have obsessive interests in technical or niche activities (OED 2019).

traits listed for this speaker in the previous section such as *sensible*, *articulate* and *educated*, while popularity is also associated with femininity and attractiveness. Unlike the popular group, the arty group are not as well-integrated into the mainstream, though there no real parallels for this in Ellie's personality trait results (terms such as *mainstream* and *alternative* were included as options in the survey but were rarely selected – they may have been too abstract and complex to be quickly selected in the survey compared to more conventional traits such as *educated*). What exactly the difference is between the arty group and the geeks beyond their typical practices (e.g. art and drama vs. sci-fi and computers) is unclear, since they are both pro-school, non-mainstream groups. It may be that gender could be a factor – the arty group would seem to be mostly formed of girls and the geeks are mainly boys. This is not mentioned by participants but would help explain why Chris was mostly deemed a geek while Ellie was more likely to be categorised with the arty group. It is also worth noting that neither of the two speakers are ever labelled as one of the chavs.

There is a significant difference between the two schools, χ^2 (80, N = 45) = 104.44, p = 0.035, which may be largely caused by the results for Luke, who shows the most variability between the schools. His social categories are mixed, but the most frequently selected group for him by the private school listeners is the geeks, while for the state school participants, it is the sporty group. The chavs and the popular group have minority selections from listeners from both schools. The geek label is similar to some of the characteristics discussed earlier such as *shy*, *lonely*, *weak* and *geeky*, while words such as *laddish* and *masculine* can be stereotypically associated with the sporty group. Hence the two clusters of traits discussed in Section 7.2.2.1 are to a large extent borne out in these social group results, with a general preference for the geek-related traits by the private school participants and the same for the sporty-related characteristics by the state school listeners. There is little uniting geeks and the sporty group other than arguably a pro-school orientation, since they are at opposite ends of the scale between mainstream and alternative social statuses and practices. This also supports the idea that these two concepts do not co-exist at the same time in listeners' perception of Luke, but rather that different participants were responding to different social meanings evoked by his speech. This may be related to his high rate of /t/-glottalling but relatively backed GOOSE tokens.

Finally, the results for Amy (high rates of /t/-glottalling and GOOSE-fronting) are slightly more consistent between the two schools; the chavs are the most frequently chosen answer, followed by the popular group and the arty group. The chav perception echoes the findings from the trait section (e.g. *chavvy*, *annoying* and *uneducated*). Some of the traits can also apply to stereotypes of the popular group, such as *casual*, *confident* and *friendly*. It is difficult to conceive of any shared characteristics or practices between the chavs and the arty group, however – while chavs are outgoing, anti-school and are involved in more mainstream interests, the arty group are reserved, pro-school and alternative. It is likely that, similarly to Luke, a minority of participants do not perceive Amy's speech to be chavvy at all, and that

they are interpreting her phonetic realisations with a totally different set of social meanings.

7.2.2.4 Friendship

The next question asked respondents whether the speaker would be someone with whom they would be likely to be friends at school / college. The possible responses were:

- *Yes*
- *Not friends, but acquaintances*
- *No, but he/she could go to my school / college*
- *No, he/she would go to a different school / college*
- *No, he/she doesn't sound local*

The rationale with the options presented was that they would encompass the range between sounding 'normal' (i.e. he could be my friend) and sounding 'strange' (she doesn't sound local). If there were any sharp perceptual differences between how people supposedly spoke within the school or the local area, these would also be captured through the responses.

This was, however, a somewhat contentious question to include. By selecting any of the options other than 'yes', participants were indicating that they could not imagine themselves being friends with the speaker, which threatens underlying values among students and promoted by educational institutions that school should be an inclusive place in which in principle, everyone is friends with one another. The wording of the responses, between 'yes' and different forms of 'no', perhaps added to the potentially divisive nature of the question. In the group conversations, a handful of participants offered critique of this question, arguing that one cannot or should not decide whether one can be friends with somebody based on the manner in which he or she speaks. In addition, the tendency for many adolescents to make friends primarily with people of their own sex means that the meaning of the word 'friend' may mean something different to listeners when assessing a male voice versus a female voice depending on their own gender. It is important to bear these points in mind when analysing the responses to this question, although it is clear from the variability in answers selected in Figure 7.8 that these provisos did not prevent listeners from using the whole range of possible answers to perceive the stimuli and that responses varied between them.

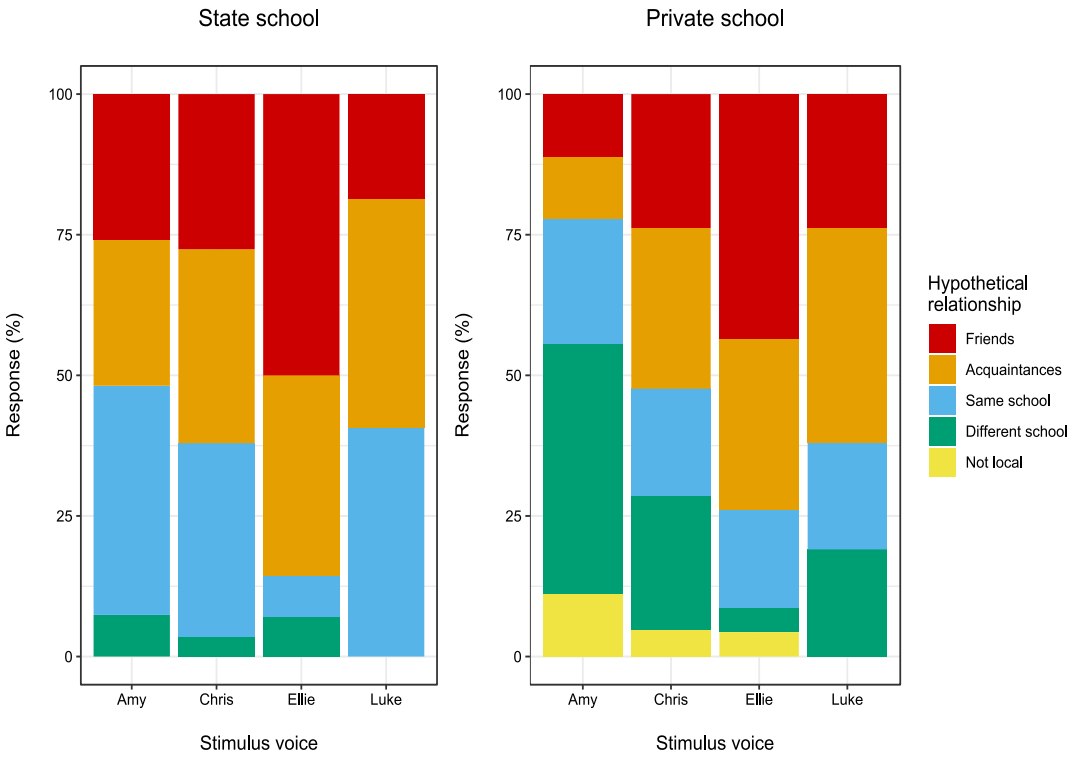

Figure 7.8: Perception responses for relationship with listener by school

The results show that listeners in both schools categorised Ellie as someone they would be more likely to be friends with than the other speakers. This may be related to the positive traits associated with her speech in the first question, such as *friendly* and *attractive*. Only a minority of participants did not think that they would even be acquainted with someone who spoke like Ellie. Luke was less likely than Ellie to be described as a potential friend, though the results between the two schools show similar proportions for 'friend' and 'acquaintance'. The main difference for Luke is that none of the state school listeners thought he would go to a different school based on his speech, whereas 19% of the private school participants did. This may be linked to his relatively high rate of /t/-glottalling and low rate of GOOSE-fronting. Similar findings occur for Chris – 'friends' and 'acquaintances' make up similar proportions of responses for both schools, but the private school listeners were more likely to label him as from a different school or not local. Chris's use of the two variables of interest in production is rather different to Luke's, so it may be that the private school listeners' perceptions were different to those of the state school participants on an overall level as well as on at the level of individual speakers, which is reinforced by the fact that the latter group never selected 'not local' as an option, whereas the former occasionally did.

Overall, there is no significant difference between the state school and the private school, χ^2 (64, N = 45) = 75.02, p = 0.163. However, Amy is labelled as 'friend' or 'acquaintance' by 52% of state school listeners versus 22% of private school listeners. In contrast, 56% of participants at the private school thought that Amy would not attend their school or did not sound local based on her speech, whereas only 7% of

those at the state school did the same. Amy showed the most advanced rates of /t/-glottalling and GOOSE-fronting in production, suggesting that listeners at the two schools may have different social meanings or interpretations thereof associated with these variables.

7.2.3 Summary of survey results

The survey results show that there are a variety of social meanings associated with the stimulus voices encompassing several facets of the speakers' social characteristics and identities. Listeners were able to make these socio-indexical links between speakers' voices and social information based on short recordings with limited auditory input.

I will now briefly summarise the results for each speaker from across the whole survey. Amy was perceived to be the speaker with the lowest-status and most urban socio-economic background and was associated with the stereotypical persona of the chav, who does not care about school work and would not be part of many listeners' friendship groups, particularly for those from the private school, who might not even expect to encounter someone with her kind of speech at their school. In contrast, Ellie is considered most likely to come from a more well-off background and is perceived as educated and articulate. She is frequently categorised as a member of the popular or arty groups, is considered to be friendly and feminine, and the most likely to be a friend to the listeners. Chris is perceived to share Ellie's higher socio-economic class background and greater levels of education and articulateness, but conversely, he is associated with the geeks and similar qualities such as weirdness. The perception of Luke's speech appears to be split between those who see him as shy, geeky and middle-class, similarly to Chris, and others who interpret the way he speaks as indexical of a sporty, masculine 'lad'.

Throughout the sections above, I have made tentative suggestions regarding the links between the results of the perception results and the stimulus speakers' realisations of /t/ and GOOSE. These have necessarily been tentative because it is not possible to attribute listener perceptions to specific phonetic features based on the survey alone. However, there some similarities between the results reported here and previous findings. The speakers with the most /t/-glottalling (Amy and Luke) were perceived to be of a lower social class background and less educated than the stimuli with fewer glottal tokens (Chris and Ellie), which is also found in Fabricius (2000) and Schleef (2014, 2017b). In addition, this reflects how /t/-glottalling is used in speech production to some extent, as previous work finds that glottal variants are more frequently used by those from working-class backgrounds (Docherty & Foulkes 1999; Kerswill 2003), and moreover, in Chapter 4, I find that /t/-glottalling is more advanced in the speech of participants from the state school and from those lower down the social class scale.

It is more difficult to tease apart the production-perception relationship for GOOSE-fronting, since previous work on this feature has yielded mixed results. The speaker

with the most GOOSE-fronting, Amy, is associated with a lower social class and a chavvy persona, but Lawrence (2017) finds that among his younger, more socially mobile listeners in York, it is backed and diphthongal variants of GOOSE that are linked to chavs. On the other hand, in Chapter 5, I found that the production of GOOSE-fronting was led by those who hung out in the outgoing room at the private school vis-à-vis those who spent time in the reserved room. Compare this to the fact that traits such as 'outgoing' and 'confident' were linked to Amy, Chris and Ellie, who all used more GOOSE-fronting than the 'shy' and 'lonely' Luke. It may be that the social meanings of variants of GOOSE are different in Hampshire compared to York, but at this stage, these interpretations are only tentative inferences based on fairly subtle and descriptive variation in /t/ and GOOSE production and perceptual response data between the stimuli.

Finally, the results described above were relatively consistent between the state school and the private school. The only significant difference was related to speakers' social group membership. In one sense, this is unsurprising, as the local communities of practice that form each school are unique to each institution as a constellation of practice. On the other hand, because the schools are loci of different socio-economic classes, it is perhaps odd that the question on speakers' class backgrounds did not yield more notable differences between the two schools. This suggests that the indicators of class may be perceived in similar ways by those from higher- and lower-class backgrounds, or that class in East Hampshire may mean something similar regardless of the type of school one attends. It also indicates that the role of the school as a unique constellation of practice with its own 'culture' may be more affected by its social group make-up than the socio-economic characteristics of its students. It is important to note, however, that the small sample size of the survey data set precludes the proclamation of clear quantitative findings based on this analysis; rather, the survey has been most useful for observing interesting broad-brush patterns that can be explored further. The conversation task data is able to offer a much closer look at the role played by the social dynamics within each school, and moreover, can also provide insight into how the participants linked social information to specific phonetic variation, which is missing from the survey data. This is what I now turn to in the next section.

7.3 Conversation task

7.3.1 Methods

In this section, I analyse some examples of extracts from the group conversations with participants in order to shed further light on the social meanings they associated with /t/-glottalling and GOOSE-fronting. The conversation tasks for each set of participants took place immediately following the survey task and comprised three main phases. In phase one, I initially played back each stimulus in the order in which they were first heard for the survey and asked participants to give their impressions of the speaker's

voice. I typically began the discussion of each stimulus by asking 'What did you think of (*speaker*)?' and proceeded naturally from there. During this phase, some participants identified specific linguistic features and commented on their social associations. These encompassed a variety of levels of language, including prosodic and voice-quality-related remarks alongside segmental ones. By virtue of the fact that respondents were able to identify these linguistic variables by themselves without any assistance, it would be reasonable to suggest that these variables are the most noticeable ones to listeners.

