A Sociolinguistic Study of T-glottalling in Young RP: Accent, Class and Education

Berta Badia Barrera

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Department of Language and Linguistics

University of Essex

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It is impossible for an Englishman to open his mouth without making some other Englishman hate or despise him.

George Bernard Shaw, *Pygmalion (1916) preface*
Irish dramatist & socialist (1856 - 1950)

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PhD thesis abstract

Received Pronunciation (RP) has been widely described linguistically (Wells 1982, 1991, 1997), although little sociolinguistic research has been carried out on it (Fabricius 2000). Over the last few years, a new trend has been observed in young RP speakers to incorporate non-standard features in their accent, such as t-glottalling (Fabricius 2000).

This quantitative sociophonetic study analyses to what extent t-glottalling is present in the speech of young RP speakers and which are the linguistic and social constraints that affect its variability. The data are based on sociolinguistic interviews of 20 teenagers, aged between 13 and 17, from three different types of schools in the South of England: a major public (private) boarding school, a private non-boarding school and an outstanding rated comprehensive school in a prosperous rural area. These data are complemented by 15 older speakers, aged 27, who are ex-alumni of the schools under study. The quantitative data are analysed through multivariate analysis using Varbrul.

This thesis aims at re-visiting t-glottalling, a widely researched linguistic variable, from an innovative perspective, by splitting the dataset into word-medial and word-final and by analysing a wide range of linguistic factors, which have often been overlooked in previous studies of t-glottalling in British accents. The linguistic constraints analysed in the study are: preceding and following phonological environment (with types of consonants and types of vowels), style, grammatical category, stress, number of syllables and lexical frequency. As for the social constraints, they include type of school (used as a proxy for social class), age and gender.

Results show that young RP speakers are being conservative in terms of word-medial t-glottalling, whereas in word-final contexts, they are being innovative and language change is in progress, especially in the word-final pre-pausal and pre-vocalic (back vowels)

phonological environments. Furthermore, lexical frequency seems to be playing a role in the different progressing stages of the glottal stop word-internally and across word boundaries. Finally, this research shows that type of school is a crucial factor in explaining the variability of the glottal stop in this accent, with teenagers from the comprehensive and private non-boarding schools being the ones who are leading the changes of t-glottalling in young RP and with those speakers belonging to the most elitist private boarding schools resisting considerably the adoption of t-glottalling.

This thesis examines how different RP is in middle, middle-upper and upper class youth today, as well as analyses the state of RP in the current generation, to see if there are any changes in progress. Another variant has been found in the analysis, which has shown a new and interesting development in young RP: taps. This may suggest that new non-standard features might be making their way into young RP speech. Moreover, this study aims to re-evaluate RP as a label and revise the relationship between social class and language variation, by discussing new approaches in the social class literature and by drawing concepts and ideas from the sociology of education and the sociology of the elites to understand the nature of RP as a social accent.

Introduction to the PhD thesis

This PhD thesis is organised around five chapters and a conclusion. Chapter one is an introductory chapter about Received Pronunciation (RP), in which we discuss why RP has been neglected in sociolinguistic variationist studies and why it is important to do more research on this accent. Moreover, we will discover how accent rose as a social symbol in Britain and how the elite public boarding school system in England contributed in consolidating and spreading RP as a non-localised and prestigious accent. Furthermore, we will define RP and describe all the labels that it has been given. We will also examine the phonological characteristics of RP and its phonological innovations, followed by a discussion of what is characteristic of RP and how it should be defined. Finally, the chapter ends with a personal discussion of RP and it suggests a different approach to the RP accent by approaching the notion of "elite accents of British English".

In chapter two, we review the previous literature on t-glottalling in relation to RP and to other accents, both in Britain and in other areas of the English-speaking world. We also describe what t-glottalling is and we explain where linguists believe it comes from. Moreover, we comment on one of the very few studies which focus on upper-class varieties of English: Kroch's (1996) study on Philadelphia (USA). Finally, we briefly review a secondary linguistic variant that was also found in the speech of young RP speakers, besides t-glottalling: taps.

Chapter three reviews and discusses how language variation as a discipline has incorporated notions of social class in their sociolinguistic studies. The chapter has two main parts. In the first section, we discuss how sociolinguistics and the sociology of social stratification and social class have evolved theoretically and methodologically from a macro perspective towards a micro perspective. In the second part of the chapter, we draw on concepts and ideas from the sociology of education and the sociology of the elites in order to understand RP not from a linguistic perspective, but as a social accent.

In chapter four, we first review the field of variationist sociolinguistics, in which this PhD research is theoretically and methodologically based on. Then, we discuss how the participants of this study were selected, as well as the procedure of data collection. Next, we explain how the linguistic variable (t), which is the main object of this variationist study, was identified and coded. And finally, we describe the various linguistic and social factor groups selected for this study and we explain the analytical procedures that have been performed on the data.

Finally, in chapter five, we present and discuss the results obtained from the multivariate analyses for t-glottalling, which is the main object of study of this thesis, for the word-medial and word-final samples. Furthermore, we also present and discuss the cross-tabulations of the linguistic factor groups in relation to the social factor groups. In the last section of the chapter, we examine the results for taps, a secondary variant found in the speech of RP speakers. Chapter five is then followed by the concluding remarks of the thesis.

This PhD thesis addresses the following research questions:

What is the current state of t-glottalling in young RP?

Are there any differences in terms of t-glottalling between RP middle-class youth and RP upper-middle and upper-class youth?

Are there any changes in progress in young RP?

CHAPTER 1

Elite accents of British English: Introduction to RP

In this introductory chapter about Received Pronunciation (RP), we are going to discuss why RP has been rather neglected in sociolinguistic variationist studies and why it is important to do more research on this accent. Moreover, we will discover how accent rose as a social symbol in Britain and how the elite public boarding school system in England contributed in consolidating and spreading RP as a non-localised and prestigious accent. Furthermore, we will define RP and describe all the labels that it has been given. We will also examine the phonological characteristics of RP and its phonological innovations, followed by a discussion of what is characteristic of RP and how it should be defined. Finally, the chapter ends with a personal discussion of RP and it suggests a different approach to the RP accent by approaching the notion of "elite accents of British English".

1.1 Why study RP sociolinguistically?

Received Pronunciation (RP) has been widely described phonetically (Wells 1982, Wells 1994, Wells 1997, Roach 2000, Cruttenden 2001, Hughes, Trudgill and Watt 2005), but there are almost virtually no sociolinguistic studies of the British standard accent, with the exception of Fabricius' (2000) study on t-glottalling in RP. Therefore, the descriptive studies of RP are mainly impressionistic descriptions of the accent and the main disadvantage is that they lack in providing quantitative data on the actual usage of linguistic vowel and consonantal variables by its speakers.

Labovian quantitative sociolinguistic literature has just concentrated on vernacular accents and older as well as more modern investigations of urban accents do not go beyond the middle-class. But RP speakers are also part of a speech community and therefore, they also participate in language change. Thus, it has been quite unfair the poor treatment of upper-class varieties in the field of language variation and change. Fabricius (2005) has pointed out

three possible reasons why this has been the case: the search for the vernacular is done in other communities, these kind of people are inaccessible and their generally high levels of education make them unreliable as "naïve linguistic subjects".

According to my experience, and as it will be discussed further on in the methodology in chapter four, the main obstacle I encountered in studying the RP speech community was accessibility, especially in the most exclusive and elitist private schools, either boarding or non-boarding. The access was only gained when I managed to obtain a contact who was an insider of those schools. Even though the access to this speech community proved extremely challenging, I firmly believe that the RP speech community should be seriously considered for further variationist studies. Only by examining and analysing the accent of those in the upper-middle and upper layers of society, we will be able to have a more complete picture of language change in the middle and lower layers of society and of society as a whole.

1.2 The rise of accent as a social symbol in Britain: elite public boarding schools and RP

As Mugglestone (2003) argues, in 19th century Britain, the emergence of industrialisation and capitalism and the consequent creation of a socially stratified society gave rise to a strong class-consciousness in British society. This segregation of society along class lines also meant a divergence in speech, at the level of dialect and accent. While new urban vernaculars, with strong working-class connotations, were emerging in cities like Manchester and Leeds, there was also the emergence of a uniform speech, RP, amongst the elite (aristocracy, civil servants, senior managers, capitalist and traditional landowners). Therefore, 19th century British English was split not only into regional dialects, but also into social dialects. And the major public boarding schools, such as Eton, Winchester, Harrow, Westminster, Rubgy and Charterhouse, provided not only an exclusive education to the sons of this elite, but also they were helping in the creation and perpetuation of this uniform speech.

Mugglestone (2003) further argues that in the 18th century, before 1750s, it was accepted for the upper-class in Britain to speak with a regional accent. However, in the 19th century, the views had changed and an accent free from regional markers had started to act as a dominant social symbol. This change was mainly due because from the late 18th century onwards, in Britain there was a start of searching for a spoken standard (besides a written standard) and the issues of correctness developed in the emergence of the written standard during that century also started to affect the attitudes towards spoken English.

Indeed, in the late 18th and 19th centuries there was a large-scale shift in language attitudes and social images in terms of pronunciation in England, and class and accent became a major "national obsession" (Mugglestone 2003). In the mid-late 18th century, the study of language started to be more focused on the prescription of rules for grammar and pronunciation and many dictionaries were published during that time (Cruttenden 2014). Moreover, elocution gained enormous popularity in private and public domains and the notion of "talking proper" became influential. As a consequence, many elocution manuals were published in the late 18th century to address the new pronunciation needs of the population. Mugglestone (2003: 3) claims that during the late 18th century there was the "growing conviction that accent could provide a way of articulating social identity as much as words in themselves".

In addition to this change in attitudes towards language, in the late 18th and 19th centuries there was an increasing involvement of the state in issues concerning education (Mugglestone 2003). As a result, the new public attitudes towards accent that had developed started to influence the education domain as well. Mugglestone (2003: 219) argues that during that time it was common in popular language attitudes to confer "superior linguistic proprieties to education at a public school". A publication in 1869, named *Good Society*, declared that "the best accent is that taught at Eton and Oxford" (Mugglestone 2003: 219).

The first official reference to the "public school" was made in the 1860 appointment of the Royal Commission which had been created in order to investigate this type of schools (Mugglestone 2003). These public schools were set as Eton, Westminster, Winchester, Harrow, Rugby, Charterhouse and Shrewsbury. As Mugglestone (2003) argues, in the 19th century, the idea of the public school as a socially select form of education was to become more ingrained in the public consciousness. However, most of these "great public boarding schools" had been long standing by the 19th century. For instance, Winchester dates back to 1382, Eton to 1440 and Westminster and Shrewsbury were founded in 1560 (Mugglestone 2003). These public schools were originally created for the poor and their emphasis was on education in the classical languages.

Despite the fact that public schools started as egalitarian educational institutions, in the early 19th century the student population started to change and there was a considerable increase of the sons of the gentry and the aristocracy, as well as the sons of the new rich industrialists (Mugglestone 2003). Both the old and the new elite of the time wanted their offspring to be educated as gentleman in social and linguistic manners.

In the 19th century, there were crucial changes in the organisation of society in England, with industrialisation taking place, the advent of the railway and the rise of the modern notion of "class" (Mugglestone 2003). As Mugglestone (2003: 222) argues, the 19th century saw the consolidation of two key elements in the construction of the "public school ideal": the rise of a non-localised student intake (thanks to the introduction of the railway system) and a consolidation of a sense of social exclusivity (with the new student intake from the old and new elite).

Indeed, in the 19th century, education in public schools was seen as a means of integration into the linguistic and social proprieties of the elite (Mugglestone 2003: 226). Public schools played a decisive role in homogenising the accents of their pupils and public school education was able to "cleanse" the speech of their students of regional forms, which in the

19th century were perceived and depicted as "statusless". As Mugglestone (2003) claims, boarding was a way by which local pronunciations could be countered. Linguistic markers of local identity were considered unsuitable and vulgar for the gentlemen of the aspiring elite in the 19th century.

Thus, public boarding schools in the 19th century contributed to create the linguistic segregation of the elite in England. These institutions not only taught the classical syllabus and correct manners to the sons of the elite, but also the correct speech. Therefore, a non-localised education and a non-localised accent became strongly embedded in language attitudes of the time as a marker of status and success (Mugglestone 2003: 233). Tutors and teachers of the public boarding schools, who also themselves had previously attended those schools, were in charge of setting the spoken standard to their pupils, and as the 19th century advanced, English and specially spoken English started to be included in the syllabus of the public boarding schools, which continued to have the dominance of the classical syllabus nevertheless. Even in the early 20th century, elocution lessons were still a common practice in public schools and in Oxford colleges, especially in girl's schools and colleges. For instance, Mugglestone (2003: 266) states that "the then women-only Somerville College in Oxford offered a course in "voice production", ostensibly to help the women speak verse but really a euphemism for eliminating [regional] accents".

It was in the early 20th century that the well-known British linguist and phonetician Daniel Jones established the term "Received Pronunciation" or "RP" as representing standard spoken British English (Cruttenden 2014). He first coined this term in the third edition (1926) of the *English Pronouncing Dictionary*. This book and two others by Jones "were regarded as the standard books from the 1920s to the 1960s and hence RP was the term used regularly to describe standard British English pronunciation" (Cruttenden 2014: 77). However, in the first edition of Jones's dictionary published in 1917, he had referred to the model of English pronunciation he had himself phonetically described as "Public School Pronunciation", but he later changed it to "RP".

The beginning of broadcasting by the BBC in 1926 was the principal reason for the spreading of a standard pronunciation in the early 20th century (Cruttenden 2014). Cruttenden (2014: 77) claims that the then BBC's head, John Reith, was very concerned with prestige and "the BBC played a huge part in the promulgation of that accent described in Jones's books as RP".

1.3 What is RP and how has it been labelled?

Received Pronunciation (RP), "Received" meaning "accepted in the most polite circles of society" in the 19th century sense of the word, has traditionally been the accent of those educated at public schools, and it is mainly through these schools that the accent has been perpetuated. RP is the accent of the upper-classes, as measured by education, income, profession or title (Hughes, Trudgill and Watt 2005). One of its defining characteristics is that it is not the accent of any particular region. However, historically, its origins were in the speech of London and the surrounding area. It is estimated that only about 3 to 5 per cent of the population of England speaks RP (Hughes, Trudgill and Watt 2005).

As we have seen in the previous section, the term *Received Pronunciation* was first coined by the phonetician Daniel Jones in the third edition (1926) of the *English Pronouncing Dictionary*. However, in the first edition (1917), he used the term *Public School Pronunciation* to refer to his model of English pronunciation, but he subsequently changed it to RP. In the 1980s, Wells (1982) suggested the term *Southern British Standard* instead of RP. A few years later, in a 1997 edition of the *English Pronouncing Dictionary*, Roach and Hartman (1997) tried to abandon the RP definition and they offered the name *BBC English*. The latest addition in the search for a label for the standard British accent is the term *General British*, suggested by Cruttenden (2014) in the eight edition of *Gimson's Pronunciation of English*.

Wells (1982) describes the following varieties of RP:

Mainstream RP: it refers to the central tendency in RP and their speakers are upper-middle class.

U-RP: speakers of U-RP are in the narrow sense upper-class, and not middle-class. Wells states it is the accent of the aristocracy, upper-class army officers and elderly Oxbridge dons.

Adoptive RP: it is the variety of RP spoken by adults who did not speak RP as children.

Near-RP: this term refers to any accent which, even if not being considered within the definition of RP, exhibits very few regionalisms and it would be difficult to attach the speaker to a specific region.

Cruttenden (2001) describes the different varieties of RP by using a different terminology:

General RP: would be the equivalent to Well's *Mainstream RP*.

Refined RP: this variety is considered to be exclusively upper-class.

Regional RP: reflects regional rather than class variation, and will vary according to which region is involved. This variety reflects the fact that nowadays there is a greater tolerance

towards dialectal variation. However, where RP is the norm, Cruttenden states that only some types of regional features of RP are accepted.

In the latest eight edition of *Gimson's Pronunciation of English* by Cruttenden (2014), RP is changed for the new term *General British* and two varieties of GB are described:

Conspicuous General British (CGB): is the variety of GB that is considered to be "posh" and associated with upper-class families, with public schools and with professions which have traditionally recruited from such families.

Regional General British (RGB): Cruttenden claims that RGB reflects regional rather than class variation and will vary according to which region is involved. As a consequence, he states that we should talk of RGBs in the plural. This variety of GB is basically GB with the presence of a few regional markers.

1.4 Phonological characteristics of RP and phonological innovations

RP has currently 20 vocalic sounds, which include 12 monophthongs and 8 diphthongs, and 24 consonantal sounds, represented in the chart below[1]:

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[1] Chart extracted from www.englishclub.com

	monophthongs				diphthongs			Phonemic Chart voiced unvoiced
VOWELS	iː sheep	ɪ ship	ʊ good	uː shoot	ɪə here	eɪ wait		
	e bed	ə teacher	ɜː bird	ɔː door	ʊə tourist	ɔɪ boy	əʊ show	
	æ cat	ʌ up	ɑː far	ɒ on	eə hair	aɪ my	aʊ cow	
CONSONANTS	p pea	b boat	t tea	d dog	tʃ cheese	dʒ June	k car	g go
	f fly	v video	θ think	ð this	s see	z zoo	ʃ shall	ʒ television
	m man	n now	ŋ sing	h hat	l love	r red	w wet	j yes

The 44 phonemes of Received Pronunciation based on the popular Adrian Underhill layout

adapted by EnglishClub.com

Figure 1.1 Phonemic Chart of the RP sounds

However, the sounds of RP have not always been like the ones displayed in the chart above. As any other accent, it has experienced language change over the course of time. Wells (1997) acknowledges 16 changes in RP, distributed in three periods: early 20th century, mid 20th century and late 20th century. Some of the most recent changes (late 20th century) in RP have mainly been introduced by its younger speakers and according to Altendorf (2003: 87) "these new variants have some characteristics in common: they have originated from non-RP/non-standard accents, they are associated with London English and they have recently been spreading regionally, at least within the south-east, and socially to higher social classes and more formal styles." Wells (1997) also acknowledges this London influence on the most recent changes in RP.

The 16 changes in RP that Wells (1997) describes are:

<u>Early 20th century</u>

1.Transfer of the CLOTH set

2.Merger of /ɔə/ and /ɔ:/

3.Change in the quality of the GOAT vowel

4.Opening of /æ/

5.Loss of tapped /r/ between vowels

<u>Mid 20th century</u>

6.Decline and disappearance of /ʊə/

7.Drift from weak /ɪ/ to /ə/

8.Plosive epenthesis

9.Yod coalescence

10.T-glottalling

<u>Late 20th century</u>

11.Tensing of final and prevocalic /ɪ/

12.Rise of the diphthong /ɒʊ/

13.Change in the quality of /u:, ʊ/

14.T-glottalling

15.L-vocalisation

16.Yod coalescence

Wells (1997) dates the change of t-glottalling in the mid 20th century. He states that the production of a glottal stop is normal and accepted in RP before a consonant, both in word medial and word final position. As well, he acknowledges an extension of t-glottalling in other contexts, as a change in RP in the late 20th century, and thus, being introduced by its younger speakers. He states that the production of a glottal stop is not only found in a pre-consonantal position (both word medial and word final), but also in word final position, when the next word starts with a vowel or before a pause. However, he claims that the glottal stop in intervocalic position, within a word, is still stigmatised and regarded as Cockney, and therefore, it falls out of the scope of RP[2].

1.5 What is characteristic of RP and how should it be defined?

Wells' (1997) article on Received Pronunciation also addresses the issue of how to define RP. He states that RP's main defining characteristics are that it is geographically non-regional and socially upper-class. He also claims that changes in demography and society in Britain in the past years have made these qualities not as desirable as before.

He uses three main criteria to define RP: sociolinguistic, ideal and EFL teaching. As for the sociolinguistic criterion, he defines RP as being associated with the accent of the upper-class. However, he questions how far down the social scale we should go to define RP. He argues that strictly upper-class is an extremely small group, and therefore, we should also consider the upper-middle classes as well. He also states that the label "educated people" was used to identify RP-speakers in the past, but due to demographic and social changes in the last forty years, this label is completely outdated.

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[2] For a review of t-glottalling in RP and other English accents see Chapter 2.

As for the second criterion, Wells (1997) claims that RP has been traditionally regarded as the "correct", "beautiful" and "admired" pronunciation. RP was considered the "widely accepted" and "widely understood accent". However, as Wells notes, judgments of beauty are subjective, and as far as correction is involved, it is very difficult to determine which pronunciation is correct and which is not.

The third criterion relates to EFL teaching. Wells (1997) questions which pronunciation should be taught to learners of English as a Foreign Language. He argues that learners should be exposed to a wide range of accents. He also acknowledges that Daniel Jones, Professor of Phonetics at UCL, did a great job in codifying RP for teaching purposes, but obviously, his model is outdated and obsolete (he did his description in the 1920s). Wells believes that we should still teach RP to students of EFL (even if we change the name of this variety), but he claims that we need to redefine RP and acknowledge its most recent changes.

1.6 Discussion on Received Pronunciation (RP): elite accents of British English

Public School Pronunciation, *RP*, *Southern British Standard*, *BBC English* and *General British* are the various labels that have been used to define the standard pronunciation of British English. The inevitable question that first comes to mind is: why has it been so difficult to reach a consensus when it comes to labelling this accent? There is obviously no simple answer to that question, but I would say that two concepts are key in trying to find an answer to it: social class and accent. As we have seen, British society developed a very strong class-consciousness in the 19th century that also affected the accent domain (Mugglestone 2003), and since then, this profound class and accent consciousness has been a defining characteristic of British society (with its obvious modifications and adaptations into contemporary contexts). Furthermore, the picture gets even more complex when another concept comes into play: the upper-classes and the elite. Put all these concepts together and you get something similar to a "cocktail of sensitivity". Everyone seems to have an opinion of what RP is, but very few people dare to question openly and without

prejudice what it actually is and who are the people who speak it. Questioning RP is like questioning the Establishment. And this is without a doubt a touchy topic.

Thus, what makes an RP speaker? I would say that there are three basic elements: the phonetic sounds, non-localisability and class. Indeed, an RP speaker is mainly defined by the phonetic sounds of his/her speech, and even if the consonantal sounds are also important, I would say the most crucial sounds that make an RP speaker recognisable and separate from other regional British accents are the vocalic sounds. Moreover, one of the most crucial elements, and related to the importance of the phonetic sounds mentioned before, is non-localisability; the fact that an RP speaker exhibits phonetic sounds in his/her speech that cannot be placed geographically. And finally, the third element is class. Wells (1997) calls into question how far down the social scale we should go to define RP. Indeed, that is an important point. I would argue that obviously not working-class, as the speech would have features that indicate locality. It would have to be middle-class upwards until upper-class. I would definitely not restrict RP to the upper-class only, as there are many middle-class speakers of British English, especially in Southern England, which display a speech with very few local features, sounding mostly RP.

General British is indeed the latest label proposed, but will it be the last one? And more importantly, will it be adopted by the linguistic and sociolinguistic community, the general public and the media? I suggest that instead of concentrating on which label is more adequate for defining the standard accent spoken in Britain (which is an important matter after all), we should focus more on its speakers and their actual usage of the accent, and we should observe and study the synchronic phonological changes that this accent is currently experiencing. That should be and exciting job to be undertaken by variationist sociolinguists in the expanding field of sociophonetics.

In this PhD research, rather than focusing on which label is best for RP, it was considered of great importance to have access to this elite speech community and study their accent, with

the focus on the variability of t-glottalling and also to attempt to discover innovative linguistic features. For that reason, it was regarded as crucial to conduct the research in teenagers in the elite private schools (boarding and non-boarding) in Southern England, where most of these schools are located. As we have seen in section 1.2, the RP accent has its origins in the great public boarding schools and it is mainly through these schools that the accent has been perpetuated from old to new generations of upper-middle and upper-class British families. Furthermore, in Chapter 3, I will discuss how the British school system still reflects nowadays a strong class division (Cannadine 1999, Reay 2006, Ball 2013). Therefore, conducting research on these elite schools was deemed to be major.

Thus, if we focus on how people who belong to the RP elite speech community speak, then we should talk about "elite accents of British English", "upper-class Englishes" and/or "elite Englishes". These varieties have long been neglected in the variationist sociolinguistic study of not only British accents, but also of English accents in general. The only previous study of upper-class and elite varieties of British English is Fabricius' (2000) research on RP and as for other English accents, we can find Kroch's (1996) study of upper-class Philadelphians, for American English[3].

As we have discussed in section 1.2, the concept of *Received Pronunciation* started with a linguist's definition and, as a consequence, this makes it very difficult to have an adequate approach to study this accent in sociolinguistics, as it prevents us from investigating and examining language variation and change in elite British accents from the perspective of the speakers' usage instead of focusing on the linguistic description and the linguistic system of RP, which has originally been regarded as fixed and invariant.

General British, mirroring the *General American* label, is indeed a more neutral term. However, this is yet again another label and by making the label more "socially neutral" it

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[3] For further details on these two studies, see Chapter 2 (sections 2.3 and 2.8).

will not change the fact that RP or *General British* is still a social accent, that of the middle, upper-middle and upper-classes in the UK.

I can see a potential problem in relation to the *General British* label, which is a more neutral and general term. As a social accent, RP covers a wide range of speakers from the social class point of view, from middle-class speakers, to upper-middle class speakers up to upper-class speakers. Cruttenden (2014) talks about *Conspicuous General British (CGB)*, a variety which he associates with upper-class families and public schools. However, he argues that "the number of speakers of CGB […] has considerably declined in the last fifty years and is now mainly limited to older speakers" (Cruttenden 2014: 81). Given the results[4] of t-glottalling found in my RP speakers from the elite major public boarding schools (for both teenagers and adults), which considerably differ (with much lower rates) from the other two schools (private non-boarding and outstanding rated comprehensive), I am inclined to think that what Cruttenden calls CGB is not declining, but instead very much alive, in the upper-class younger generations.

Hence, how can we distinguish between these types of speakers, phonetically and sociolinguistically? Does a middle-class RP speaker sounds like an upper-class one? I would say definitely not. But does the difference rely only on the phonetic sounds, or is there something else involved, like prosodic features such as intonation, stress patterns and the speech style in general? These are features that have been neglected for too long in researching and studying RP and they should be sooner rather than later explored if we want to have a more insightful understanding of the upper-middle and upper-class speech in England.

As previously mentioned, one of the few exceptions in investigating an English upper-class variety is Kroch's (1996) study of upper-class Philadelphia. He discovered that the phonetic differences between the upper-class and the middle-class speech were minimal and what

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[4] See Chapter 5, section 5.3.10, for the t-glottalling results for the social factor group *Type of school*.

distinguished the most the upper-class speech of Philadelphians from the speech of the upper-middle and middle-class speakers was their distinct speech style. He found the prosody of upper-class speech to be different and he argues that upper-class speech in Philadelphia is characterised by a drawling and laryngealised voice quality and by frequent use of emphatic stress patterns and of intensifying modifiers.

This PhD thesis does not attempt to give a comprehensive overview of what modern RP is phonetically, as RP has already been previously described by well-known phoneticians and linguists. This thesis has two main objectives. First of all, it aims to re-evaluate the sociolinguistic status of one of the linguistic innovations in modern RP, t-glottalling, by using an extensive and comprehensive list of linguistic and social constraints, and to try to discover any other linguistic innovations present in the speech of those speakers.

In order to do that, I thought it was crucial to focus the study on the schools where traditionally and historically RP has been found: the elite private boarding schools, known as public schools, with the highest fees on the private schooling market. As mentioned before, my view of RP is that it should not be considered an accent exclusive of the upper-classes, but also that of the upper-middle and middle-classes. That is why two other types of schools were recruited: also elite private schools but non-boarding (with half the fees of an elite boarding school) and an outstanding rated comprehensive school in a prosperous middle-class rural area of Southern England.

As for the second objective of this PhD thesis, it aims to look at RP and its speakers from a sociological point of view. Who are they and who are the elite institutions where they study? I will attempt to answer these two questions by observing and analysing theoretical concepts from three fields in sociology: the sociology of social stratification, the sociology of the elites and the sociology of education. This sociological view of RP has unfortunately been long neglected in the academic study of this accent and if RP has been classified as a social accent, we will not have a complete picture of the standard British accent if we do not

export concepts and ideas from the social sciences into the field of variationist sociolinguistics.

CHAPTER 2

Literature Review

In this chapter, we are going to review the previous literature on t-glottalling in relation to RP and to other accents, both in Britain and in other areas of the English-speaking world. First of all, we will describe what t-glottalling is and we will explain where linguists believe it comes from, as well as critically reviewing if London can be safely appointed as the main source on innovation for t-glottalling and other phonological changes in Southern England. Then, we will see where t-glottalling stands in RP, according to several descriptive accounts of this accent given mainly by phoneticians and not sociolinguists (with the exception of Trudgill's accounts). After that, we will review previous t-glottalling variationist studies on RP, Estuary English and the South of England in general. As well, within the UK, we will look at research carried out on t-glottalling in Wales (Cardiff), Northern England (Manchester and Newcastle) and Scotland (Glasgow). As for English language varieties outside the UK, we will look at some studies conducted on t-glottalling in the United States and in New Zealand. Moreover, we will comment on one of the very few studies which focus on upper-class varieties of English: Kroch's (1996) study on Philadelphia (USA). Finally, we will briefly review a secondary linguistic variant that was also found in the speech of young RP speakers, besides t-glottalling: tap (t).

2.1 What is t-glottalling and where does it come from?

Glottalisation is the complete or partial closure of the glottis during the articulation of another sound. If the oral articulation of a plosive is replaced completely with a glottal stop (as in _it was_ [ɪʔwəz] and as in _butter_ ['bʌʔə]) this type of glottal stop is called glottalling or glottal replacement. Therefore, T-glottalling is the linguistic phenomenon in which the consonant /t/ is pronounced as a glottal plosive [ʔ], rather than the traditional alveolar [t] (Wells 1997). According to Jones (1962: 150), in producing the glottal stop [ʔ] "the glottis is closed completely by bringing the vocal cords into contact, the air is compressed by pressure from the lungs, and then the glottis is opened (by separating the vocal cords) so that the air escapes suddenly. It is neither breathed nor voiced." However, if the voiceless

plosive is realised and the glottal stop is inserted adjacently, this type of glottalisation is called pre-glottalisation or glottal reinforcement (as in *ma<u>tt</u>ress* [mæʔtrəs]).

But where does the glottal stop come from? Even though there is not a clear consensus among linguists and no study has been made so far with definite conclusions as to where the glottal stop originated, there are three regions that can possibly claim its origin: East Anglia, Glasgow and London. According to Trudgill (1999: 132), East Anglia "appears to have been one of the centres from which glottalling has diffused geographically in modern English English." Even though London is often cited as the main geographical source of innovation of t-glottalling in Southern England, there are reasons to suppose, however, that this may not be entirely the case. Upon consultation of the Survey of English Dialects (SED), Trudgill (1974) demonstrates that northern East Anglia was the only rural area in the South of England in the 1950s in which glottalling of intervocalic /t/ was happening. Therefore, Trudgill provides a very plausible explanation as to how this feature could have possibly spread from East Anglia to London in the last century or so, and not the other way round.

The second origin that is suggested in the literature is Glasgow, in Scotland. According to Andrésen (in Collins and Mees 1996), glottalisation in southern British accents such as Cockney started as an influence of Scottish accents, and not on the other direction. Stuart-Smith (1999) states that the glottal replacement has been in use in both word-medial and word-final positions in Glasgow since the 19th century. Macafee (1997: 528) goes further and says that "Glasgow was probably the place of origin of the glottal stop in British urban speech." I believe this is a rather strong and misleading statement, bearing in mind Trudgill's (1974) findings in the SED of evidence of t-glottalling in East Anglia in the 1950s. Wells (1982) argues that glottalisation probably developed in Britain during the 19th century, after the first colonisation of Australia and New Zealand (in these accents of the Southern Hemisphere there is a lack of extensive glottalisation).

Finally, the other geographical source for the spread of t-glottalling is London and Cockney English, the accent of working-class East-Londoners. Some linguists (Wells 1994, Williams and Kerswill 1999, Przedlacka 2001, Altendorf 2004) have claimed London as the source for not only the spread of t-glottalling in the South of England and the rest of the UK, but also

for the spread of other consonantal variables such as TH-fronting and L-vocalisation. In recent years, a number of London working-class variants have not only been spreading geographically to areas outside London but also socially to higher social classes, including RP speakers. According to Altendorf (2004: 87), "these new variants have some characteristics in common: they have originated from non-RP/non-standard accents, they are associated with London English and they have recently been spreading regionally, at least within the south-east, and socially to higher social classes and more formal styles." Wells (1994: 205) states that "some of the changes…can reasonably be attributed to influence from Cockney – often overtly despised, but covertly imitated." Williams and Kerswill (1999: 159) suggest that glottal replacement of /t/ was a feature of "London Cockney English which has spread…widely across both geographical and social space." As Przedlacka (2001: 48) claims, "London constitutes the principal spatial diffusing nucleus, from which innovations normally radiate outwards." According to her account, London is a strong influential urban centre and it has a great potential in introducing linguistic innovations, not only in the South-East, but also in England.

Surely London could be appointed as one of the main sources for linguistic innovation and diffusion in British accents, as there is no doubt that it is a strong cultural, political and economic influential urban centre not only in the South-East, but in the rest of the UK. However, it seems to me that it is a bit simplistic to attribute only London the potential for linguistic diffusion. Most likely the British media have contributed far too much in spreading this rather simplistic perception among the general public, and it has even influenced some linguists' views to a certain extent. In any case, as Altendorf and Watt (2004: 185) argue "many of the so-called London variants have long existed in the accents of areas surrounding cities such as Glasgow and Norwich, and appear more likely to have originated from accents of the immediate vicinity than to have spread from London." Therefore, London could most possibly be one of the geographical sources for the diffusion of t-glottalling in British accents, but certainly not the only one. Other urban and rural areas of the UK, such as Norwich and East Anglia and Glasgow in Scotland have also been diffusing centres from which t-glottalling has originated.

2.2 T-glottalling in descriptive accounts of RP

As stated by Trudgill (1999: 136), t-glottalling "is one of the most dramatic, widespread and rapid changes to have occurred in British English in recent times." What is interesting about this change is that it is spreading in three directions: socially, from lower to higher-class accents; stylistically, from informal to formal speech; and phonologically, from more favoured to less favoured environments (Trudgill 1999).

According to modern descriptions of RP (Wells 1982, Wells 1997, Cruttenden 2001, Hughes, Trudgill and Watt 2005), t-glottalling is on the increase in young RP speakers. But is glottalisation in RP an exclusively 20th century phenomenon? As Collins and Mees (1996) argue it is not. In fact, they suggest that pre-glottalisation and glottal replacement were firmly established in the upper-class speech as far back as the mid 19th century. They claim that even though glottalisation is currently on the increase, it has been part of RP for a considerable period of time.

The first recognition by linguists of the glottal stop in several accents of English is in the 19th century: Bell, Ellis and Sweet in 1860, 1875 and 1877 respectively for Scottish accents of English; Babbitt for New York in 1896 and Sweet for "North English" in 1908. And curiously enough, glottalisation in Cockney is not commented on by a linguist until 1909 (Jones and Jespersen). As for the period of pre-1939, there are just a few mentions of glottalisation in the standard accent of RP. These comments mainly come from Daniel Jones and his colleagues at the Phonetics Department of University College London. In 1921, there is a first reference to the importance of the glottal stop in English made by Professor Jones in the *Daily Chronicle*, where he states that "*…there is one change taking place in our language to-day…It is called the "glottal stop". …the fashion of suddenly stopping the glottis down is growing so much that in 100 years' time the word "mutton" is likely to be pronounced "muh-un."* (Collins and Mees 1996: 178).

The first mention of glottalisation in non-dialectal speech in a scholarly work was made by Jones and his co-author Trofimov in 1923. They claimed that "educated Southern British persons" replaced /t/ for a glottal stop before a syllabic /n/ (Collins and Mees 1996: 179). Ten years later, in 1932, Jones noted glottalisation in many other contexts, such as syllable-

final before a consonant, but he mentioned that glottalisation before a vowel was only dialectal, and therefore, not happening in RP speakers. In 1957, Firth, one of Jones' colleagues, also mentioned the use of glottalisation in RP, noting that many "educated people" used a glottal stop in replacement of /t/ in "fairly rapid colloquial speech" before a consonant and syllabic /n/. Firth also mentioned that the glottal stop did not happen intervocalically in "educated speech" (Collins and Mees 1996: 179). Collins and Mees (1996) state that the first treatments and studies on glottalisation start to appear in the post-war period, with O'Connor and Christophersen studies being the first ones (in 1948 and 1952 respectively). It is important to note that O'Connor recognises the widespread use of the glottal stop in RP as an acceptable usage in certain contexts, and Christophersen claims that the glottal stop has firmly established in certain positions in the speech of young RP speakers.

As we have seen, Collins and Mees (1996) doubt that glottalisation is a recent innovation in RP in the last half century. In order to argue their point, they do not only rely on the previously published literature on the subject, but they also resort to pre-1930 audio recordings of reading passages, speeches and free discourses of notable public figures of the time, such as actors, writers, academics, politicians and broadcasters, who were upper-class RP speakers. By analysing these recordings, Collins and Mees found that glottalisation was present in the speech of all subjects to various degrees. However, that study was not very exhaustive in regards of the phonological contexts.

All in all, Collins and Mees (1996) come to the conclusion that glottalisation was a common feature in RP upper-class speech in the late 19th century and early 20th century. However, Wells (1982) states that late 20th century RP exhibits no glottalisation in upper-class speech (U-RP). Collins and Mees believe that his comments may be true for late 20th century U-RP, but certainly not for late 19th century and early 20th century U-RP. Wells (1997) dates the change of t-glottalling in the mid 20th century. He states that the production of a glottal stop is normal and accepted in RP before a consonant, both in word-medial and word-final position. As well, he acknowledges an extension of t-glottalling in other contexts, as a change in RP in the late 20th century, and thus, being introduced by its younger speakers. He states that the production of a glottal stop is not only found in a pre-consonantal position

(both word-medial and word-final), but also in word-final position, when the next word starts with a vowel or before a pause. However, he claims that the glottal stop in intervocalic position, within a word, is still stigmatised and regarded as Cockney, and therefore, it falls out of the scope of RP.

Similar claims as the ones described above had been made by Wells in a previous account, in 1982, where he recognises pre-glottalisation as a widespread phenomenon in RP and he says that no social value is attached to it. He states that t-glottalling is a widespread feature in the local accents of London, Glasgow, Edinburgh and in many rural accents of the south of England and East Anglia, as well as urban accents everywhere in England. As for the RP accent, Wells (1982: 261) argues that t-glottalling in pre-consonantal environments (both word-medial and word-final) "is a feature of current mainstream RP". As well, he goes further to suggest that younger RP speakers use the glottal stop even in pre-vocalic environments, but only in word-final position, as pre-vocalic t-glottalling in word-medial position is highly stigmatised and it is regarded as a Cockneyism (Wells 1982).

According to Cruttenden (2001), young RP speakers increasingly replace (glottalling) or reinforce (pre-glottalling) syllable-final /t/ in a word-final position by using a glottal stop [ʔ] when a consonant follows (for example, *that table, get down*). As for using the glottal stop word-finally before words beginning with vowels or before syllabic /n/ and /l/, until recently, it was stigmatised as non-RP, but is now acceptable in London Regional RP (for example, *eat an apple, cotton, little*). As for the use of the glottal stop word-medially intervocalically (as in *water*) it still remains highly stigmatised as non-RP and it is regarded as a feature of lower-class accents.

Hughes, Trudgill and Watt (2005) also mention the recent spread of t-glottaling in the speech of young RP speakers. However, they also state that the glottal stop has long been a feature of RP, although it does not have any phonemic status and it goes largely unnoticed in the accent. Indeed, RP speakers often use the glottal stop to reinforce /p, t, k, ʧ/ in a range of syllable-final environments (pre-glottalisation). As for glottalisation, Hughes, Trudgill and Watt (2005) claim that young RP speakers, both from middle and upper-class backgrounds, are using more and more often the glottal stop in word-final position, mainly

before a consonant (*get down*) or a pause (*that*), but even before a vowel (*quite awful*). They believe that it is possible to relate the increased use of the glottal stop in RP to the influence of popular London speech. As they claim, "younger RP speakers are also adopting [?] despite (or perhaps because of) the stigma of ugliness, inarticulacy and "sloppiness" that is often attached to the form" (Hughes, Trudgill and Watt 2005: 67). Indeed, according to them, the stigma attached to the glottal stop may be receding, as public figures such as Tony Blair, and some young members of the British Royal Family often exhibit this feature in their speech (mainly in word-final pre-consonantal and pre-pausal position, but even in word-final pre-vocalic positions). However, Hughes, Trudgill and Watt state that the glottal stop is most common in the speech of younger urban working-class speakers of British regional accents, and is now found in almost all regions of the UK.

So, according to these impressionistic descriptions of RP glottalisation is not a new phenomenon in RP at all. Pre-glottalisation (or glottal reinforcement) has long been an established feature in the standard accent in Great Britain and even glottalling (or glottal replacement) has been a common feature in RP, but it has been restricted to a pre-consonantal environment only, in both word-medial and word-final positions. However, it is true that recently, in the last 20 to 30 years, there has been an increase of the glottal stop in young speakers of RP in phonological positions where previously it was not accepted in the standard accent, such as word final pre-vocalic and pre-pausal. As for word-medial intervocalic, most of the authors previously mentioned consider this position as highly stigmatised and it is regarded as a feature of lower-class accents, and therefore, it falls out of the scope of RP.

2.3 T-glottalling in the South of England

We now turn to discuss some of the most recent sociolinguistic studies on t-glottalling in relation to RP, Estuary English and Southern British English in general. RP has been widely described phonetically (Wells 1982, Wells 1994, Wells 1997, Roach 2000, Cruttenden 2001, Hughes, Trudgill and Watt 2005), but there are almost virtually no sociolinguistic studies of the British standard accent, with the exception of Fabricius' (2000) study on t-glottalling in RP. Therefore, the descriptive studies of RP mentioned in the previous section 2.2 are mainly impressionistic descriptions of the accent and the main disadvantage is that they lack

in providing quantitative data on the actual usage of linguistic vowel and consonantal variables by its speakers. Labovian quantitative sociolinguistic literature has just concentrated on vernacular accents and older as well as more modern investigations of urban accents do not go beyond the middle class. But RP speakers are also part of a speech community and therefore, they also participate in language change. So it has been quite unfair the poor treatment of upper-class varieties in the field of language variation and change. Fabricius (2005) has pointed out three possible reasons why this has been the case: the search for the vernacular is done in other communities, these kind of people are inaccessible and their generally high levels of education make them unreliable as "naïve linguistic subjects".

Fabricius' (2000) PhD thesis is the only study that focuses on t-glottalling in RP so far, until the present research. Her account focuses on the speech of young RP speakers: ex-public school students, who study at the University of Cambridge (where she recruited the informants). She only looked at t-glottalling in word-final position, because as stated in her study, she thought it was in such an environment where research was lacking (Fabricius 2000: 21). However, by just focusing on word-final t-glottalling, I believe her study misses out on a very important aspect of t-glottalling, which is its behaviour in word-medial position. I think by researching in this position we can discover important behaviours of the glottal stop both in linguistic and social terms.

A total of 24 speakers were analysed, aged between 18 and 26, producing a total of 9888 tokens (8768 interview style and 1120 reading passage style) analysed using a multi-factor ANOVA analysis. As for the linguistic constraints, she looked at five phonetic environments following the glottal stop (stops, fricative, liquid/semivowel, vowel and pause), in two different speech styles (interview style and reading passage style). In terms of the social constraints, she focused on sex (males and females), region (London, Home Counties and Rest of England), parental origins (parents born outside Britain and British parents), primary school education (independent school and local school) and secondary school education (day and boarding school, school membership and school's Academic League position). She reached several conclusions at the end of her study (Fabricius 2000: 134):

a)Word-final pre-consonantal t-glottalling has completed its spread as a linguistic change in RP, and it is now a common feature in the accent of younger generations of upper-middle class speakers, and thus it is in the process of losing stigma. However, this is not the case for the pre-vocalic and pre-pausal environments, where t-glottalling is still stigmatised in RP.

b)She acknowledges 3 waves of t-glottalling in word-final position: the first one being the pre-consonantal category (which has completed its spread in RP), the second is the pre-pausal category and the third one and the newest one is the pre-vocalic category. The two last categories are still in the process of spreading in RP.

c)In gender terms, young RP male and female speakers do not differ significantly in their rates of t-glottalling in word-final position. So, it is not possible to point to a single group who is leading the linguistic change. Therefore, it can be claimed that t-glottalling in RP is simply a linguistic change led by young speakers.

d)Fabricius did not observe a style-shift in t-glottalling from an informal style to a more careful formal style of speech in the pre-consonantal environment (more specifically, the pre-stop environment). In other words, the high rates of t-glottalling in interview style are beginning to affect the reading style as well. However, she found a dramatic style-shift in the pre-vocalic and pre-pausal environments, where glottal replacement is virtually absent from the reading passage style. Thus, with regard to style-shifting in upper-middle class speakers, Fabricius (2000: 135) reports that "t-glottalling is a sociolinguistic variable which is consistently susceptible to style-shifting".

As for her results for the interview analyses, she found the following phonological environment to be a highly significant factor in all the analyses she conducted. The glottal stop was most frequent when followed by a liquid/semivowel (83%), a fricative (68%), stops (72%), and it was least frequent when followed by a vowel (40%) and a pause (36%). Moreover, she found differences between speakers across regions in the pre-vocalic and pre-pausal environments, and in the pre-vocalic environment she also discovered a difference according to the parental background. As for the pre-consonantal environments, they did not show any significant interactions with social or educational factors. Finally, the

educational background (those who had attended more elitist private schools and those who had attended more modest private schools) did not show a difference on the rates of t-glottalling the speakers exhibited.

So, according to Fabricius (2000: 148-149), word-final t-glottalling has largely lost its stigma in RP in pre-consonantal environments, but in pre-vocalic and pre-pausal positions it still has negative judgments and it is avoided by RP speakers in more formal speech. Thus, Fabricius concludes that the status of t-glottalling in modern RP falls between stigma and prestige, and she claims that future modern RP speakers may bring the change to completion: "The next few generations will prove crucial in determining whether t-glottalling continues to advance or stagnates. If t-glottalling in pre-vocalic and pre-pausal environments continues to spread from London and reaches the hypothesised 50% point at which acceptability can begin, the stage will be set for it to gain overt acceptability, and, if adopted by female speakers, to gain prestige." (Fabricius 2000: 148)

Even though Fabricius' (2000) study is the first and only sociolinguistic quantitative research conducted on RP so far (until the present thesis) and it shows interesting and revealing results on the usage of t-glottalling among young RP speakers, it lacks in some aspects. She uses a rather restricted set of linguistic constraints: pre-consonantal (even though she divides it into three categories stops, fricative, liquid/semivowel), pre-vocalic and pre-pausal. Moreover, she only looks at following environment and she omits preceding environment. As well, she does not analyse type of vowel or other linguistic factors important for t-glottalling such as stress, grammatical category, number of syllables and lexical frequency. And most crucially, she does not analyse tokens in word medial position, as she only looks at tokens in word-final position. As for the age social factor, she only focuses on one age group (university students 18-26), but she does not compare it to a younger or older RP age group. Finally, she only looks at upper-middle class RP speakers, but does not compare them to more middle class RP speakers.

One of Fabricus' (2000) conclusions about her study is that word-final pre-consonantal t-glottalling has completed its spread as a linguistic change in RP, and it is now a common feature in the accent of younger generations of upper-middle class speakers, and thus it is in

the process of losing stigma. However, this is not the case for the pre-vocalic and pre-pausal environments, where t-glottalling is still stigmatised in RP. It seems to me that it is not very accurate to claim that a feature is stigmatised or not without actually carrying out some kind of attitudes survey. Very loose claims are being made quite often in the literature of t-glottalling about people's attitudes on this feature rather than their actual usage. It is very difficult to tell from usage alone whether something is stigmatised or not. Indeed, t-glottalling is very much researched from a quantitative variationist perspective, but there is a great lack of research about the actual speakers' attitudes on the usage of the glottal stop, both in RP and in any other accent in the UK.

Altendorf's (2003) study is mainly concerned with researching Estuary English, in the locations of London, Colchester and Canterbury. However, she also looks at RP as she compares her EE speakers with RP and Cockney speakers. Although her study only has 10 female participants, she focuses on a wide range of consonantal and vocalic linguistic variables. She analyses six consonantal variables (amongst them t-glottalling and TH-fronting) and five vocalic variables (including diphthongs as well). Her speakers are drawn from three types of schools: comprehensive school (two female working-class speakers from London), grammar school (six female middle class speakers from London, Colchester and Canterbury) and private school (two female upper-middle class speakers from London), so she uses type of school as a proxy for social class. As for style, she looks at speech produced in interview style, reading style and word list style.

I would say that one of the weaknesses of the study is her rather restricted set of linguistic constraints for t-glottalling. Again, like Fabricus' (2000) study, more linguistic constraints could have been explored in order to have a better understanding of the linguistic behaviour of t-glottalling. Moreover, she only focuses on female speakers and she mentions that her method of quantification simply consists in calculating percentages of occurrence of the variants under study. So, she does not provide any statistically processed results and I believe this is a major drawback in her study. As well, for her upper-middle class RP speakers, she only looks at two female speakers, so it is not a big sample at all (as most of her sample is concerned with EE).

As for her results for t-glottalling, they are corroborated by Fabricius' (2000) findings for RP and by Tollfree's (1999) findings in London. Altendorf (2003) analyses t-glottalling tokens in both word-medial and word-final position. She argues that t-glottalling is a marker in the Labovian sense, because it is spread in al social classes and styles, but at the same time displays social and stylistic variation. These social and stylistic constraints become evident when results are correlated with different phonetic contexts. Indeed, t-glottalling is very much subject to linguistic constraints which condition the occurrence and frequency of the glottal variant. These linguistic constraints affect t-glottalling in the following order: pre-consonantal position (GaTwick) > pre-vocalic (quiTe easy) and pre-pausal position (QuiTe!) > pre-lateral position (boTTle) > intervocalic position (buTTer). Moreover, these phonetic constraints are further strengthened by social and stylistic factors.

Altendorf (2003) reports that her middle class speakers differ from working class speakers in that they avoid the glottal stop in socially sensitive positions in more formal styles. They display a reduced frequency of the glottal variant in pre-vocalic and pre-pausal position and avoid it completely in the most stigmatised intervocalic position. It must be mentioned that her results for t-glottalling for the working class speakers show a categorical production of the glottal stop at a 100% rate in all the phonetic contexts in both interview and reading style, with the exception of word-medial intervocalic position (buTTer) where they display around 90% of glottal stops in interview style and around 70% in reading style (still extremely much higher rates than their middle class and upper-middle class counterparts for this position).

As for the results for her upper-middle class speakers, she reports that they differ from all other social classes in that they avoid the glottal stop in these socially sensitive positions in both informal and formal styles. In the most informal style, they have noticeably lower rates of pre-vocalic and pre-pausal t-glottalling and they avoid it almost completely in the formal reading style. As for the glottal stop in the most stigmatised positions (pre-lateral and intervocalic), she states that it does not occur at all. Thus, in her results for word-medial t-glottalling, she finds that before a consonant, the production of the glottal stop falls within the scope of RP, whereas in intervocalic and pre-syllabic /l/ positions, the glottal stop is still stigmatised and not considered part of the RP accent. It has to be mentioned that she does

not report any results for t-glottalling in the word-medial syllabic /n/ position, such as in *buTTon*, for any of the three school groups analysed.

In her results for t-glottalling, Altendorf (2003) also mentions the middle class treatment of word-medial pre-lateral t-glottalling (boTTle) as an interesting development. In informal speech, she states that London working-class and middle class speakers treat pre-lateral t-glottalling in the same way as word-medial pre-consonantal t-glottalling (GaTwick) and use it with the same frequency. However, upper-middle class speakers continue to consider it to be as stigmatised as word-medial intervocalic t-glottalling (buTTer) and thus they avoid it altogether. As for more formal styles, the middle class speakers change their word-medial pre-lateral t-glottalling habits in a drastic way and they join the upper-middle class speakers this time and they avoid it altogether.

Finally, Altendorf (2003) makes an interesting remark stating that there has been a striking increase in the frequency of the glottal variant in the most socially sensitive phonetic environments, such as in word-final pre-vocalic and pre-pausal positions and in word-medial intervocalic position. She claims that "for middle-class speakers in the most informal style, T Glottalling in pre-vocalic and pre-pausal position is almost five times higher than in the Hudson-and-Holloway (1977) data" (Altendorf 2003: 89). These results are also confirmed by Tollfree (1999) who finds an increase in pre-pausal and pre-vocalic t-glottalling in her middle class data. Altendorf suggests that for upper-middle class speakers, the glottal stop in these contexts must have increased as well. Indeed, in her study, upper-class frequencies in these positions are approaching the 50% mark in informal style. As for the other socially sensitive phonetic environment, the word-medial intervocalic position, Altendorf states that the glottal variant in this position has also increased dramatically for middle class speakers, from 0% in the Hudson-and-Holloway (1977) data to 55% in her study. She further claims that these results are not confirmed by Tollfree (1999).

So, as Altendorf (2003: 91) argues "T Glottalling has increased in all social classes, styles and phonetic contexts in London and the south-east … where it is now very widespread indeed. Social differentiation is, however, retained by differences in frequency and distribution of the glottal variant in different phonetic contexts".

Przedlacka (2001, 2002) study is also mainly concerned with researching Estuary English like Altendorf's (2003) research. However, she also analyses the speech of two RP speakers and two Cockney speakers for comparison purposes to EE. Even though the RP sample is very small (only 285 tokens for all the variables analysed and 48 tokens for t-glottalling), her results are still worth being considered. Prezdlacka is mainly concerned with analysing the speech of 16 teenagers aged 14-16, born and brought up within a 50-mile radius of Greater London, grouped by class (working class and middle class), gender (males and females) and county (Buckinghamshire, Essex, Kent and Surrey). Like Altendorf (2003), she defined social class solely by the type of school: comprehensives for working class speakers and grammar schools for middle class speakers.

The total number of tokens she analysed is 2254 for Estuary English and 285 for RP. Even though the data are not very large and she only used an auditory analysis, she investigated a wide range of phonetic variables, fourteen in total, including five consonants (amongst them t-glottalling and TH-fronting) and nine vowels. Concerning style however, she only focused on formal speech and therefore she does not provide results for informal speech. She designed a questionnaire based on the SED questionnaire, which consisted of 116 questions, out of which 60 exemplified more than one variable. Her data were processed statistically using a chi-square analysis. As for the two Cockney speakers, they were drawn from a comprehensive school in East London. The two informants were one female (aged 14) and one male (aged 15) and they were born and brought up in Bethnal Green. The recordings of the two RP speakers on the other hand were made at Eton College. They were both male and aged 13. One of them exhibited a number of features described in the literature as U-RP, while the other was a mainstream RP speaker.

Her results for t-glottalling show that RP speakers use the glottal stop the least (with an 8.3% of glottal realisations) whereas Cockney speakers fall at the other extreme of the spectrum with an 85.2% of glottal stops. As for the EE speakers, she found that their production of glottal stops fell in between the RP and Cockney speakers, with a total production of 32.2%. It must be noted that again, like Fabricus (2000) and Altendorf (2003), the range of phonetic constraints analysed for t-glottalling is very limited, and she only looks at word final positions before a consonant, vowel and pause and word medial intervocalic,

syllabic /l/ and /n/, and due to the fact that her RP data are so small, her description of results does not cover all of these categories. Przedlacka (2001, 2002) reports that only 8% of the tokens analysed of the two male RP speakers exhibited t-glottalling. She states that both informants have a glottal stop before an obstruent, both word internally and in word-final position and before a syllabic nasal in word-medial position. As for t-glottalling in her EE informants, she found that female speakers had a much higher rate of glottal stops (47%) than males (28%). She claims that glottal replacement is favoured in the following phonetic environments: word final pre-consonantal, word final pre-vocalic and word medial syllabic /n/. On the other hand, word-internal intervocalic glottalling is almost non-existent in the data, with only a total of 4 instances out of 335. In relation to her two Cockney informants, Przedlacka reports that as many as 85.2% of the tokens exhibited t-glottalling, with a figure of almost 100% for word medial intervocalic t-glottalling. And she finally remarks that her data show a striking increase in comparison with Hudson and Holloway's (1977) study, where only 17% of the tokens were glottalised.

Another study that is focused on London English is Tollfree's (1999) research. She conducted Labovian interviews during 1990-94 in South East London. She interviewed a total of 90 informants from two different areas: Peckham, Sydenham and Penge (working class communities) and Dulwich, Beckenham and Bromley (middle class communities). She examined a wide range of vocalic and consonantal variables, amongst them t-glottalling and TH-fronting. She distinguished between two general accent groups: SELE or South East London English, which includes "medially to maximally broad varieties" (Tollfree 1999: 164) and SELRS or South East London Regional Standard, which she claims is the local form of near-RP and which covers "regionalised forms of RP which fall towards the minimally broad end of the continuum" (Tollfree 1999: 164). As for age and style, she divided her informants into two age groups (15-30 and 54-89) and she interviewed them under different speech situations ranging from formal to informal. She transcribed the recordings auditorily.

Tollfree (1999) reports results for two other common phonetic variants for the (t) variable (affricated/fricated and voiced tap) besides the glottalised variants, which neither Fabricius (2000), Altendorf (2003) nor Przedlacka (2001, 2002) report on. In relation to the affricated/fricated variant, Tollfree (1999) states that SELRS informants use a fricated [tˢ]

occasionally in pre-vocalic position and in word final position, especially utterance-finally where it may also be glottalised. According to Tollfree (1999: 170) "the plosive [t] is the prestige form, but according to informants, fricated variants have a similar high status." She further claims that "fricated forms are used mainly by older speakers and are particularly associated with a confident, or affected, speech style" (Tollfree 1999: 170). As for the fricated variant in broader varieties, she states that it is sometimes found in SELE informants, where it is usually related with an emphatic production, most frequently in pre-pausal and word medial intervocalic contexts. In terms of the tap variant, she reports that both SELRS and SELE speakers produce taps mainly in two environments: intervocalically across a word boundary (particularly in phrases containing commonly used lexical items such as *but I, lot of, get a, quite a, what is, that is*) and intervocalically word-internally (in items such as *getting, better*).

As for the glottalised variants, Tollfree (1999) states that they are frequently used by both SELRS age groups in pre-consonantal position, both in word medial contexts (*nightmare*) and across a word boundary contexts (*trinket box*). Moreover, there is frequent use (especially by older SELRS informants) of glottalised variants preceding syllabic /n/ (*button*), but not preceding syllabic /m/ (*bottom*) or before syllabic /l/ (*bottle*), where she claims t-glottalisation is stigmatised. As for t-glottalisation in word final pre-vocalic and pre-pausal position, she found the greatest disparity between the two age groups, where older SELRS speakers use the glottal stop only sporadically and younger SELRS speakers use it more often. Tollfree (1999: 171) argues that this age disparity in these phonetic contexts may "suggest a change in progress" and that "the results for older speakers of SELRS seem to reflect the traditional stigma of T-glottalisation, particularly in intervocalic contexts."

On the other hand, in the SELE informants, Tollfree (1999) found that the distribution of the glottalised variants was more widespread than in the SELRS informants. She found that t-glottalisation in pre-consonantal and pre-pausal positions is near-categorical in SELE speakers and she also observed a high incidence of t-glottalisation in word final pre-vocalic position and in word medial intervocalic position where the prominence of the preceding syllable is greater than that of the following syllable.

In Southern England the glottal stop has not only been observed in and around London, but also in other geographical areas such as East Anglia, which also claims for the origin and diffusion centre of this feature (see section 2.1). Trudgill (1974, 1988, 1999) seminal work on Norwich English also examines t-glottalling among many other vocalic and consonantal variables. In his 1974 study, he used a random sample of 60 informants born and brought up in or around Norwich, and in his follow-up study from 1988 he used a sample of 17 informants. In terms of t-glottalling, his findings show that the glottal stop is the usual realisation of /t/ in intervocalic and word final position in casual speech. In his follow-up study of 1988, he found that the glottal stop was also spreading into more formal styles.

Another sociolinguistic study of t-glottalling in the East Anglia region is that by Straw and Patrick (2007), where they look at the acquisition of glottal variation in /t/ in the speech of Barbadians in Ipswich (Suffolk). They only look at word final /t/ and it is a preliminary study of eight informants, four Anglos and four Barbadians, all of which reside in the same working class neighbourhoods. The sample of speakers is divided according to gender (males and females) and age (40-50 middle aged and 68-74 retired). A total of 250 tokens were analysed acoustically, making this paper one of the very few studies of t-glottalling using an acoustic method of analysis (for acoustic analysis of consonantal variables see Docherty and Foulkes 1999).

Straw and Patrick (2007) talk about the *diffusion pattern* for t-glottalling; that is the ordering of diffusion of t-glottalling in different phonetic environments: PreC > PreP > PreV. In their paper they argue that "pre-vocalic and pre-pausal environments seem to allow the greatest play for social factors. Pre-consonantally, the frequency of glottal variants is high nearly everywhere. This is the first environment to become categorical at or near 100%, while pre-vocalic is the last and consequently shows the greatest contrasts by age, sex and class" (Straw and Patrick 2007: 6). Furthermore, they talk about the *early diffusion pattern*, in which pre-pausal glottal variation patterns with pre-vocalic (PreC > (PreP, PreV)) and the *late diffusion pattern*, in which pre-pausal and pre-consonantal environments show similarly high rates and they pattern together ((PreC, PreP) > PreV).

As for the results of the Anglo informants, Straw and Patrick (2007) found that the most favoured environment for glottal variation was the PreV environment, an unusual result that has not been reported in the sociolinguistic literature before. As for the PreC and PreP environments, they report that they do pattern together (as in the late diffusion pattern), but at a lower rate than PreV. Straw and Patrick (2007) refer to this unusual distribution of variation as the *Ipswich pattern* (PreV > PreC, PreP), as it is evident that the Ipswich Anglo speakers do not follow any of the expected diffusion patterns. In relation to the results of the Barbadian speakers, Straw and Patrick (2007) state that women display the early diffusion pattern, with having higher rates of PreC leading both PreP and PreV. On the other hand, the men show neither the diffusion patterns described in the literature, nor the Ipswich pattern. As a conclusion, Straw and Patrick (2007: 20) argue that "the use of the (t) variable by Ipswich Anglo urban speakers does not suggest diffusion from the London area … while the partial resemblance between Barbadian immigrant and Anglo speakers argues for dialect acquition."