After the participants had finished giving their impressions of the four stimuli, the second phase of the conversation task began. During this phase, I played the clips again and asked respondents to listen carefully to the speakers' pronunciation and, if they picked up on anything interesting, describe it and offer their thoughts on it. We would also expect the features identified during this phase to be the most noticeable ones, even if they required extra concentration and metalinguistic knowledge to identify.

In the final phase, I played back short clips of the stimuli that displayed particular phonetic features that had not yet been mentioned by participants and asked them whether they noticed anything interesting or unusual about the way the speaker said a particular word. If they successfully identified the feature, I asked them to talk about their opinions of it; if not, I pointed out, explained and imitated the pronunciation, and asked the group whether they had noticed it and what they thought of it. The exact quantity and identity of the features discussed during this phase varied depending on whether any of the variables had previously come up in the first two phases as well as how much time of the interview was left. However, the majority of the variables I identified and got the participants to discuss were those that are undergoing variation and change in South East England as 'youth norms' or 'Estuary English': /t/-glottalling, GOOSE-fronting, TH-fronting, /h/-dropping, /l/ vocalisation and /ɹ/ labialisation. If a feature was rarely mentioned during the first two phases and, after being pointed out by me, prompted participants to state that they had not picked up on it before, then we can interpret these as less noticeable.

The analysis of the perceptual conversation data is done in a similar way to the interactional analysis of speech production reported in Chapter 6, in which selected extracts of conversations are presented and discussed via a simple form of discourse analysis (a key for the symbols used is found in Appendix E). This account is by its very nature partial and subjective. The extracts of conversation I present here are those that I believe to best exemplify and act as representatives of attitudes expressed by many of the participants (unless specified otherwise). For qualitative data such as these, it is difficult to follow an 'objective' set of criteria for which certain extracts of conversation can be selected as appropriate for presentation and analysis. Recordings were chosen based on sustained engagement with the data, involving repeated listenings, identification of common themes and careful consideration of which extracts best illustrated these themes.

The following results section is structured so that I first examine to what extent /t/-glottalling and GOOSE-fronting were noticed in the first two phases of the conversation task. This will enable me to make some comments on the variables' noticeability, which is linked to salience as more salient variables are those that are more prominent or stick out compared to their surroundings (Kerswill & Williams 2002; Rácz 2013), and so are likely to be noticed by participants without any explicit identification from me. This analysis does not necessarily make any claims about what makes these features noticeable, which, as established in Section 2.3, appears to be a complex combination of cognitive and linguistic factors. However, it will be able to contribute to the idea of salience as 'noticeability' and whether the two variables, as examples that do and do not fulfil the criteria for salience in many studies, are indeed noticed by participants.

The second part of the results section looks at the social meanings associated with /t/-glottalling and GOOSE-fronting, as articulated by participants' discussions of the stimuli as a whole, as well as their metalinguistic comments specifically directed towards the phonetic variables in question. As part of this, I will move away from comparing the participants' reactions to the four stimuli, as I did in the survey section, and concentrate more on what they say about how the features themselves are used, whether in the stimulus recordings or by their peers at school or in their own speech. These are compared to the results of the quantitative, interactional and survey analyses in order to see whether the socio-indexical meanings alluded to in speech production and accessed via the survey have reached the level at which they can be identified, described and evaluated by listeners, building a cohesive picture of how social meanings work in speech production and perception.

7.3.2 Results

7.3.2.1 Salience of /t/-glottalling

First, I present conversation results for the participants' ability to identify /t/-glottalling. Based on the fact that it fulfils the criteria for salience in previous work (see Section 4.2.3), we would expect listeners to be able to point it out in their initial impressions of the stimuli or when asked to concentrate on the speakers' pronunciation. This is indeed the case for many participants, who sometimes offered detailed comments on how they picked up on the variable and what kind of person it made them think of (see Section 7.3.2.2 for these social meanings). The extract below illustrates a typical scenario – when invited to give their views on Amy's speech, some of the participants note her glottal production of the /t/ in *little* and link it to some social characteristics.

ROY: what made you think she er her voice was annoying? (5)

VANESSA: she didn't pronounce her Ts at all (Cath laughs) I'm not saying that's annoying it's just (.) that doesn't annoy me [it's just]

JAKE: [you pick up on it] don't [you?]

VANESSA: [yeah]

ROY: [all] three of you picked up on that did you?

CATH: no I [didn't]

ROY: [no] OK you didn't

JAKE: there was one word in particular I can't remember it but as soon as I heard it it sort of made me think

At this point in the conversation with Cath, Jake and Vanessa, who were students at the private school, I have just played Amy's recording back and asked them what they think of her speech. Vanessa replies with 'annoying', and when I ask why, she immediately responds with 'she didn't pronounce her Ts at all'. This kind of comment was common in many of the interviews, whereby participants referred to speakers 'not pronouncing' or 'dropping' their Ts, though some respondents were even able to use the term 'glottal stop', reflecting its entry into mainstream discourse on language (e.g. Littlejohn 2011; Hoyle 2014; Shariatmadari 2015). After some laughter from Cath, Vanessa then backtracks on her judgement of 'annoying' before Jake interjects with the tag question, 'you pick up on it, don't you?' Jake explicitly acknowledges here the noticeability of /t/-glottalling, affirmed by Vanessa. When I ask whether all three of the adolescents picked up on this realisation in Amy's speech, Cath replies in the negative. Clearly, glottal /t/ is not so noticeable that it is universally identified by all participants immediately. This is unsurprising on some level since if /t/-glottalling was so noticeable that everyone picked up on it straight away, it would probably not be subject to sociolinguistic variation, not to mention the fact that individual differences in linguistic experiences, metalinguistic knowledge and speech perception will affect listeners' ability to verbally identify and discuss linguistic features. However, it also shows that the mere presence of /t/-glottalling may not be enough for it to reach the level of conscious awareness for some listeners. Yet for Jake, as for many of the young people in the study, glottal /t/ is something 'you pick up on' and that 'there was one word in particular – I can't remember it, but as soon as I heard it, it sort of made me think'. Later in the conversation, this word is confirmed to be *little*, which Amy pronounces with a glottal stop, unlike the other three stimuli. The extract

below from a conversation with state school participants also demonstrates the immediate noticeability of /t/-glottalling, particularly in Amy's realisation of *little.*

ROY: so you've been saying about how erm (2) like different (1) features of the pronunciation sort of make you think (.) different things about the person (.) do you think that you can like attribute those qualities just to one sort of one or two features in their voice or do you think it's that whole combination of lots of things and you g- and you need several kind of (.) things in order to build up that image of the person if you see what I mean?

MICHAEL: I think there'll be a combination but I mean there'll always be one or two stand-out features which like (.) you pick up on at the start and if you dig deeper you keep finding ones that back up that (.) first thing (.) [yeah]

ROY: [yeah] OK what kind of stand-out features would you say (.) [do it for you?]

MICHAEL: [the] (.) Ts definitely (.) wa- wh- when they're pronounceable they don't (.) or replacing TH with a (.) F or V

ROY: [OK (.) yeah]

MICHAEL: [they're] the two main ones

ROY: OK (.) what do other people think?

IMOGEN: I feel like instantly with (.) Amy as soon as she said 'little' [lɪʔə] (.) I got that chavvy vibe (.) and I feel like it's only (.) someone only needs to say that once and it'll be in my head

This group of participants were particularly adept at identifying and describing phonetic features and their social meanings in the stimuli, and so I ask them whether these social associations can be gleaned from individual linguistic features or from a combination of them. Michael says that 'there'll always be one or two stand-out features which… you pick up on at the start', and when I ask him to give some examples, he quickly singles out /t/-glottalling and TH-fronting as 'the two main ones'.[24] After I invite the other group members to offer their thoughts, Imogen describes how she got a 'chavvy vibe' as soon as Amy uttered the word *little,* and that 'someone only needs to say that once and it'll be in my head'. Imogen exaggeratedly pronounces *little* here with a total glottal replacement of /t/ and an open back rounded vowel [ɔ] for the word-final /l/, mimicking /t/-glottalling and /l/ vocalisation, which were both present in the original stimulus. This is interesting because in the context of

[24] Michael's explanation that 'when they're pronounceable they don't' I interpret to mean that when Ts are in a position to be realised as [t], sometimes people do not do so.

the conversation on individual features, she would seem to be agreeing with Michael about how noticeable the use of /t/-glottalling in *little* is. However, her hyper-realisation of the vocalised /l/ in the same word suggests that it may be the combination of the two features that particularly contributes to the 'chavvy vibe' she got from Amy's speech. It raises the question of whether a variable is more noticeable and socially salient if it appears together with other features that also index similar social meanings. What is clear from this conversation, though, is that Amy's /t/-glottalling in *little* is highly noticeable and also strongly evocative of chavviness to these participants. The links to the chav persona will be explored further below, but before doing so it would be good to assess whether /t/-glottalling in other positions or by other speakers is noticed by participants. The short extract below shows that this is indeed the case.

EDDIE: I w- I was thinking working class cause he pronounces his Fs (1) ['third'] [fɜːd]

JONAH: [and] he doesn't really like (.) he misses his Ts a bit as well so like 'foot of a mountain' [fʊʔ əv ə maðnʔĩn] (.) kind of thing

EDDIE: yeah 'third' [fɜːd] that kind of thing

These participants from the private school have just heard the recording of Luke's speech for the second time and Eddie points straight away to the use of TH-fronting in *third*, linking it to a working-class background. Jonah adds that Luke 'misses his Ts a bit', imitating his pronunciation of *foot of a mountain*. This phrase includes two pre-vocalic /t/ tokens, in word-final and word-medial positions. What is particularly interesting is that in the recording, Luke uses a glottal /t/ in *foot* [fʊʔ] but not in *mountain* [maðntĩn], yet in Jonah's imitation of the phrase a few seconds later, he uses a glottal /t/ in both words. Indeed, Luke's /t/-glottalling in the extract used for the stimulus only encompasses word-final positions (see Section 7.2.1).[25] This suggests that not only is frequent word-final pre-vocalic /t/-glottalling noticeable to listeners in and of itself, but it has the capacity to prime them to interpret word-medial /t/ as glottalled (as in *mountain*) even when the speaker does not do so. It is also noteworthy that even though all the speakers in the stimuli used /t/-glottalling at least some of the time, listeners only ever identified it in the speech of Luke and Amy (the two who use it the most), and never Chris or Ellie. This indicates that it may be the presence of other variables together with /t/-glottalling as part of a style (Moore & Podesva 2009) that makes it more salient to listeners. This is supported by comments from the two conversation extracts above that mention TH-fronting at the same time as /t/-glottalling and imitate hyper-realised /l/ vocalisation. TH-fronting and /t/-glottalling

[25] Luke (and the other three speakers) use a glottal realisation word-medially in *unfortunately*. This is to be expected, however, as /t/ preceding a non-syllabic consonant is almost always glottalled.

fulfil the traditional criteria for salience and are associated with working-class identities and 'chavviness', and so hearing one may provoke listeners into expecting the other. Jonah's imitation of *foot of a mountain* and comments from the other conversations presented so far suggest that both word-final and word-medial /t/-glottalling can index these social meanings, whether independently or in conjunction with TH-fronting. This evidence indicates that /t/-glottalling is a very noticeable and socially salient phonetic feature.

7.3.2.2 Social meanings of /t/-glottalling

We saw in Section 7.2.2 that the two stimuli that display the most /t/-glottalling, Amy and Luke, shared some characteristics in common in the survey results compared to the stimuli that show less of the feature (Chris and Ellie). These included a greater likelihood of being labelled as uneducated or chavvy, to come from a working-class background and not to go to the listener's school; this pattern was especially prevalent among the private school participants. In the previous section on the salience of /t/-glottalling, I noted that over the course of the conversations, participants frequently identified /t/-glottalling in the speech of Amy and Luke during either the first or second phase of the task. In some of the transcripts, participants associated 'dropping one's Ts' with characteristics including 'annoying', 'chavvy' and 'working-class'. These social meanings will be explored further in this section.

Previous work on indexicality has proposed that socio-indexical associations between linguistic forms and social meanings occur on a series of levels (Moore & Podesva 2009). Kiesling (2009) argues that this initially takes place via the association of a form with a temporary stance taken up in interaction. Over time and repeated uses of the form when taking a certain stance, the stance accretes (Rauniomaa 2003) to gradually form a more permanent personal characteristic that is indexed by the linguistic feature. This is known as an *n*+1st order in Silverstein's (2003) concept of the indexical order, whereby eventually the social meanings reify into more and more solid forms, such as social types, personae and stereotypes. These *n*-th order meanings do not overwrite one another, but all exist at the same time as possible indices that can be invoked in interaction by using the variant, known in Eckert's (2008) work as the indexical field. This is linked to salience, as features which gain higher-order indexical meanings are more likely to be noticed by listeners, especially those that reach stereotype status.