Finally, we will review the work of Williams and Kerswill (1999) on Reading, Milton Keynes and Hull. Williams and Kerswill conducted two sociolinguistic projects: the Milton Keynes project and the Dialect Levelling project. Both aim to explain the phenomenon of dialect and accent levelling in England, a process in which "differences between regional varieties are reduced, features which make varieties distinctive disappear, and new features emerge and are adopted by speakers over a wide geographical area" (Williams and Kerswill 1999: 149).

The Milton Keynes project (around 100-hour corpus) is based on the speech of 48 working class children who were either born in Milton Keynes or had arrived within the first two years of life. The informants were divided in three age groups (4, 8 and 12 years old) and in two sexes (males and females). The recordings of the children were made in pairs with the fieldworker and it consisted of a semi-structured interview and a word-list reading, so covering both informal and formal styles of speech.

As for the Dialect Levelling project (around 90-hour corpus), it was conducted in three towns: Hull, Reading and Milton Keynes. These towns had a similar size population, but they differed in the geographical location, demographic characteristics and social composition.

Milton Keynes is a new town, built around 1967 on a green-field next to the M1 motorway, and it is located within an 80-kilometre radius of various important urban centres, such as London, Oxford, Leicester, Coventry and Cambridge. Most of the people who moved to Milton Keynes (around 75%) came from other areas in the South-East, including London. Therefore, in Milton Keynes we find a "socially fluid population made up of newcomers with aspirations to improve both their housing conditions and their employments prospects" (Williams and Kerwill 1999: 150). Hull, on the other hand, is a city with very low levels of social and geographical mobility, where out-migration exceeds in-migration, and it has a high rate of unemployment, poverty and poor educational achievement in the local schools. And due to its geographical position 400 kilometres north of London, it has very few commuters. As for Reading, it shares features with both Hull and Milton Keynes. It is an old established town with a stable, local population, but due to its close location to London (60 kilometres) it has attracted many international companies and industries, meaning that it has a great influx of in-migrants from different socio-economic groups.

The interviews of the Dialect Levelling project consisted of a sample of 96 adolescents aged 14-15 in the three locations previously mentioned: Hull, Reading and Milton Keynes. The informants came from two social class backgrounds (working class and middle class) and two sexes (males and females). In terms of style, the interviews ranged from more formal to informal settings, and there were both individual and group interviews. Moreover, the project included older informants, four working-class persons aged 70 or above (two male and two female) in each town. All of the informants in the project (adolescents and older speakers) were native-born or had arrived within the first four years of life.

Both projects (Milton Keynes and Dialect Levelling) researched a wide range of vocalic and consonantal variables, amongst them t-glottalling. Williams and Kerswill (1999: 147) report that "there is considerable evidence of convergence in the consonant systems of British accents … suggesting that T-glottalling and the fronting of /θ/ and /ð/ to [f] and [v] are widespread and show increasingly similar phonological and sociolinguistic patterning throughout the country." They further argue that these consonantal mergers, amongst them t-glottalling and TH-fronting, constitute a set of "youth norms" which are being adopted by young people across the UK. Williams and Kerswill (1999) found the glottal

replacement of non-initial /t/ to be the norm among young working class people in all three towns, and they report that males used the glottal stop a little bit more. As for the middle class young informants, girls exhibit glottal replacement more in Reading and Hull, while in Milton Keynes it is the boys who show a higher rate. It is pre-consonantal environments (such as *let me*) that favour t-glottalling the most. Williams and Kerwill (1999) further report that older speakers in Hull have lower rates of t-glottalling than younger people, and this suggests a recent introduction of the feature.

2.4 T-glottalling in Wales

After having widely reviewed the studies on t-glottalling in RP and Southern British English in general, we now turn to discuss glottal variation in another area of the United Kingdom where this linguistic phenomenon has also been observed: Wales and most specifically its capital Cardiff.

Collins and Mees' (1999) study is based on the spread of t-glottalling in Cardiff English. It is an interesting account because it acknowledges the fact that t-glottalling is recently being acquired in Cardiff English as a sign of prestige and social advancement, in a change from above led by young middle class females (see also Milroy et al. 1994 and Holmes 1995). According to Collins and Mees (1999), London and its lifestyle are seen as trendy and fashionable, and most often public figures and "celebrities", such as young royals and rock stars, are heard exhibiting glottal stops in their speech. Therefore, in turn, these prestigious associations are also applied and transferred to glottalisation.

Collins and Mees' (1999) study shows that glottalisation is on the increase in Cardiff. Taking into account social variables such as class (working class, lower middle class and middle middle class – on the basis of the father's occupation), style (reading passage style and interview style), gender and time (1976, 1981 and 1990), it is revealed that glottal replacement of word-final /t/ is a spreading prestigious feature, with young middle-class females leading the linguistic change. On the other hand, Collins and Mees (1999) find little evidence that this linguistic change has spread in the speech of the working classes, where the levels of glottalisation are very low. So, as Collins and Mees (1999: 202) state "the upwardly mobile Cardiff females can be seen to acquire RP-style glottalisations together

with a professional career, a suburban house and a well-qualified partner. Those who lack such aims are also likely to lack glottalised forms." However, one of the drawbacks of this study (as many others in t-glottalling as we have seen so far) is the restricted set of linguistic and phonological environments analysed, organised only along the lines of word final pre-consonantal, pre-pausal and pre-vocalic contexts.

2.5 T-glottalling in Northern England

T-glottalling has not only been observed in Southern England and Wales, but also in Northern England. In this section we are going to review Milroy et al.'s (1994) study on glottalisation in Newcastle English, where it is a common long-standing feature in the speech of the elderly, but not glottal replacement (or glottalling), which is a new feature and it is associated with younger speakers. Milroy et al. (1994) argue in their article that early studies on t-glottalling suggest that this feature is a male norm (Macaulay 1977, Reid 1978, Romaine 1975, Trudgill 1974, Macaulay 1991). However, this male norm (which is reflected by a long-standing negative social evaluation) is not found where glottalling is emerging as an innovation or it is increasing (see Collins and Mees 1999). Milroy at al. (1994) argue that the rapid spread of t-glottalling can be attributed to a general ongoing supra-local change in British English, and this change is not only affecting the urban dialects of British cities, but also RP.

Milroy et al.'s (1994) article draws results from two studies: Hartley (1992) on Newcastle and Milroy et al.'s findings from Tyneside from the early stages of a current (1994) research project on variation in British English. Hartley (1992) analysed glottalisation and glottalling of the plosives /t/, /p/ and /k/ in the speech of 16 children (aged 5-10 years old), from both genders (males and females), in two speech styles (peer-interaction style and word-list reading style). In terms of class, the informants were all drawn from a primary school in Blakelaw, a low income working-class area of Newcastle. The data were processed statistically. Hartley's (1992) results suggest that males use glottalised variants of all kinds more frequently than females and if glottaled and glottalised variants are analysed separately, there is a clear gender-related preference, with girls preferring glottal stops and boys preferring glottalised variants. In terms of style, Hartley (1992) reports that girls style-shift more than boys and that there is less glottalisation and glottal replacement in word-list

style than in peer interaction style for both genders. As for the linguistic contexts analysed, they are rather limited, as it has been the case for most of the studies on t-glottalling so far. Harltey (1992) looks at word-medial intervocalic context and word-final context before a following consonant, pause and vowel. Results show that for word-medial intervocalic position, boys have a preference for glottalisation and girls prefer glottalling in this context. In word-final position before a following consonant, Hartley (1992) reports that glottal stops are preferred (especially by boys) and in word-final pre-pausal position, non-glottalised forms are preferred for both males and females. As for word-final pre-vocalic position (where voiced or tapped variants are favoured especially in Northern dialects) two variants, glottalised and voiced, are competing for the same space. Hartley (1992) finds that although voiced variants are strongly favoured in this specific context (boys use voiced variants of /t/ at the highest frequency, 68%), glottalised variants are also used around one-quarter of the time by boys and one-third of the time by girls.

As for the Tyneside study (Milroy et al. 1994), five variants of (t) were analysed in the speech of 32 adults from Newcastle, half of them from a working class area and the other half from a middle class area. The informants were divided into two age groups (16-24 and 45-65) and they were both males and females. In terms of style, they only interviewed the speakers in informal style, in peer-interactions sessions. A total of 2838 tokens were analysed but only in one phonetic environment: word-final (t) in intervocalic word-final contexts (as in *get it*). In this context, they find that it is young middle class speakers (and especially females) who lead in the production of the glottal stop, and their working class and older counterparts fall behind. Therefore, glottal variants are mainly associated with young middle class speakers (especially females), whereas glottalised variants are usually associated with older speakers (older speakers use a higher proportion than younger speakers in both classes) and male speakers. In the younger group, working class speakers use the glottalised variants more frequently than middle class speakers, and overall males more frequently than females. Thus, overall, Milroy et al.'s (1994) study shows that diffusion of t-glottalling is done by females and it is a supralocal change which brings about a favourable evaluation.

2.6 T-glottalling in Scotland

As we have previously seen in section 2.1, Scotland (and most specifically Glasgow) claims to be one of the original places where the glottal stop appeared and developed (Collins and Mees 1996, Macafee 1997, Stuart-Smith 1999). In this section, we are going to review two studies on t-glottalling in Scotland: Schleef (2013) on Edinburgh English (and also London English) and Stuart-Smith et al. (2007) on Glasgow English.

Schleef's (2013) account on t-glottalling in Edinburgh and London is one of the latest additions to the study of glottal variation in the sociolinguistic literature of British English. It is also one of the most complete studies (if not the most) in terms of the wide range of phonological and linguistic constraints involved in the research of this feature up to date. Moreover, the study includes two locations (Edinburgh and London), which is quite unusual in the sociolinguistic literature on t-glottalling.

Indeed (as previously seen in the studies we have reviewed so far) most research on t-glottalling only assumes a very small set of phonological and linguistic constraints. Schleef (2013) on the other hand looks at a wide range of internal constraints, which can potentially contribute to the variability of /t/. Besides analysing the following phonological context (in which he looks at vowel, pause and different types of consonants –nasal, liquid, plosive, fricative/affricate and glide-) and the preceding phonological environment (vowel, pause, nasal and liquid), he also takes into account other non-phonological factors, such as lexical frequency, grammatical category (proper noun, pronoun, simple noun, adjective, adverb, conjunction, verb, past participle, verb progressive and preposition) and number of syllables (1, 2, 3, 4 and 5) that have long been ignored in the literature. Furthermore, he splits the data according to the position of t-glottalling in word-medial and word-final position in order to conduct the quantitative analysis, which is not very common in the literature (see Roberts 2006). As for the social constraints involved in his study, he looks at speech style (reading and conversational), speaker sex (male and female) and speaker age (only teenagers). Even though he covers a very wide range of internal and external constraints that can contribute to the variability of /t/, he does not include stress in his linguistic constraints, a factor which I believe it is also important to look at for assessing the occurrence of t-glottalling (see Tollfree 1999, Holmes 1995 and Eddington and Taylor 2009).

Moreover, it would also have been interesting to include in the analysis the quality of vowels (see Eddington and Taylor 2009).

In terms of the data collection, Schleef (2013) recruited the informants from two high schools, one in West Edinburgh and one in West London. Both schools had a high intake of students from low-income families, as indicated by pupils' eligibility for free school meals. So, the adolescents used for the study came from an upper-working to lower-middle class background. A total of 45 speakers (21 for Edinburgh and 24 for London) aged between 12 and 18 were analysed, and that produced a total of 2633 tokens of /t/ from the Edinburgh informants and 2524 tokens of /t/ from the London informants, with an overall total of 5157 tokens analysed. The data were analysed auditorily and not acoustically, as this seems to be the general practice in the literature for analysing consonantal variables.

As for the results, Schleef (2013) reports that glottal replacement occurs more often in word-final position that in word-medial position for both groups of speakers (Edinburgh and London) and that the glottal variant is more used by adolescents in Edinburgh than in London, especially in word-medial position, thus making Edinburgh speakers more advanced in their production of t-glottalling than their London counterparts. Regarding the results for t-glottalling in word-final position, the constraints are very similar in both locations and the two constraints with the strongest effect are following and preceding phonological context respectively, followed by style. As for the following phonological environment, a following vowel (PreV), pause (PreP), glide and plosive disfavour t-glottalling, whereas a following nasal, liquid and fricative/affricate favour glottal replacement. So, both locations clearly show the typical pattern of diffusion: PreC> PreP> PreV (Straw and Patrick 2007). In terms of the preceding phonological environment, preceding nasals and liquids tend to disfavour t-glottalling, while vowels favour it. As for style, t-glottalling is more likely to occur in conversational style. Schleef (2013) also found a lexical frequency effect for the London speakers in word-final /t/ (more frequent words favour glottal replacement in word-final position), but not for the Edinburgh speakers in this context.

In word-medial position, Schleef (2013) reports that the factors that constraint t-glottalling in word-medial position are similar in Edinburgh and London, but the effect sizes are very

different. The results show that preceding and following phonological environments have a similar constraint on the variability of word-medial /t/ and word-final /t/ in London. In word-medial position, preceding vowels and following consonants favour the glottal stop for the London teenagers. As for the Edinburgh teenagers, preceding vowels also favour t-glottalling, but the following phonological environment amongst these speakers was not statistically significant. In terms of style, Schleef's (2013) results show that its effect is much stronger in word-medial position for both Edinburgh and London informants than in word-final position. In terms of lexical frequency, it is significant in both locations in word-medial position (in word-final position, lexical frequency was only significant for the London speakers). The main difference between word-final and word-medial /t/ is the appearance of a grammatical category constraint in medial position for both Edinburgh and London, in which adjectives and nouns disfavour glottal replacement and function words (low-content adverbs, prepositions and pronouns), progressives and past participles favour the glottal stop. As for verbs, they only show weak effects in between these two extremes. As well, Schleef (2013) finds an effect of number of syllables in Edinburgh, in which words of four and five syllables favour t-glottalling and words of three syllables disfavour it (words of two syllables are in-between and have a neutral effect).

Thus, to sum up, Schleef's (2013) study shows that t-glottalling is constrained by more than phonological factors and that other linguistic factors such as grammatical category, lexical frequency and number of syllables are also significant in constraining the variability of /t/. In terms of style, he found that t-glottalling is more frequent in informal speech and in terms of gender, he did not discover a significant difference in his data. Finally, the proportions of application values in Schleef's (2013) study demonstrate that t-glottalling is more advanced in Edinburgh than in London and according to him "this makes speculations on the longer history of T-glottalling in Edinburgh, when compared with London, very plausible. Furthermore, considering the high degree of similarity of the factors constraining variation in /t/, a diffusion scenario seems more likely than independent development" (Schleef 2013: 11).

Stuart-Smith et al. (2007) analysed eight consonantal variables (amongst them t-glottalling) in the speech of 32 speakers from Glasgow, from two age groups: adolescents (13-14 years

old) and adults (40-60 years old). The participants were divided into males and females and into working and middle class. The adolescent informants were recruited from two schools in Glasgow, with different profiles in educational and socio-economic criteria (grades 1 and 2 in Standard Grade, school leavers going on to full-time higher education and receipt of clothing grants), which matched the categories of working class and middle class. As for the adults, the researchers used the contiguous residential catchment areas of the two schools in order to select the adult participants. The informants were recorded in two different speech style situations: spontaneous conversations and wordlist reading. The total data analysed were 3597 tokens (1212 for wordlists and 2385 for conversations) and they were analysed auditorily and statistically.

As for the results for t-glottalling, Stuart-Smith et al. (2007: 237) report that "glottals are thriving in Glaswegian, and comparison with Macaulay's data indicates a real-time increase in glottalling since the 1970s." In informal speech, there is a clear class divide between working class (92.47%) and middle class speakers (56.56%) in terms of their production of the glottal stop. Regarding formal speech, there is a great polarisation between young working class speakers and young middle class speakers, with a production of t-glottalling of 76.32% and 4.65% respectively. As for gender, they do not find significant differences between males and females in their rates of t-glottalling. Even though the results presented in the article are interesting indeed, Stuart-Smith et al. (2007) do not provide any results for different phonetic environments affecting t-glottalling, and therefore we get quite a limited account of the linguistic behaviour of t-glottalling in the speech of the Glasgow informants analysed.

2.7 T-glottalling outside the UK: the United States and New Zealand

T-glottalling has been observed not only in several accents across the UK, but also in other varieties of English overseas, such as the United States and New Zealand. Some studies on American English have acknowledged t-glottalling in some American accents, such as Roberts (2006) and Eddington and Taylor (2009). I believe these studies are worth looking at, even if they do not focus on British accents, because they include linguistic factors that were not previously included in British English studies on t-glottalling (besides Schleef's

2013 research). These factors are: preceding phonological environment, types of consonants, types of vowels, stress and word frequency.

For instance, Roberts (2006) looks at t-glottalling in Vermont, which is a feature that has long been present in that area and that it has been rather stigmatised, but no variationist studies have been conducted on that Vermont feature before. She analysed the speech of 47 participants, aged between 3 and 80, grouped into six age groups. She conducted sociolinguistic interviews and she coded the (t) variable impressionistically. The data were analysed quantitatively through GoldVarb. She found that both the preceding and following phonological segment were significant in the variation of (t), as well as gender and age. As for the preceding phonological environment, Roberts (2006) observed that a preceding vowel favours t-glottalling, whereas a preceding consonant inhibits it. Regarding following phonological environment, a following pause, nasal and glide favour the glottal stop, whereas obstruents, vowels and liquids disfavour t-glottalling. In terms of gender, males favour t-glottalling and females disfavour it, and 9 year-olds and teenagers seem to be the age group that is favouring the glottal stop the most.

As for Eddington and Taylor's (2009) study, they conducted a rather different type of experiment to observe the variability of (t). They conducted a shadowing experiment, in which they included 20 collocations of word final pre-vocalic /t/. The frequencies of all the test items were taken from the British National Corpus. So, in this study, they did not look at t-glottalling in informal speech, but rather in more formal speech, and they did not include word medial tokens either. The experiment included 58 participants, grouped according to geographical location: 20 speakers from Utah, 22 from Western states and 16 from non-Western states. The data they obtained from the experiment were analysed quantitatively using GoldVarb. Factors such as word frequency, stress (preceding and following), vowel quality (preceding and following), gender and age were analysed in the study. However, the only factors that emerged as significant were following vowel, age (by gender) and region. They found that a following front vowel favours t-glottalling in word final pre-vocalic /t/, whereas a following back vowel disfavours the glottal stop. In terms of age (by gender), females in their 20s, 30s and 40s favour t-glottalling the most, and males in their 20s-30s

also favour the glottal stop. As for geographical region, t-glottalling is favoured the most by Western speakers, rather than by Non-Western speakers.

Regarding t-glottalling in New Zealand, Holmes (1995) conducted an apparent-time study in New Zealand English. She analysed the speech of two age groups (middle-aged 40-55 and young adults 18-30). She looked at word medial and word final /t/ tokens, as well as different type of consonants. In her research, she observed that t-glottalling is spreading, as young adult speakers exhibit more glottal stops in their speech than middle-aged speakers. Moreover, she reports on social stratification: working-class speaker have much higher rates of glottal stops than their middle-class counterparts. In terms of gender, she found that young women in both middle-class and working-class young speakers use more glottal stops than men in the same social class. Therefore, there is a clear gender difference and females are leading in this change in progress in New Zealand English. As for phonological environments, she reports that t-glottalling is spreading in word-final environments, whereas intervocalic t-glottalling (both word medial and word final) is still quite infrequent. As for the phonological environment following the glottal stop in word final position, she observed the following hierarchy: pause 40% > liquid 21% > glide 19% > nasal 15% > fricative 14% > plosive 13% > vowel (very infrequent). What seems to be different in this variety of English is that the pre-pausal environment is the most favoured context for word final t-glottalling.

2.8 Variationist studies on upper-class varieties of English

One of the few exceptions in investigating an English upper-class variety is Kroch's (1996) study of upper-class Philadelphia. His main revealing finding was that, even though the upper-class showed some differences in phonetic terms when compared to the working class speech, the phonetic differences between the upper class and the middle class speech were minimal and hardly distinguishable and what distinguished the most the upper-class speech of Philadelphians from the speech of the upper-middle and middle class speakers was their distinct speech style. He found the prosody of upper class speech to be distinctive and he argues that upper-class speech in Philadelphia is characterised by a drawling and laryngealised voice quality and by frequent use of emphatic stress patterns and of intensifying modifiers.

2.9 Brief review on a secondary linguistic variant: tap (t)

In this final section of the literature review chapter, we are going to briefly review some literature on tap (t). As we will see in chapter 5 (section 5.4), this variant of (t) has been found in the speech of the young RP speakers in the present research, even if in much less volume than the main object of study which is t-glottalling.

As Foulkes and Docherty (2007) argue, the distribution of taps in British English is not very clear and some studies report it to be mainly a feature of older male speech in the North of England. Mathisen (1999, in Foulkes and Docherty 2007) reports the voiced stop variant [ɾ] to be mainly a feature of older male speech in Sandwell. On the other hand, this feature seems to be on the increase in Newcastle, as reported by Watt and Milroy 1999 (in Foulkes and Docherty 2007). Milroy et al. (1994) report that pre-vocalic word-final contexts is an environment that favours voiced and/or tapped realisations, especially in Northern dialects, including Tyneside.

As for tap variants in accents in Southern England and RP, there are almost no reports on it. Fabricius (2000) does not report any instances of taps in her analysis of t-glottalling in young RP speakers. The only study that mentions taps in a Southern English accent is Tollfree's (1999) study on South-East London English. She reports that both SELRS (South East London Regional Standard) and SELE (South East London English) speakers produce taps mainly in two environments: intervocalically across a word boundary (particularly in phrases containing commonly used lexical items such as *but I, lot of, get a, quite a, what is, that is*) and intervocalically word-internally (in items such as *getting, better*).

CHAPTER 3

Language Variation and Social Class: RP and Elite Education

After having reviewed the literature on t-glottalling for RP and several other British accents, we now turn to review and discuss how language variation as a discipline has incorporated notions of social class in their sociolinguistic studies. This chapter has two main parts. In the first section, we are going to discuss how sociolinguistics and the sociology of social stratification and social class have evolved theoretically and methodologically from a macro perspective (centred on general categorisations) towards a micro perspective (centred on individual agency). In the second part of the chapter, we are going to draw on concepts and ideas from the sociology of education (how has inequality in education in the UK been created and perpetuated) and the sociology of the elites (how privilege is created and enforced upon students in elite boarding schools), in order to understand RP not from a linguistic perspective, but as a social accent.

3.1 Language variation and social class: from a macro to a micro approach

Both the disciplines of sociolinguistics and the sociology of social stratification have evolved theoretically and methodologically from a macro perspective, in which the focus of attention were general and rather homogeneous categorisations, towards a micro perspective, in which the individual and its agency and the complex negotiation of identities are the main object of study, therefore bringing heterogeneity to the forefront.

Modern sociolinguistics started in the 1960s as an interdisciplinary subfield, a combination of sociology, anthropology and linguistics (Shuy 2003, in Malllinson 2011). At the beginning, modern sociolinguistics in the United States was mainly concerned with solving language-related social problems, especially "the educational inequalities facing the underclass, whose language patterns are stigmatized in the US educational system" (Mallinson 2011: 89). Therefore, early variationist sociolinguists started to address these issues by studying quantitatively how linguistic variables were patterned by linguistic and social factors.

The pioneer study in quantitative variationist sociolinguistics was Labov's (1966) research of linguistic variation in New York City. With this study, he established the early methods in the investigation of class and it became the first systematic investigation of an urban speech community. His main aim was to research how language was related to social stratification. His hypothesis was that the deletion or not of word-final or preconsonantal /r/ in words such as *four* and *park* (and also other linguistic variables) would exhibit a correlation with social stratification and social class in the speech community he studied in New York City (Dodsworth 2011). Moreover, Labov also observed that the informants who had a higher status used the most prestigious and least stigmatised linguistic forms, and this pattern was also seen across different speech styles, with more standard and prestigious forms of language being used in more formal registers. As for gender variation, he observed that it was also related to class variation, with middle-class women using more standard forms than other women or men (Mallinson 2011). Regarding the category of class, Labov (1966) used a socioeconomic scale, which had a combination of three elements: level of education, family income and occupational rank. As Dodsworth (2011: 194) states, "the combined-class index, in various forms, has persisted in studies of sociolinguistic variation since Labov's NYC study, as have many of the methods for constructing it." The occupational rank that Labov used in his 1966's study was based on four categories, which had been derived from US Census categories.

Amongst the early quantitative sociolinguistic studies of language variation, other studies also used the combined-class indexes, where class was represented as a socioeconomic scale. Trudgill's (1974) study of language variation in Norwich, England, also used a combined scale, which included occupation, income, education, father's occupation, type of housing and neighbourhood. However, he considered occupation as the most important class indicator in his research. His study had a five class category, based on the 1966 Registrar-General occupational ranking, and they were: middle middle class, lower middle class, upper working class, middle working class and lower working class (Mallinson 2011, Dodsworth 2011). Macaulay's (1977) study of language variation in Glasgow used occupation as the only class indicator. He used a four class category, which was based on the Registrar-General's ranking of occupation and Kellas' (1968) class model for Scotland.

The four class categories were: classes I and IIa (middle class or non-manual labourers) and classes IIb and III (working class/manual labourers) (Dodsworth 2011).

These early variationist studies in sociolinguistics were large-scale studies which adopted a macro perspective of analysis, by using combined-class indexes, in which social class was based upon socioeconomic scales. Furthermore, their main object of study was centred on the notion of "speech community". Labov's definition of "speech community" has been largely cited in the sociolinguistic literature: "The speech community is not defined by any marked agreement in the use of language elements, so much as by participation in a set of shared norms; these norms may be observed in overt types of evaluative behaviour, and by the uniformity of abstract patterns of variation which are invariant in respect to particular levels of usage" (Labov 1972: 120-1, in Britain and Matsumoto 2005).

In speech communities, its members do not necessarily have to speak the same way, but they do have to share a set of evaluations about the speech of that community. In his New York study, Labov claimed that New York was "a speech community, united by a common evaluation of the same variables which differentiated the speakers" (Labov 1966: 125, in Britain and Matsumoto 2005).

But speech communities have received several criticisms. Paul Kerswill (1993, in Britain and Matsumoto 2005), who has focused his research on the dialectology of mobility, questions if members of the speech community have to be natives of it, in order to be a member of this community. Modern societies are increasingly mobile, so how valid can be sociolinguistic studies which exclude non-natives to the community? Some work in second dialect acquisition has shown that migrants can acquire simple phonological rules and lexical items from their new linguistic community, so they would be partial members of that community. Moreover, some studies have shown that non-natives can lay the beginnings and origins of some linguistic changes that are underway in a community. For instance, Hovarth (1985, in Britian and Matsumoto 2005) found that Italians and Greeks were leading some linguistic changes in the English of Sydney, and Fox (2005, in Britain and Matsumoto 2005) discovered that adolescent Bangladeshi immigrants were leading some linguistic changes in Tower

Hamlets, in East London, the home of the Cockney dialect, and these changes were in turn spreading to the speech of the white male adolescents.

As well, a further criticism of Labov's speech community is that it views those without power in society as "sharing", rather than being "imposed" on them, the values of the socially dominant group. Some linguists, however, believe that those powerless in society have been indoctrinated with a standard ideology that tells them that the standard form is correct and proper, whereas the non-standard form is inadequate and bad (Britain and Matsumoto, 2005).

Eckert (2009), in relation to the theoretical and methodological approaches applied in variationist sociolinguistics, argues that the treatment of social meaning in variation has come in three waves of analysis. She suggests that no wave replaces the previous one, but rather each one grows out of the findings of the previous wave. As for the first wave of variation studies, pioneered by Labov's New York City study (Labov 1966), she claims it was the foundation for the study of variation, and its main aim was to establish broad correlations between linguistic variables and macro-sociological categories, such as class, gender, ethnicity and age. As for the second wave, it was characterised by ethnographic studies of more locally-defined categories (pioneered by Milroy 1980, Milroy and Milroy 1992 and their Social Networks' framework), and the third wave, which is still in an early stage, sees variables as having more basic meanings that combine stylistically to construct the kinds of personae that populate social categories (initiated by Eckert 1989, 2000 and her Communities of Practice approach). So, in other words, the third wave sees linguistic variables as having social meaning which its speakers in turn combine stylistically to construct different kinds of identity, while the first two waves related the meaning of variables directly to the social categories with which they correlate. Thus, the newer approach reverses the perspective from variation as a reflection of social place, to variation as a resource for the construction of social meaning (Eckert 2009).

As we have previously seen, during the late sixties and the seventies there were several urban survey studies, which showed a picture of the distribution of linguistic variables across large urban populations. These first urban survey studies were the foundation for variationism within sociolinguistics (Labov 1966, Trudgill 1974, Macaulay 1977) and they viewed class as a broader category which was mainly based on socioeconomic scales. The Labovian approach to class has indeed been very productive in many other subsequent variationist studies across languages and geographic locations. However, these early class models have received several criticisms.

For instance, Eckert (2009) argues that in the first wave, the social meaning of variation could only be assumed on the basis of a general understanding of the macro social categories that were used to select and classify speakers. Thus, the survey method's primary virtues were mainly coverage and replicability, but they had a broad and rather superficial emphasis on the local social meaning of variation. According to Mallinson (2011: 91), several scholars, such as Romaine, Cameron and Williams, have claimed that early "variationist theory and analysis do not actually explain the relationship between language and society; rather, they reflect sets of assumptions about the nature of society and about the nature of social factors." Furthermore, Dodsworth (2011: 198-199) argues that a basic shortcoming, mainly for small communities, "is that the class categories determined by the researcher are not recognizable social groups from the perspective(s) of community members" and that "discrete class groupings can be seen as overly static, not allowing for individual mobility." Rickford (1986, in Dodsworth 2011) has also critiqued the early class models of variationist studies, arguing that by concentrating only on occupation and combined-class indexes they miss on ethnographic grounds, as they ignore locally meaningful distinctions in socioeconomic status that change by area and community.

Therefore, building up on the shortcomings of the first wave, the second wave of variation studies emerged, where ethnographic methods were used in order to get closer to the local dynamics of variation. These studies focused on local categories that could shed light on the relevance of macro-sociological categories for life in the local setting and its specific use of the linguistic variables (Eckert 2009).

Ethnographic studies focus on smaller communities for longer periods of time, and they aim to discover, rather than to presuppose, locally salient social categories. The categories are discovered in virtue of their place in local social practice. As a result, the ethnographic studies have brought us a clearer view of how ways of speaking are permeated with local meaning (Eckert 2009). The pioneer work in the second wave was conducted by Lesley Milroy (Milroy 1980, in Eckert 2009), who carried out an ethnographic study of the English of Belfast. She focused on *social networks* – configurations rather than categories – and her main aim was to discover what it is that makes working class speech local. Literature has vastly shown that working class people's social networks are more locally based than those of the middle class. Working class people tend to get jobs through family and friendship networks, to live close to their friends and relatives, and to pursue leisure activities with them. The result is greater density and multiplexity of social networks.

Milroy then suggested that interacting with the same people in a variety of contexts – work, neighbourhood, church, leisure activities and family – would have a strong vernacular norm enforcing power. So, she showed a relation between the use of local vernacular variables and the density and multiplexity of women's working class social networks. The ethnographic studies of the second wave, then, gave a local perspective on the findings of the survey studies of the first wave, and they tried to establish a connection between macro-sociological categories and more concrete local categories and configurations that gave them meaning on the ground (Eckert 2009).