We saw earlier that /t/-glottalling was often noticed and commented on by listeners in the conversation. Based on the literature on indexicality, we would expect that such a salient feature will index social meanings at multiple levels of the indexical order: stances, social characteristics, personae and stereotypes. This was somewhat in evidence in the interactional analysis in Section 6.4. The question is whether participants are aware of this. The extract below provides some evidence supporting

this idea. The transcript continues straight on from that one shown in the previous section featuring Cath, Jake and Vanessa discussing Amy's use of glottal /t/.

VANESSA: yeah well I (.) I don't find that annoying it's just I think it says something (.) maybe more about *her*

ROY: what does it say about her?

VANESSA: oh no (.) um (.) oh no I'm digging myself a hole (laughs) um (.) I don't know she sounded quite uneducated which isn't annoying but that kind of coupled with how loud she was just kind of made me feel how kind of like in a lesson she'd be really not focused and kind of the one that's chatting at the back with all her friends and that kind of yeah (.) I'm not that yeah

ROY: OK (.) and it was and the dropping the Ts contributed to that [as well]?

VANESSA: [yeah]

Vanessa disowns her judgement of 'annoying' and concedes that the pronunciation of /t/ 'says something more about *her* (Amy)'. I press her for some details, and she paints a lucid picture of Amy as 'quite uneducated', 'loud' and 'in a lesson… really not focused and… the one's that chatting at the back with all her friends'. After this, I confirm with her that it was the use of glottal stops for /t/ that contributed to this perception.

This is noteworthy as it demonstrates the capacity that /t/-glottalling has for the indexation of social meanings at multiple levels of the indexical order by the same person. 'Annoying' is a temporary stance attributed to Amy that, despite her laboured attempt to go back on this claim, was Vanessa's initial response to my first question and so may be representative of her 'gut reaction'. She also describes Amy as 'loud', even though her recording was played at the same volume as the other stimuli, suggesting that this may be a perceived permanent characteristic of the speaker, or if not, at least a temporary stance when reading the text. 'Uneducated' is another permanent characteristic attributed to Amy, and then the rest of the utterance describes in detail the speaker's imagined persona – the kind of person who is inattentive in class and disrupts others by chatting to her friends. Vanessa's comments on Amy's /t/-glottalling thus span three levels of the indexical order – temporary stance, permanent quality and persona – revealing the depth of the indexical field associated with /t/-glottalling for this participant. This supports the idea that as a salient feature, /t/-glottalling can be used for socio-indexical work across multiple layers of social meaning including higher tiers like personae, and that these can be observed through listeners' metalinguistic comments on the variable.

On the surface, it would seem from the perception results discussed so far that participants were more likely to label a speaker as a chav or as from a lower social class background if they heard them use more glottal /t/ realisations. However, many of the participants showed a more sophisticated understanding of the social meanings associated with /t/-glottalling, not seeing it as one-to-one marker of chav category membership but as a stylistic resource that can be used to index a chav identity in certain interactional contexts. The extract below, which follows on from that featuring Eddie and Jonah in the previous section, gives an example of this tendency.

EDDIE: I find chavvy people quite confident

JONAH: yeah confident and it sounds like they're almost trying to drop their Ts and their Fs and stuff (.) not their Fs (.) but yeah

ROY: so you think chavs like consciously drop their Ts (.) [to sound]

JONAH: [sometimes] (.) but like it's

EDDIE: yeah

JONAH: do you know what I mean?

ROSS: yeah

JONAH: like it's kind of like

EDDIE: [it's like slang]

ROSS: [it's almost]

JONAH: [it sounds like] more affected it's like almost like they're putting it on

In this extract, the boys talk about how 'chavvy people' sound 'confident' and that it's 'like they're almost trying to drop their Ts and their Fs' (referring to TH-fronting) and 'almost like they're putting it on'. I would argue that they are attempting here to articulate the idea that people use language as a form of stylistic practice to construct identity, which is not controversial but is something that they may not have ever described before. The participants' comments imply that it is not necessarily those from 'chavvy' backgrounds who use /t/-glottalling, but those who want to 'put on' chavviness.

So far, we have seen that for the participants in the study, /t/-glottalling indexes a 'chav' identity and characteristics associated with this stereotype, such as lack of care about education and a working-class background. The previous conversational extract

hinted that participants were aware that despite the feature's social indexations, it was not perceived solely as a marker of a person's background, but also as a kind of performance that could be used to invoke chavviness and its associated traits. This is shown more clearly in the transcripts below from an all-female and an all-male group recorded at the private school.

ISLA: there's someone in our year who like I wouldn't say was extremely well-spoken but he's like *really* wealthy like

LILY: (whispering) I know who you're talking about!

ISLA: like probably one of the wealthiest per- like if not *the* (.) like

(…)

DEBBIE: yeah [he he does it (.) he almost sounds like Geordie]

ISLA: [he's he's not (.) I wouldn't say he was very well like] spoken (.) but he is like really (.) rich

(…)

DEBBIE: if you saw him you'd be like 'what?'

ISLA: yeah you wouldn't yeah you wouldn't you wouldn't put the fa- like the name with the place (.) like and I reckon he's had like he *has* had quite like a like a luxury upbringing

DEBBIE: but you wouldn't

ISLA: but you wouldn't think

DEBBIE: from the way he

ISLA: whereas like some people (.) d'you d'you remember Chloe

DEBBIE: yeah

ISLA: like she had a very luxurious upbringing and she did sound very [well-spoken]

DEBBIE: [well-spoken]

ISLA: and like articulated

ROY: mm-hmm (.) OK (.) so do you think this guy is kind of putting on his like an accent or something?

DEBBIE: it's just he's one of the like outgoing like lads [like]

ISLA: [yeah he's] like one of the lads

DEBBIE: yeah

JIM: but Theo is hugely different because he is he's such an [extraordinary person]

LEE: [obtuse person]

JIM: he's so he's so (.) upper-class

LEE: (laughs) yeah

JIM: but he is his dialect is so

LEE: chavvy

JIM: not upper-class [so yeah]

LEE: [he's a] contradiction (.) there are there are quite a few people like that though who I think are they're very upper-class they have basically everything you could want and yet are still quite I don't wanna say working-class but less educated

JIM: but I've known Theo for about eight years and I've seen the transition between him being him talking like me… (laughs) um and him sort of over the last like three or four years changing into this like it's like (.) I dunno I don't really understand why (.) um but yeah I know I see what you're saying and there's a few more people (.) o- in the room that I (.) am in who are more like (1) 'oi naah' [ʔɔɪ naː]

LEE: I'd say you have a more [eccentric sort of language]

ROY: [OK OK] so do you do you think those people put it on a little bit?

LEE: yes most certainly I wouldn't say they'd go home and talk like that

JIM: (laughs) no

LEE: they wouldn't talk to their family like that whereas if I were to go home I would… (laughs) I would talk with my family like that whereas I don't think

	Seb would be calling his mum all sorts of profanities that he uses during that langu- [so]
JIM:	[yeah true]
ROY:	but is it like pronunciation as well?
JIM & LEE:	yes
LEE:	[most certainly]
JIM:	[I think his pronunciation] would change when he gets home
ROY:	OK d-d-d- so this sort of so this 'upper-class' group who sort of what put on chavviness if you like
LEE:	yeah
ROY:	they put on the T-dropping
JIM:	yeah
ROY:	and H-dropping and that and TH
LEE:	yes
ROY:	and stuff like those sorts of features is that [about]
LEE:	[they] do it to act cool I dunno why

The conversation in both extracts turns to the same topic: that of the speech of some of the most privileged students at the school. They are described as 'really wealthy', 'having [had] a luxury upbringing', 'upper-class' and 'having basically everything you could ever want'. However, some individuals from this kind of background are said to speak in a way that is not perceived to match their upbringing, which Jim and Lee confirm includes /t/-glottalling (as well as other features such as /h/-dropping and TH-fronting alongside using 'profanities') at the end of their extract, while the girls do so elsewhere. This is described by the speakers as a 'chavvy dialect' or 'almost like Geordie'.[26] When both groups highlight the supposed incongruity between the speakers' pronunciation and their wealth, I ask whether they might be putting it on. Jim and Lee reply in the affirmative, showing an awareness of style-shifting by

[26] 'Geordie' refers to the people and dialect of Newcastle upon Tyne in the North East of England. When Debbie makes this comparison, I do not think she is saying that her classmate actually produces Tyneside features such as distinctive realisations of the vowels in FACE and GOAT. Rather, Geordie is invoked here as it sounds very different to RP and is associated with working-class masculine stereotypes.

discussing how their friend would not use such features when talking to his family at home. Lee states that 'they do it to act cool', which is similar to Debbie and Isla's explanation that the classmate in question is 'one of the lads'. In other words, the participants' comments suggest that these very wealthy students do not use /t/-glottalling because they are from a 'chavvy' or working-class background, but because they want to construct a 'cool' or 'laddish' identity which is appropriate for social purposes at the school. This shows that while the primary social meanings of /t/-glottalling are based on negative associations with lack of education and the stereotypical chav persona, these can be reinterpreted in the school context to suit the construction of 'cool' and 'laddish' identities, even by those from the 'least chavvy' backgrounds at the private school.

7.3.2.3 Salience and social meanings of GOOSE-fronting

In this section, I present the results from the conversation on the extent to which GOOSE-fronting in the stimuli was noticed by the participants and associated with social characteristics. This feature does not fulfil many of the criteria for salience from previous studies (see Section 5.2.3), so we would expect listeners not to be able to point it out in the first two phases of the conversation task nor to give detailed thoughts on its social meanings. This is indeed the case, which means that the conversational transcripts shown in this section will be shorter and less numerous by virtue of the fact that GOOSE-fronting was simply less talked about than /t/-glottalling. This also motivates the inclusion of both salience and social meanings into one section.

Whereas almost all the groups of young people in the study were able to identify glottal variants of /t/ during the first two phases of the conversation, this never occurred at all with GOOSE-fronting. Instead, the variable would only come up in the discussion after I played back specific clips of the speaker producing it (usually Amy in 'afternoon', but I also demonstrated it in other speakers' recordings), explained and imitated the pronunciation and asked listeners whether they noticed it and what they thought of it. The conversation following once such instance of me highlighting the feature is shown below.

ROY: what do you think of that?

FRED: hmmm (.) I have no clue

HEATHER: that's quite weird (laughs) I don't know

FRED: yeah I think it might be his own little add-on to his (.) I don't think too many people've convinced him to go [ỹ::]

HEATHER: it's it's an awkward mix between his two kind of

FRED: yeah exactly like a

HEATHER: yeah

FRED: it's like yugh

ROY: OK but did you pick up on that?

HUGH: no

ROY: or did you only notice when I pointed it out?

HUGH: yeah

FRED: I think I only noticed it when you (unintelligible) yeah

HEATHER: yeah I forgot about it

It is clear that in this transcript, Fred, Heather and Hugh (private school) are not aware of GOOSE-fronting nor of any social meanings associated with it. When I point it out in Luke's realisation of *used*, the listeners find it 'weird', 'an awkward mix' or a 'little add-on' to his speech, but do not link with it any wider social group ('I don't think too many people've convinced him to go [ỹ::]'). They also freely admit that they only noticed the feature after I highlighted it to them. Responses such as this were common whenever I asked participants. Unlike for /t/-glottalling, for which comments were specifically elicited for two speakers (Amy and Luke) but not for the other two, responses varied little depending on the speaker. Sometimes participants would try to interpret the social meanings of GOOSE-fronting based on what they had already said before, trying to back up their previous impressions. When shown fronted GOOSE in other speakers, this sometimes led to confusion and attempts to mediate or qualify their original answers. This is shown in the extract below, featuring the same participants as the previous one but later on in the conversation, after I identify GOOSE-fronting in Ellie's pronunciation of *used*.

HEATHER: (quietly) U thing yeah

ROY: did you notice that or have any feelings about that?

FRED: so she's doing the same thing as the other dude

HEATHER: [yeah 'afternoon']

FRED: [so that makes me think] he is going to a more well-educated [place]

HEATHER: [yeah I] agree with that

FRED: cause he's showing the same sort of

ROY: OK so you think do you think that's kind of a posh trait to do that [y:] thing?

FRED: I think [it is yeah]

HEATHER: [yeah] I think it is (.) a quite yeah just think it

ROY: the thing is before that when you when you said when it was just Luke you said 'ah maybe it's [just a weird thing he does']

FRED: [yeah but it's] like a weird mix [between like the the the chav and the]

HEATHER: [yeah like a mix between] yeah

FRED: but now I think it's just more of a

HEATHER: maybe it is like a trait yeah

FRED: maybe it is just more of just a trait they share

After realising that Ellie is realising GOOSE in a fronted way similarly to Luke ('the other dude'), Fred redefines his perception of the latter as 'going to a more well-educated place' (i.e. school) because earlier he and his peers described Ellie as posh and well-educated. When I ask whether they think that GOOSE-fronting itself is a posh trait, Fred and Heather say yes, though when I bring up their comments from the previous transcript about Luke's use of the variable, they change their opinion again. Fronted GOOSE becomes 'a weird mix between chav and [posh]' and then 'maybe just a trait they share'. Here, Fred and Heather reinterpret my use of the phrase 'posh trait', meaning a characteristic of posh people, removing the word 'posh' to leave just a 'trait', forming a kind of non-descript term that summarises their confusion and ambivalence towards GOOSE-fronting. This demonstrates how listener perceptions of GOOSE-fronting are weak and liable to change based on the direction of the conversation. This suggests that GOOSE-fronting is not noticeable for the participants – it is not identified until I point it out to them, and rather than eliciting strong and clear indexical meanings, participants use what they have previously said to guide their comments on it, sometimes in a haphazard fashion.

The conversation data also revealed some degree of diversity in what social meanings GOOSE-fronting was linked to. Above, we see Fred and Heather describe the feature as 'a weird add-on' and 'a weird mix between chav and (posh)'. Below I present a selection of shorter extracts displaying the range of social information participants attribute to GOOSE-fronting, often in an uncertain manner. While there are some unifying themes, these are rarely elaborated on in detail and often come across as mere speculation.

GEORGE: I think like younger people who aren't like as well-off would probably use that more than like old posh people

ROY: right yep (.) so d'you think it's a working-class (.) thing or [more just like middle-class people]

GEORGE: [mm (.) more (.) working-class yeah] (.) maybe middle

ROY: OK

ROY: OK um (1) what do you think (.) of that pronunciation in terms of yeah do you do you reckon a certain type of person would be more likely to use it or (.) something like that?

MOLLY: er (3) n- not sure it might (2) I don't know I'd never really noticed it in that many people I guess maybe it's like a more (1) maybe more chavvy thing but I don't r- I haven't really noticed that so not sure

ROY: OK (1) so it's not like really anything you noticed [before?]

MOLLY: [no]

LEE: it sounds like he's from Leicester

JIM: (quietly) afternoon

ROY: do you think that's (1) so yeah what what do you make of that?

LEE: I would say that's a sign of someone (.) who is less privileged so probably yeah working-class again (.) but saying that I've also got middle-class down on that so it's probably upper-working-class [again]

ROY: [OK] so you think that he- you're more likely to hear that kind of pronunciation from working-class people?

LEE: yes

(…)

JIM: [um] (1) yeah again it's another thing that I've never really noticed that other people would say differently to how I'd say it (.) um (1) but when you point it out it's like it's something (.) that (1) because I have family (.) up north-ish um more like Wales area (…) I know I n- would now associate that with the sort of way that they would speak

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ROY: do you think it's you know now you h- sort of hear it do you think there are certain people who'd be more likely to do that or is it just a kind of fairly random (.) [thing?]

NATASHA: [um] (1) I mean I probably have done it before with a slip-up (.) but like it probably is a bit of an accent feature

ROY: OK (1) as in what kind of accent feature?

JOEL: similar to Luke

NATASHA: yeah (.) similar to Luke

ROY: what like what do you mean by [that?]

NATASHA: [like] somewhere between middle class and working class

ROY: OK OK (1) so like lower middle class or [something like that]?

NATASHA: [yeah]

The majority of participants in these extracts, when asked what social associations they had with GOOSE-fronting, offered somewhat vague and uncertain responses, typically with hedges and qualifiers ('probably', 'maybe', 'not sure') and a lack of detail. George, Molly, Lee and Natasha all make references to either chavs or those from working-class or lower-middle-class backgrounds, suggesting a possible indexical relationship between fronted GOOSE and speakers from these kinds of backgrounds, but the presence of hedges and the fact that these comments did not arise without me identifying and prompting the listeners to talk about GOOSE-fronting in the first place suggest that these perceptions may be more based on what the participants had already said about the stimuli (typically Amy, who was regarded as

chavvy and working-class because of her /t/-glottalling and other features). The only respondent in the study who shows a greater degree of confidence in his answers on GOOSE-fronting is Lee, who immediately says that the speaker 'sounds like he's from Leicester' and is 'less privileged'. Lee regularly visits family in the Midlands and frequently mentions in the conversation his familiarity with the speech of the region and how distinct it is from the accent of his peers in Hampshire. Research does not suggest that GOOSE-fronting is particularly advanced in Midlands varieties compared to accents of the South East or other places in England (Ferragne & Pellegrino 2010), so it is unclear whether Lee's comments reflect what is actually going on in speech production or not. It is likely that Jim's remarks about fronted GOOSE being associated with his family up north are an echo of Lee's and are not a firm perceptual link. It would seem, then, that the listeners in the study do not strongly connect GOOSE-fronting with social characteristics of the speaker; rather, their comments on working-class backgrounds stem mainly from what they have already said via other more noticeable features such as /t/-glottalling and TH-fronting.

Finally, it is also worth noting the private school participants' discussion of the differences between the two rooms where the sixth-form students hung out at lunch time. As shown in the two previous chapters, the production of /t/ did not vary significantly between members of the two rooms, whereas for GOOSE, pupils in the outgoing room used significantly fronter realisations than the those in the reserved room. It would therefore be interesting to examine how the young people described the linguistic differences between the two rooms. It turned out that the participants rarely referred to any examples of features that the members of the rooms used differently, and GOOSE-fronting was never mentioned. As we have seen above, neither was GOOSE-fronting attributed to any stances or social characteristics that could be indicative of 'outgoing' vs. 'reserved' categories. The transcript featuring Jim and Lee in the previous section, on privileged students who speak like chavs, was originally given in response to a question on the linguistic differences between the rooms. Jim is in the outgoing room and Liam is in the reserved room, and they talk about how Jim's room contains the majority of the 'chavvy-sounding but upper-class' pupils and how they speak in a more 'eccentric' manner. As discussed earlier, this includes /t/-glottalling and TH-fronting but not GOOSE-fronting. The following transcript also shows a group of participants talking about the lack of linguistic differences between the rooms (here referred to as 'groups').

ROY: and can you te- can do they speak differently the different groups?

TIM: no

CARA: no

TIM: we all speak we all speak everyone at (school name) speaks relatively similarly

CARA: [yeah]

OWEN: [yeah] apart from there are a few people which speak differently but (.) but they [it doesn't]

TIM: [like Hal] (laughs)

OWEN: yeah it's not to do with what group they're in it's just cause (1)

CARA: they want

OWEN: it's [who they are yeah in a sense]

TIM: [their upbringing] well what school [they went to first or anything]

OWEN: [it doesn't really make a difference to what group they're in]

ROY: oh right so (.) so why do those (.) people speak differently?

TIM: well like

OWEN: ah p- probably just their background kind of when they they've always kind of spoke that way and it hasn't really made a difference to what group they're in there isn't kind of groups that will (.) speak in a certain way (.) but people (.) there's a little variety in

ROY: and when you say 'background' like their parents and er (.) [where they come from]

OWEN: [yeah I think] (.) I mean there there's some people who you can tell are probably a little bit more upper-class in the way they speak they may not even be (.) that much (.) richer in the sense although they probably are [but I think] it's just their general (.) they're more kind of posh in a sense but

TIM: [they just sound it] (4) yeah like (.) like one kid

OWEN: it it doesn't really affect their personality but just kind of (.) the way they speak you can tell

TIM: yeah like one guy went to (1) boarding school before this and he sounds a lot posher than (.) anyone and stuff so it's stuff like that

It is clear in this conversation that these three participants do not think that the members of the two rooms at the private school speak differently. Instead, they focus on how certain individuals who have more 'upper-class' backgrounds (e.g. previously attending boarding school) use more 'posh' speech. This is later described to include some unspecified phonetic features together with lexical items. The point is that as far as these participants are concerned, it is primarily a student's background or possibly what 'they want' to sound like that drives linguistic variation at the school rather than friendship group or room membership. This complements the comments from earlier alluding to 'posh' pupils who use 'chavvy' language, but it suggests that these are not necessarily delineated by room. Neither /t/-glottalling, nor GOOSE-fronting, nor any other specific features are mentioned in these discussions, suggesting that linguistic differences between the rooms, if any, are subtle and not noticeable. This ties in with the results for speech production, whereby the more noticeable and socially salient /t/-glottalling did not vary by room but the less noticeable and less socially salient GOOSE-fronting did. It may be that highly salient variables index too much social meaning to be used for micro-level identity work in this context, especially in a school where many students were at pains to point out that everyone was more or less the same and that the rooms were inclusive and welcoming of people who did not normally hang out in that room. Any identity construction related to room membership or indexing the qualities associated with them (outgoingness vs. reservation) would hence have to be done using less socially salient variables that operate at a lower level of the indexical order.

7.4 Chapter summary

This chapter has presented analyses of the social meanings and salience of /t/-glottalling and GOOSE-fronting in the speech of young people from Hampshire by examining data elicited from survey and conversation tasks. Each of the four stimulus voices was associated with a different range of social characteristics, though some similarities emerged. In particular, the stimulus voices seemed to form two pairs in terms of sharing a similar cluster of traits, namely Amy and Luke as one pair and Ellie and Chris as the other, which was largely present for both the state school listeners and the private school listeners.

The survey results showed that the two stimulus voices that used relatively high rates of /t/-glottalling, Amy and Luke, were more likely to be labelled with characteristics such as 'uneducated' and 'working-class' than Chris and Ellie. These latter two speakers, in contrast, were perceived to be 'educated', 'articulate' and 'middle-class'. In the conversation task, many listeners were able to notice individual glottal stops in the stimulus voices and associate these pronunciations with the social type of the chav. One phenomenon particular to the private school was that some participants showed an awareness that glottal /t/ can be used to 'sound chavvy' even by speakers from privileged backgrounds, demonstrating its ability to evoke social meanings at

multiple levels of the indexical order via inclusion as part of a style. The participants did not link glottal stops with solidarity or any of the other subtle, stance-based meanings from the interactional data, suggesting that these meanings may be extended reinterpretations of the chavvy persona that have yet to reach conscious awareness.

The survey data did not show clear patterns in terms of the social meanings of GOOSE-fronting, as Amy and Luke, who used the most and least fronting respectively, clustered together in terms of social associations. In the conversations, some participants linked GOOSE-fronting to working-class speakers, but their comments were almost always uncertain, reliant on my identification, and largely shaped by their previous remarks made in response to more salient features such as /t/-glottalling. This suggests that GOOSE-fronting had a minimal effect on their perceptions and may thus not be noticeable or socially salient in this community. This supports previous work suggesting that the social meanings of GOOSE-fronting are variable and community-dependent. The implications of these findings are discussed in the next chapter.

8 Discussion

8.1 Summary of findings

The quantitative analysis of /t/-glottalling showed that this feature varied according to macro-sociological categories among the young people in East Hampshire sampled for this thesis. This included social class, gender, school and previous school, but not the micro-level category of room (constellation of practice) at the private school. In contrast, GOOSE-fronting was led by speakers who hung out in the outgoing room, yet the significant interactions it showed with phonological context according to previous school, gender and settlement were very small and were mostly down to differences between preceding contexts. In terms of how individual speakers used these variables in interaction, high rates of glottal /t/ appeared to index a position of solidarity, while high rates of alveolar /t/ were seemingly used to construct a geek identity. I interpreted these findings as higher-order indices based on existing associations between glottal /t/ and working-class-ness, and alveolar /t/ and articulateness respectively. Acoustically extreme tokens of GOOSE could be used to index mainstreamness and formality vs. alternativeness and lack of respect for authority for acoustically front and back GOOSE respectively.

In perception, /t/-glottalling was frequently noticed by participants in the conversation and associated with a lack of care for education and chavviness, reflecting similar results in the survey associating these characteristics with Amy and Luke, the two stimuli with the most glottal tokens. Listeners were also able to demonstrate their awareness of the *n*+1st index of laddish masculinity linked to /t/-glottalling by identifying it as a feature of certain boys from highly privileged backgrounds. GOOSE-fronting was never identified by listeners without my intervention and its perceptual associations were weak and highly influenced by preceding discussions of other features. While speakers at the private school were all very aware of the outgoing-reserved room split in the sixth form, this social division was never linked to variation in GOOSE-fronting and rarely to linguistic differences in general.

The next three sections of this chapter will be structured around the three research questions posed in Section 3.3, which are reproduced below.

1. To what extent are the patterns of sociolinguistic variation of phonetic features reflected in speakers' perceptions of these features?
2. Does a feature's availability for making social meaning depend on its fulfilment of salience criteria and whether it is noticed by speakers?
3. How do the production and perception of variables undergoing change operate on a local level among adolescents at a state school versus at a private school?