The ethnographic studies of the second wave focused on the role of local social realities in defining class. Milroy and Milroy (1992, in Dodsworth 2011: 200) argue that "an adequate model of sociolinguistic variation will link social class with information about the density and multiplexity of social networks." They claim that the lower and upper classes have dense and multiplex social networks, which inhibit language change among their members. On the other hand, middle class networks are weak and uniplex and they encourage language change, and it is usually the middle classes who lead in linguistic change.

As we have seen, the first and the second wave studies were focused on *structure* and macro social categories, whereas the last and third wave is characterised by a focus on *practice* and the individual (a micro approach), where *agency* is given a prominent place in the analysis. *Agency* is defined as "the day-to-day activity in which human beings make sense of their lives and move their projects along in the face of constraints imposed by social structure and the power relations that keep that structure in place" (Eckert 2009: 14). The third wave has been pioneered by Eckert´s study (1989, in Eckert 2009) of Belten High School in Detroit, where by using a *Communities of Practice* approach and ethnographic research methods, she identified two oppositional CofPs among the adolescents in the school, the "Jocks" and the "Burnouts", as well as a third group, the "in-betweens", with each of these groups showing different linguistic and social identities.

This move from the study of *structure* to the study of *practice*, giving *agency* its place in the analysis, has defined the recent history of the social sciences. It does not negate the importance of structure, but emphasises the role of structure in constraining practice and, in turn, the role of practice in producing and reproducing structure. In the study of language variation, therefore, a focus on practice brings social meaning into the foreground (Eckert 2009). In the seventies, the French sociologist Pierre Bourdieu developed a *theory of practice*, which placed the *habitus* at the centre of the process of social reproduction (Bourdieu 1977, in Eckert 2009). The habitus is being described as "the lasting set of dispositions – patterns of behaviour, affect and thought – that one develops in the course of life in a particular social position. The habitus mediates between social structure and individual behaviour, shaping, but not determining, individual action" (Eckert 2009: 14).

Thus, the community of practice approach formulated by Eckert views class and other macro-social structures as being instantiated by daily practices. In this approach, therefore, "class-related linguistic practices must be analysed in the context of locally meaningful social groups that are small enough for interactions –the process of making meaning- to be observed" (Eckert 2000: 42, in Dodsworth 2011). So, economic status is considered secondary to class identity, which is the main motivator of linguistic patterns and sociolinguistic variables are not simply a reflection of economic stratification; they are

symbols representing social meanings, which are manipulated by speakers from one setting to another.

However, these post-Labovian more ethnographic identity-based approaches to class have not come across without criticisms either. According to Dodsworth (2011), these new theoretical and methodological approaches do not seem to be about class anymore, if we view class as an economic phenomenon, and moreover, related to the first criticism, it seems that "identity-based approaches appear to ignore the fine-grained stratificational patterns that Labov finds for variables such as (r) and (-ing), yet surely those patterns must be accounted for by any sociolinguistic class model" (Dodsworth 2011: 203).

So far, we have seen how variationist sociolinguistics as a discipline has evolved theoretically and methodologically from a macro perspective to a micro perspective. As for the field of the sociology of social stratification, it has followed a similar path. The main aim of the sociological studies of social stratification is to investigate systematic and structured inequality in societies. First of all, this field aims to identify the different forms of stratification that exist in societies and how they are organised, as well as how to label and impose the different social classes. Secondly, the sociology of social stratification aims at developing various theories about the social classes that have been previously labelled, as well as comparing stratification between societies and to explore how stratification changes and evolves over time (Mallinson 2011).

The late eighteenth century saw the birth of industrial capitalism in England, which meant a total reorganization of society and the modern concept of class derives from that period. Industrial capitalism or modern capitalism had two major consequences in the social sphere: it created new classes in a transformed class structure and class was allocated on the basis of ability rather than birth (Edgell 1993).

Karl Marx's and Max Weber's theories are the foundations of the sociological theories of social stratification. Both authors viewed class from a relational point of view, in which class was defined by people's relationships to different income-generating resources or assets (Mallinson 2011). Marx viewed social stratification as conflict between social classes over

economic inequalities. He argued that the most powerful class ruled not only in material terms (as they owned material goods), but also intellectually (through their ruling ideas). According to Mallinson (2011: 92), Marx also claimed that "the ideology best expressing the interests of the ruling class always prevails in social institutions such as religion, economics, education, law and politics. The ideologies are necessarily pervasive because they must convince the elite as well as the rest of society that the rule of the dominant class is legitimate and justified."

Karl Marx was the creator of the first and one of the most important sociological theories of class. For Marx, what was "new" about industrial capitalism, the new mode of production initiated in the late eighteenth century, was its greater efficiency in creating "surplus-value" or profit. In other words, it was a historically superior system of exploiting labour (Edgell 1993). As well, Marx thought that industrial capitalism was distinctive for its increasingly "simplified" class system, with two main classes: the bourgeoisie and the proletariat. The reason why Marx claimed there were only two classes was based on the fact that since private property was the basis of economic relations, there could only be two classes: one who owns the means of production and a class who does not and who has to sell their capacity to work (Edgell 1993).

According to Egdell (1993), Marx believed that the relations between the employers and the employees were inherently "antagonistic", because in order to make profit and survive in a competitive economic situation, the former are constrained to "exploit" the latter. Moreover, the employer's main aim is to keep costs as low as possible by paying the minimum necessary to attract and retain workers, and also, the employer aims at achieving the highest level of production. Thus, profits and wages are inversely related, and "the interests of capital and the interests of labour are diametrically opposed" (Marx 1952: 36, in Edgell 1993). Therefore, there is an inevitable conflict between the two main social classes over the price of labour and the labour process or productive system. So, according to Marx, there were two antagonistic and opposed classes: one was an increasingly large, poor, homogenized and alienated work force of employees (proletariat), and the other was a smaller wealthier class of employers (bourgeoisie).

Max Weber developed Marx's theory of class in a broader context, of what later became known as social stratification, that is, the division of a society into a number of hierarchically arranged strata. In contrast to Marx, Weber took into account other forms of stratification besides class, mainly status and ethnic stratification. Unlike Marx, Weber gave a systematic discussion of the concept of class, which Marx viewed as a highly political subject. Whereas Marx was highly critical of industrial capitalism and he firmly opposed to that system in favour of socialism, Weber approved of the rationality of modern capitalism and was opposed to socialism (Crompton 1998). According to Mallinson (2011: 93), Weber viewed status groups as "communities that recognize each other as having more or less social honour, which affects the organization of everyday life. For example, a specific lifestyle is expected from those who wish to belong to the elite, and restrictions are placed on social interactions with undesirable others; language use may be one way that groups great and signal status distinctions."

Most sociological thought since the time of Marx and Weber has also seen social relationships as basically unequal. Since then, many sociological methods were developed in order to understand social inequality, mainly in the UK and the USA. Both countries pioneered in carrying out several community studies and various class mobility surveys were also developed (Savage 2005, in Mallinson 2011). In the late sixties, occupational and socioeconomic scales were introduced and they were the norm in the sociological studies of social stratification. These scales were first introduced in the USA, by Blau and Duncan (1967, in Mallinson 2011). They regarded occupation and mobility as the best indicators of class differentiation and social stratification. In the UK, the Goldthorpe Class Schema has been the best-known and most widely used sociological class schema:

Goldthorpe's Class Schema (1987) (seven-category UK version)

I Service class (higher grade)

II Service class (lower grade)

III Routine non-manual employees

IV Small proprietors

V Lower grade technicians and supervisors

VI Skilled manual workers

VII Semi- and unskilled manual workers   *(source Rose and Pevalin 2001)*

These occupational and socioeconomic scales have been very useful and widely used in variationist sociolinguistic research. However, these scales have also been criticised by some academics within sociology, which claim that there is a lack of theory behind how the scales are created and that these indices tend to be male and Eurocentric biased, which make them not very useful outside Western societies (Mallinson 2011).

However, in the last couple of decades, sociologists have moved towards two new focuses in their theories and methods of social stratification. First of all, they have started paying more attention to the context around social class, and secondly, sociologists are trying to discover how other social structures like gender, sexuality, race and region of origin (amongst others) relate to social class and the systems of social stratification as a whole (Mallinson 2011). Therefore, the new theories on social stratification which have emerged and are emerging since the move towards these two focuses tend to include identity and agency as the main areas of attention. So, as we have observed in the new theoretical and methodological shifts in the field of variationist sociolinguistics, the field of the sociology of social stratification has also moved from macro-categories of socioeconomic indices and occupational scales, towards a more micro perspective of social class, in which identity and agency are the main focus of study and class is analysed in relation to the individuals' lifestyles, consumption practices and identities (Mallinson 2011).

Indeed Savage (2005, in Mallinson 2011: 93) claims that "stratification theories that do not successfully incorporate identity and agency can only reach something of a dead end, because they fail to make clear the theoretical linkages between class position, class consciousness and class action. Instead, more pluralistic theories of social stratification are needed to address contemporary conditions of inequality."

Amongst these micro-approaches of social stratification is the work of French sociologist Pierre Bourdieu (1986, 1991 in Mallinson 2011). Bourdieu's theories are already well known and have been used in the field of sociolinguistics, as much of his work is focused on language. He argued that there are different types of capital in the process of status attainment: cultural, social, economic and symbolic. These capitals tend to accumulate over time and as a result, advantage and privilege also accumulate for some social groups over

time, and that in turn is what creates social stratification. In relation to more traditional views of social stratification, Bourdieu's theories are innovative in two ways: on the one hand, his theory acknowledges agency, identity and subjectivity, and on the other hand, his theory brings sociological attention to processes of accumulation of resources, rather than merely seeing social class from a Marxian relational point of view, in which class is mainly understood as a person's relationship to income-generating resources (Savage 2005, in Mallinson 2011).

As for the sociology of stratification in the UK context, the latest study on social class that takes a more micro perspective of social class is Savage et al.'s (2013) BBC's Great British Class Survey. In this research project, identity and agency have been considered the main focus of class study and class has been analysed in relation to the individuals' lifestyles, consumption practices and identities. Savage et al. (2013) claim that socioeconomic indices based on types of occupation cannot capture well enough the role of social and cultural processes in creating class divisions. This study is the largest survey of social class ever conducted in the UK, with 161,400 web respondents. The survey also includes a nationally representative sample survey, which incorporates unusually detailed questions asked on social, cultural and economic capital. Savage et al. (2013) derived seven classes from the research: an elite, whose wealth separates them from an established middle class, a class of technical experts, a class of 'new affluent' workers, and at the lower levels of the class structure, an ageing traditional working class, a precariat (characterised by very low levels of capital) and finally a group of emergent service workers.

Thus, to recapitulate, in this section we have discussed how both the disciplines of sociolinguistics and the sociology of social stratification have evolved theoretically and methodologically from a macro perspective, in which the focus of attention were general and rather homogeneous categorisations, towards a micro perspective, in which the individual and its agency and the complex negotiation of identities are the main object of study, therefore bringing heterogeneity to the forefront. As well, we have seen how social class and stratification have rather been background concepts in variationist studies, rather than an object of theoretical and analytic inquiry. Moreover, if social stratification is changing theoretically and methodologically within the field of sociology, how can

sociolinguists adapt these new approaches to the study of language variation and change? And which approach, macro or micro, would be best to apply to variationist studies? I believe there are several aspects that have to be taken into account in trying to find a response to these questions.

First of all, the nature of the linguistic variable should be considered first and foremost. Indeed, some variables may have more potential for being socially meaningful than others, and speakers may or may not be consciously aware of the potential social meanings of these variables in their speech. Therefore, depending on the potential of the linguistic variable for being socially meaningful, a more ethnographic micro approach could be more appropriate or not.

Secondly, in choosing a more macro or micro methodology in a variationist study, we should take into account which is the main objective of the research. A macro study has different objectives from a micro study of language variation, and one should not exclude the other, but rather they should try (if possible) to complement each other. We should not forget that both macro and micro approaches to variation have their own validity, with their own strengths alongside their own inevitable shortcomings.

Thirdly, in conducting a variationist study and choosing which methodology is most appropriate, we should also bear in mind how much access does the researcher have to the informants in order to collect the data. Time constraints and accessibility constraints may inevitably determine if we adopt a more macro methodology or a more micro and ethnographic approach.

And finally, in relation to incorporating the concept of social class and the new identity-based approaches of social stratification into variationist research, it would also depend on the approach we take on our study of language variation, either more macro or more micro. However, I believe social class should not be such a complex concept to define after all, and it should not bring additional theoretical and methodological difficulties to our studies of language variation and change. We should not forget that variationist studies at the end of the day have a very different objective from studies in sociology. Our main aim as

variationists is to study how language varies according to different linguistic and social constraints in a community of speakers, and sociologists' main aim is to study how society is structured and organised. Our emphasis is on language; theirs is on society. Therefore, even if we should try our best to apply the newest trends in the sociology of stratification in our sociolinguistic studies, it should not be an obsession after all, as our main aim is to study variation in language in a stratified community of speakers and not how a given community of speakers is stratified. Social class is just a tool (or one of the tools) that help us explain this variation. All in all, social class should not be that difficult to define, either if we choose a macro approach or a micro approach in our sociolinguistic study and research.

3.2 RP and elite education

Inequality has risen quite dramatically in Western societies in the past 20 years and especially in the last five years, since the outbreak of the latest world financial crisis (Khan 2011, Abbink and Salverda 2013). Both in the field of sociolinguistics and sociology, the study of upper-class accents and the study of the elites respectively has been rather neglected (Fabricius 2003, Abbink and Salverda 2013). Traditionally, for variationist sociolinguistics, the focus has been more on vernacular accents, where it has been argued that more variation occurs, and regarding the field of sociology, they have mainly concentrated on researching lower status groups, as it was believed that academic research could help them reduce their poverty levels and improve their living standards.

Recent economic and educational reports from the OECD (2010, 2011) have drawn attention to the fact that the United Kingdom has the developed world's lowest levels of social mobility and that its schools are among the most socially segregated in the developed world. The OECD 2011 economic report on the UK showed that income inequality among working-age persons has risen faster in the United Kingdom than in any other OECD country since 1975. From a peak in 2000 and subsequent fall, it has been rising again since 2005 and is now well above the OECD average. The annual average income of the top 10% in 2008 was almost GBP 55,000, almost 12 times higher than that of the bottom 10%, who had an average income of GBP 4,700. As well, the report showed that top income shares have doubled in the past decades. The share of the top 1% of income earners increased from 7.1% in 1970 to 14.3% in 2005.

As for the OECD 2010 educational report, it revealed that the UK has unusually high levels of "segregation" in terms of poorer and migrant families being clustered in the same schools, rather than being spread across different schools. It looks at where the children of "low-educated" mothers are going to school (which in the UK means the children of mothers who did not achieve five good GCSEs) and found that in the UK they were much more likely to be taught in schools with high numbers of disadvantaged children. Among the children of immigrant families in the UK, 80% were taught in schools with high concentrations of other immigrant or disadvantaged pupils (the highest proportion in the developed world). As a consequence, these findings mean that the social background of a school's intake exerts a strong influence on the likely outcomes for pupils.

A study published by the Office for National Statistics (2004, in Reay 2006) on social inequalities found that in the UK the socio-economic background of students had a high impact on student performance, compared with the other 32 countries in the study. More recently, research by the Sutton Trust has found that elitism is even more entrenched in English society than it was twenty years ago (Reay 2006). Furthermore, a recent study from the Higher Education Funding Council for England (2013) found that students recruited to university from independent schools are a third more likely to be in a top graduate position several years after finishing their degree course. These figures are rather shocking, especially when bearing in mind that independent schools (that is fee-paying private schools, either boarding or day schools) in the UK account for only 7% of all schools (source The Independent Schools Guide 2013).

Thus, in view of the reports above, it seems clear that the education system in the UK is an engine that still keeps fostering sharp social divisions in Britain. Cannadine (1999: 192) argues that "the division between those who enrol in the state system and those who are educated at fee-paying schools is widely thought to perpetuate and intensify the view that Britain is not one but two nations … No British government this century has been prepared to tackle this exceptionally complex and contentious question with the courage and imagination it requires."

Indeed, as various sociologists of education argue (Reay 2006, Ball 2013), class has been long ignored and not effectively resolved in English education policies, and that has reinforced and perpetuated deep educational inequalities within the British population. Ball (2013: 113) claims that "class divisions are repeatedly reinscribed within education policy – in curriculum organisation and content, in access to higher education, and in the pathologising of socially disadvantaged families." Moreover, he further argues that the more recent policies of the New Labour and Coalition governments have addressed and continue to address "a very similar social agenda to that which underlay the development of state education in the 19th century" (Ball 2013: 113). Indeed, as Gillard (2011) states, the education system in Britain was created along class lines in the 19th century and this system of education that caters for different classes has remained pretty much unchanged since then. Unlike the United States, which by the 1830s was creating a public school system based on a common education for all its citizens, England had established a divided school system which was developed in line with its class structure (Gillard 2011). Furthermore, this class-based system was further enhanced by three national education commissions, whose reports (and the Acts which followed them) each related to provision for a particular social class (Gillard 2011):

- The Clarendon Report (1864) focused on the nine 'great' public (private) schools and led to the 1868 Public Schools Act.
- The Taunton Report (1868) (produced by the Schools Inquiry Commission) and the Endowed Schools Act of 1869 dealt with separate institutions for the middle classes.
- The Newcastle Report (1861) and the 1870 Elementary Education Act made provision for schools for the masses.

Reay (2006) argues that social class injustices have never been adequately tackled within education in Britain. She claims that education policy has mainly focused on within-school processes "at the expense of understanding the influence of the wider economic and social context on schooling" (Reay 2006: 289). She further adds that "until we address social class as a central issue within education then social class will remain the troublesome un-dead of the English education system" (Reay 2006: 289). As well, she blames the current move towards capitalist privatised education in England as "consuming the working classes" and

she claims that it does still matter "the level of material and cultural resources that families can bring to their engagement with schooling" (Reay 2006: 295).

So, inequality levels in terms of education in the UK appear to be higher than in any other Western developed nation. The organisation of the education system and the fact that the issue of class has not been effectively tackled in the education policies seem to account for this perpetuation of educational inequality. And what is more, these levels of inequality seem to be increasing rather than decreasing, both in the education and the economy of the UK. Therefore, I believe that in view of this rise in inequality, it is urgent that we understand what happens in the upper layers of society, both linguistically and socially, by focusing the interest of analysis of both variationist sociolinguistics and sociology towards this social group. In that way, we will have a better understanding of these inequalities and by understanding how the upper social groups are organised, we will also have a better understanding of how middle and lower social groups are organised. That is why analysing the behaviour of the RP speaking community, both linguistically and socially, becomes more crucial than ever in the light of the recent and current economic events.

And the best place to understand these processes is by focusing our attention on the traditional cradles of RP: the major public boarding schools and private educational institutions in general (either boarding or day schools). Indeed, elite boarding schools in Britain "appear" to be more "socially open" (open-public websites, promotion of scholarships, emphasis on excellent academic achievement…), or at least that is the image they want to portray in order to avoid being criticised for being elite and privileged institutions. However, in reality, they are still restricted to a very small section of the British population, those who have the economic means to have access to these institutions of privilege, mainly the upper-middle and the upper-classes. Moreover, these elite educational institutions in the UK are virtually invisible in both the literature of sociology (in order to understand their sociological make up and organisation) and sociolinguistics (in order to understand the current state of RP in the younger generations of speakers).

However, recently, with the 2008 world financial crisis making more evident and visible the different levels of inequality in the well-off West, there has been an increase in interest to understand how the elite is socially organised within the field of sociology (Abbink and Salverda 2013). As we have previously mentioned, sociology was traditionally more interested in the lower classes and the not privileged, believing that by studying them, their lives could be improved. In that way, the sociological studies of the elite were long neglected. But in order to understand present-day inequalities, we need to understand how the elite works, who they are and how they are organised. Thus, by looking at the top of society, we can also understand how the other layers of society work, both in the middle and lower layers.

If we want to find any sociological study of the major English public boarding schools, we have to go back to the late sixties, with one of the very few studies on English elite boarding schools (Wakeford 1969). Since then, besides a few other studies published during the seventies, there has been virtually no sociological study of English elite boarding schools, making them virtually invisible in academic sociological accounts. Even though, as we have previously mentioned, there has been a recent increase in the sociology of the elites within sociology, if we want to find any recent up-to-date study of elite boarding schools we have to look at the United States (Khan 2011) and Ireland (Courtois 2013).

Both studies draw from Bourdieu's approach in relation to the role of symbolic, cultural and social aspects of elite formations, which has been very influential in social science. In *The State Nobility: Elite Schools in the Field of Power* (1989, 1996), Bourdieu highlighted the importance of education in the reproduction of the elites. He argued that schools and universities were very important for the education, training and recruitment of the generations of young elites (Abbink and Salverda 2013). According to Bourdieu (in Abbink and Salverda 2013), the privileged not only maintain their power through economic capital, but also through cultural capital (prestigious academic titles), symbolic capital (noble titles, membership to exclusive clubs) and social capital (inherited from family or acquired through marriage). Through these different forms of capital, the privileged have access to and create influential networks, which are not accessible to most people. In relation to RP, I would argue that if education is crucial in reproducing the elite, prestigious boarding schools and

other prestigious private schools in England are also key in reproducing and perpetuating an "elite social accent" like RP. Let us not forget that it was in these elite boarding institutions where RP first started as a way of homogenising the speech of the upper-middle classes and the upper-classes during the 19th century, by removing any traces of their regional speech (Mugglestone 2003, see Chapter one, section 1.2).

Courtois' (2013) study of the Irish elite in Ireland's top fee-paying schools shows how the construction of a collective elite identity begins at a very young age, with the process of recruitment at elite schools. She claims that these elite schools have a very socially and homogenous clientele and that they also have a very restricted access, which is maintained by high fees and admission policies. As a consequence, she argues that this exclusiveness contributes to create a collective sense of eliteness, which in turn leads to acquiring skills, confidence and rich social capital, which later in life will be very beneficial in getting positions of power. Furthermore, Courtois (2013) defines the elite boarding institutions as a closed world and a microcosm, in which there is isolation and social segregation from the community where these schools are geographically located. This isolation helps to reinforce the consciousness of its pupils of being part of a separate and a superior group.

Indeed, in the interviews I conducted in Winchester College (see Chapter four, section 4.2, for schools' selection for the present research), which is one of the top elite boarding schools in England, the students I interviewed seemed to display this consciousness of belonging to a separate and superior group. When I asked them how would they label or describe their accent, all of the four male teenage informants responded unanimously without hesitating at all: "Upper-class!". If I said I was not mesmerised at the fact that 13 and 14 year olds displayed such a strong class consciousness at such an early age, I would be lying. Moreover, while continuing the conversation with them, they commented on the fact that they had very limited contact with other social environments of their own and outside the school. They mentioned that their friends from home were also attending other boarding schools in England. In contrast, in the interviews I conducted with teenagers (15-16 year olds) at the private non-boarding Hampton School, which is situated in a well-off suburb in South-West London (see Chapter four, section 4.2), the four male informants commented on the fact that they had friends not only within the school, but also outside

the school, from other sixth-form colleges nearby. Therefore, they seemed to have contact with a wider social context besides their own. As we will see later on in Chapter five, in the analysis and discussion of the (t) variable, this isolation and social homogeneity from the elite private boarding school and the rather social-openness of the private non-boarding school produce very different rates of t-glottalling in the speech of the informants analysed, with speakers from the exclusive private boarding school consistently displaying the lowest rates of t-glotalling.

The other most recent up-to-date sociological analysis of an elite boarding school is Khan's (2011) study of St. Paul's school, which is located in the outskirts of Concord, New Hampshire, in the United States. The school has a population of just five hundred students and it is considered one of the most influential elite boarding institutions in the United States. What is interesting of this study is that Khan himself was a student at St. Paul's a few years earlier. Khan did come from a well-off background, as his dad was a successful surgeon and his mother was a nurse. However, his family had worked its way up from humble beginnings, as his father had grown up in a small rural village in Pakistan and his mother in rural Ireland, before moving to the United States.

When Khan arrived at St. Paul's, he soon realised that it was far from being racially diverse, as well as socially diverse. He was accommodated at the minority student dorm. He mentions that St. Paul's had long been the home to the social elite of the nation and that even though his family was wealthy, their wealth was miniscule in comparison to many at the school. At the beginning, he did not feel comfortable around this new group of people, but later on he learned to fit in, even though he was not particularly happy there. The source of his unhappiness was his increasing awareness of inequality while he studied at St. Paul's. That is what drove him later on to study sociology at university and to conduct an ethnographic study of this elite boarding school, through the theories and methods of cultural sociology and the sociology of the elites. Therefore, he got a job at St. Paul's for a year, where he also lived in an apartment. He mentions he was completely honest to the school about his research project: to understand the American elite.

Khan (2011) argues that no society will ever be equal; however, we should aim at reducing such inequalities as much as possible, as too much inequality is both immoral and inefficient for societies. Moreover, he claims that inequality is more tolerable if its character is perceived as "fair", as contemporary societies do not accept anymore those systematic and durable inequalities that are seen as being transferred from generation to generation. In helping to create this perception of fairness of inequality (what he calls "democratic inequality") in our contemporary society, the concept of meritocracy is crucial (Khan 2011). The term "meritocracy" was coined in 1940 by Michael Young in England and it meant "rule by the cleverest people". Young had been asked by the Labour Party in England to help create and evaluate a new educational system which would allow all young British the opportunity to get the best education, should they be able.

However, Khan (2011) argues that there is nothing innate about merit and that in fact, it is highly contextual. According to him, "the meritocracy of hard work and achievement has naturalized socially constituted distinctions, making differences in outcomes appear a product of who people are rather than a product of the conditions of their making." Indeed, our successes come from our own hard work, however, our successes are also framed within a social context of different opportunities and possibilities, and we may not all have access to the same opportunities. Khan (2011) believes that by looking at the rise of meritocracy we can better understand the new elite, and as a consequence, we can also understand how contemporary inequality works.

In relation to the making of the new elite in these exclusive boarding schools, Khan (2011) found in his ethnographic study that the new young elite generations see themselves as more individualised and they tend to deemphasise refined tastes in order to look less exclusive. If we relate this finding to the speech of young RP speakers in our research, considering RP as a social accent, we can argue that by acquiring non-standard features (such as t-glottalling) young RP speakers are making a statement against the privilege that having such an accent confers to them. However, at the same time, these speakers seem to be very register-conscious, therefore knowing exactly in which situations it is more socially acceptable to use these non-standard features and in which situations it is not (see Chapter five for results and discussion on Speech style, section 5.3.1).

Khan (2011) discovered three lessons of privilege that students learn in elite schools: *hierarchies are natural and they can be treated like ladders, not ceilings; experiences matter; and privilege means being at ease, no matter what the context.* As for the first lesson (*hierarchies are natural and they can be treated like ladders, not ceilings*), Khan (2011) argues that "learning to climb [socially] requires interacting with those above (and below) you in a very particular way: by creating intimacy without acting like you are an equal. This is a tricky interactive skill, pretending the hierarchy isn't there but all the while respecting it." Thus, the new young elite sees hierarchies as ladders that allow for advancement and not barriers. Therefore, hierarchies are enabling rather than constraining and they are perceived as fair. So, young RP speakers have also had to interact with those below them (even if having a limited contact) in order to climb the hierarchy and position themselves in the upper layers of the social strata. This contact (even if limited) could have triggered accent change through incorporating non-standard features in their speech such as t-glottalling.

Regarding the second lesson of privilege (*experiences matter*), it refers to the fact that students learn the first lesson through experience (Khan 2011). Privilege is not something you are born with, but instead something you learn to develop and cultivate. This, according to Khan (2011), means a shift from the thinking of the old elite (who you are) to that of the new elite (what you have done).

Finally, the third lesson learnt in elite schools is *privilege means being at ease, no matter what the context*. What students cultivate in elite educational institutions is a sense of how to carry themselves and feeling comfortable in any social situation is at the core of this practice of privilege. Therefore, in relation to my young RP informants, in these elite institutions they have been "trained" to be able to accommodate to any social situation and this has in turn had an effect on their linguistic behaviour, maybe by trying to adopt (consciously or not) non-standard features, such as t-glottalling, in their speech.

So, in order to summarise this section, we have tried to demonstrate how concepts and ideas from the fields of the sociology of education and the sociology of the elites can offer some insights into RP as a social accent, traditionally being found and perpetuated through the elite boarding schools in England.

CHAPTER 4

Methodology

In the previous chapter, we reviewed and discussed how language variation as a discipline has incorporated notions of social class in their sociolinguistic studies and we also explored concepts and ideas from the sociology of education and the sociology of the elites in order to understand RP as a social accent. In this chapter, we will first review the field of variationist sociolinguistics, in which this research is theoretically and methodologically based on. Then, we will discuss how the participants of this study were selected, as well as the procedure of data collection. Next, we will explain how the linguistic variable (t), which is the main object of this variationist study, was identified and coded. And finally, in the last two sections, we will describe the various linguistic and social factor groups selected for this study and we will explain the analytical procedures that have been performed on the data.

4.1 Variationist sociolinguistics

This present research is circumscribed within the field of variationist sociolinguistics. The field of sociolinguistics studies the relationship between language and society. Indeed, language exists in context. Speakers by using language mark their own history and identity. Moreover, speech also has a social function, as a way of communication as well as a way of identifying social groups (Tagliamonte 2006).

Modern sociolinguistics started in the 1960s in the United States as an interdisciplinary subfield, a combination of sociology, anthropology and linguistics (Shuy 2003, in Malllinson 2011). Early variationist sociolinguists were concerned about solving language-related social problems, such as educational inequalities in terms of language use, and they started to deal with these matters by studying with quantitative methods how linguistic variables were patterned by linguistic and social factors (Mallinson 2011). The founding study in quantitative variationist sociolinguistics was Labov's (1966) research of linguistic variation in New York City, which became the first systematic investigation of an urban speech community. His main goal was to research how language was related to social stratification.

Variationist sociolinguistics is grounded in three main principles: the principle of heterogeneity, based on the observation that language varies and therefore it has inherent variation; the principle of language change, that is language is constantly changing; and the principle of social meaning, which means that language conveys non-linguistic (social) information besides the actual meaning of its words (Tagliamonte 2006). In order to analyse this variation found in language, the researcher aims at having access to the "vernacular", which has been defined as "the style in which the minimal attention is given to the monitoring of speech" (Labov 1972, in Tagliamonte 2006: 8). And the access to the "vernacular" is done through the immersion of the researcher into the speech community, both as an observer and a participant, where the sociolinguist can record language use in its sociocultural setting (Tagliamonte 2006). The main unit of analysis of a variationist study is the linguistic variable, which is basically "different ways of saying the same thing", and it may be found either at the level of grammar (morphology, syntax, semantics), phonology and/or discourse (pragmatics) (Tagliamonte 2006: 10). As for the main method of analysis of variationist sociolinguistics, it is based on quantitative analysis. The main observation for quantitative variationist analyses is that speakers make choices when they use language and that these choices vary in a systematic way and therefore, they can be studied through a quantitative approach (Tagliamonte 2006).

4.2 Sampling: selecting the participants

RP speakers were recruited mainly by means of school, especially major public boarding and private day schools, where RP has traditionally and historically been found (Mugglestone 2003, see chapter one). The schools were approached with an email explaining the research project and asking if they were willing to participate in the study. That proved completely fruitless, as public schools were very suspicious of an outsider wanting to study the accent of their students (even though the contacting letter did not explicitly reveal that my main research interest was accents, but rather contemporary British teenagers' speech). Several tens of schools (both major public ones and other private ones) were persuaded for almost a period of 6 months, not only with emails, but seeing how unfruitful it was, with calls to the school.