The first section considers the relationship between speech production and perception in regard to the social meanings linked to /t/-glottalling and GOOSE-fronting. The second section assesses what the results suggest regarding the salience of the two features and how the findings can be used to inform how researchers go about theorising and operationalising salience in the future. The third section discusses how the two schools in the study act as two social class groups as well as two constellations of practice, and what this means for the social meanings of the two linguistic variables at a community level.

8.2 Social meaning in speech production and perception

8.2.1 /t/-glottalling in speech production and perception

Previous work on production-perception relations in sociolinguistics has found that some sociolinguistic production patterns are borne out in listener perceptions but that there is no robust one-to-one link between the two (Drager 2015; Lawrence 2017). The results in this thesis support this view.

In the conversation, /t/-glottalling was regarded by most participants as a feature primarily used by those from less privileged backgrounds or people who are 'less educated'. Similarly, in the survey task, the two stimuli with the most /t/-glottalling, Amy and Luke, were rated as more likely to be 'chavs' and associated with traits such as 'uneducated'; in contrast, Chris and Ellie, who used less /t/-glottalling, were not seen as chavs but as 'educated' and 'articulate'. These perceptual social meanings were, in some sense, related to what was taking place in production. Speakers who attended the state school (or who had formerly attended state school) used more glottal /t/ than those who (had formerly) attended private school. Girls with a lower social class score also used more glottal stops than those with a higher score. To say that a state school education leads to someone being 'less educated' than does a private school education is of course a matter of subjective opinion rather than fact, but the traditional prestige and high assessment outcomes associated with private schools do influence the way people talk about quality of education. In this sense, the variation in /t/-glottalling production by school, previous school and social class score is to some extent reflected in participants' responses to the perceptual stimuli.

The perception results for /t/-glottalling also revealed that some participants were aware of how the glottal stop could be used to index other qualities regardless of socio-economic or educational background. Indeed, some private school participants discussed the existence of a group of highly affluent male students at the school who spoke in a 'chavvy' way (which explicitly included /t/-glottalling) in order to express their identities as 'lads' or to be 'cool' among their friends. Unfortunately, I was not able to identify this specific phenomenon in interaction, as none of the participants I recorded identified themselves as 'lads' or engaged in clear ideological stances relating to the construction of that kind of masculinity. On a few occasions,

participants recommended that I record one or two specific individuals who were said to exemplify this behaviour and identity regularly, but sadly these boys did not agree to take part in the study. However, the interactional analysis did show that the participant John used a very low rate of /t/-glottalling as part of his strong identification with a geek persona. In many ways, the geek persona is the opposite of that of the lad – geeks are quiet, scholarly and engage in technical, 'safe' interests that do not accord with traditional masculinity, while lads are loud, outgoing, sporty and enjoy riskier masculine activities such as parties and binge-drinking. So, while it was not possible to observe glottal stops being used to index laddishness in production, alveolar /t/ was found to index geekiness in the interactional analysis. This accorded with the perception results, which showed Chris, who used the fewest glottal tokens, to be perceived as 'geeky', 'educated' and 'weird'.

One of the clearest themes from the production-perception findings discussed above is that the social meanings of /t/-glottalling appear to be gendered. It would seem to be no coincidence that participants talked about the use of 'chavvy language' by 'upper-class' *boys* specifically, that the high rate of alveolar /t/ to index geekiness was used by a male participant (John) and that the stimulus voice Chris (male) was much more likely to elicit negative perceptions such as 'weird' and 'geeky' as a result of his 'articulate' speech than Ellie (female, who used similarly few glottal tokens). The links between variants of /t/ and laddishness and geekiness are more pertinent for boys because sounding as though one does not care about education (the key characteristic of chavs in the community) is a prized attribute in traditional forms of masculinity that emphasise physical prowess over intellectual achievement. This may also help explain the finding that boys were significantly more likely to use glottal stops than girls overall. Similar effects have often been found in previous research, whereby men are more likely to use 'stigmatised' variants than women as a result of the 'covert prestige' of working-class forms and their association with 'tough' masculinity (Trudgill 1972).

I would suggest that a kind of covert prestige is in operation for glottal /t/ among these adolescents in Hampshire, as it is associated with traditional physical masculinity, which in a contemporary British school context is expressed through the 'lad' persona in contrast to that of the 'geek'. The latter represents a rejection of the masculine ideal embodied by the lad and is thus constructed via the avoidance of glottal stops (and use of alveolar stops). The lad and geek identities are on paper equally available to teenage boys (in this community) regardless of social class as they are more about orientation to gender norms than class norms. This is particularly so in the private school, where economic conceptions of class do not play much of a role due to the financial attendance barrier already in place, thus prompting the discussion of wealthy boys who use glottal stops 'because they're lads'. This may also help in the interpretation of the significant interaction between gender and social class score. A predictable class effect (in which those lower down the class spectrum use more glottal stops) occurs for girls because glottal stops do not seem to be associated with adolescent female personae or stereotypes, but it is nullified for boys because of the

existence of the lad-geek dichotomy that transcends social class. I put forward this interpretation with caution due to the imbalance in class backgrounds represented among the participant sample and between the boys and the girls, but in light of the interaction and perception results, it would seem to be a compelling argument that warrants consideration.

Not all of the /t/ production results were reflected in perception, however. Glottal /t/ was used by Kim to express solidarity and casualness when sharing stories about a group of BTEC students constructed in opposition to A-level students, among whom were herself and her interlocutors. Despite the awareness that some listeners showed regarding the capacity for glottal stops to be used for social purposes regardless of a speaker's background (as discussed above), there was no acknowledgement that they could be employed to reinforce stances such as those taken by Kim in the interactions analysed in Chapter 6. However, these meanings occur at the very lowest level of the indexical order, i.e. temporary stances of solidarity and openness, which are, in Silverstein's (2003) model of indexicality, below the level of consciousness anyway as they have not reached stereotype status. In this case, it is not surprising that these meanings did not appear in listener perceptions. Considering the notorious difficulty lay listeners find the task of discussing the details of language and its social associations, it is impressive that the participants were able to discuss how features such as /t/-glottalling could be used for particular stylistic practices and social purposes by certain types of speakers. Further study of lower-order indices in speech perception would likely benefit from less direct methods (e.g. perception experiments in controlled settings, such as D'Onofrio 2015, 2018) as they are too far below the level of awareness for speakers to be able to comment on them, although it has also been suggested that such relationships may not be amenable to priming effects (Juskan 2016). The survey question on the speaker's mood at the moment of the interaction aimed to capture the temporary meanings linked to their speech, but this was largely nullified by the fact that all speakers were reading the same passage. Future work would benefit from a carefully considered operationalisation of stance in speech perception, for which an implicit measure such as the Implicit Association Test may prove useful.

8.2.2 GOOSE-fronting in speech production and perception

The production results showed that GOOSE-fronting primarily varied according to language-internal factors such as preceding context (palatal, coronal, non-coronal or liquid) and following context (coda lateral or other). Preceding context showed significant interactions with a handful of social factors, namely gender, previous school and settlement, suggesting that these social effects were restricted to certain phonological environments. Observation of the graphs revealed that these social effects were small and inconsistent. The only social factor that showed a significant effect regardless of context was the room difference in the private school, with outgoing room students using more fronted GOOSE than those in the reserved room.

However, this room effect was not reflected in participants' perception results. In the conversations about the differences between the two rooms, students rarely mentioned any linguistic phenomena that characterised each room's members, let alone variation in GOOSE. Indeed, GOOSE-fronting was never mentioned by participants unless I pointed it out. There were few recurring themes in terms of the proposed social associations linked to fronted GOOSE – the only one of note being something akin to a lower-middle-class identity or a 'weird mix between chav and posh'. This was, however, largely suggested as a follow-on from previous discussions about other features or from general comments about the speakers and were delivered in an uncertain fashion.

It would hence be fair to say that the production patterns for GOOSE-fronting were not reflected in listener perceptions. However, it is difficult to make meaningful comment about the perceptions of a feature which participants were so unsure about and did not 'hear' until I pointed it out. The survey responses offer an indirect route to accessing listener perceptions, but there was little patterning based on the realisation of GOOSE tokens in the stimuli. The survey results showed that similar perceptions were associated with Amy and Luke as one cluster of voices and Chris and Ellie as another. For instance, both Amy and Luke were much more likely to be categorised as 'chavs' or 'working-class' than Chris and Ellie, who never received these labels. However, Amy and Luke are at opposite ends of the spectrum of GOOSE-fronting, with Amy using the most fronted tokens and Luke the least fronted. In terms of differences between the two, Amy was regarded as 'confident 'and 'outgoing' while Luke was seen as 'shy' and 'boring'. These are very difficult to attribute to GOOSE-fronting, though, because corroborating evidence does not appear in the interaction or conversation data nor in previous research.

The findings suggest, therefore, that fronted GOOSE is not overtly socially meaningful in speech perception, even though it may potentially be used for lower-order social work in production thanks to its split between the rooms at the private school and the use of acoustic extremes in interaction to index stances towards formality and authority. Other work on the perception of GOOSE-fronting has also found that listeners do not consistently show sensitivity (even implicitly via priming experiments) to its social indexation (Fridland *et al.* 2004, 2005; Alderton 2015; Lawrence 2017). This is likely to be related to the fact that, as shown in this study, listeners do not notice GOOSE-fronting in the first place, or at least do not have the metalinguistic terminology to identify it. Drager (2015) and Juskan (2016) suggest that for variables below the level of conscious awareness, even implicit tests of sociolinguistic knowledge such as priming studies may not be successful. This raises the question of how to go about studying the social meanings of non-salient variables. If listeners are not able to identify and discuss them using direct methods like conversation tasks as reported in this thesis, nor do they respond to visual primes containing social information in a controlled perception experiment as in Lawrence (2015) and Juskan (2016), then how are researchers supposed to access these social meanings in perception? For GOOSE-fronting, it may well be that its status as a very

widespread, phonetic co-articulation-induced change and its very community-specific variation and social meanings mean that these meanings are simply too weak and subtle to be perceptible by listeners in the community regardless of experimental methodology. But what about features such as velar nasal plus in Liverpool (Juskan 2016) or /t/ affrication in Sheffield (Kirkham 2013), which can be markers of local or ethnic identity in production but whose existence or whose sociolinguistic patterns are rarely perceived by listeners? This may be where further work should use a mixture of perceptual methods (e.g. D'Onofrio 2018) – both direct and indirect – in combination with community studies to see if these features are particularly socially salient for certain groups versus others, whose exposure and attitude towards identity factors may vary (Levon & Fox 2014; Schleef 2017b).

8.2.3 Summary

The results of this thesis suggest that the link between sociolinguistic speech production and perception is not a one-to-one match and is particularly weak for variables below the level of conscious awareness, supporting Drager (2015). As literature in the field takes increasingly seriously the differences between direct and indirect methods of investigating speech perception (e.g. Pharao & Kristiansen 2019; Rosseel & Grondelaers 2019), it is important that we make use of both kinds of methods in our study designs, particularly in sociophonetics, which has tended to favour implicit techniques. In the words of Dennis Preston, the way to 'trick respondents into revealing implicit attitudes' is to 'talk to them' (Preston 2019). This might mean that when we conduct sociolinguistic interviews with speakers and the topic turns to what language variation they have noticed in the community, their comments are not ignored or treated lightly but analysed properly using qualitative methods. Juskan (2016) puts this into practice in order to establish the noticeability of Liverpool features for a priming experiment, yet the overt evaluations he elicits from participants are treated as part of the production analysis rather than as a form of perception data to access variables' social meanings. I showed in Chapter 7 that doing survey and conversation tasks with the help of auditory stimuli of speakers from the same community allows rich data to be obtained on how listeners position themselves in relation to the users of particular variants and the range of indexical meanings that they associate with them. These can then be compared with quantitative and qualitative production data to see how the statistical patterns of variation are borne out in individual identity-laden moments of conversation. The difficulty comes in analysing the perceptions of variables that speakers neither find it easy to talk about nor seem to link to social information in laboratory-style experiments. Just because these features are hard to investigate, however, that does not mean that they are impossible to study, as their social meanings may still be encoded somewhere in perception, even if they are very dependent on the social or interactional context (Eckert 2005). Preston's (2019) work on language regard, for example, shows that by looking at the underlying implications and presuppositions behind speakers'

utterances when discussing language, low-level social meanings of regional accents can be uncovered. Future work could extend this approach to individual linguistic features.

8.3 Social meaning and salience

The notion of 'salience' has had several different conceptualisations over the course of research in sociolinguistics, as discussed in Section 2.3. Despite the different definitions of salience used in different studies, in the respective chapters for the quantitative analyses of /t/-glottalling and GOOSE-fronting I discussed how the former matched many of the criteria for salience from previous work while the latter did not. Regarding the data analysed in this thesis, I operationalised salience through two constructs: noticeability (with my own working definition) and social salience (Levon & Fox 2014). The former refers to participants' ability to identify the features without prompting in the conversation task. The latter refers to the features' capacity to evoke social meaning via quantitative patterns and interactional work in production and strong links to various indices at different tiers of the indexical order in perception. This was part of an effort to acknowledge the difference between two aspects of salience: (i) the cognitive processes behind attending to a surprising or prominent object; and (ii) the processes of reinterpretation of socio-indexical relationships, which gradually leads some features to index stereotypes (Silverstein 2003).