The initial thread to getting the schools was in the end through a friend of mine, a PhD student in Economics at the University of Essex, who had done his bachelor's degree at the University of Oxford, where he had met many students who went to a private school. Thanks to this one initial contact, I started slowly pulling the thread. He put me in contact with several ex-alumni of some major public boarding schools and other private ones, and in turn, two of these contacts, facilitated my access to a major boarding public school and two private non-boarding schools (one only male and another only female). So, in that way, I recruited the participants (teenagers and ex-alumni) of the public boarding and private schools.

As for the participants from a comprehensive school, thanks to my contact at Essex, who had studied in an outstanding rated comprehensive school in Hampshire, I was able to have access to his old secondary school and to his old peers when he was a student there. I had also tried to approach outstanding rated comprehensive schools in the South of England myself with an email letter and some calls, and even though the research had not been so fruitless as in the case of the private schools (2 comprehensive schools showed interest in participating in the project), in the end, it was not possible to reach an agreement with any comprehensive school on my own. As for the comprehensive school, the main objective was to select a school in a prosperous rural area in the South of England, where RP speakers from a middle-class background could be found, and the comprehensive school my Essex contact put me in touch with in Hampshire fulfilled this criteria.

After my experience in recruiting speakers in schools, both private and comprehensive ones, I would say that doing research in a school setting is almost virtually impossible if the researcher does not have a contact in the school (either an ex-alumni or a teacher). Schools have a very busy schedule and someone in the school, usually a teacher, has to spend some time recruiting potential students, and in turn, these students have to miss at least half an hour of a lesson in order to participate in the research project. Moreover, in the case of the major public boarding schools, their students have many other activities scheduled during the day besides the academic lessons, and there is the added factor that these elite schools

are usually very suspicious of an outsider coming and doing research in such an exclusive environment.

After having sorted all the obstacles and challenges encountered in the recruitment process, I was able to gather a sample of 35 individuals[5], distributed in the following way:

- **Teenagers (20 speakers), 4 schools**

    – Comprehensive school, Robert May's (middle-class RP speakers):
        - In Odiham, Hampshire, in a prosperous middle-class rural area, with "outstanding" rating in the 2008-2009 Ofsted.
        - 4 boys and 4 girls (14-16 years old).

    – Private non-boarding school, Hampton School (upper-middle class RP speakers):
        - In Hampton, London. All boys' school. Fees £14,610 a year.
        - 4 boys (17 years old).

    – Private non-boarding school, Lady Eleanor Holles School (upper-middle class RP speakers):
        - In Hampton, London. All girls' school. Fees £15,450 a year.
        - According to the Good Schools' Guide, one of the top girls' school in the UK.
        - 4 girls (15-16 years old).

    – Private boarding school, Winchester College (upper-middle/upper class RP speakers):
        - In Winchester, Hampshire. Major public boarding all boys' school. Fees £31,350 a year.

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[5] See Appendix 4 for the list of all the 35 informants included in this research.

- It is the oldest of the original nine English public schools (Public Schools Act 1868).
- It is one of four remaining full boarding independent schools, meaning all pupils are boarders, in the UK (the others are Eton College, Harrow School and Radley College).
- 4 boys (13-14 years old).

- **Adults (15 speakers)**

    - Comprehensive school (middle-class RP speakers): 7 former students of Robert May's school in Hampshire, 4 females and 3 males, all aged 27.

    - Private school (upper-middle/upper class RP speakers): 8 former students of several private/public schools in Southern England and Oxbridge ex-alumni, 3 females and 5 males, all aged 27.

As for the two private day schools, Hampton School (boys) and Lady Eleanor Holles School (girls), they are both located in the London Borough of Richmond upon Thames, in South-West London. According to the report on the borough from 2012 (London Borough of Richmond upon Thames Borough Profile 2012), it is a prosperous, safe and healthy borough in South-West London. The estimated population is 190,900, according to the figures provided in 2010 by the Office for National Statistics (ONS). It is also reported that Richmond upon Thames is one of the least ethnically diverse boroughs in London, as well as one of the least deprived areas in the country and in London (2010 Index of Multiple Deprivation, IMD). In terms of employment by occupation, 69% of the population of Richmond work in managerial, professional and technical jobs, meaning that the residents of this London borough are highly skilled. Only 4% of the residents in the borough work in elementary positions, such as manufacturing, processing or cleaning. In 2001, the census showed that 62% (55,500 people) of all employed residents commuted out of the borough to work, mainly to The City, Westminster, Hounslow and Kingston. Regarding the median annual earnings for the residents of Richmond (£41,607), they are 30% higher than the London

average (£31,935), which reflects the position of the borough as a desirable place to live and to commute from for well paid jobs. As for the average house price in Richmond upon Thames, it was £455,386 (December 2011) compared to £343,298 in the London region. Finally, in terms of unemployment, the rate of Richmond (4.5%) was much lower than the London rate (9.2%) in June 2011, suggesting that Richmond is holding up to economic pressures well. Therefore, the student population of the two private day schools of the study, Hampton School (boys) and Lady Eleanor Holles School (girls), resides in a very wealthy upper-middle class area of South-West London.

Regarding the comprehensive school included in the study, Robert May's, rated as outstanding by Ofsted reports, it is located in Odiham, a small rural village (4,406 residents, 2013) in the district of Hart, in Hampshire. According to the Hart district council website (www.hart.gov.uk), the district of Hart has an estimated population of 91,700 residents (2011) and similarly to the London Borough of Richmond upon Thames, it is a very little ethnically diverse area, with an overwhelming 97.7% white population. Hart district is one of the richest and least deprived areas in the whole of the UK. In the Indices of Deprivation from 2004, Hart was ranked at 354 out of 354 local authorities in England, where 1 was the most deprived area and 354 the least deprived, meaning that Hart was the least deprived area in England. A 2008 census also revealed Hart to be the area of England with the best quality of life and it also showed Hart to be the second richest area in England, after Richmond upon Thames. Thus, the student intake from the comprehensive school Robert May's resides in a very desirable prosperous rural area in Hampshire.

In terms of the private boarding school included in this present research, Winchester College, it is located in Winchester, Hampshire. It is one of the most prestigious and most well-known public boarding all boys' school in the UK, with the highest fees in the private education sector, of £31,350 a year. It is the oldest of the original nine English public schools (Public Schools Act 1868) and it is one of four remaining full boarding independent schools, meaning all pupils are boarders, in the UK (the others are Eton College, Harrow School and Radley College). It is a school that has traditionally catered and continues to cater for a very

selective student population, mainly from the upper-middle and upper classes across the UK.

4.3 Data collection

Meetings were arranged with the participants during March, May and June 2011. Before the data could be collected, I applied for the ethical approval of research involving human participants that the University of Essex required. After the ethical approval had been granted, I also had to obtain a CRB (Criminal Record Bureau) check, in order to do research in a school setting. I had an informal conversation with each participant, except in Winchester College, where the informal conversation was made to a group of 4 students (the formal speech task was made individually though). Before starting the informal talk, each participant read and signed a consent form to agree to take part in the research project[6]. The consent form had a broad summary of the project, but it did not mention that the object of study was t-glottalling. The informal interviews were arranged around several topics: the speakers' background, their attitudes towards accents in the UK, their daily lives, hobbies, travels and friendship. As for eliciting formal speech, a list of words and sentences containing the different phonological environments involved in the variation of (t) were created[7].

The length of the conversations varied with each speaker, with the shortest being 15 minutes and the longest 1 hour and 15 minutes. The average length for the teenagers was shorter than the one of the adults, with an average of 20 minutes. It was not that easy to engage the teenagers in the conversations and there was also a time constraint, as the interviews were made during lesson hours. As well, sometimes their lives' experiences were not as vast as the ones of the adults. As for the adults, the average length was between 35 and 40 minutes. They were by far much more engaged in their conversations than the teenagers.

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[6] See Appendix 6 for the participants' consent form.
[7] For the content of the interviews, see Appendices 1, 2 and 3.

The conversations were recorded using a digital recorder VN-6500PC Olympus placed on a surface near the participant. Recordings were made as .wav files and then transferred onto a PC. As for the teenagers, the conversations were recorded in a classroom in the school itself, with the exception of Winchester College, where they were made in a study room in one of the boarding houses. In the case of the adults, interviews were recorded mainly at their homes or in some cases, in a room at their work place, a classroom at a university and a hotel room. In all the interview settings, there was no background noise.

4.4 The dependent variable

The basic element in variation analysis is the linguistic variable. According to Labov (1966/1982 in Tagliamonte 2006: 70) the linguistic variable must be "high in frequency, have a certain immunity from conscious suppression… [be] integral units of larger structures, and…be easily quantified on a linear scale." Moreover, the linguistic variable has to be "highly stratified" and have "an asymmetric distribution over a wide range of age levels or other ordered strata of the society" (Labov 1972 in Tagliamonte 2006: 70).

This present research focuses on the variable realisation of (t), in particular the alternation between the alveolar stop [t] and the glottal stop [ʔ]. T-glottalling is a variant of (t) that is usually restricted to a very specific context. According to Tollfree (1999), it can occur after a preceding sonorant in coda or non-foot-initial onset position, the latter referring to cases where the stress on the syllable following (t) is less than that borne by the preceding syllable, as in *better* and *guilty*. Where these conditions are found, t-glottalling can happen variably, also influenced by a set of linguistic (internal) and social (external) constraints.

Each realisation of (t) occurring in the relevant envelope of variation was coded and imported into a spreadsheet, where more coding was undertaken for the linguistic and social

constraints[8]. Tokens that were excluded are those in which (t) is preceded by fricatives, plosives and in consonant clusters like –str- and –st (such as *first, kept, best*) and words in which the stress pattern blocks t-glottalling, as in *tutorial*. Words that contain a (t) in consonant clusters with preceding nasals and liquids were included in the analysis (as in *mountain*).

Table 4.1 displays the four variants of the (t) variable that have been coded for in this research: [t], [ʔ], [ʔt] and [ɾ]. The main object of study of this thesis is the variability of the glottal stop in RP and the results and discussion for this variant are presented in section 5.3, in chapter 5. Besides t-glottalling, I will also report and discuss some results for the tap variant in section 5.4, in chapter 5.

Dependent variable (t)
Alveolar stop [t]
Glottal stop [ʔ]
Pre-glottal stop [ʔt]
Alveolar tap [ɾ]

Table 4.1 Variants of the linguistic variable (t)

4.5 Independent variables

In terms of the independent variables included in the present research, the main aim was to include factor groups that can potentially contribute to the variability of (t) but that traditionally, in most previous studies, have not been considered (Milroy et al. 1994, Collins and Mees 1999, Fabricius 2000, Altendorf 2003, Straw and Patrick 2007). Indeed most previous research on t-glottalling has assumed only a very small set of linguistic and phonological constraints, focusing mainly on the phonological environment following (t), and this context distributed only along the lines of pre-consonantal, pre-vocalic and pre-pausal environments.

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[8] See Appendix 5 for the coding protocol used in this research, for the (t) dependent variable and the independent variables (linguistic and social factor groups).

However, the present research includes a much wider range of linguistic factor groups, which include: style, following phonological environment and preceding phonological environment (with type of vowel quality and type of consonants), grammatical category, stress, number of syllables and lexical frequency. In terms of social factor groups, gender, age and type of school were considered in this research. Furthermore, the dataset has been divided into two, according to the position of (t) in the word: word-medial (in words such as *water*) and word-final (in words such as *that*). This is innovative and not common in the previous research of t-glottalling, for both RP and other English accents. The only study that has also split the dataset into word-medial and word-final is Schleef's (2013) research of t-glottalling on Edinburgh and London English.

This section describes the different factor groups selected for the analysis of the data and explains the classification of the individual factors within each factor group. First, the linguistic (or internal) factor groups for the (t) variable are presented. Then, the social (or external) factor groups are reported.

Factor group 1: Style

Previous research on t-glottalling, both in RP and other English accents, consistently shows that style is an important linguistic factor group contributing towards the variability of the glottal stop. What research shows is that t-glottalling increases as the language register becomes less formal. In this research, in terms of style, three factors were considered (table 4.2): word list and sentences (for a formal register) and informal interview (for an informal speech style).

Style
word list
sentences
informal interview

Table 4.2 Individual factors for the Style factor group

Factor group 2: Following phonological environment

Following phonological environment is the linguistic factor group that has received most attention in the literature of t-glottalling. However, the full potential of the individual factors included in these research have not been adequately investigated, neither in RP nor in other English accents. In this thesis, it was considered of high importance to explore these phonological contexts in an exhaustive manner. Therefore, when considering the individual factors, different types of consonants and vowels were included in the research. The following phonological constraints considered for each dataset were different. Table 4.3 shows the phonological constraints for the WM sample and table 4.4 displays the phonological constraints for the WF sample.

WM Following phonological environment
WM following consonant (*Gatwick*)
WM following front vowel (I)
WM following central vowel (ə)
WM following back vowel (u)
WM following syllabic /l/ (*little*)
WM following syllabic /n/ (*button*)

Table 4.3 Individual factors for the WM Following phonological environment factor group

WF Following phonological environment
WF pre-stops (p, t, k, b, d, g)
WF pre-nasals (m, n)
WF pre-liquids (l, r)
WF pre-fricatives/affricates (f, v, ɵ, ð, s, z, ʃ, ʒ) (ts, dz, tʃ, dʒ)
WF pre-glides (w, j)
WF pre-front vowel (i:, I, e, æ)
WF pre-central vowel (ʌ, ə, ɜ:)
WF pre-back vowel (u:, ʊ, ɔ:, ɒ, a:)
WF pre-pausal

Table 4.4 Individual factors for the WF Following phonological environment factor group

Factor group 3: Preceding phonological environment

On the other hand, preceding phonological environment has been long neglected in variationist studies of t-glottalling, as all of the attention was focused on the following phonological environment. The only studies of t-glottalling that have considered preceding phonological contexts are Schleef (2013) for Edinburgh and London English and Roberts (2006) and Eddington and Taylor (2009) for American English. Table 4.5 and table 4.6 display the individual factors included in this research for the WM and WF preceding phonological contexts respectively.

WM Preceding phonological environment
WM preceding front vowel (i:, ɪ, e, æ)
WM preceding central vowel (ʌ, ə, ɜ:)
WM preceding back vowel (u:, ʊ, ɔ:, ɒ, a:)
WM preceding nasals (*wanted*)
WM preceding liquids (*Balti*)

Table 4.5 Individual factors for the WM Preceding phonological environment factor group

WF Preceding phonological environment
WF preceding front vowel (i:, ɪ, e, æ)
WF preceding central vowel (ʌ, ə, ɜ:)
WF preceding back vowel (u:, ʊ, ɔ:, ɒ, a:)
WF preceding nasals
WF preceding liquids

Table 4.6 Individual factors for the WF Preceding phonological environment factor group

Factor group 4: Grammatical category

This linguistic factor group has been selected to explore further if the variability of the glottal stop is also constrained at the level of morphology. Very little is known about how t-glottalling operates at the morphological level, as almost all variationist research has focused exclusively at the phonological level. The only study which has included grammatical category as a factor group in the analysis of t-glottalling has been Schleef's

(2013) research on Edinburgh and London English. The grammatical category constraint in this research is comprised of the following ten individual factors (table 4.7):

Grammatical category
simple noun (*water, flat*)
proper noun (*Gatwick, Matt*)
pronoun (*whatever, it, what*)
adjective (*better*)
adverb (*pretty much, quite*)
preposition (*at*)
conjunction (*but*)
verb (*forget, get*)
progressive verb (*waiting, sitting*)
past participle (*forgotten*)

Table 4.7 Individual factors for the Grammatical category factor group

Factor group 5: Stress

Another factor group that has been taken into consideration in this research is stress. This linguistic factor group has often been overlooked in the literature of t-glottalling and very little is known about the effects of stress in the variability of the glottal stop. Only a few studies include stress in their analysis, but without reaching very conclusive findings. These are Tollfree's (1999) research on London English and Roberts' (2006) and Eddington and Taylor's (2009) studies on American English. Table 4.8 displays the four individual factors included in the stress factor group.

Stress
preceding stressed syllable
preceding unstressed syllable
following stressed syllable
following unstressed syllable

Table 4.8 Individual factors for the Stress factor group

Factor group 6: Number of syllables

Each token of (t) was classified and coded according to the number of syllables of the word containing that segment. The inclusion of this linguistic factor group in the analysis provides an opportunity to examine if syllable structure has any kind of effect on the variable realisation of (t). Like other linguistic factor groups included in this research, number of syllables has also been long neglected in the literature of t-glottalling, both in RP and in other English accents. The only previous study which has included number of syllables is Schleef's (2013) research of t-glottalling in Edinburgh and London English. The five individual factors included in the number of syllables factor group are displayed in table 4.9.

Number of syllables
1 (*flat*)
2 (*better*)
3 (*forgotten*)
4 (*authority*)
5 (*university*)

Table 4.9 Individual factors for the Number of syllables factor group

Factor group 7: Lexical frequency

Lexical frequency has been barely explored in studies of t-glottalling, not only in RP but in other British English accents. This is the only variationist research up to date that considers the effects of lexical frequency on t-glottalling in the RP accent, as the other main variationist study of RP by Fabricius (2000) did not include lexical frequency as a factor group in her analysis. As for other British accents, Schleef's (2013) study considers lexical frequency in his research of t-glottalling in Edinburgh and London English.

It has been shown that lexical frequency has an effect in phonological variation, and in particular, it has been argued that reductive phonological processes tend to advance more rapidly in high-frequency words (Bybee 2002). T-glottalling is a reductive phonological

process and therefore, it would be expected lexical frequency to be an important factor in the variability of the glottal stop.

In order to measure lexical frequency in this research, the book "Word Frequencies in Written and Spoken English: Based on the British National Corpus" (Leech, Rayson and Wilson 2001) was employed. This book provides frequency lists for written and spoken English, which are based on the British National Corpus. The frequency numbers provided in these lists are per million words. Table 4.10 displays the six lexical frequency bands used in this study of t-glottalling. These frequency bands are based on the spoken corpus of the BNC and they are rates per million words. The spoken corpus of the BNC includes both "conversational speech" and "task-oriented speech". "Conversational speech" is described as texts of casual and unplanned conversations. As for "task-oriented speech", it includes four domains of spoken discourse: educational, business, public/institutional and leisure.

For each dataset (word-medial and word-final), the different token types that were present were checked and for each token I attached a frequency measure to it (based on the spoken corpus of the BNC). Then, some graphs were developed to see the distribution of the lexical frequencies along the token types of my word-medial and word-final samples[9]. And finally, according to this distribution, I developed the measures for the six lexical frequency bands (table 4.10).

Lexical frequency
0-99
100-299
300-499
500-999
1000-4999
5000+

Table 4.10 Individual factors for the Lexical frequency factor group

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[9] The same procedure was done for the "whole corpus" and data was also coded for the "whole corpus" lexical frequencies. This was done for comparison reasons with the "spoken corpus". However, in the Varbrul analyses, only "spoken corpus" frequencies were considered.

Factor group 8, 9 and 10: Gender, Age and Type of school

As for the social constraints considered in this study, these include: gender (table 4.11), age (table 4.12) and type of school (table 4.13). In terms of the social factor groups, it was considered of major importance including type of school. As we have mentioned in chapter one, one of the main objectives of this research is to study RP where historically it has been nurtured and perpetuated: the major public boarding schools, together with private day schools. Moreover, as we have discussed in chapter three, the British education system still shows sharp divisions in terms of social class (Cannadine 1999, Reay 2006, Bell 2013). By selecting type of school as a social factor group, we expect to compare speakers of RP from an upper-middle class background (in private schools, boarding and non-boarding) to speakers of RP from a middle-class background (comprehensive school in a prosperous rural area in Southern England) in terms of their usage of t-glottalling. Therefore, type of school acts as a proxy for social class in this research.

Gender
male
female

Table 4.11 Individual factors for the Gender factor group

Age
teenagers
adults

Table 4.12 Individual factors for the Age factor group

Type of school
comprehensive
private non-boarding
private boarding

Table 4.13 Individual factors for the Type of school factor group

4.6 Data analysis

It was decided that auditory analysis would be sufficient for the present study, as consonantal variables such as glottal variation in (t) have tended to be analysed auditorily in the past (Fabricius 2000). As well, the present research is more focused on the sociolinguistic character of t-glottalling rather than with its acoustic profile.

In all, a total of 5248 (t) tokens were analysed, with an average of 150 tokens per speaker. The dataset was split into two: (t) tokens in word-final position (4143 tokens) and (t) tokens in word-medial position (1105 tokens). Then, the two datasets were analysed separately through multiple logistic regression analyses using Varbrul. As for the four variants of the (t) variable, [t], [ʔ], [ʔt] and [ɾ], they were collapsed into two variants for analysis purposes, [t] and [ʔ], as there were very few tokens of [ʔt] and [ɾ] in the dataset, and they did not seem to contribute much to the overall results of the study.

Varbrul is a probability-generating multivariate analysis application program that has been designed specifically to deal with linguistic variation. It is a two-step statistical procedure: logistic regression followed by a post hoc step-up/step-down comparison. Its main purpose is to show the contributions of various independent factors to the overall variability of the dependent variable (Tagliamonte 2006). Multivariate analysis is preferred over univariate analysis in variationist sociolinguistics, where the data (based on spontaneous speech) are not proportionately distributed across the independent variables. Varbrul presents results in terms of factor weights. Factor weights that are above 0.5 indicate a variable that favours the glottal stop, whereas factor weights under 0.5 disfavour the glottal stop (Tagliamonte 2006).

For a long time, Varbrul has been the reference statistical software for variationist sociolinguists. However, in the past few years, a new programme has spread amongst quantitative sociolinguists, named Rbrul, created by Johnson (2009) and based on R, which

has recently become the reference statistical package for quantitative analysis in the social sciences. The present research has used Varbrul for the quantitative analysis of t-glottalling in RP, as during my master's degree in sociolinguistics at the University of Essex, I was trained in this kind of quantitative methodology. Therefore, even though towards the end of the PhD Rbrul has gained more popularity amongst variationists and it is now the main statistical programme of reference in quantitative sociolinguistics, it was decided to continue the analysis with Varbrul.

One of the main differences between Varbrul and Rbrul is that Rbrul can run mixed-effects regressions (Johnson 2009, Gorman and Johnson 2013). Mixed-effects regressions are a recent innovation which allows random effects predictors in addition to the fixed-effects predictors. For instance, in a quantitative variationist analysis, random effects would be individual speaker and word type. Moreover, Rbrul can run regression for continuous variables, like vowels. As well, Rbrul presents results not only in factor weights (like Varbrul), but also in log-odds, which is the common practice in the social sciences (Johnson 2009).

Even if Varbrul does not allow for mixed-effect analyses, in which factor groups such as individual speaker are treated as a random effect, instead of a fixed effect, I tested these effects in the Varbrul analyses following this procedure. First, several runs were conducted with all the linguistic factor groups and individual speaker, without including the social factor groups. In this first step of the analysis, each linguistic factor group was excluded and included in the runs, to test for the importance of the group in the variation of (t). When the linguistic analysis was refined to the best possible run (with the lowest chi-square/cell[10]), then, the social factor groups were added in the analysis and individual speaker was removed from it. In this second step of the analysis, each social factor group was excluded and included in the runs, to test how much each social factor group adds to the variability of (t). After following these analytical procedures, I obtained the best run (with the best lowest chi-square/cell) for the word-medial dataset and for the word-final dataset.

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[10] The chi-square/cell weighs to which extent the combination of factors in a specific run best account for the variation of the linguistic variable under study. A low chi-square/cell indicates a good fit of the statistical model of the data.

CHAPTER 5

Analysis and Discussion of the (t) Variable

5.1 Introduction

This chapter is organised in three sections. In section 5.2, I describe the analytical procedures that I have followed when analysing the data with Varbrul. Then, in section 5.3, I present and discuss the results obtained from the multivariate analyses for t-glottalling, which is the main object of study of this thesis, for the word-medial and word-final samples. Furthermore, in section 5.3, I also present and discuss the cross-tabulations of the linguistic factor groups in relation to the social factor groups. Finally, in section 5.4, I examine the results for taps, a secondary variant found in the speech of RP speakers.

5.2 Analytical procedures

As explained in the methodology chapter (see Chapter 4, section 4.6), Varbrul is the statistical tool I have used in the variationist analyses of (t). A series of Varbrul analyses have been conducted for both the word-medial (WM) and word-final (WF) datasets and the results presented in this chapter (section 5.3) are extracted from the best Varbrul analysis of each dataset. Varbrul analyses aim to reveal which linguistic (internal) and social (external) factor groups best promote or constrain t-glottalling.

As discussed in section 4.6, Varbrul does not allow for mixed-effect analyses, in which factor groups such as individual speaker are treated as a random effect, instead of a fixed effect. However, I tested these effects in the Varbrul analyses following this procedure. First, several runs were conducted with all the linguistic factor groups and individual speaker, without including the social factor groups. In this first step of the analysis, each linguistic factor group was excluded and included in the runs, to test for the importance of the group in the variation of (t). When the linguistic analysis was refined to the best possible run (with

the lowest chi-square/cell[11]), then, the social factor groups were added in the analysis and individual speaker was removed from it. In this second step of the analysis, each social factor group was excluded and included in the runs, to test how much each social factor group adds to the variability of (t). After following these analytical procedures, I obtained the best run (with the lowest chi-square/cell) for the WM dataset and for the WF dataset.

Besides the Varbrul runs, cross-tabulations of all the linguistic and social factor groups were also conducted for both the WM and WF datasets. These cross-tabulations show us the variation between two factor groups and they serve to further illuminate how t-glottalling operates across the sample and across the different linguistic and social factor groups. The results of the cross-tabulations are given in percentages and token numbers, whereas the results for the Varbrul analyses are presented in probabilities (factor weights), percentages and token numbers. Only the probabilities (factor weights[12]) obtained from the multivariate analyses of Varbrul can tell if a factor group favours or disfavours t-glottalling; percentages alone cannot give such information. A total of 64 cross-tabulations were conducted (36 for WM data and 28 for WF data). However, in this chapter I will only refer to the cross-tabulations that give important information on the behaviour of t-glottalling when linguistic and social factor groups are related and in cases where a factor group did not turn out significant and I want to explore the reasons why. When the results of the cross-tabulations are as expected, then I will not refer to them.

5.3 Results for t-glottalling

In this section, I present and discuss the results for the glottal [ʔ] variant of the sociolinguistic variable (t). Particularly, four variants of (t) were considered: [ʔ] glottal, [ʔt] pre-glottal, [t] alveolar and [ɾ] tap. Varbrul conducts binomial analyses and it allows only two factors in the dependent variable: one variant is selected to represent the rule

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[11] The chi-square/cell weighs to which extent the combination of factors in a specific run best account for the variation of the linguistic variable under study. A low chi-square/cell indicates a good fit of the statistical model of the data.

[12] Factor weights range from 0 to 1. Those above .50 favour the application of the rule and factor weights below .50 disfavour it (Tagliamonte 2006).

application and the other variants represent the non-application of the rule. In the analyses I conducted with Varbrul of the WM and WF datasets, the application selected was the [ʔ] glottal variant and the non-application consisted of the other three variants: [ʔt] pre-glottal, [t] alveolar and [ɾ] tap. Pre-glottals were first grouped with glottals in the analysis, but seeing that the results did not change substantially, it was decided to group pre-glottals with alveolars and taps. The results presented in this section are focused on the [ʔ] glottal variant, as it is the main object of study of this thesis. However, in section 5.4, I will present some results on the [ɾ] tap variant, as it displayed an interesting pattern worthy of being highlighted and commented upon.

A total of 5248 tokens of (t) were examined in this research. Table 5.1 shows the overall distribution of each variant of the dependent variable (t) in the WM dataset (which has a total of 1105 tokens) and table 5.2 displays the distribution of each variant for the WF dataset, comprising a total of 4143 tokens of (t).

WM dataset *(Total tokens: 1105)*				
	[t]	**[ʔt]**	**[ʔ]**	**[ɾ]**
Tokens	814	127	71	93
%	73.7	11.5	6.4	8.4

Table 5.1 Distribution of the variants of (t) in the WM sample

WF dataset *(Total tokens: 4143)*				
	[t]	**[ʔt]**	**[ʔ]**	**[ɾ]**
Tokens	1507	109	2303	224
%	36.4	2.6	55.6	5.4

Table 5.2 Distribution of the variants of (t) in the WF sample

The results of t-glottalling for the WM and WF datasets presented in this section are extracted from two different Varbrul analyses. Table 5.3 displays the details of the two analyses with the rank ordering of their relevant significant factor groups, from the highest to the lowest effect.

Analyses	Constraint ranking of factor groups
WM analysis[13] Chi-square/cell = 0.72	1.Style 2.Type of school 3.WM Following phonological environment 4.Lexical frequency 5.Gender 6.WM Preceding phonological environment
WF analysis[14] Chi-square/cell = 1.41	1.Style 2.Type of school 3.WF Following phonological environment 4.Gender 5.Lexical frequency 6.Age 7.Number of syllables 8.WF Preceding phonological environment

Table 5.3 Constraint ranking of factor groups for the WM and WF analyses

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[13] In the WM analysis, these factor groups were selected as non-significant by Varbrul: Age, Stress and Grammatical category. The factor group Number of syllables was excluded from the final best WM analysis, as the chi-square/cell was lower and therefore the model improved when this factor group was removed.

[14] In the WF analysis, when the factor groups Grammatical category and Stress were included in the analysis the chi-square/cell was higher (1.5) and therefore the model did not improve. Moreover, both factor groups were eliminated in one of the step runs conducted. Consequently, Grammatical category and Stress were removed from the final best WF analysis.

All these factor groups selected by Varbrul together with their corresponding individual factors are summarised in table 5.4 for the WM dataset and in table 5.5 for the WF dataset. The factor groups are presented in the first column and they are organised hierarchically according to the significance assigned to them by Varbrul; and in the case of the specific factors, the order in which they appear in the table depends on their relative weight within each group. The second column consists of the factor weights or probabilities of t-glottalling in relation to the other variants considered together (figures in square brackets are for non-significant factor groups) and the corresponding percentages are given in the next column. The last column contains the number of cases of t-glottalling in proportion to the total number of (t) tokens found in the data (which include the other variants as well).