The results showed that glottal /t/ is both noticeable and socially salient in perception for the adolescent listeners in Hampshire. It was regularly identified by participants in the conversation task without prompting, given a name such as 'not pronouncing the Ts' and imitated in particular words such as *little* [lɪʔo] – that is, it was highly noticeable. It also attracted strong, consistent and multi-layered social meanings in listener perceptions. Participants spoke of the 'chavvy vibes' that they immediately got from hearing a glottal stop; of the stances, characteristics, personae and stereotypes they associated with its use (e.g. annoying, uneducated, disruptive students and chavs); and of its ability to index laddishness as part of a style employed by 'upper-class' male speakers. In other words, /t/-glottalling is highly socially salient.

In contrast, fronted GOOSE is neither noticeable nor socially salient for the sample in perception. Participants did not pick up on the GOOSE variable nor any of its variation between the stimuli until I identified it for them, at which point they sometimes struggled to 'hear' the difference even when acoustically front and back clips were played to them and I demonstrated it to them with my own imitations of the pronunciation. When asked what kind of speaker they thought would be most likely to use GOOSE-fronting, many participants were not sure, commenting that 'the U thing' was something that 'everybody did' or was 'normal'. Some listeners suggested certain class or region-based demographic information for speakers who used GOOSE-fronting, but this was typically done in a reactionary way to what they had already

said for a particular stimulus and not specifically about GOOSE or the kind of style that fronted GOOSE would be a part of. Hence GOOSE-fronting does not appear to be very socially salient for these participants.

My definition of social salience offered in Section 2.3.4 also encompassed the extent to which the variables can be used to evoke social meaning in speech production. The difference between /t/-glottalling and GOOSE-fronting here is less clearly defined than in perception, but it is still present. Glottal stops were used more often by current and former state school students, boys, girls with lower social class scores and in the conversation task. It was used to an extreme rate in interaction as part of discourses laying claim to an open and solidary identity in the context of storytelling about an oppositional social group at school. It was also used to an extremely low degree by a speaker who identified with the geek label and privileged articulateness and education. This combination of macro-level quantitative patterns and meso-level instances of stance and persona construction in interaction suggest that glottal /t/ is highly socially salient in speech production. GOOSE-fronting showed smaller macro-level effects in the statistical models, the main significant factors being linguistic ones such as phonological context. The most significant social factor was that it was led by students in the outgoing room at the private school. In interaction, acoustically extreme tokens of GOOSE were used to construct identities of respect versus disrespect for formality and authority. These slightly mapped on to the room divide in terms of the similarities between these stances and the characteristics that defined the two rooms, but they were not an exact match. Thus, in the private school in my study, GOOSE-fronting seemed to serve some kind of purpose in indexing mainstream and normative social roles, though students were not aware of this difference in their perceptions of the two rooms or of the phonetic variable. On a community-wide level, however, there was little evidence for social meanings of fronted GOOSE, particularly at higher orders of indexicality such as personae and stereotypes. In sum, this suggests that GOOSE-fronting may be slightly socially salient in production at the private school, but overall it is much less socially salient than /t/-glottalling.

Some of the research on social meaning has put forward the idea that some variables are only imbued with meaning (or at least do so more strongly) as part of a cluster of other features, forming a style (Campbell-Kibler *et al.* 2006; Moore & Podesva 2009; Slobe 2018). This has implications for salience as it suggests that some variables may only be socially salient if they appear together with others, which may also extend to noticeability. There was some evidence for this in the data. Glottal /t/ was often mentioned together with other 'Estuary English' variables, particularly TH-fronting, to form what participants described as 'uneducated'-sounding or 'chavvy'-sounding speech. The oft-mentioned word *little*, which featured a glottal stop in Amy's recording, also included /l/ vocalisation. In their imitations of the stimuli, speakers sometimes produced additional glottal stops or other Estuary features that were not present in the original recordings that they had heard mere seconds before. While glottal stops were also identified independently, as discussed above, this provides evidence that the social salience of a feature depends on its co-occurrence with other

variables that likely share similar patterns and social meanings. This gives participants the easier job of framing their perception in terms of overall accents or styles (such as 'chavvy speech') with linguistic examples, rather than as individual phonetic phenomena devoid of stylistic context. This latter effect seems to be what occurred for GOOSE-fronting – even though it appeared together with some Estuary features in the four stimulus voices, it did not receive a boost in social salience thanks to this clustering. This indicates that for adolescents in East Hampshire, GOOSE-fronting is not part of a socially meaningful style, at least not to the point that the social meanings of other features cross over onto fronted GOOSE. It is possible that other features may also do the work of indexing the attitudes to formality that GOOSE appeared to do at the private school, though my focus on only two variables in this thesis precluded this from being tested. It may also be the case that other, more socially salient variables 'blocked' listeners from picking up on the social meanings of GOOSE-fronting (Campbell-Kibler 2009; Levon 2014; Pharao *et al.* 2014). Future work on salience and social meaning would benefit from the study of a large number of variables undergoing change at the same time (i.e. more than the two studied here and in many other studies such as Levon & Fox 2014; Schleef 2017b) to see whether some features boost the salience of others if they occur together. The South of England would be an ideal place to do this given the large number of linguistic variables associated with youth styles / Estuary English that are spreading throughout the region (Przedlacka 2002; Altendorf 2003, 2017).

The distinction I have employed here between noticeability and social salience has been useful as it has allowed me to talk about different aspects of the overall concept of salience without conflating different phenomena. However, it is clear that the two are closely related, which has been pointed out even in studies that separate cognitive and social salience. For example, Rácz (2013) states that only cognitively salient features can become socially salient. Cognitive salience and noticeability are not directly equivalent as the former is usually measured via mathematical modelling, but the latter term attempts to express a similar idea – that the feature stands out compared to its surroundings. This is evident in the results – /t/-glottalling is both noticeable and socially salient, while GOOSE-fronting is neither. Yet at the same time, it would seem that fronted GOOSE can potentially perform some kind of social meaning-related role in production (at the private school) without being noticed. This kind of tendency has been observed from the very beginning of sociolinguistics, with Labov's (1972) 'marker' being a feature that shows variation according to task formality but does not reach conscious awareness. This either implies that noticeability is not a pre-requisite for social salience, or that we need to be more rigorous with our definitions of cognitive and social salience. Is noticeability as used in this thesis an adequate equivalent for cognitive salience? Where does one draw the line for social salience? Does a feature have to reach stereotype status (in Labovian terms) to be classed as socially salient, or can we talk about a continuum of social salience according to what levels of the indexical order it reaches or how big an indexical field it has?

These questions are difficult to answer empirically. However, they raise important concerns about what exactly is meant by terms such as cognitive and social salience, noticeability, consciousness and awareness. Recent treatments of the topic such as Campbell-Kibler (2016) and Drager and Kirtley (2016) provide a useful step in the right direction. What is evident is that studies of salience and related concepts in sociolinguistics must be as clear as possible in their definitions of these terms and justify why they are useful to study the particular questions that researchers are investigating. The literature has shown that there is still a considerable amount that we do not know about why some features are more 'prominent' than others and that simply using 'salience' as a catch-all term for this phenomenon is not sufficient if we want to make a point about it at more than a superficial level. The risk of circularity is strong, and so we should at the very least attempt to make clear whether we are talking about the cognitive factors that make an item 'surprising' compared to its surroundings, its ability to index social meaning according to theories such as indexicality, or something else. It is likely that most studies in sociolinguistics will be more interested in social salience as opposed to cognitive salience, the latter increasingly situated in the realm of psychology and cognitive science, although we do not yet know enough about either to confidently treat them as entirely separate processes. It is very tempting to completely abandon salience as a construct, as suggested by Auer (2014), but to do so would ignore the undeniable fact that some sociolinguistic variants are more prominent to listeners than others and that this is a multi-faceted phenomenon that is not exclusive to linguistic, cognitive or social factors.

8.4 School, social class and constellations of practice

8.4.1 Social class

As discussed in Section 3.7.1, it is possible to conceptualise social class in a multitude of ways. I tested several methods for this thesis and settled on a composite score of three separate indices (parental education, parental occupation and house price), which showed the least collinearity compared to other measures and accounted for several individual class characteristics. /t/-glottalling showed a small but significant interaction between social class score and gender, while this variable was not significant at all for GOOSE-fronting. However, school and previous school type can also be considered as ways of measuring social class, since only a certain portion of the population has the means to send their children to private school. School and previous school showed a bigger significant interaction with phonological context for /t/-glottalling than social class score, while GOOSE-fronting showed a weak effect of previous school.

The relatively small effect of social class score is surprising on some level, particularly for /t/-glottalling, since previous research suggests that this feature is more common in the speech of working-class people compared to those of higher

socio-economic status (Trudgill 1972; Milroy *et al.* 1994; Williams & Kerswill 1999; Stuart-Smith *et al.* 2007). GOOSE-fronting also shows some class variation in some previous studies (e.g. Przedlacka 2002; Altendorf 2003; Flynn 2012; Jansen 2019). This result could be for a number of reasons. The first is that the sample is potentially too homogeneous in its overall social class make-up. I attempted to account for this by setting the class scores and house prices relative to the area, thus spanning a wide range (house price, for example, ranged from 0.36 times the average for the area to 3.17 times, with a mean of 1.35 times the average). Yet ultimately, the samples from both schools were dominated by pupils whose parents were university-educated and had professional / managerial occupations, with the lowest end of the socio-economic spectrum (e.g. participants whose parents had semi-/routine occupations) only represented by a handful of speakers at the state school and none at the private school. It may be that the sample does not represent the full range of socio-economic variation, though the distribution is ultimately not particularly surprising given the demographics of East Hampshire and the fact that a private school was one of the two fieldwork sites. It is also the case that those towards the upper end of the socio-economic spectrum tend to be more willing to participate in academic social science research (Savage *et al.* 2015). In this study, this relates to both participant willingness and parental willingness, since parental consent was sought and required prior to speakers' participation. It is also possible that composite class scores are not good ways of modelling social stratification, though these were tested alongside other options and proved to work best in the regression models.

The influence of parental mentality is also strongly linked to the choice of school for one's child, which is itself a manifestation of social class. It is possible that the willingness to pay for a perceived educational advantage for one's child in the form of private school is on its own terms a very powerful mode of distinction (Bourdieu 1984), which potentially transcends economic concerns such as occupation or house price to some extent. For example, while Dearden *et al.* (2011) find that families with higher incomes are more likely to send their children to private school than those with lower incomes, this effect is smaller than that of socio-cultural factors such as having a parent who attended private school themselves and parental political party affiliation. This is particularly relevant for the region in question, where private school fees are high, and the quality of the local state schools is good; these two factors have been shown to reduce the demand for private education (Blundell *et al.* 2010). The importance of cultural factors in school choice is highlighted in Ball *et al.* (1996), who find considerable variation in parents' approaches to choosing a school for their children. They analyse these differences in terms of Bourdieu's (1984) notions of cultural capital and taste: middle-class parents are able to adeptly make distinctions between schools based on numerous subtle criteria, while working-class parents may lack the discourse of educational choice or are limited by necessity to a simpler and starker selection. This points to more general findings within sociology that social class differences in contemporary industrial societies – particularly between different kinds of middle-class groups – are as much rooted in the ability and

desire to discern and articulate the 'correct' cultural practices and preferences in the 'correct' fashion as traditional economic indices like wealth and income, though these are of course inter-related and act as reproductions of one another (Bourdieu 1984; Bennett *et al.* 2009; Savage *et al.* 2015).

8.4.2 Constellations of practice at school

The difference between state and private school is not only a marker of different parental class identities, but the schools themselves are institutions with unique social orders, made up of groups who share and diverge in practices, ideologies and behaviours – and thus in communities and constellations of practice (Wenger 1998; Drager 2015; see Section 2.4.2) As discussed in Section 3.6, the state school was a dedicated sixth-form college with around 2,000 students studying a range of both traditional and vocational further education qualifications, whose intake spanned a number of secondary schools from towns across the region. The private school, by contrast, had 215 students in the sixth form, many of whom had attended the school together since age 11, all studying traditional academic subjects.

This has clear implications for the development of communities and constellations of practice, and hence social life as a whole, at the two institutions. Within the small, close-knit environment of the private school, communities of practice may emerge early on in pupils' educational careers and then potentially remain throughout their time at school. With time to develop over the seven years of secondary education, communities of practice may be strongly entrenched into students' identities and thus develop distinctive and enduring behaviours. By knowing everyone in the year group, and by extension the sixth form (which had its own dedicated building on the school grounds), students were likely to be more aware of the year group as a constellation of a limited set of communities, which might form a small number of clearly defined constellations within the cohort. By contrast, the state school student body was considerably larger, more diverse and more fragmented. Pupils' social networks were generally limited to those whom they knew from their previous school, their classes and their extra-curricular activities. This situation encourages the development of smaller communities of practice which may not be defined as strongly in relation or opposition to others, since it is impossible to know all of the communities of practice in the school. Constellations are more likely to form based on smaller friendship groups from different feeder secondary schools merging as a result of interaction in class or the refectory rather than due to sharing similar stances, ideologies or behavioural practices, as students cannot easily find other groups who share such things.

These differences between the schools as constellations of practice are important because they help explain the significant differences between the two schools in variation in /t/-glottalling, which are bigger than those for social class, and the absence of a school effect for GOOSE-fronting. /t/-glottalling, as a traditionally class-

stratified sociolinguistic variable, varied between schools much more than along the social class score dimension. Hence /t/-glottalling is stratified by class, but this is manifested through school differences rather than parental occupation, education and house price, as the former is more relevant as a class indicator in East Hampshire and a more powerful influence on social practices. GOOSE-fronting, however, does not exhibit the same robust and consistent variation by class as /t/-glottalling in previous work, and so we would not expect there to be a school difference for this feature in East Hampshire either. What emerges instead is a difference *within* the school rather than *between* schools, which I frame here as another distinction between constellations of practice.

In Section 5.2.3, I reviewed the third-wave and speech perception literature concerning GOOSE-fronting. This body of work is fairly small, particularly in a (southern) British context, and offers a mixed picture regarding GOOSE's ability to be used for any identity work whatsoever. However, a tendency seemed to emerge that while GOOSE-fronting does not seem to strongly index broad macro-sociological categories such as region or social class in speech production compared to other variables (Fridland 2008, 2012; Haddican *et al.* 2013; Lawrence 2017), it may be used in specific ways in local contexts to evoke micro-level social meanings that are relevant to the community (Fought 1999; Hall-Lew 2005). The statistically significant difference in GOOSE production between the two constellations of practice at the private school in my study would support this idea. This may be related to how extremely front and back tokens of GOOSE were used in interaction to index stances of mainstream respect or alternative disrespect for formality and authority, though these were not evident in perception.

8.4.3 Summary

Overall, it is clear that the more significant effect of school on /t/-glottalling than traditional social class indices such as parental occupation and house price is unsurprising when school itself can be regarded as a powerful indicator of class (particularly as a form of distinction between different kinds of middle class) and considering the development of very different kinds of social lives within schools as unique constellations of communities of practice. In interaction, however, it is reinterpreted to index casual solidarity. GOOSE-fronting rarely interacts with class in previous studies, hence why there is little to no variation by school or social class score in this thesis. Instead, its social meaning seems to operate on a micro level between constellations of practice within one school, as shown through the difference in quantitative use between the outgoing and reserved rooms at the private school and its indexation of attention to speech and formality (and mainstream youth identity) in interaction. Future work on language use among adolescent peer groups would thus benefit not only from studying communities of practice within a secondary school, but also from observing how these groups form constellations of practice based on shared space, behaviour or ideology. Considering the year group or the school itself as a

constellation of practice would also be useful as it would help locate communities of practice within a wider social structure of connected groups engaged in similar endeavours that can make use of shared or distinct stylistic and symbolic resources, not least linguistic variation.

9 Conclusion

9.1 Thesis summary

In her introduction to a recent edited collection, *Southern English Varieties Then and Now*, Laura Wright (2018 p. 1) laments the fact that '… southern England has always been the most densely-habited part of the country, yet this area is also one of the least studied from a dialectal or sociolinguistic point of view… [l]inguists have had little to say about working-class language in Kent, middle-class language in Hampshire, or upper-class language in Gloucestershire'. I am pleased to report that this thesis helps fill this gap in one way, since it describes the findings of a sociolinguistic study of the speech of mostly middle-class people in Hampshire. However, the thesis does not simply stick another pin on the map of studies of language variation and change in the British Isles; moreover, it tackles broader theoretical questions on the nature of sociolinguistic meaning and the concept of salience in speech production and perception.

The first two analysis chapters presented the results of quantitative statistical modelling of the production of /t/-glottalling and GOOSE-fronting respectively among 16-19-year-olds attending two schools in Hampshire. These two features represent highly salient and highly non-salient variables according to previous research, yet both are undergoing change in South East England. The analyses showed that glottal stops were used significantly more by state school students and boys, but that there was no variation between constellations of practice within one of the schools. Fronted tokens of GOOSE, however, were produced significantly more often by students who hung out in the 'outgoing' room at the private school compared to those who spent time in the 'reserved' room, but showed little variation according to gender, school and social class. These results support the findings of previous literature in showing strong macro-level variation for /t/-glottalling (Fabricius 2000; Badia Barrera 2015) but more community-specific patterns for GOOSE-fronting (Fought 1999; Hall-Lew 2005).

The quantitative patterns in production in Chapters 4 and 5 were expanded upon in the following chapter, which examined the extent to which the distribution of variants of /t/-glottalling and GOOSE-fronting was related to individual speakers' use of these features to construct identity in interaction. In a similar way to Podesva (2011) and Kirkham (2013), I investigated how extremely high and low rates of glottal /t/ and acoustically extreme tokens of GOOSE helped speakers make identity-related meaning in the conversation tasks I conducted with them, with the help of Bucholtz and Hall's (2005) qualitative analytical framework. A speaker with an exceptionally high rate of glottal stops compared to the others used the variant to index openness and solidarity with her peers in a similar way to the speaker in Kirkham and Moore (2016), while a pupil with a very low rate of /t/-glottalling used alveolar variants as part of an

‘articulate’ ‘geek’ persona, in a similar way to how hyper-released /t/ in American English can also index a nerdy or geeky identity (Bucholtz 2001). I interpret the social meanings of /t/-glottalling (or the absence thereof) in interaction as reinterpretations of the traditional covert prestige of glottal stops (Trudgill 1972, 1974) shown via their greater usage by male speakers and by those lower down the social scale. The relationship between the quantitative and qualitative results for the production of GOOSE-fronting was less clear-cut, as acoustically extreme tokens of GOOSE were used to index attitudes of acceptance or rejection towards formality, though this is only tangentially related to the outgoing-reserved room divide at the private school and has not been identified before in previous research. This finding does, however, support the idea that the social meanings of less salient variables like GOOSE-fronting are subtle and operate at lower levels of the indexical order such as temporary stances rather than identifiable personae or stereotypes.

Chapter 7 presented the results of two types of perception data – a trait selection survey and a follow-up conversation about speakers’ impressions of auditory stimuli. These two methods were used in an effort to access immediate and more considered associations between phonetic variation and speakers’ social information. The survey data showed remarkably consistent perceptions between listeners at the two schools, who, broadly speaking, classified the four stimulus voices into two pairs – Chris and Ellie versus Amy and Luke. The former pair used relatively little /t/-glottalling and medium levels of GOOSE-fronting, and were perceived as ‘educated’, ‘articulate’, ‘sensible’ and ‘middle class’. The latter pair used more glottal stops, but their use of GOOSE-fronting was not uniform – Amy produced highly fronted GOOSE tokens while Luke’s were the backest among the stimuli. They were both perceived to be ‘uneducated’ and more likely to be ‘chavs’ or ‘working class’. Notwithstanding individual differences between how the four stimuli were perceived, these results would imply that /t/-glottalling made a greater contribution to listeners’ responses than GOOSE-fronting.

This became clear in the conversation data, which revealed that listeners were able to identify glottal stops in the stimulus recordings and attribute a range of social meanings to them as part of a broader ‘chavvy’ style together with other features commonly associated with supra-regional changes in the South of England. Some participants also displayed an awareness of how glottal /t/ could be deployed for stylistic purposes as a reinterpretation of the ‘chavvy’ style to construct a desirable ‘lad’ identity, particularly when contextualised as the style used by some of the wealthiest boys at the school. These boys’ privileged backgrounds meant that their use of glottal stops was not interpreted to index working-class ‘chavviness’; instead, the associations between this stereotype and masculine toughness were reformulated within a middle-class milieu to claim a ‘lad’ persona that conformed to traditional masculinity. In contrast, listeners did not identify GOOSE-fronting in the stimuli without my intervention. Even after being presented with examples of the pronunciation, they had uncertain and mixed attitudes towards it and did not clearly link it to any broader speech styles or relevant personae in the community.

9.2 Implications

Taken as a whole, the findings of the thesis support previous research showing that there is a certain degree of overlap, but not a one-to-one match, between the social meanings associated with phonetic variables in production vis-à-vis those in perception (e.g. Drager 2015; Lawrence 2017). This raises questions regarding how social meanings are linked to linguistic variation. Much research in sociophonetics lends support to exemplar models of speech production and perception, which claim that social and phonetic information are stored as exemplars within the minds of listeners and activated when hearing an incoming utterance (Pierrehumbert 2001; Foulkes & Docherty 2006; Johnson 2006; Drager & Kirtley 2016). This allows listeners to be influenced by the social information of a speaker when exposed to their speech (Hay *et al.* 2006a, 2006b; Hay & Drager 2010). Listeners in the present study were able to associate some social associations with the variables – particularly how class-related variation in /t/-glottalling was manifested in a secondary school context – but their comments did not suggest that stances such as solidarity were part of their perceptions, nor did they clearly attribute any social information to GOOSE-fronting. It could be argued that this was because of the direct survey and conversation methods used in the study, yet even indirect methods such as priming experiments do not always produce results that support a close link between social and phonetic information (Lawrence 2015; Juskan 2016; Walker *et al.* 2019). It has been suggested that laboratory methods such as priming do not work effectively for low-salience variables (Drager 2015; Juskan 2016). However, this then raises another question: how best to study such variables, especially if neither direct questioning as in this thesis nor indirect experimental techniques as in Juskan (2016) are up to the task.

I would argue based on the results of this thesis that the study of the production and perception of phonetic variables, whether 'salient' or not, would be improved by employing a wider a range of methods, including more direct techniques traditionally classified into the 'language attitudes' category rather than the 'sociophonetics' one. In particular, the thesis has shown that asking people directly about their views of phonetic variants is not a fruitless exercise despite the obvious limitations of most people's metalinguistic knowledge (Preston 2019). By presenting stimuli that are genuine representations of 'real' speech of members of the community and then identifying specific pronunciations, listeners are enabled to articulate their views in a holistic and natural manner before thinking more carefully about what aspects of language contribute to their impressions. Not only does this yield useful and interesting data for the analyst, but it can also act as an educational and cathartic experience for the participants as they come to think about sociolinguistic variation and articulate it in their own terms – something that they may not have ever done before. Laboratory studies are sometimes critiqued for an over-reliance on the typical participant sample of 18-22-year-old undergraduates (Hanel & Vione 2016); the methods described above, however, do not need to be done on a university campus, but can be part of fieldwork conducted in any community of speakers.

In taking the recommendations above on board, we can also avoid a mechanistic approach to social meaning that assumes a direct and fixed connection between a linguistic form and its social associations. Even for a variable like /t/-glottalling, that does tend to elicit strong and immediate reactions from participants, the data indicate that it is its presence with other variables (like /l/ vocalisation) that allows listeners to respond so decisively to its production. The fact that the stimulus voices Chris and Ellie did use (some) /t/-glottalling but listeners never picked up on it would imply that even a highly socially salient variable may not provoke the expected reactions if it does not form a meaningful style with other variables. Similarly, by studying a variable like GOOSE-fronting using a range of methods in production and perception, we can see how 'non-salient' variables may show some local patterns in variation and may be used to take stances in interaction, yet not be noticed in speech perception.

The findings also have implications for the theorisation and operationalisation of the concept of salience in sociolinguistics. It is beyond doubt that certain linguistic changes reach the level of conscious awareness while others do not (Labov 1972; Silverstein 2003) and that this process involves linguistic, cognitive and social factors (Kerswill & Williams 2002; Rácz 2013), but the term 'salience' can easily be used in a vague and circular fashion. I negotiate this issue in this thesis by using the terms 'noticeability' and 'social salience', which capture the cognitive process of listeners' ability to identify a feature and the possibility for it to evoke social meaning (Levon & Fox 2014) respectively. This distinction proves useful in keeping the different elements of salience separate and avoiding circularity. The fact that /t/-glottalling turned out to be both noticeable and socially salient in my data while GOOSE-fronting appeared to be neither highlights the reality, however, that the two concepts are not independent of one another and that the link between the cognitive and social aspects of salience is poorly understood. The (albeit limited) capacity that GOOSE-fronting has for stance-based indexical work in production, without being noticeable at all, also places a question mark over the notion that socially salient variables are always cognitively salient but not vice versa (Rácz 2013). This points to the importance of considering linguistic variables as part of styles (Moore & Podesva 2009), for which the presence or absence of one feature may affect the social meanings of another. This notion is now fairly well-established in sociolinguistics, but it is rarely considered in the salience literature. Future work on sociolinguistic salience would benefit from taking this into account, as well as seriously considering measuring the extent to which participants 'notice' a feature instead of simply inferring its salience from its social associations. This can be done using qualitative methods as in this thesis by designing a task in which listeners are invited to discuss which features they notice, or via experimental methods such as Montgomery and Moore's (2018) real-time online survey instrument. In separating noticing from social salience, we can try to move away from circular definitions of salience or discussions over whether salience is an 'internal' or 'external' property of a linguistic variable, and instead work towards an understanding of the roles that both cognitive and social factors play in making features prominent – roles that are closely related but distinct. I would also argue in

favour of viewing salience not as a binary phenomenon but as something that can be relative and dependent on the presence or absence of other linguistic features and contextual properties relating to the speaker and the interaction.