Table 5.4

Contribution of linguistic and social factors selected as significant to the probability of word-medial (WM) t-glottalling in RP (square brackets for non-significant factor groups)			
Input 0.008 Log likelihood -159.000			
Chi-square/cell = 0.72			
Total N 1105			
FACTOR GROUPS	Factor Weight	%	N
Style informal interview sentences word list *Range*	.97 .41 .11 *86*	18.7 3.1 0.9	300 350 455
Type of school private non-boarding comprehensive private boarding *Range*	.72 .65 .19 *53*	11.7 7.5 1.6	266 455 384
WM Following phonological environment WM following consonant (*Gatwick*) WM following syllabic /n/ (*button*) WM following front vowel (I) WM following central vowel (ə) WM following syllabic /l/ (*little*) *Range*	.97 .72 .31 .27 .15 *82*	6.6 4.1 8.9 2.3 9.2	213 73 326 298 195

FACTOR GROUPS	Factor Weight	%	N
Lexical frequency			
500-999	.92	21.3	150
100-299	.45	4.1	294
0-99	.38	4.1	661
Range	*54*		
Gender			
male	.62	7.3	634
female	.33	5.3	471
Range	*29*		
WM Preceding phonological environment			
WM preceding central vowel (ʌ, ə, ɜ:)	.79	2.8	145
WM preceding back vowel (u:, ʊ, ɔ:, ɒ, a:)	.69	3.9	258
WM preceding front vowel (i:, I, e, æ)	.35	8.1	702
Range	*44*		
Age			
adults	[.58]	5.7	505
teenagers	[.42]	7	600
Stress			
following stressed syllable	[.88]	33.3	12
following unstressed syllable	[.70]	7.7	181
preceding stressed syllable	[.46]	5.9	880
preceding unstressed syllable	[.21]	3.1	32
Grammatical category			
adverb (*pretty* much)	[.76]	17.6	17
proper noun (*Gatwick*)	[.72]	12.7	71
past participle (*forgotten*)	[.70]	16.7	6
progressive verb (*waiting, sitting*)	[.66]	36.2	47
adjective (*better*)	[.63]	6.7	389
simple noun (*water, bottle*)	[.37]	2	555
pronoun (*whatever*)	[.11]	15.8	19

Table 5.5

Contribution of linguistic and social factors selected as significant to the probability of word-final (WF) t-glottalling in RP			
Input 0.556			
Log likelihood -1892.532			
Chi-square/cell = 1.41			
Total N 4140[15]			
FACTOR GROUPS	Factor Weight	%	N
Style			
informal interview	.72	72.5	2845
sentences	.16	23.9	700
word list	.06	11.8	595
Range	*66*		
Type of school			
comprehensive	.67	65.2	1740
private non-boarding	.53	65	1092
private boarding	.24	34.9	1308
Range	*43*		
WF Following phonological environment			
WF pre-liquids (l, r)	.78	56.2	240
WF pre-glides (w, j)	.63	74.7	359
WF pre-nasals (m, n)	.60	65.3	225
WF pre-fricatives/affricates (f, v, θ, ð, s, z, ʃ, ʒ) (ts, dz, tʃ, dʒ)	.54	51.3	766
WF pre-pausal	.50	52.4	683
WF pre-back vowel (u:, ʊ, ɔ:, ɒ, a:)	.44	67.4	377
WF pre-stops (p, t, k, b, d, g)	.42	45.7	442
WF pre-front vowel (i:, I, e, æ)	.39	49.7	386
WF pre-central vowel (ʌ, ə, ɜ:)	.37	53.2	662
Range	*41*		
Gender			
male	.58	55.6	2173
female	.40	55.5	1967
Range	*18*		
Lexical frequency			
300-499	.65	45.8	48
5000+	.60	67.2	1858
500-999	.56	59.6	500

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[15] The total number of tokens in the WF dataset is reduced in the final analysis from 4143 to 4140. Three tokens produced *knockouts*, meaning they showed a value of 0 or 100 per cent in a cell (Tagliamonte 2006). Knockouts show no variation and therefore they have to be excluded from variationist analyses. The three tokens were: two tokens from the *number of syllables* factor group, for three and four syllable words (both tokens being glottalised) and one token from the *grammatical category* factor group for proper nouns (which was not glottalised).

100-299	.38	38	71
0-99	.36	37.9	232
1000-4999	.36	43.1	1431
Range	*29*		
Age			
teenagers	.59	62.6	2163
adults	.39	47.9	1977
Range	*20*		
Number of syllables			
2 (*about*)	.71	65.8	146
1 (*but*)	.49	55.2	3994
Range	*22*		
WF Preceding phonological environment			
WF preceding back vowel (u:, ʊ, ɔ:, ɒ, a:)	.57	60.4	1160
WF preceding front vowel (i:, I, e, æ)	.47	47	2241
WF preceding central vowel (ʌ, ə, ɜ:)	.46	74	739
Range	*11*		

The next sections present and discuss the results displayed in tables 5.4 and 5.5 in a detailed manner. Each section deals with one factor group at a time. First the linguistic factors are presented followed by the social factors. Each section for every single factor group has the following structure: it starts with a presentation of the general tendencies found in the multivariate analyses for the WM and WF datasets and it continues with a discussion of the findings of both the WM and WF samples in relation to the previous literature of t-glottalling in RP and other English accents. Furthermore, at the end of each section for every single factor group, relevant cross-tabulations are presented in which linguistic and social factor groups are related and discussed together. Finally, at the end of this chapter, in section 5.4, I present some results on the [ɾ] tap variant.

5.3.1 Style

In the word-medial (WM) multivariate analysis, style emerged as the most significant factor group contributing towards the variation of t-glottalling. RP speakers clearly favour the glottal stop in informal speech and clearly disfavour it in more formal settings (table 5.6).

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For the informal interview, these speakers favour t-glottalling with a probability of .97 and for the sentences reading task the probability drops to .41, disfavouring the usage of the glottal stop, and the lowest probability is displayed in the word list reading task, in which RP informants disfavour the glottal stop the most, with a probability of .11. In figure 5.1, we can observe the dramatic increase in the production of t-glottalling when the language register becomes more informal. So, when speech style comes into play, RP speakers seem to be very register-conscious, knowing when it is appropriate to produce more or fewer glottal stops according to the formality of the register they use when they speak.

Contribution of style to the probability of word-medial (WM) t-glottalling in RP			
Input 0.008 Log likelihood -159.000			
Chi-square/cell = 0.72			
Total N 1105			
FACTOR GROUP	Factor Weight	%	N
Style informal interview sentences word list *Range*	.97 .41 .11 *86*	18.7 3.1 0.9	300 350 455

Table 5.6 Contribution of style to the probability of WM t-glottalling in RP
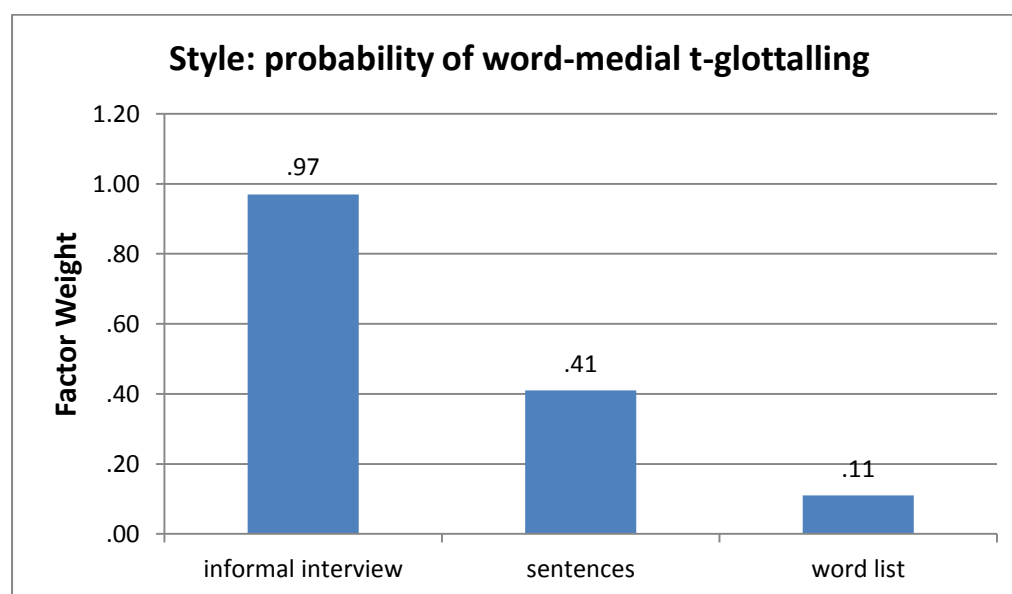
Figure 5.1 Style: probability of word-medial t-glottalling

In the word-final (WF) multivariate analysis, style also emerged as the most significant factor group contributing towards the variation of the glottal stop in RP. As seen in table 5.7, in informal interview RP speakers produced 72.5% of glottal stops, which corresponds to a probability of .72, so RP informants clearly favour t-glottalling in conversational speech. As for their speech in more formal situations, RP speakers clearly disfavour the use of the glottal stop, with a probability of .16 in the sentences reading task, with the word list reading task being the context where they use the least amount of glottal stops, with a probability of only .06. Figure 5.2 displays how RP informants favour t-glottalling the most in informal settings and how they visibly disfavour the glottal stop in more formal registers.

Contribution of style to the probability of word-final (WF) t-glottalling in RP			
Input 0.556 Log likelihood -1892.532			
Chi-square/cell = 1.41			
Total N 4140			
FACTOR GROUP	Factor Weight	%	N
Style informal interview sentences word list *Range*	.72 .16 .06 *66*	72.5 23.9 11.8	2845 700 595

Table 5.7 Contribution of style to the probability of WF t-glottalling in RP

Figure 5.2 Style: probability of word-final t-glottalling

As we have seen, style has been selected in both word-medial and word-final position as being the most statistically significant factor group in the Varbrul analysis, and therefore, the one evaluated by this program to have the largest impact on t-glottalling in RP. The results on style found in this thesis go in line with previous research, which consistently shows t-glottalling as a feature exhibiting a very marked stylistic variation (Fabricius 2000, Altendorf 2003, Tollfree 1999, Trudgill 1974, Williams and Kerswill 1999, Mees and Collins 1999, Milroy et al. 1994, Stuart-Smith et al. 2007, Schleef 2013). RP informants in my research seem to be very style conscious when it comes to their production of the glottal stop, with very low probabilities in the formal contexts (WM .41 sentences, WM .11 word list, WF .16 sentences, WF .06 word list) and a much higher production in informal settings (WM .97 informal interview, WF .72 informal interview), for both word-final and word-medial position.

Thus, when it comes to stylistic variation of t-glottalling in young RP speakers, we have observed that it is very common for them to style-shift. These informants display a very low rate of glottal stops in the more formal contexts, but they show quite a high rate of glottal stops in informal speech. Previous literature on t-glottalling steadily shows how upper-middle class and middle-class speakers have a tendency to style-shift in the production of the glottal stop in their speech, whereas working-class speakers barely style-shift. For instance, Fabricius (2000) also reports style-shifting in t-glottalling for her upper-middle class RP informants. She states that "t-glottalling is a sociolinguistic variable which is consistently susceptible to style-shifting" (Fabricius 2000: 135). Stuart-Smith, Timmins and Tweedie (2007) found in their study of Glasgow that working-class speakers almost barely style-shifted when it came to the production of t-glottalling, whereas middle-class speakers did clearly style-shit. Moreover, Tollfree (1999), in her study of London, also found differences between working-class and middle-class speakers in terms of style, with SELE (South East London English) speakers using the glottal variant more frequently than by SELRS (South East London Regional Standard) speakers.

As Altendorf (2003) argues, t-glottalling is a marker in the Labovian sense, because it is spread across all social classes and styles, but at the same time displays social and stylistic variation. She claims that "the pattern of variation is that of a vernacular variant leading to a decrease of t-glottalling in higher social classes and more formal styles" (Altendorf 2003: 87). These social and stylistic constraints on the glottal stop are exhibited more clearly when results are correlated with different phonetic environments. In section 5.3.2.1, I examine the cross-tabulations of the factor group following phonological environment in relation to style and school, in order to see how these stylistic and social constrains are displayed in my RP data.

Indeed, Labov (1972: 178-180) defines a "marker" as "a variable feature which shows stylistic variation, i.e. speakers use different variants in different contexts, because the use of one variant or another is socially meaningful." He further claims that speakers may not be aware of the variables or their social meanings. However, in the case of my young RP informants, and in line with the results I have found for their stylistic variation, I would say that this group of speakers seem to be very aware of the role of the glottal stop and their social meanings in formal and informal situations, and they clearly reduce their amount of t-glottalling in formal settings and they increase it in conversational speech. In fact, while conducting the interviews for my research, I asked my informants if they would relate the "dropping of T" (as non-linguists usually label this phenomenon) to a lower social status. It was widely agreed by them that they viewed t-glottalling not in relation to socio-economic status but rather as an "informal device" to be used in conversational speech, and they mentioned that they would try to reduce their production of the glottal stop if they found themselves in more formal settings.

Besides modifying speech for self-conscious reasons, it has also been demonstrated that speakers can make adjustments in order to express solidarity with, or distance from, an interlocutor. This effect has been named *audience design* (Bell 1984). Trudgill (1986), in his Norwich study, found that his own use of the glottal stop varied in correlation with the proportion of glottals used by his interviewees. In this direction, I suggest for future

research on t-glottalling to carry out a controlled experiment in which two groups of people, one with heavy glottalisers and one with light glottalisers interact with each other in different sessions for an extended period of time and record themselves without the researcher being present. This kind of research could shed light into the variability of t-glottalling from an audience design perspective.

Both quantitative studies (Altendorf 2003, Tollfree 1999) and descriptive studies (Wells 1982, Wells 1997, Cruttenden 2001, Hughes, Trudgill and Watt 2005) on RP claim that RP speakers tend to avoid the glottal stop word-medially in intervocalic (*water*) and syllabic /l/ (*little*) contexts and therefore display low rates of t-glottalling word-internally (as this research has also found). The literature argues that this is due to "stigmatisation" effects within the RP speech community. The present research investigates whether it could also be linked to lexical frequency effects, in which WM tokens of (t) belong to lexical categories with lower frequency rates and WF tokens of (t) belong to lexical categories with higher frequency rates. This argument is explained in greater detail in section 5.3.7, which presents the results and discussion for the influence of the lexical frequency factor group on t-glottalling in RP.

5.3.1.1 Style and Gender

I now turn to analyse the effect of gender on the rate of t-glottalling in relation to the different speech styles. As we have seen in the previous section 5.3.1, style emerged as the most significant factor group for the presence of t-glottalling in RP, for both the word-medial and word-final datasets. Before examining the cross-tabulations of style and gender, we should highlight that in the WM sample, only 6% (71 tokens) of the total 1105 tokens were glottalised by the RP informants, in comparison to the WF sample, where 56% (2301 tokens) of the total 4140 tokens displayed the glottal stop. This goes in line with the previous literature on t-glottalling in RP (Altendorf 2003, Tollfree 1999), where such

speakers show much lower rates of the glottal stop word-internally and much higher rates across word boundaries[16].

Table 5.8 displays the cross-tabulation of word-medial t-glottalling by style and gender. In the WM sample, we can observe that males glottal slightly more (7%) than females (5%) overall. Males and females mainly differ in their production of the glottal stop in informal interviews, where males are ahead with a 20% rate and females display fewer glottal stops with a 17% rate. In formal speech, females do style-shift consistently in both the sentences reading task and word list reading task, in which they only display a 1% of glottal stops. However, males, which also style-shift in more formal settings, they have a higher rate of t-glottalling (4%) than females (1%) in the sentences reading task. This could suggest that the rates of glottal stops of conversational speech may start affecting the formal contexts in RP and it is males who are leading in this change.

This tendency is shown more clearly in the WF dataset (table 5.9), where it is in the sentences reading task context where males are most obviously ahead in the production of t-glottalling in RP, with a rate of 34% and females are visibly much behind, with a rate of only 10%. In the informal interview and word list contexts in the WF sample, males and females show similar rates and they only differ minimally and the rates are expected in terms of style: high percentages for informal speech (slightly above 70%) and low percentages for formal speech (just above 10%). In interview speech, we clearly see how t-glottalling is much more present in the WF dataset for both genders, with rates of 70%, whereas the WM sample displays much lower rates of glottal stops (around 20%) for both genders.

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[16] Differences in rates of t-glottalling between word-medial and word- final positions cannot be compared to Fabricius's (2000) study of RP, as she only researched t-glottalling in word-final position and she did not include word-medial (t) tokens in her study.

WM dataset	Word list	Sentences	Informal Interview	Total
	N - %	N - %	N - %	N - %
Male				
Glottal	2 – **1**	9 – **4**	35 – **20**	46 – **7**
Non-glottal	258 – 99	191 – 96	139 – 80	588 – 93
Total	260	200	174	634
Female				
Glottal	2 – **1**	2 – **1**	21 – **17**	25 – **5**
Non-glottal	193 – 99	148 – 99	105 – 83	446 – 95
Total	195	150	126	471
Total				
Glottal	4 – **1**	11 – **3**	56 – **19**	71 – **6**
Non-glottal	451 – 99	339 – 97	244 – 81	1034 – 94
Total	455	350	300	1105

Table 5.8 WM t-glottalling by Style and Gender

WF dataset	Word list	Sentences	Informal Interview	Total
	N - %	N - %	N - %	N - %
Male				
Glottal	43 – **13**	138 – **34**	1028 – **72**	1209 – **56**
Non-glottal	297 – 87	262 – 66	405 – 28	964 – 44
Total	340	400	1433	2173
Female				
Glottal	27 – **11**	29 – **10**	1036 – **73**	1092 – **56**
Non-glottal	228 – 89	271 – 90	376 – 27	875 – 44
Total	255	300	1412	1967
Total				
Glottal	70 – **12**	167 – **24**	2064 – **73**	2301 – **56**
Non-glottal	525 – 88	533 – 76	781 – 27	1839 – 44
Total	595	700	2845	4140

Table 5.9 WF t-glottalling by Style and Gender

5.3.1.2 Style and Age

WF dataset	Word list	Sentences	Informal Interview	Total
	N - %	N - %	N - %	N - %
Teenagers *Glottal* *Non-glottal* *Total*	 53 – **16** 287 – 84 340	 111 – **28** 289 – 72 400	 1190 – **84** 233 – 16 1423	 1354 – **63** 809 – 37 2163
Adults *Glottal* *Non-glottal* *Total*	 17 – **7** 238 – 93 255	 56 – **19** 244 – 81 300	 874 – **61** 548 – 39 1422	 947 – **48** 1030 – 52 1977
Total *Glottal* *Non-glottal* *Total*	 70 – **12** 525 – 88 595	 167 – **24** 533 – 76 700	 2064 – **73** 781 – 27 2845	 2301 – **56** 1839 – 44 4140

Table 5.10 WF t-glottalling by Style and Age

In the cross-tabulation of style and age, we only look at the WF dataset, since age emerged as non-significant in the WM sample. In word-final position, teenagers exhibit t-glottalling at a much higher rate overall (63%) than adults, which show a 48% rate of glottal stops (table 5.10). Moreover, teenagers are also much more advanced in the production of t-glottalling in every style analysed (16% word list, 28% sentences and 84% informal interview) than adults (7% word list, 19% sentences and 61% informal interview). Thus, teenagers visibly lead the change of t-glottalling in the RP speech community in these apparent-time data (age as a factor group is explored in detail in section 5.3.9). As we have seen in the previous section 5.3.1.1, which analysed style and gender, both age groups (teenagers and adults) also style-shift, like both genders (males and females), and both teenagers and adults exhibit higher rates of t-glottalling in informal speech and lower rates in formal contexts.

5.3.1.3 Style and Type of school

WM dataset	Word list	Sentences	Informal Interview	Total
	N - %	N - %	N - %	N - %
Private boarding				
Glottal	0 – **0**	5 – **4**	1 – **1**	6 – **2**
Non-glottal	156 – 100	115 – 96	107 – 99	378 – 98
Total	156	120	108	384
Private non-boarding				
Glottal	1 – **1**	1 – **1**	29 – **35**	31 – **12**
Non-glottal	103 – 99	79 – 99	53 – 65	235 – 88
Total	104	80	82	266
Comprehensive				
Glottal	3 – **2**	5 – **3**	26 – **24**	34 – **7**
Non-glottal	192 – 98	145 – 97	84 – 76	421 – 93
Total	195	150	110	455
Total				
Glottal	4 – **1**	11 – **3**	56 – **19**	71 – **6**
Non-glottal	451 – 99	339 – 97	244 – 81	1034 – 94
Total	455	350	300	1105

Table 5.11 WM t-glottalling by Style and Type of school

In the overall WM data (table 5.11), the private boarding school exhibits the least t-glottalling, with a very low rate of 2%. Interestingly, the private non-boarding school displays the highest rate of glottal stops, with a rate of 12%. As for the comprehensive school, it falls between the other two, with a rate of 7%. All three schools do style-shift when it comes to t-glottalling, with very low rates of the glottal stop in formal contexts and higher rates in informal speech. However, in informal interview, two schools pattern together in exhibiting similar rates of t-glottalling (35% private non-boarding and 24% comprehensive) and one school stands on its own displaying almost categorically low rates of glottal stops in WM position (1% private boarding).

Two further percentages are worth highlighting and commenting upon in the cross-tabulation of style and type of school. First of all, the school with the highest social profile, the private boarding one, exhibits no glottalised tokens at all in the most formal context (0% word list) in word-medial position. Secondly, the private non-boarding school (which is located in South-West London) displays the highest rate of t-glottalling in informal speech (%35) in word-medial contexts.

When interpreting these two results, we should recall two arguments suggested by the previous literature on RP in terms of t-glottalling (Cruttenden 2001, Hughes, Trudgill and Watt 2005, Altendorf 2003, Tollfree 1999). The first argument is that London speakers show higher rates of t-glottalling word-internally. Therefore, the fact that my private non-boarding school informants show the highest rate of t-glottalling (35%) in conversational speech in word-medial position could be explained by the geographical location of these speakers and the school, which is situated in South-West London. The second argument proposed by the literature is that the higher the social profile of the speaker and the higher the register of speech, the less t-glottalling will be exhibited. In this case, the WM most formal data (0% word list) of the school with the highest social profile (private boarding) in my research are a good example which corroborates this argument to the extreme.

WF dataset	Word list	Sentences	Informal Interview	Total
	N - %	N - %	N - %	N - %
Private boarding				
Glottal	15 – **7**	48 – **20**	393 – **45**	456 – **35**
Non-glottal	189 – 93	192 – 80	471 – 55	852 – 65
Total	204	240	864	1308
Private non-boarding				
Glottal	15 – **11**	32 – **52**	643 – **81**	710 – **65**
Non-glottal	121 – 89	108 – 68	153 – 19	382 – 35
Total	136	160	796	1092

Comprehensive				
Glottal	40 – **16**	67 – **22**	1028 – **87**	1135 – **65**
Non-glottal	215 – 84	233 – 78	157 – 13	605 – 35
Total	255	300	1185	1740
Total				
Glottal	70 – **12**	167 – **24**	2064 – **73**	2301 – 5**6**
Non-glottal	525 – 88	533 – 76	781 – 27	1839 – 44
Total	595	700	2845	4140

Table 5.12 WF t-glottalling by Style and Type of school

In terms of the WF data (table 5.12), the rates of t-glottalling for the three schools are much higher overall than the rates found in the WM sample. The two schools with the middle and lowest social profile (private non-boarding and comprehensive) pattern together in the overall rates of t-glottalling (both displaying a 65% rate of glottal stops) and the school with the highest social profile (private boarding) stands on its own with half the rate of t-glottalling (35%) than the other two schools in word-final position.

In informal speech, we also find a similar patterning of schools. The private non-boarding school and the comprehensive school display very high rates of the glottal stop across word boundaries (81% and 87% respectively), whereas the private boarding school again stands on its own with half the rate of t-glottalling (45%) than the other two schools. As for the formal contexts (word list and sentences) in the WF dataset, we also observe a clear style-shift of the three schools like in WM position, with much lower rates of t-glottalling (between 10 and 20%) than in conversational speech.

However, the London private non-boarding school again seems to be ahead in the production of the glottal stop (like in the WM sample for conversational speech), but in this case, it is in formal speech (sentences) for the WF sample. The data suggest that the high rates of t-glottalling in informal speech for the London private non-boarding school (81%) are starting to affect the sentences reading task (52%) in word-final position much more

than in the case of the comprehensive school (87% informal speech and 22% sentences), which is located further away from London, in the county of Hampshire.

Thus, the London private non-boarding school may be leading the change in the production of t-glottalling in terms of style in two directions: in WM position in informal speech and in WF position in the sentences formal context. And, on the other hand, the private boarding school, the one with the highest social profile (also situated in Hampshire), seems to be the school in which speakers are quite considerably behind in the adoption of the glottal stop, for both WM and WF positions, and for both informal and formal speech styles. As for the comprehensive school in relation to style, it somehow falls in an in-between position between the private non-boarding and the private boarding schools, but mostly it patterns together with the London private non-boarding school in the production of t-glottalling, for both the WM and WF datasets and for both informal and formal settings. The influence of type of school as a factor group on t-glottalling in RP will be explored in greater detail in section 5.3.10.

5.3.2 Following phonological environment

After having analysed and discussed the effect of style on t-glottalling in RP, I now turn to present and discuss the results of the multivariate analyses for following phonological environment for the word-medial and word-final datasets. This factor group was selected as the third most significant (after style and type of school) for both the WM and WF samples, therefore being the linguistic structural factor group with the largest impact on the variability of t-glottalling in RP.

Table 5.13 displays the contribution of following phonological environment to the probability of word-medial t-glottalling in RP. The probabilities clearly display two phonological environments as favouring the glottal stop in the word-medial context for RP speakers: following consonant, with a probability of .97 and following syllabic /n/ with a

probability of .72. As for the disfavouring contexts, following vowels[17] visibly disfavour t-glottalling with low probabilities (front vowels .31 and central vowels .27) and following syllabic /l/ has emerged as the most disfavouring environment for RP informants in word-medial position, with a very low probability of .15. Figure 5.3 graphically displays the findings just mentioned for following phonological environment for word-medial t-glottalling in RP.

Contribution of following phonological environment to the probability of word-medial (WM) t-glottalling in RP			
Input 0.008 Log likelihood -159.000			
Chi-square/cell = 0.72			
Total N 1105			
FACTOR GROUP	Factor Weight	%	N
WM Following phonological environment			
WM following consonant (*Gatwick*)	.97	6.6	213
WM following syllabic /n/ (*button*)	.72	4.1	73
WM following front vowel (I)	.31	8.9	326
WM following central vowel (ə)	.27	2.3	298
WM following syllabic /l/ (*little*)	.15	9.2	195
Range	*82*		

Table 5.13 Contribution of following phonological environment to the probability of WM t-glottalling in RP

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[17] In the coding scheme for the factor group following phonological environment for the WM sample, I also included the factor *back vowels*. However, the data collected did not display any token for this factor.

Following phonological environment: probability of word-medial t-glottalling
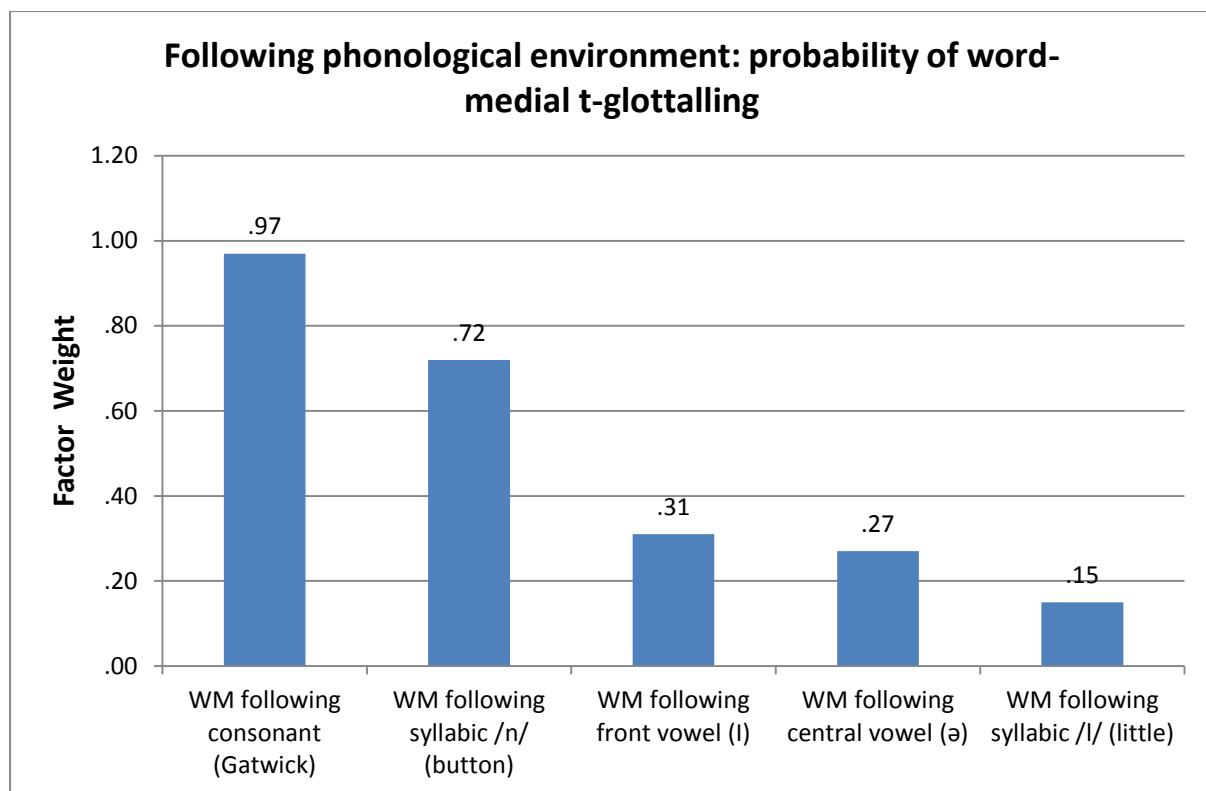
Figure 5.3 Following phonological environment: probability of word-medial t-glottalling

In the word-final multivariate analysis for following phonological environment (table 5.14 and figure 5.4), of all the nine environments analysed, four types of consonants favour the production of the glottal stop in word-final position for RP speakers: liquids (with the highest effect at .78), glides (.63), nasals (.60) and fricatives/affricates (.54). On the other hand, following vowels and stops (.42) disfavour the presence of the glottal stop in word-final context. The type of vowels that disfavour t-glottalling the most are central vowels (.37), followed by front vowels (.39) and back vowels (.44) which are very close to the .50 mark that indicates no effect. As for the pre-pausal environment, it has reached the .50 probability, which indicates no effect on the presence of the glottal stop in word-final position in RP.