Finally, this thesis shows how the private school and the state school act as two constellations of practice (Wenger 1998; Drager 2015) and as reproductions of socio-economic class relations in England. The sample is unusual in comparison to other studies of language variation and change, in that the community is relatively socially homogenous and there is little economic deprivation. Traditional measures of adolescent social class such as parental occupation, parental education and house price are less important in this community than the division between those whose parents are able to afford and consider it worthwhile to send their children to a fee-paying school, and those who are not or do not. The nature of the schools, including their entrance requirements, cohort sizes, recruitment strategies and educational cultures, has an effect on the social lives of their pupils and hence how linguistic variation operates within the two institutions. Future work on adolescent peer groups and language variation is therefore encouraged to make more use of the concept of constellation of practice. Not only can it be used as a way to aggregate related friendship groups as in Drager (2015), but also as a way to interpret similarities and differences between groups at different tiers of the social structure, such as year groups and individual schools themselves. This is particularly useful for communities where traditional markers of socio-economic stratification such as occupational class may not be as socially relevant or influential compared to less quantifiable factors like cultural practices or social networks. In post-industrial western countries in the 21st century, this situation is becoming increasingly common as geographical mobility, the move to a knowledge economy and globalisation usher in a highly connected and fluid model of society. More sociolinguistic work that explores how social structures that transcend the traditional boundaries of class and ethnicity via both communities and constellations of practice (e.g. Kirkham 2013; Drager 2015), would thus help situate patterns of language variation and change and social meaning within local contexts at different levels of the social order.

9.3 Final remarks

The aim of this thesis is to investigate how social meaning works in speech production and perception, and its relation to the concept of salience, via a study of sociophonetic variation among adolescents at two schools in Hampshire. My findings highlight the importance of combining multiple approaches to the study of social meaning, such as quantitative and qualitative analyses of phonetic variation in production, and more immediate and more controlled methods of testing speech perception. In particular, I join Preston (2019) in encouraging researchers studying the perceptions of non-linguists to 'talk to them' in order to access the social information they associate with phonetic features and styles. People may be constrained by the

meta-linguistic discourse that is available to them, but this does not prevent them from showing a sophisticated awareness of the social meanings of language variation. It is also intended that my results inspire scholars not to shy away from the term 'salience', but to take its complexity seriously and to try to be as specific as possible when employing it, so that we can come to a better understanding of why some linguistic features are more noticeable than others. Finally, the thesis builds on the important work on language variation among adolescent peer groups at secondary school, showing that the school itself can act as an aggregate of ideologies and practices that can influence linguistic behaviour. I hope that these findings and suggestions may prove useful in advancing our knowledge and understanding of the nature of sociolinguistic meaning.

10 References

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11 Appendices

A: Reading passage

Note: The whole text was read aloud by each participant. The paragraphs starting with asterisks (*) are those that were used to form the perception stimuli.

* There was once a poor shepherd boy who used to watch his flocks in the fields next to a dark forest near the foot of a mountain. One hot afternoon, he thought up a good plan to get some company for himself and also have a little fun.

Raising his fist in the air, he ran down to the village shouting, 'Wolf, Wolf.' As soon as they heard him, the villagers all rushed from their homes, full of concern for his safety, and two of his cousins even stayed with him for a short while. This gave the boy so much pleasure that a few days later he tried exactly the same trick again, and once more he was successful.

However, not long after, a wolf that had just escaped from the zoo was looking for a change from its usual diet of chicken and duck. So, overcoming its fear of being shot, it actually did come out from the forest and began to threaten the sheep.

* Racing down to the village, the boy of course cried out even louder than before. Unfortunately, as all the villagers were convinced that he was trying to fool them a third time, they told him, 'Go away and don't bother us again.' And so the wolf had a feast.

B: Word list

hid

head

had

hod

hud

who’d

heed

hard

hoard

heard

hood

C: Survey answer sheet

Speaker: Luke

Please don't spend long thinking about each answer. Just write your gut responses.

1. Tick the following box if you recognise the speaker's voice: ☐

2. From what you heard, which of these traits would you associate with the speaker? (Circle all that apply.)

Lazy	Annoying	Relaxed	Confident	Compassionate	Up-tight
Cool	Self-centred	Articulate	Sensible	Hardworking	Tough
Shy	Geeky	Modest	Formal	Troublemaker	Casual
Caring	Uneducated	Chavvy	Boring	Party animal	Arrogant
Ugly	Alternative	Educated	Outgoing	Feminine	Normal
Posh	Weird	Laddish	Like you	Condescending	Attractive
Weak	Not like you	Friendly	Fashionable	Masculine	Lonely

Other: _____

3. Right now, does the speaker sound… (circle all that apply)?

Bored	Complaining	Joking	Nostalgic	Argumentative	Happy
Chatty	Polite	Secretive	Boastful	Hiding something	Awkward
Sad	Interested	Confused	Comfortable	Trying to impress	Relaxed

Other: _____

4. Would the speaker be someone you would be likely to be friends with at school?

Yes Not friends, but acquaintances No, but he/she could go to my school
No, he/she would go to a different school No, he/she doesn't sound local

5. Which group at school do you think the speaker would be a member of?

Popular group Chavs Geeks Arty group Sporty group

Other: _____

6. Where does it sound like the speaker might be from? Circle all that apply.

Petersfield	Clanfield	Waterlooville	Portsmouth	Alton	Midhurst
Harting	Froxfield	Bordon	Liphook	Liss	Anywhere

Other: _____

The inner-city The city suburbs A small town A rural village

Other: _____

7. What do you think the speaker's background is?

Wealthy background Middle-class background Working-class background

Other: _____

8. Do you have any other thoughts about this speaker?

_____

_____

_____

NB: The available responses differed slightly depending on the school.

D: Background information questionnaire

Thank you very much for participating! Now please fill in this short questionnaire. Remember, your participation is entirely voluntary. If you do not wish to answer any particular question, feel free to leave the answer blank.

Gender: Male Female Year group: _____ Age: _____

Ethnicity: White Black Asian Chinese Mixed: _____ Other: _____

Where do you currently live? (Town / village name) _____

What is your postcode? _____

Where were you born? (City / region) _____

Have you lived anywhere else in the last 10 years? _____

_____

Before going to college, which secondary school(s) did you previously attend? _____

_____

Other languages you speak at home (if any): _____

What is your father's job? _____

What is your mother's job? _____

Where did your father grow up? _____

Where did your mother grow up? _____

Did your parents go to university? Yes, both parents Yes, one No
Don't know

Do your parents own their home? Yes, they own it / pay a mortgage No, they rent
Don't know

Are you a member of any clubs, societies or teams at college? _____

_____

Are you a member of any clubs, societies or teams outside of college? _____

_____

What would you say are the main activities / hobbies you do in your free time after college and at weekends?

_____

What are you planning to do after leaving college? _____

NB: The available responses differed slightly depending on the school.

E: Transcription conventions

(.) = short pause (less than one second)

(1) = pause of 1 second

[square brackets containing normal text] = overlapping speech

square brackets containing IPA, e.g. [t] or [ʔ] = phonetic transcription of the preceding word or a relevant sound in it

: = long vowel

? = question (not necessarily rising intonation; intended as a reading aid)

(round brackets) = miscellaneous sounds such as laughter or transcriber's notes

italics = stress / emphasis

bold and underline = the word contains a phonetic feature of interest

F: Pairwise comparisons

i) Pairwise comparisons (Bonferroni-corrected) for the four phonological contexts included in the /t/-glottalling regression model (Table 4.2).

Contrast	Estimate	SE	*z* ratio	*p*	
SORT OF – WHAT	-1.36	0.193	-7.038	<0.001	***
SORT OF – LITTLE	1.06	0.641	1.652	0.591	
SORT OF – BUTTER	3.51	0.652	5.385	<0.001	***
WHAT – LITTLE	2.41	0.650	3.715	0.001	**
WHAT – BUTTER	4.87	0.663	7.342	<0.001	***
LITTLE – BUTTER	2.45	0.880	2.790	0.032	*

ii) Pairwise comparisons (Bonferroni-corrected) for the four preceding contexts included in the main GOOSE-fronting regression model (Table 5.2).

Contrast	Estimate	SE	DF	*t* ratio	*p*	
Non-coronal – Coronal	0.144	0.122	283	1.188	1.000	
Non-coronal – Palatal	0.517	0.119	280	4.358	0.001	**
Non-coronal – Liquid	-0.618	0.221	762	-2.796	0.032	*
Coronal – Palatal	0.373	0.085	338	4.367	0.001	**
Coronal – Liquid	-0.762	0.209	762	-3.648	0.002	**
Palatal – Liquid	-1.136	0.207	790	-5.495	<0.001	***

iii) Pairwise comparisons (Bonferroni-corrected) for the four preceding contexts included in the private school GOOSE-fronting regression model (Table 5.4).

Contrast	Estimate	SE	DF	*t* ratio	*p*	
Non-coronal – Coronal	0.128	0.111	100.2	1.158	1.000	
Non-coronal – Palatal	0.640	0.106	127.9	6.023	<0.001	***
Non-coronal – Liquid	-0.156	0.115	176.5	-1.357	1.000	
Coronal – Palatal	0.512	0.085	52.8	6.041	<0.001	***
Coronal – Liquid	-0.284	0.105	77.8	-2.709	0.050	*
Palatal – Liquid	-0.796	0.099	98.0	-8.052	<0.001	***

G: Perception results for personality traits

Count of personality traits selected for the four stimulus voices by all participants

Luke		Ellie		Chris		Amy	
Trait	**Count**	**Trait**	**Count**	**Trait**	**Count**	**Trait**	**Count**
shy	30	confident	27	geeky	19	chavvy	17
boring	18	articulate	23	educated	17	casual	14
laddish	13	educated	21	formal	17	confident	13
casual	12	sensible	21	sensible	17	uneducated	13
masculine	10	feminine	16	confident	16	friendly	11
modest	10	friendly	15	hardworking	14	outgoing	11
uneducated	10	attractive	12	articulate	13	annoying	9
weak	10	hardworking	12	weird	13	normal	9
lonely	9	posh	12	friendly	11	self-centred	8
relaxed	7	relaxed	11	posh	10	shy	8
geeky	6	casual	9	boring	9	relaxed	7
lazy	6	formal	8	shy	9	boring	6
sensible	6	outgoing	8	casual	8	party animal	6
chavvy	5	fashionable	7	relaxed	8	sensible	6
normal	5	modest	7	modest	7	not like you	5
friendly	4	normal	6	caring	6	alternative	4
not like you	4	like you	5	lonely	6	arrogant	4
troublemaker	4	caring	4	alternative	5	lazy	4
weird	4	cool	4	annoying	5	caring	3
hardworking	3	self-centred	3	arrogant	5	feminine	3
tough	3	annoying	2	normal	5	modest	3
up-tight	3	arrogant	2	up-tight	4	tough	3
arrogant	2	compassionate	2	weak	4	troublemaker	3
caring	2	shy	2	condescending	3	up-tight	3
confident	2	up-tight	2	feminine	3	educated	2
educated	2	not like you	1	outgoing	3	laddish	2
like you	2	alternative	0	cool	2	like you	2
annoying	1	boring	0	party animal	1	lonely	2
articulate	1	chavvy	0	self-centred	1	masculine	2
compassionate	1	condescending	0	attractive	0	ugly	2
outgoing	1	geeky	0	chavvy	0	articulate	1
party animal	1	laddish	0	compassionate	0	attractive	1
alternative	0	lazy	0	fashionable	0	compassionate	1
attractive	0	lonely	0	laddish	0	cool	1
condescending	0	masculine	0	lazy	0	weak	1
cool	0	party animal	0	like you	0	weird	1
fashionable	0	tough	0	masculine	0	condescending	0
feminine	0	troublemaker	0	not like you	0	fashionable	0
formal	0	ugly	0	tough	0	formal	0
posh	0	uneducated	0	troublemaker	0	geeky	0
self-centred	0	weak	0	ugly	0	hardworking	0
ugly	0	weird	0	uneducated	0	posh	0