Contribution of following phonological environment to the probability of word-final (WF) t-glottalling in RP			
Input 0.556			
Log likelihood -1892.532			
Chi-square/cell = 1.41			
Total N 4140			
FACTOR GROUP	Factor Weight	%	N
WF Following phonological environment			
WF pre-liquids (l, r)	.78	56.2	240
WF pre-glides (w, j)	.63	74.7	359
WF pre-nasals (m, n)	.60	65.3	225
WF pre-fricatives/affricates (f, v, ɵ, ð, s, z, ʃ, ʒ) (ts, dz, tʃ, dʒ)	.54	51.3	766
WF pre-pausal	.50	52.4	683
WF pre-back vowel (u:, ʊ, ɔ:, ɒ, a:)	.44	67.4	377
WF pre-stops (p, t, k, b, d, g)	.42	45.7	442
WF pre-front vowel (i:, I, e, æ)	.39	49.7	386
WF pre-central vowel (ʌ, ə, ɜ:)	.37	53.2	662
Range	*41*		

Table 5.14 Contribution of following phonological environment to the probability of WF t-glottalling in RP

Following phonological environment: probability of word-final t-glottalling

Factor Weight values by following phonological environment:
- WF pre-liquids (l, r): .78
- WF pre-glides (w, j): .63
- WF pre-nasals (m, n): .60
- WF pre-fricatives/affricates (f, v, θ,...): .54
- WF pre-pausal: .50
- WF pre-back vowel (uː, ʊ, ɔː, ɒ, aː): .44
- WF pre-stops (p, t, k, b, d, g): .42
- WF pre-front vowel (iː, ɪ, e, æ): .39
- WF pre-central vowel (ʌ, ə, ɜː): .37
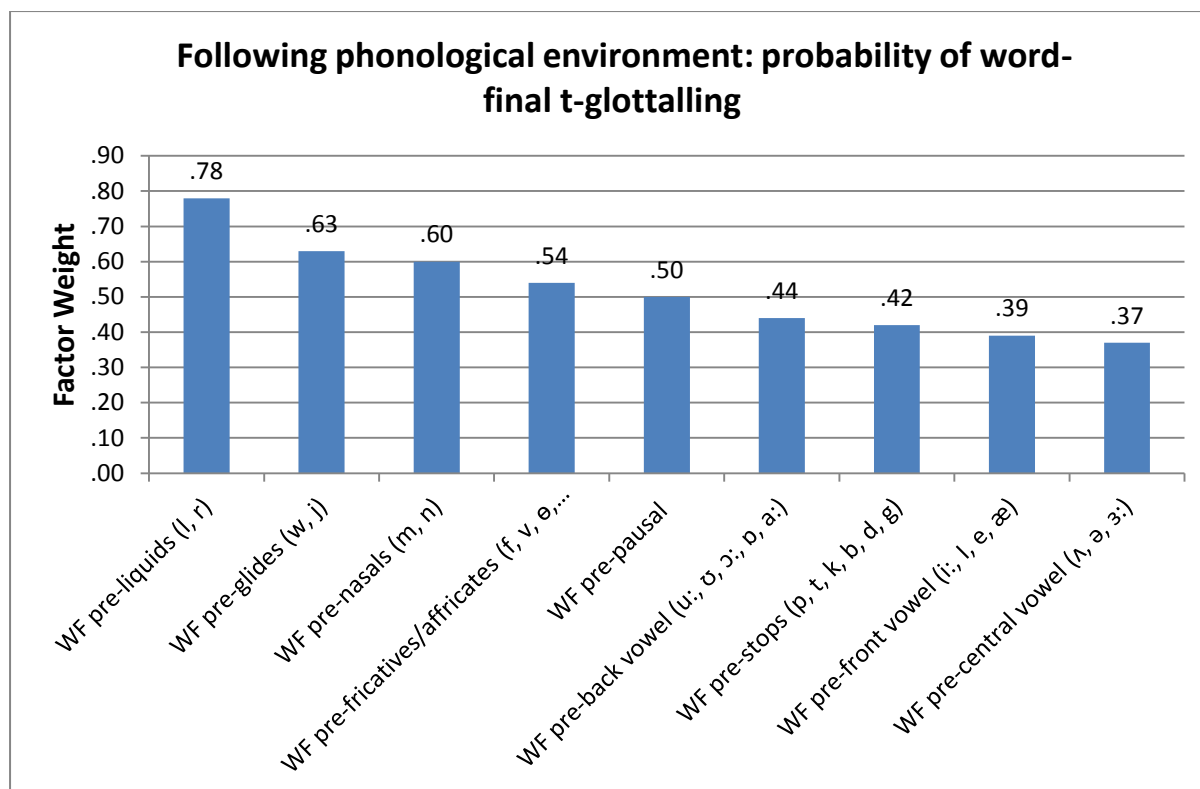
Figure 5.4 Following phonological environment: probability of word-final t-glottalling

After having described the results of the multivariate analyses for following phonological environment for the word-medial and word-final samples, I now turn to discuss these results in relation to the previous literature on t-glottalling in RP and other English accents. As we have seen, following phonological environment emerged as the third most significant factor group for both the WM and WF datasets (after style and type of school), therefore being the linguistic factor group with the biggest impact after style on the variability of t-glottalling in RP.

T-glottalling is very much constrained by the linguistic environment around it. However, the full potential of phonological constraints on the glottal stop has not been fully explored in the literature. The majority of studies on t-glottalling have mainly concentrated on the following phonological environment (neglecting the preceding environment), and the set of factors explored have been mainly restricted to three environments: word-final pre-consonantal, word-final pre-vocalic and word-final pre-pausal. Most studies show that t-

glottalling occurs more frequently in word-final position before a consonant, and much less before a pause and a vowel. Straw and Patrick (2007) call this tendency the "diffusion pattern", that is the ordering of diffusion of t-glottalling in different phonetic environments: PreC > PreP > PreV. The only previous study that has explored both preceding and phonological environments (with a wide range of linguistic factors) in relation to t-glottalling in British accents is Schleef's (2013) study of teenagers in Edinburgh and London. As for American accents, some recent studies have also looked at both preceding and following phonological contexts, including a variety of type of consonants and vowels (Roberts 2006, Eddington and Taylor 2009). Holmes (1995) for New Zealand English, and Fabricius (2000) for RP, also looked at different types of consonants, but only in word-final position for following phonological environment.

As for Fabricius' (2000) study on t-glottalling in RP, she found that word-final pre-consonantal t-glottalling has completed its spread as a linguistic change in RP, and it is now a common feature in the accent of younger generations of upper-middle class speakers, and thus it is in the process of losing stigma. However, this was not the case for the pre-vocalic and pre-pausal environments, where t-glottalling was still stigmatised in RP. She acknowledges 3 waves of t-glottalling in word-final position: the first one being the pre-consonantal category (which has completed its spread in RP), the second is the pre-pausal category and the third one and the newest one is the pre-vocalic category. The two last categories are still in the process of spreading in RP. As for her results for the interview analyses, she found the following phonological environment to be a highly significant factor in all the analyses she conducted. The glottal stop was most frequent when followed by a liquid/semivowel (83%), a fricative (68%), stops (72%), and it was least frequent when followed by a vowel (40%) and a pause (36%). Thus, the phonological constraint hierarchy for t-glottalling in word-final following environment is this:

liquid/semivowel (83%) > stops (72%) > fricative (68%) > vowel (40%) > pause (36%)[18]

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[18] Fabricius (2000) does not provide results in factor weights, as she does not use Varbrul but ANOVA. She gives her results with *p* values and percentages only.

In Schleef's (2013) research on t-glottalling in Edinburgh and London teenagers, he found the following linguistic constraint hierarchies in terms of phonological context. For following environment in word-final t-glottalling in Edinburgh:

nasal (.74) > liquid (.64) > fricative and affricate (.53) > plosive (.45) > glide (.41) > pause (.37) > vowel (.34)

For following environment in word-final t-glottalling in London:

nasal (.78) > fricative and affricate (.68) > liquid (.54) > plosive (.48) > glide (.46) > pause (.43) > vowel (.16)

And for following environment in word-medial t-glottalling in London (Edinburgh was not significant):

obstruent (.89) > nasal and liquid (.61) > vowel (.07)

As for the results for the RP informants in my research, the phonological hierarchies I have found are the following. For word-final following phonological environment:

liquids (.78) > glides (.63) > nasals (.60) > fricatives/affricate (.54) > pause (.50) > back vowel (.44) > stops (.42) > front vowel (.39) > central vowel (.37)

And for word-medial following phonological environment:

consonant (.97) > syllabic /n/ (.72) > front vowel (.31) > central vowel (.27) > syllabic /l/ (.15)

Regarding the word-final following phonological environment, we can see that liquids, glides, nasals and fricatives/affricates favour t-glottalling the most, whereas back vowels, stops, front vowels and central vowels disfavour the glottal stop. Thus, in line with previous research on t-glottalling, both in RP (Wells 1982, Wells 1997, Cruttenden 2001, Hughes, Trudgill and Watt 2005, Fabricius 2000, Altendorf 2003, Tollfree 1999) and other English accents (Straw and Patrick 2007, Schleef 2013), my data show that RP speakers favour the glottal stop in word-final pre-consonantal positions, but not in pre-vocalic positions. As for

the types of consonants in the word-final following phonological context, my hierarchy resembles those of Fabricius (2000) and Schleef (2013).

So, in relation to word-final pre-consonantal and word-final pre-vocalic contexts, we have observed that the findings of this research go in line with the previous studies on t-glottalling. However, there is one environment in the word-final data of this thesis which displays a different behaviour from previous research on RP: the pre-pausal context. The pre-pausal context in the word-final dataset has emerged as a neutral factor regarding the glottal stop, with a probability of .50. Fabricius (2000), in her thesis on t-glottalling in RP, found that word-final pre-consonantal t-glottalling was a completed linguistic change in this speech community. However, she argued that the pre-pausal and pre-vocalic environments were changes still in the process of spreading in RP. Fabricius (2000: 148) claimed that "the next few generations will prove crucial in determining whether t-glottalling continues to advance or stagnates. If t-glottalling in pre-vocalic and pre-pausal environments continues to spread from London and reaches the hypothesised 50% point at which acceptability can begin, the stage will be set for it to gain overt acceptability, and, if adopted by female speakers, to gain prestige." Therefore, RP informants in this thesis have accomplished this change of word-final pre-pausal context, with a neutral probability of .50 and a 52% rate.

This research has uncovered another change which may be moving to completion in RP for the word-final environment: the word-final pre-vocalic context displays a probability of .44 for following back vowels, while rates of occurrence before all vowels range from 45% to 67%. Even though it is still a disfavouring result for the glottal stop compared to other segments, it shows a development of increasing acceptability for glottal stops before vowels.

Thus, I suggest that t-glottalling in word-final position is experiencing language change in RP and it is advancing towards previously less favourable and "stigmatised" environments in this speech community: word-final pre-pausal and word-final pre-vocalic. In the cross-

tabulations of following phonological environment with style (section 5.3.2.1), gender (section 5.3.2.2), age (section 5.3.2.3) and school (section 5.3.2.4), I explore in more detail which speakers are leading these changes in RP and if these changes are more common in informal or formal speech.

Concerning the word-medial following phonological environment, the contexts that favour t-glottalling the most in my research are following consonant (.97) and following syllabic /n/ (.72), and those that clearly disfavour it are following front vowel (.31), following central vowel (.27) and following syllabic /l/ (.15). In word-medial position, it is not possible to compare my results with those of Fabricius (2000), as she only examined t-glottalling in word-final contexts. Altendorf (2003), however, looked at both word-medial and word-final environments, but her data on t-glottalling are rather small and she only looked at female teenagers in her study. In any case, for her upper-middle class RP speakers, she reported that as for the glottal stop in the most stigmatised positions (word-medial pre-lateral and intervocalic), it did not occur at all. Thus, in her results for word-medial t-glottalling, she finds that before a consonant, the production of the glottal stop falls within the scope of RP, whereas in intervocalic and pre-syllabic /l/ positions, the glottal stop is still stigmatised and not considered part of the RP accent.

My own data for RP speakers corroborate Altendorf's (2003) and Tollfree's (1999) studies, in the production of the glottal stop word-medially before a consonant (Altendorf 2003 does not report on WM before a syllabic /n/), where it is very common in RP to use t-glottalling. In relation to the WM environment before a consonant, in my dataset we can distinguish three different types of tokens: those which contain a /t/ followed by a liquid (such as *mattress*), those followed by a glide (such as *Gatwick*) and those followed by a nasal (such as *witness*). In the case of tokens with /t/ followed by /r/, they are less likely to be glottalled than tokens with /t/ followed by /w/ and /n/.

In my WM dataset, *mattress* tokens account for 35 tokens (out of 213 tokens for the WM following consonant factor) and all the 35 tokens are indeed not glottalled, but pronounced with a full alveolar [t]. On the other hand, *Gatwick* and *witness* tokens are mostly pronounced with a pre-glottal stop [ʔt] (Gatwick tokens account for 70 out of 213, with 60 tokens pre-glottalled, 8 tokens glottalled and 2 tokens with alveolar [t]; and *witness* tokens also account for 70 out of 213, with 66 tokens pre-glottalled, 2 tokens glottalled and 2 tokens with alveolar [t]).

These *mattress, Gatwick and witness* tokens in the WM dataset occur mainly in formal speech, and in informal speech, other tokens such as *netball* and *fitness* appear, which are pronounced with t-glottalling for *netball and with* pre-glottalling for *fitness*. We must note, however, that /t/ tokens in WM position mostly belong to low frequency categories, whereas tokens in WF position are mainly high in frequency. This fact will be further explored in section 5.3.7.2 in the cross-tabulation of lexical frequency and following phonological environment and in section 5.3.7, which presents and discusses the results of lexical frequency for t-glottalling in WM and WF contexts in RP.

This lexical frequency effect of the distribution of certain tokens in certain phonological factors can also be observed in the WM following syllabic /n/ factor, in which 70 tokens out of a total of 73 tokens belong to the word *button*, which is included in the word and sentences lists, and only three tokens (*written*) are found in informal speech.

Furthermore, my data agree with that of Altendorf (2003) and Tollfree (1999) in word-medial intervocalic and word-medial before a syllabic /l/, where my RP informants clearly disfavour the glottal stop. These findings are also in line with the previous linguistic descriptions provided by various linguists of RP (Wells 1982, Wells 1997, Cruttenden 2001, Hughes, Trudgill and Watt 2005), in which they claim that word-internally RP speakers favour t-glottalling before a consonant, but not intervocalically and before a syllabic /l/.

These descriptions of RP claim that glottals in these two environments are "stigmatised" in RP and, therefore, they are regarded as a feature of lower-class accents.

Thus, the glottal stop in word-medial position for RP informants in this research seems to remain in the same favouring and disfavouring categories and no change is visible. As a result, RP speakers persist in being conservative in their pronunciations of t-glottalling word-internally. On the other hand, as we have previously seen, RP informants display more advanced pronunciations than previously reported in word-final position, where change may be in progress in the pre-pausal and pre-vocalic contexts. The literature on t-glottalling in RP argues that the glottal stop is more "stigmatised" in certain phonological contexts word-medially and word-finally. I believe this argument has often been used too loosely and based on subjective evaluations, rather than on quantifiable objective facts. In section 5.3.7.2, in the cross-tabulation of lexical frequency and following phonological environment, I argue that word frequency effects may play a role in the glottal stop being more common and widespread in word-final rather than word-medial contexts in RP. Furthermore, lexical frequency may also be helpful in explaining the changes that RP informants are experiencing in their pronunciations of word-final pre-pausal and word-final pre-vocalic contexts.

So far, in the discussion of the results for the factor group following phonological environment for the RP informants in this research, we have observed various hierarchies in terms of types of consonants and vowels that constrain the glottal stop. If we turn to phonological theory, we may find an explanation for those hierarchies (Goldsmith 1990, Laver 1994). The sonority hierarchy refers to the ordering of speech sounds from highest amplitude to lowest amplitude. Vowels are the most sonorous, whereas voiceless plosive consonants are the least sonorous. The sonority hierarchy that Goldsmith (1990) and Laver (1994) suggest is the following: *(most sonorous) vowel > glide > liquid > nasal > fricative > affricate > stop/plosive (least sonorous).* In terms of vowels, which are the most sonorous in the sonority scale, there is also a scale within (Laver 1994): *(most sonorous) low open vowels > mid vowels > high close vowels (least sonorous).* As for flaps, they fall in-between glides

and liquids, and regarding the glottal stop, it is located at the least sonorous place on the sonority scale.

The sonority hierarchy has been used to explain distributions of segments in syllables (Goldsmith 1990, Laver 1994). So, the sonority scale is important for syllable structure. Syllables are considered to be hierarchical sound structures. There is a nucleus, which is obligatory, and there is an onset (before the nucleus) and a coda (after the nucleus), which are both optional. The nucleus and coda form a sub-unit within the syllable called the rhyme. The most common type of syllable is CV, that is an onset-nucleus syllable where the onset consists of one consonant and the nucleus consists of one vowel. The nucleus of a syllable is commonly a vowel, which is the most sonorous element. The sonority of the surrounding consonants must decrease to the left (onset) and to the right (coda) starting from the vowel. In other words: the more sonorous a segment, the closer to the nucleus of the syllable. This is called the *Sonority Sequencing Principle*, which is a phonotactic principle that aims to outline the structure of a syllable in terms of sonority (Goldsmith 1990, Laver 1994).

Besides the *Sonority Sequencing Principle*, two other theories use the notion of sonority in order to explain the properties of syllables (Goldsmith 2011). The first one is the *Minimum Sonority Difference (or dissimilarity)* by Steriade (1982), which proposes that "once an appropriate numerical sonority hierarchy has been established, a language may impose the restriction that adjacent segments must be a minimum sonority distance from each other" (Steriade 1982, in Goldsmith 2011: 177). The second theory is the *Dispersion Principle* by Clements (1990), which argues that "a language will preferentially maximize sonority difference in the syllable onset, but minimize it in the coda" (Clements 1990, in Goldsmith 2011: 177).

Thus, in relation to the *Sonority Sequencing Principle* (Goldsmith 1990, Laver 1994), the findings in terms of WF following consonant phonological context for t-glottalling in RP

informants for this research could be generalised as follows: the more sonorous the following segment, the more it promotes the glottal stop. So, the hierarchy observed in this research for WF following consonant environment (which also correlates to previous studies) respects the sonority hierarchy: the more sonorous, the more favouring t-glottalling. However, in the WM following consonant environment the sonority hierarchy may not be a so clear explanation, as in examples such as *Scotland* and *mattress* a following /l/ and a following /r/ are highly likely to induce a glottal stop, but this process is related to syllabification and not the sonority hierarchy (in *Scotland*, the /t/ can't resyllabify forward with /l/)[19].

If the sonority hierarchy was followed completely, vowels should have been ranked at the top, as the most favouring environment, and not at the bottom, as the least favouring context, in both WF pre-vocalic and WM intervocalic environments. One explanation could be that word-final pre-vocalic and word-medial intervocalic are environments in which the glottal stop has long been "stigmatised" and considered mainly dialectal or related to working-class accents. Therefore, this common and powerful sociolinguistic knowledge, which is shared within the RP speech community, together with normative pressures, have supressed the phonetics and it has prevented speakers from using pre-vocalic t-glottalling. This is also true of the RP informants in my research, where in word-medial intervocalic position the glottal stop is not favoured, as well as in word-final pre-vocalic position, where t-glottalling is also disfavoured.

Besides the normative pressures for reducing t-glottalling in WF pre-vocalic and WM intervocalic environments, Clements and Hume's (1995) and Hume's (1992, 1996) theory that considers front vowels to be coronal could explain the low rates of t-glottalling next to front vowels, which would act as an inhibitor for the glottal stop. Clements and Hume (1995) argue that front vowels and coronal consonants are members of the natural class of coronal sounds. For instance, in many languages, velar and labial consonants become

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[19] Resyllabification is a phonological process in which consonants are attached to syllables other than those from which they originally came. (Goldsmith 2011)

coronal before front vowels, and in a similar manner, vowels are fronted next to coronal consonants in various languages, such as Maltese Arabic (Clements and Hume 1995). They claim that "phonological rules offer considerable evidence for the natural classes of labial, coronal and dorsal consonants and vocoids. This result supports a unified account of place in consonants and vocoids, in which [labial], [coronal] and [dorsal] do double duty for consonants and vocoids, allowing the standard features [back] and [round] to be eliminated" (Clements and Hume 1995: 27).

However, as we have previously seen, in the word-final pre-vocalic environment pre-back vowels, even though they also disfavour the glottal stop, they show a probability rate very close to the .50 threshold, with a result of .44. If we look back at the sonority hierarchy, back (low open) vowels are the most sonorous within the vowel sonority scale, and therefore prime candidates for being the first type of vowel which sooner (rather than later) will promote t-glottalling within RP speakers. Indeed, I confidently predict that within a few years vowels, powered by the natural effects of the sonority hierarchy, will rise up the ranks and strongly favour glottal stops in RP speech, as the artificial social constraints currently disfavouring them are removed.

5.3.2.1 Following phonological environment and Style

I now turn to analyse the effect of style on the rate of t-glottalling in relation to the different following phonological environments in the word-final and word-medial samples. As we have seen in the previous section 5.3.2, following phonological environment emerged as the third most significant factor group for the presence of t-glottalling in RP (after style and type of school), for both the word-final and word-medial datasets, therefore having the strongest influence on the variability of the glottal stop in this speech community of any structural feature.

In section 5.3.2, when discussing the results obtained from the multivariate analysis for the factor group following phonological environment for the word-final and word-medial samples, I concluded that RP speakers in this study remain conservative in their pronunciations of t-glottalling word-internally, whereas in word-final contexts, RP informants display more advanced pronunciations and change seems to be in progress in the pre-pausal and pre-vocalic (back vowels) environments. This present cross-tabulation of following phonological environment and style examines the distribution of the word-final progressive patterns and the word-medial conservative patterns in the different speech styles.

Figure 5.5 displays the cross-tabulation of the data for the word-final following phonological environment by style in the pre-pausal and pre-vocalic (back vowels) contexts. Of the nine following phonological environments analysed in the word-final sample, in the cross-tabulations with style and other social factor groups (gender, age and type of school), I focus on the behaviour of t-glottalling in the pre-pausal and pre-vocalic (back vowels) contexts, where change may be occurring in RP. The other seven phonological environments (WF pre-liquids, WF pre-glides, WF pre-nasals, WF pre-fricatives/affricates, WF pre-stops, WF pre-front vowels and WF pre-central vowels) displayed expected patterns of style-shift in the present cross-tabulation with style: very high percentages (60-90%) of t-glottalling in informal speech, medium-low percentages (15-50%) in the sentences reading task and low percentages (5-20%) in the word list reading task.
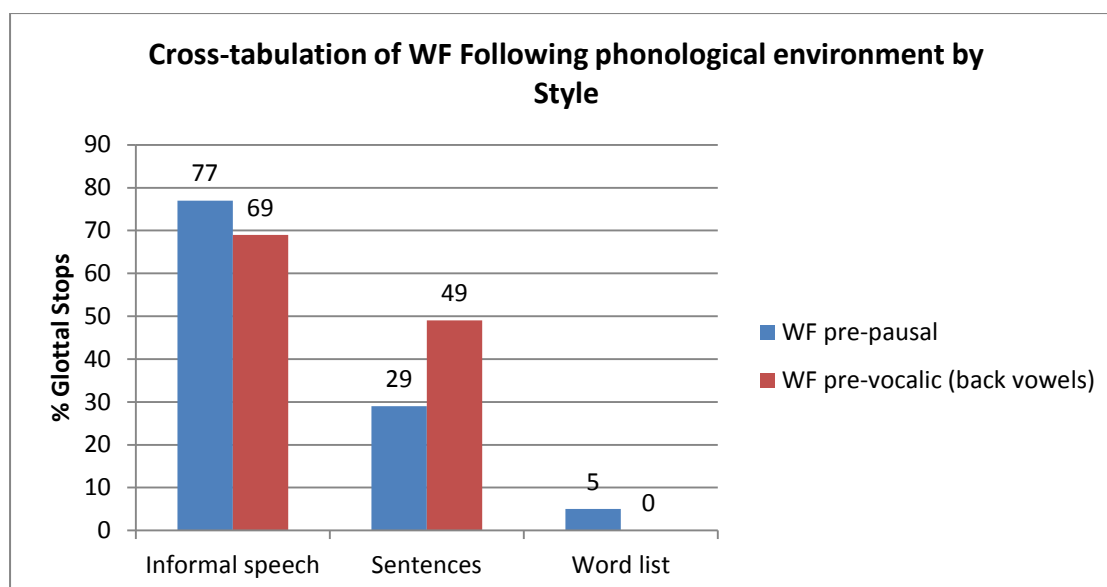
Figure 5.5 WF t-glottalling by Following phonological environment and Style[20]

The RP informants also style-shift in the WF pre-pausal and WF pre-vocalic (back vowels, such as *that I, but also, but I, at all, not I*) contexts and they display very high rates of t-glottalling in informal speech (above 70%) and very low rates (0-5%) in the word list reading task. However, in the sentences reading task, both environments show relatively high rates of glottal stops for the formality of the context (between 30 and 50% rates). As for the WF pre-pausal context, it shows a higher rate (77%) than the WF pre-vocalic (back vowels) context in interview speech, which has a rate of 69%. However, in the sentences reading task, the WF pre-vocalic (back vowels) context displays a higher percentage (49%) than the WF pre-pausal environment (29%). Finally, it is worth highlighting that both the WF pre-pausal and WF pre-vocalic (back vowels) contexts show extremely low rates of t-glottalling in the most formal register (word list), with a 5% and 0% rate respectively.

Thus, from the cross-tabulation of WF following phonological environment and style, we can observe how the change of t-glottalling in the WF pre-pausal and WF pre-vocalic (back vowels) contexts in RP seems to be driven mainly by interview speech, followed by the sentences formal setting. From the rates of the sentences reading task, we may conclude

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[20] See Appendix 7 for the corresponding tables of the cross-tabulations, with percentages and token numbers.

that the change in these two phonological environments is also starting to affect significantly this formal context.

Cross-tabulation of WM Following phonological environment by Style

	WM following consonant (Gatwick)	WM following syllabic /n/ (button)	WM following front vowel (I)	WM following central vowel (ə)	WM following syllabic /l/ (little)
Informal speech	100	0	15	13	33
Sentences	11	9	0	0	0
Word list	2	0	1	0	0
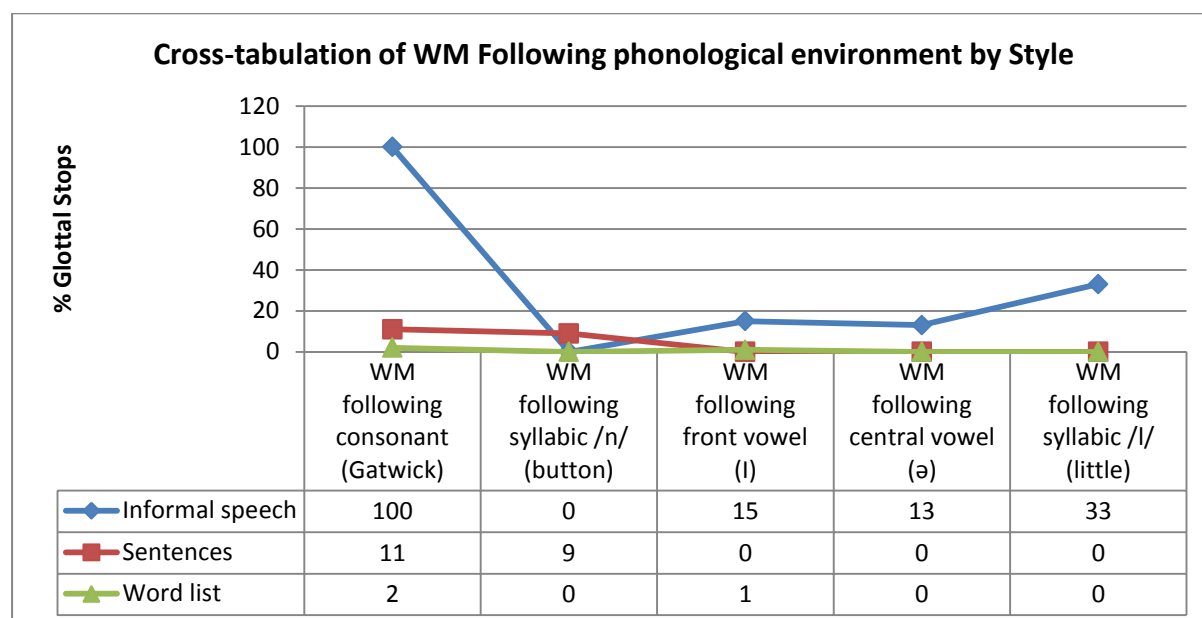
Figure 5.6 WM t-glottalling by Following phonological environment and Style

In the cross-tabulation of following phonological environment with style in the word-medial sample (figure 5.6), we can observe a much more severe style-shift than in the word-final sample, with very low percentages of t-glottalling overall, almost no word-medial tokens glottalised in the sentences and word list reading tasks and with most glottalisation happening in the informal speech. In terms of informal speech, we can see how RP informants display a consolidated pronunciation (100%) of the glottal stop word-internally when followed by a consonant or glide (such as *Gatwick*), whereas when followed by a front vowel (such as *beautiful, meeting, getting*), a central vowel (such as *butter, better, water*) and a syllabic /l/ (such as *little, bottle)*, the percentages are much lower (between 15 and 30%). In the formal settings (sentences and word list), no glottalised tokens appear at all for the following vowel (front and central) and following syllabic /l/ environments. In terms of syllabic /n/ (such as *button*), glottalised tokens are only displayed in the sentences reading task, with a 9% rate.

Thus, as previously argued in section 5.3.2, RP informants in this research remain conservative in their pronunciations of t-glottalling word-internally and no change is visible. Indeed, in the cross-tabulation of WM following phonological environment with style, we can observe these conservative patterns for the syllabic /n/, syllabic /l/ and vowels (front and central) contexts, for both informal and formal settings. However, for the following consonant environment, it is very common for RP speakers to use t-glottalling, but mainly in informal speech. These results[21] are in line with Altendorf's (2003) study, where in her results for word-medial t-glottalling, she finds that before a consonant, the production of the glottal stop falls within the scope of RP, whereas in intervocalic and pre-syllabic /l/ positions, the glottal stop is still stigmatised and not considered part of the RP accent.

5.3.2.2 Following phonological environment and Gender

In the cross-tabulation of following phonological environment and gender for the word-final dataset (figure 5.7), males show higher t-glottalling in the WF pre-pausal context, with a rate of 56%, against females, who display a percentage of 48%. In the WF pre-vocalic (back vowels) context, there is no gender gap. The other seven environments (WF pre-liquids, WF pre-glides, WF pre-nasals, WF pre-fricatives/affricates, WF pre-stops, WF pre-front vowels and WF pre-central vowels) did not display notable gender patterns in terms of style for t-glottalling.

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[21] Remember that Fabricius' (2000) study of RP did not analyse tokens in word-medial position.

Cross-tabulation of WF Following phonological environment by Gender
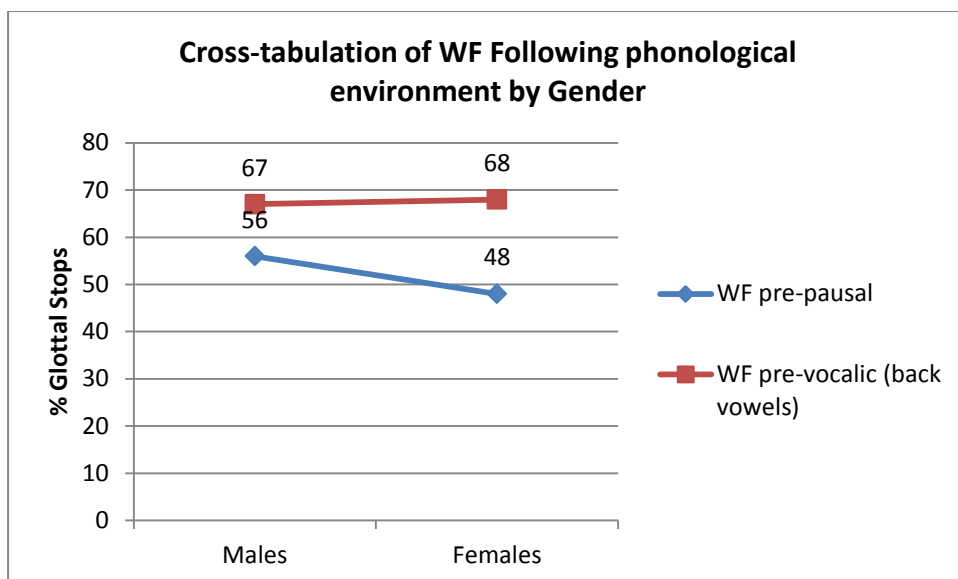
Figure 5.7 WF t-glottalling by Following phonological environment and Gender

In the word-medial sample (figure 5.8), males lead in the pronunciation of the glottal stop in all the following phonological environments (syllabic /n/, syllabic /l/, front vowel and central vowel), except in the following consonant context, where females seem to take the lead. However, the differences in percentages are not very large.

It is not surprising that females are marginally ahead in the production of t-glottalling in the word-medial following consonant context, as this environment has long been considered by the literature of RP (Wells 1982, Wells 1997, Cruttenden 2001, Hughes, Trudgill and Watt 2005, Tollfree 1999, Altendorf 2003) as a favouring environment (and "non-stigmatised"); whereas, all the other word-medial following environments (syllabic /n/, syllabic /l/, front vowel and central vowel), which have been viewed as "stigmatised" contexts by the literature of RP, show that males are ahead in the production of the glottal stop. Females display two interesting very low rates of t-glottalling in two of these "stigmatised" phonological environments: following syllabic /n/, with a 0% rate, and following central vowel, with a 1% rate.

Thus, overall, in terms of following phonological environment and gender, males are ahead in their pronunciations of t-glottalling compared to females, even though this difference is not very large.
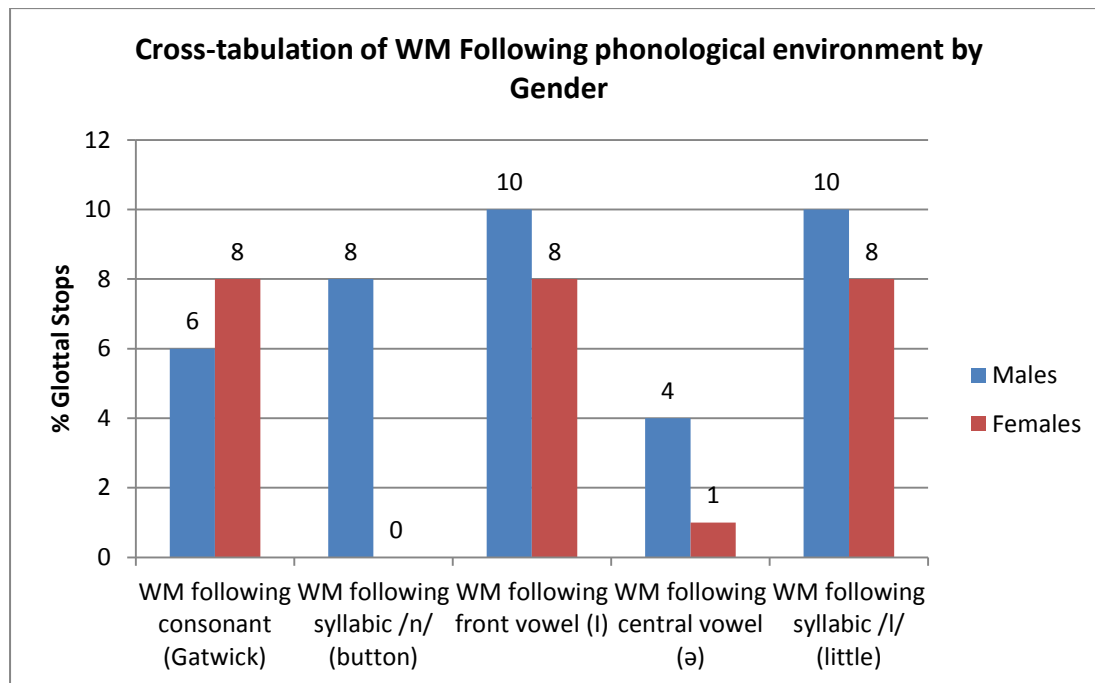
Figure 5.8 WM t-glottalling by Following phonological environment and Gender

5.3.2.3 Following phonological environment and Age

In this section, I discuss the cross-tabulation of following phonological environment in relation to age for t-glottalling. Let us recall that age did not emerge as a significant factor group in the multivariate analysis for the word-medial dataset. Therefore, in this cross-tabulation, I only focus on the results for the word-final sample.

In figure 5.9, we see how there is a clear difference for the production of the glottal stop in terms of age for both the word-final pre-pausal and word-final pre-vocalic (back vowels) environments. Teenagers are visibly ahead in the percentages for both these contexts which may be showing change. As for the other seven following phonological environments (WF pre-liquids, WF pre-glides, WF pre-nasals, WF pre-fricatives/affricates, WF pre-stops, WF

pre-front vowels and WF pre-central vowels), they also displayed a notable difference in terms of age for t-glottalling, with teenagers being ahead overall than adults, with average difference rates of between 10-20%.

Cross-tabulation of WF Following phonological environment by Age
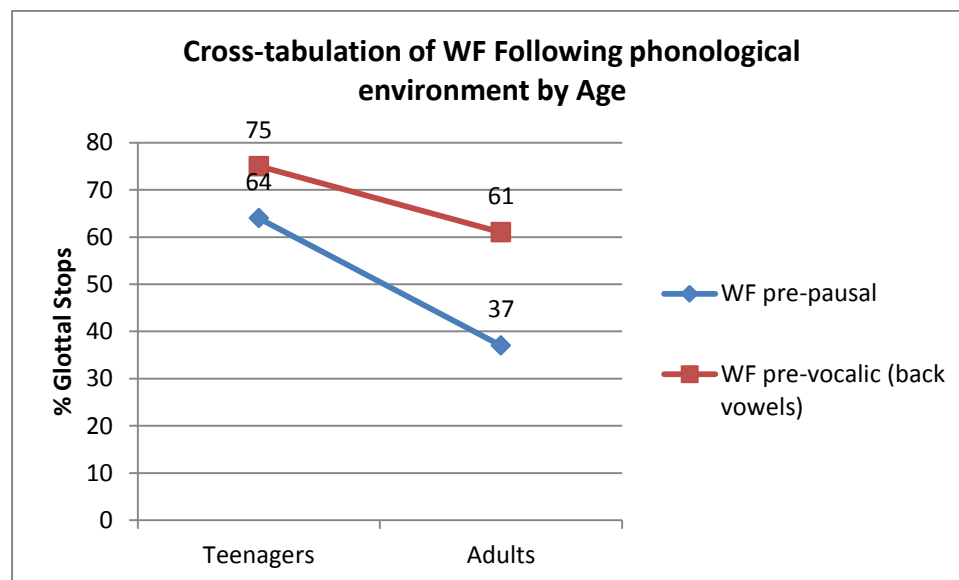
Figure 5.9 WF t-glottalling by Following phonological environment and Age

Thus, the cross-tabulation of WF following phonological environment and age suggests that change of t-glottalling in the WF pre-pausal and WF pre-vocalic (back vowels) contexts is driven mainly by the youngest generation of RP speakers analysed in this research: the teenage informants. Foulkes and Docherty (2007) state how the adolescent peer group is key in the transmission of vernacular forms. They claim that "adolescence is a time at which conformity to the peer group norms becomes especially important. The vernacular takes on a special role: its use becomes symbolic of the construction of identity, a means by which adolescents can align themselves with some speaker groups and differentiate themselves from others" (Foulkes and Docherty 2007: 57). Therefore, according to the data found in this research, teenagers are also a crucial group in RP for the transmission and diffusion of the glottal stop. In section 5.3.9, I explore in more detail the effects of age in the variability of t-glottalling in RP.

5.3.2.4 Following phonological environment and Type of school

Cross-tabulation of WF Following phonological environment by Type of school

	Comprehensive	Private non-boarding	Private boarding
WF pre-pausal	55	69	34
WF pre-vocalic (back vowels)	80	69	44
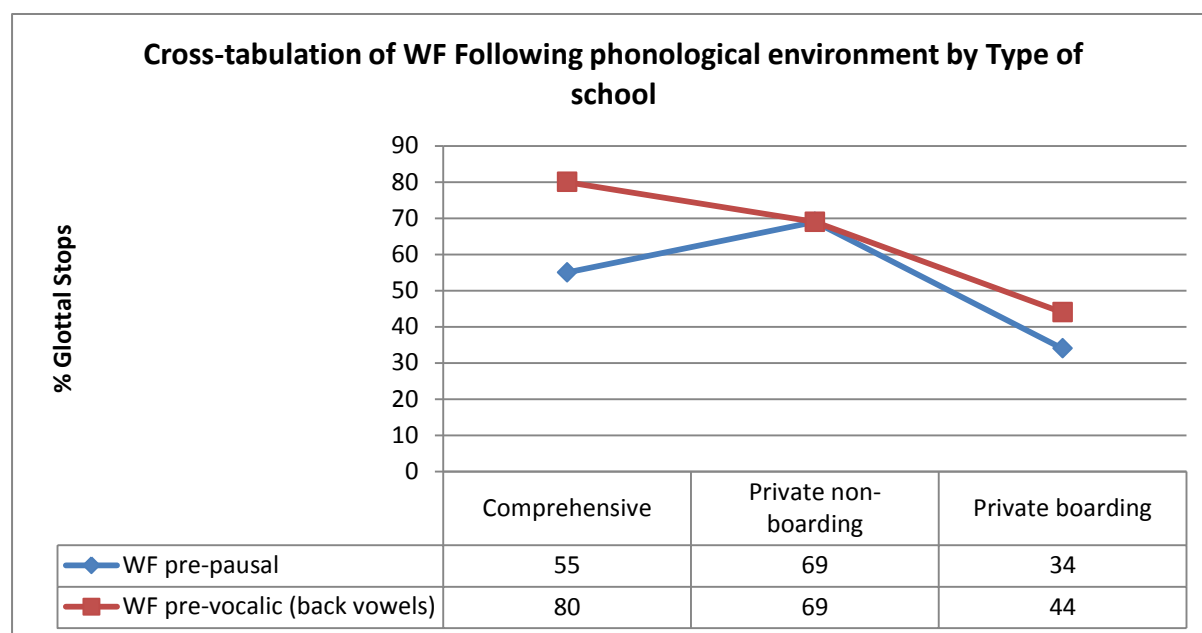
Figure 5.10 WF t-glottalling by Following phonological environment and Type of school

In this section, I discuss the cross-tabulation of following phonological environment in relation to type of school for t-glottalling. As for the word-final dataset (figure 5.10), we can observe how in the WF pre-vocalic (back vowels) environment[22], it is the comprehensive school who is leading the change, with the highest rate of glottal stops (80%), whereas the private boarding school falls at the other end of the spectrum, with the lowest rate of t-glottalling (44%). As for the private non-boarding school, it falls in an in-between position, with a rate of 69% for t-glottalling in the WF pre-vocalic (back vowels) context.

Regarding the WF pre-pausal phonological environment[23], it is the private non-boarding school who is leading the change, with a 69% rate of t-glottalling. Concerning the private boarding school, again, it falls at the lowest end of the scale, with a 34% rate of glottal

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[22] Remember that the WF pre-vocalic (back vowels) environment had a probability of .44 and I claimed that it was a change in progress for t-glottalling in RP which was fast approaching the .50 threshold.

[23] Recall that the WF pre-pausal environment displayed a probability of .50 and we argued that it was a change in progress for t-glottalling in RP.

stops. And it is this time the comprehensive school which falls in an in-between position, with a rate of 55% of t-glottalling in the WF pre-pausal context.

Thus, in the WF pre-vocalic (back vowels) environment (such as *that I, but also, but I, at all, not I*), we observe that the higher the social profile of the school (private boarding), the lower the rate of t-glottalling, and the lower the social profile of the school (comprehensive), the higher the rate of glottal stops. And the school with the in-between social profile (private non-boarding) also displays an in-between rate of t-glottalling. With respect to the WF pre-pausal context, we see a similar tendency, but this time the school with the in-between social profile (private non-boarding) displays the highest rate of t-glottalling and not the school with the lowest social profile (comprehensive school). As for the school with the highest social profile (private boarding), remains in the same lowest category for the production of the glottal stop in the WF pre-pausal environment.

As for the other seven following phonological environments (WF pre-liquids, WF pre-glides, WF pre-nasals, WF pre-fricatives/affricates, WF pre-stops, WF pre-front vowels and WF pre-central vowels), they also displayed a notable difference in terms of type of school for t-glottalling, with the comprehensive school and the private non-boarding school patterning mostly together (or with the comprehensive or the private non-boarding being ahead) and the private boarding school always falling behind in the production of the glottal stop. We can observe these tendencies in table 5.15.

	Comprehensive	Private non-boarding	Private boarding	Probabilities (all schools combined)
WF pre-liquids	62%	64%	44%	.78 (favouring)
WF pre-glides	86%	83%	57%	.63 (favouring)
WF pre-nasals	73%	65%	52%	.60 (favouring)
WF pre-fricatives/affricates	58%	59%	37%	.54 (favouring)
WF pre-stops	58%	50%	24%	.42 (disfavouring)
WF pre-front vowels	63%	60%	25%	.39 (disfavouring)
WF pre-central vowels	67%	70%	19%	.37 (disfavouring)

Table 5.15 Cross-tabulation of WF Following phonological environment and Type of school

It is interesting to note the behaviour of the three schools in terms of t-glottalling in the word-final pre-vocalic (front and central vowels) environment[24], which emerged in the multivariate analysis as the two most disfavouring environments for t-glottalling in RP. As we saw in section 5.3.2, this finding confirms previous research on RP (Wells 1982, Wells 1997, Cruttenden 2001, Hughes, Trudgill and Watt 2005, Fabricius 2000, Tollfree 1999, Altendorf 2003), which argues that RP speakers disfavour the glottal stop in word-final pre-vocalic environments. However, in this cross-tabulation (table 5.15), we observe an even more fine grained distinction within RP speakers, in terms of type of school (and its social profile) and the WF following pre-vocalic phonological environment: the school with the highest social profile (private boarding) is the one resisting glottal use, with much lower percentages of t-glottalling (25% WF pre-front vowels, 19% WF pre-central vowels) than the other two schools (comprehensive and private non-boarding), which display percentages between 60 and 70%. Therefore, the present research has uncovered that speakers with the highest social profile (those belonging to the private boarding school) are the ones who are holding back the progression of the glottal stop within the RP speech community in the WF

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[24] Examples of WF pre-vocalic front vowels tokens include: *quite easy, at it, out in, but it*.
  Examples of WF pre-vocalic central vowels tokens include: *eat a lot, a lot and, that a, get up, got a*.

pre-vocalic (front and central vowels) environment; an environment which has traditionally been considered as "stigmatised" by the literature of RP.

Regarding the two phonological environments in word-final position which I argued in section 5.3.2 that are undergoing changes in RP in terms of t-glottalling (WF pre-pausal and WF pre-vocalic -back vowels-), this cross-tabulation has shown how in the WF pre-pausal environment, it is the private non-boarding school who is leading the change, with a 69% rate of glottal stops, and regarding the WF pre-vocalic (back vowels) environment, it is the comprehensive school who is leading the change, with an 80% rate of t-glottalling. Thus, in the present cross-tabulation we have discovered that speakers with the lowest social profile (those belonging to the comprehensive school) are the ones who are driving the progression of the glottal stop within the RP speech community in the WF pre-vocalic (back vowels) environment; an environment which has traditionally been considered as "stigmatised" by the literature of RP. And we have also seen how the school with the in-between social profile (private non-boarding school) is also leading the advancement of t-glottalling within the RP speech community in the WF pre-pausal context; a context that has often been treated as non-favourable by the literature of RP.

Hence, in the cross-tabulation of word-final following phonological environment and type of school, we have revealed how school is a crucial social factor group[25] in explaining the progression of the glottal stop in RP in the change in the WF pre-pausal context and the change in the WF pre-vocalic (back vowels) environment, but also type of school is key in illustrating how t-glottalling is holding back and resisting advancement in the WF pre-vocalic (front and central vowels) context. In section 5.3.10, I analyse type of school further as a social factor group and consider its influence on the variability of t-glottalling in RP.

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[25] Recall that in table 5.3 (section 5.3) we saw how *Type of school* emerged as the second most significant factor group (and the most significant social factor group) in the multivariate analyses for the WM and WF datasets.

Now we turn to describe and discuss the cross-tabulation of following phonological environment and type of school for the word-medial sample. In figure 5.11, we can observe that percentages for t-glottalling in the word-medial environment do not go higher than 21%, whereas in the word-final context percentages were much higher and the highest reached an 86% rate[26]. Moreover, we can observe that the three different types of schools display different behaviours in terms of t-glottalling according to which following phonological environment we are looking at. Out of the five following phonological contexts analysed in the word-medial sample, in two of them (WM following consonant and WM following syllabic /n/) the three schools have a similar behaviour in terms of t-glottalling, with very similar percentages. However, in the other three WM following phonological environments (WM following front vowel, WM following central vowel and WM following syllabic /l/), each school displays a different behaviour and we observe a very interesting trend in terms of production of the glottal stop according to the type of school: the private non-boarding school has the highest percentages, the comprehensive school falls in-between and the private boarding school shows the lowest percentages of t-glottalling.

Cross-tabulation of WM Following phonological environment by Type of school

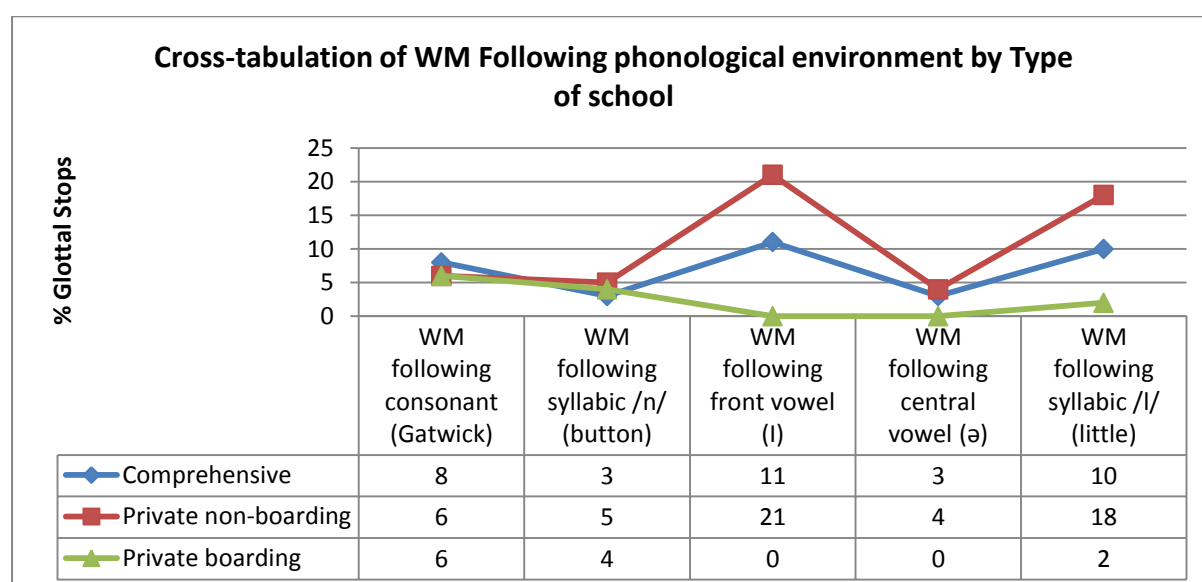|	WM following consonant (Gatwick)	WM following syllabic /n/ (button)	WM following front vowel (I)	WM following central vowel (ə)	WM following syllabic /l/ (little)
Comprehensive	8	3	11	3	10
Private non-boarding	6	5	21	4	18
Private boarding	6	4	0	0	2

Figure 5.11 WM t-glottalling by Following phonological environment and Type of school

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[26] Remember that in section 5.3 (tables 5.1 and 5.2) we observed how for the WM dataset RP speakers glottalised only a 6.4% (71 tokens out of a total of 1105 tokens), whereas in the WF sample, they glottalised much more, with a 55.6% rate (2303 tokens out of a total of 4143 tokens).

The two phonological environments (WM following consonant and WM following syllabic /n/), in which the three schools display similar patterns of t-glottalling, have usually been considered by the literature of RP as favourable environments for the glottal stop in this accent. However, the other three phonological environments (WM following front vowel, WM following central vowel and WM following syllabic /l/), in which the three schools have different patterns, are often referred as non-favourable environments in RP[27].

My data then agree with these trends of the glottal stop in word-medial contexts. However, when we look closely at the three types of schools, we see how in the non-favourable environments for t-glottalling word-medially in RP there is a considerable amount of social variation displayed, together with geographical variation. The school with the highest social profile (private boarding), which is located in Hampshire, shows the least amount of t-glottalling, with a 0% rate for WM following front and central vowels and 2% for WM following syllabic /l/. As for the school with the lowest social profile (comprehensive), also placed in Hampshire, shows higher percentages than the private boarding school in these three environments (11% WM following front vowel, 3% WM following central vowel and 10% WM following syllabic /l/), but much less than the private non-boarding school, located in South-West London, which shows the highest percentages of t-glottalling (21% WM following front vowel, 4% WM following central vowel and 18% WM following syllabic /l/).

So, even if RP speakers remain conservative and change is not visible in word-medial contexts (as argued in section 5.3.2), within the young RP speech community, we can observe how the private non-boarding school, which is located in London, is much ahead in the production of t-glottalling in the WM following front vowel/central vowel and WM following syllabic /l/ phonological environments. These two contexts have often been considered as non-favourable and "stigmatised" in the literature on RP (Wells 1982, Wells 1997, Cruttenden 2001, Trudgill 2005, Altendorf 2003, Tollfree 1999). However Cruttenden (2001) argues that it is acceptable for London Regional RP speakers to use the glottal stop in

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[27] Examples of WM tokens: following consonant (*Gatwick*), following syllabic /n/ (*button*), following front vowel (*beautiful, meeting, getting*), following central vowel (*butter, better, water*) and following syllabic /l/ (*little, bottle*).

WM syllabic /l/ contexts. Therefore, my results confirm Cruttenden's observations, in which the RP speakers from the London private non-boarding school are more advanced in word-medial pronunciations of t-glottalling in environments that are less favourable for RP speakers elsewhere. Furthermore, Cruttenden (2001) claims that as for the use of the glottal stop word-medially intervocalically (as in *water*) it still remains highly stigmatised as non-RP and it is regarded as a feature of lower-class accents. Indeed, the three schools overall disfavour t-glottalling in WM intervocalic position, but there is a difference in terms of the social profiles of these schools: the school with the highest social profile (private boarding) displays no glottalised tokens at all (with a 0% rate), the comprehensive school falls in-between (with a 11%) rate and the London private non-boarding school is much ahead with a 21% rate.

Thus, in the cross-tabulation of word-medial following phonological environment and type of school, we have seen how school is a key social factor group in explaining the variability of t-glottalling in RP, as for word-final phonological contexts. Percentages of the glottal stop in word-medial contexts are still considerably low for RP speakers, in comparison to word-final contexts, where the rates are much higher. We have seen how type of school considerably explains the social variability of t-glottalling in both the word-medial favourable and non-favourable phonological environments.

5.3.3 Preceding phonological environment

After having analysed and discussed the effect of following phonological environment on t-glottalling in RP, we now turn to present and discuss the results of the multivariate analyses for preceding phonological environment for the word-medial and word-final datasets. This factor group was selected as the least powerful, yet still statistically significant, factor group for both the word-medial and word-final samples (WM 6th out of 6 and WF 8th out of 8) in explaining the variability of t-glottalling in RP. Even though the preceding phonological environment emerged as a significant factor group, it appeared in the last position in the hierarchy of significant factor groups for both the WM and WF datasets, therefore having a

much weaker influence on the variability of the glottal stop in RP than the following phonological environment, which emerged as the third most significant factor group for both the WM and WF samples.

Contribution of preceding phonological environment to the probability of word-medial (WM) t-glottalling in RP			
Input 0.008 Log likelihood -159.000			
Chi-square/cell = 0.72			
Total N 1105			
FACTOR GROUP	Factor Weight	%	N
WM Preceding phonological environment WM preceding central vowel (ʌ, ə, ɜ:) WM preceding back vowel (uː, ʊ, ɔ:, ɒ, a:) WM preceding front vowel (i:, I, e, æ) *Range*	.79 .69 .35 *44*	2.8 3.9 8.1	145 258 702

Table 5.16 Contribution of preceding phonological environment to the probability of WM t-glottalling in RP

Table 5.16 displays the results for the multivariate analysis of preceding phonological environment for the word-medial dataset[28]. Preceding central and back vowels favour t-glottalling in word-medial position, with central vowels being the type of vowels that favour the glottal stop the most, with a .79 probability, followed by back vowels, with a .69 probability. On the other hand, front vowels appear to disfavour t-glottalling word-medially, with a .35 probability rate. Figure 5.12 graphically displays the results for the probabilities of preceding phonological environment for WM t-glottalling.

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[28] In the coding scheme for the factor group preceding phonological environment for the WM sample, two other factors were also included: *WM preceding nasals (wanted)* and *WM preceding liquids (Balti)*. However, the data collected did not display any token for these factors.

Preceding phonological environment: probability of word-medial t-glottalling

Figure 5.12 Preceding phonological environment: probability of word-medial t-glottalling

Regarding the word-final sample[29], results from the multivariate analysis show that the type of vowel that favours the glottal stop the most in the preceding phonological environment for RP are preceding back vowels, with a probability of .57. As for preceding front and central vowels, they tend to disfavour t-glottalling, with a probability rate of .47 for WF preceding front vowels and a probability of .46 for WF preceding central vowels; however, note that the probabilities are quite close to the .50 favouring environment (see table 5.17 and figure 5.13).

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[29] In the coding scheme for the factor group preceding phonological environment for the WF sample, two other factors were also included: *WF preceding nasals* and *WF preceding liquids*. However, the data collected did not display any token for these factors.

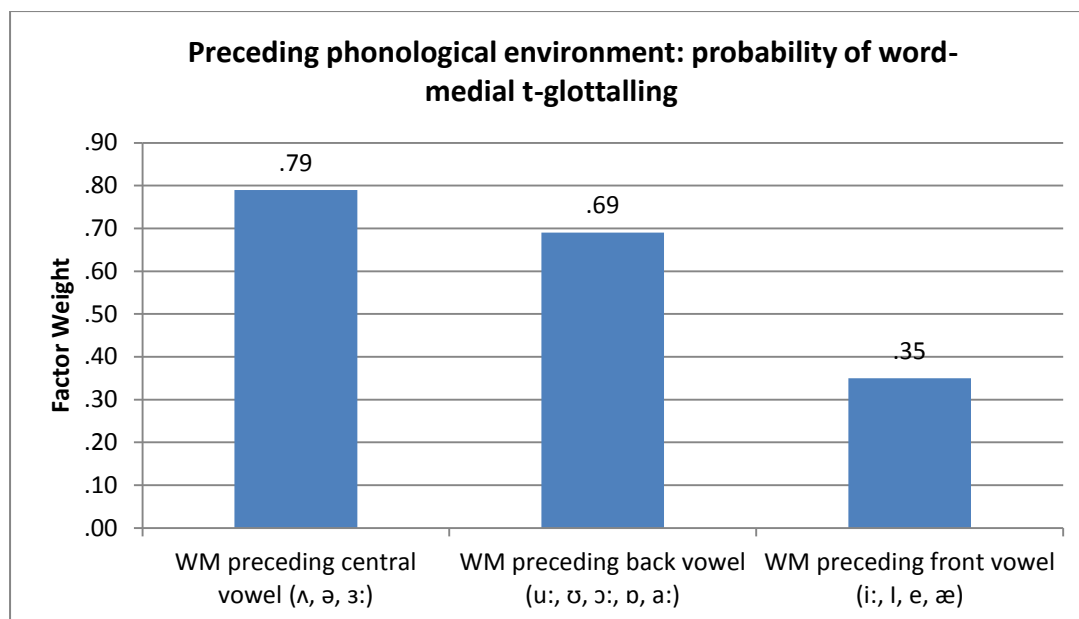| Contribution of preceding phonological environment to the probability of word-final (WF) t-glottalling in RP			
Input 0.556 Log likelihood -1892.532			
Chi-square/cell = 1.41			
Total N 4140			
FACTOR GROUP	Factor Weight	%	N
WF Preceding phonological environment WF preceding back vowel (uː, ʊ, ɔː, ɒ, aː) WF preceding front vowel (iː, I, e, æ) WF preceding central vowel (ʌ, ə, ɜː) *Range*	.57 .47 .46 *11*	60.4 47 74	1160 2241 739

Table 5.17 Contribution of preceding phonological environment to the probability of WF t-glottalling in RP

Figure 5.13 Preceding phonological environment: probability of word-final t-glottalling

Thus, in the description of the results for preceding phonological environment for t-glottalling in RP, we have observed how this factor group emerged last in the hierarchies of significant factor groups for both the word-medial and word-final datasets. Therefore, it appears that preceding phonological environment is not such a strong predictor when it

comes to explaining the variability of t-glottalling in RP, in comparison to the following phonological environment, which as we have seen it is one of the most important linguistic factor groups (after style) for explaining the variability of the glottal stop in RP (see section 5.3.2).

The preceding phonological context has long been neglected in the sociolinguistic research of t-glottalling, not only in RP but also in the studies of other English accents. Only Schleef (2013) on Edinburgh and London English, and Roberts (2006) and Eddington and Taylor (2009) on American English, have looked at the previous phonological environment. No previous sociolinguistic research on RP has looked at preceding phonological environment, except the present research. Schleef (2013) reports that a previous vowel favours t-glottalling (around .70), whereas a previous nasal and liquid inhibits t-glottalling (around .30). For Eddington and Taylor (2009), the preceding phonological environment was selected as non-significant. Roberts (2006) on the other hand, found that a preceding vowel favours t-glottalling (.57) and a preceding consonant disfavours the glottal stop (.34), in line with Schleef's (2013) findings.

My results corroborate both Roberts' (2006) and Schleef's (2013) findings, in that a previous vowel favours t-glottalling (results for a previous consonant cannot be compared, as both my word-medial and word-final samples did not display any tokens with a previous consonant). However, neither Schleef (2013) nor Roberts (2006) did look at the types of preceding vowels which constrain t-glottalling. In my research, I looked at the type of preceding vowels that constrain the variability of the glottal stop in RP both word-medially and across word boundaries. As for the word-medial dataset[30], preceding central vowels (.79) and preceding back vowels (.69) are the types of vowels that favour t-glottalling the most, whereas front vowels (.35) have an inhibiting effect. Regarding the word-final

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[30] Examples of WM preceding front vowels: *lIttle, bEtter, gEtting;* WM preceding central vowels: *bUtton, bUtter;* WM preceding back vowels: *bOttle, wAter.*

sample[31], I found that back vowels (.57) are the type of vowels that favour the glottal stop the most, whereas front vowels (.47) and central vowels (.46) disfavour t-glottalling.

If we look again at Clements and Hume's (1995) and Hume's (1992, 1996) theory that considers front vowels to be coronal (see section 5.3.2 for Following phonological environment), we might explain why front vowels disfavour t-glottalling in both the WM and WF preceding phonological environments. Front vowels behaving as coronals would act as an inhibitor for the glottal stop in WM and WF preceding contexts. Clements and Hume (1995) claim that front vowels and coronal consonants are members of the natural class of coronal sounds. For example, in many languages, velar and labial consonants become coronal before front vowels, and in a similar way, vowels are fronted next to coronal consonants in various languages, such as Maltese Arabic (Clements and Hume 1995).

In the next sections, I explore the cross-tabulations of WM and WF preceding phonological environments in relation to style, gender, age and type of school, to analyse the distribution of t-glottalling across these linguistic and social factor groups.

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[31] Examples of WF preceding front vowels: *qUIte good, bIt late, thAt man;* WF preceding central vowels: *At nine, bUt that's;* WF preceding back vowels: *nOt sure, nOt really, gOt a brother, a lOt of.*

5.3.3.1 Preceding phonological environment and Style

Cross-tabulation of WM Preceding phonological environment by Style
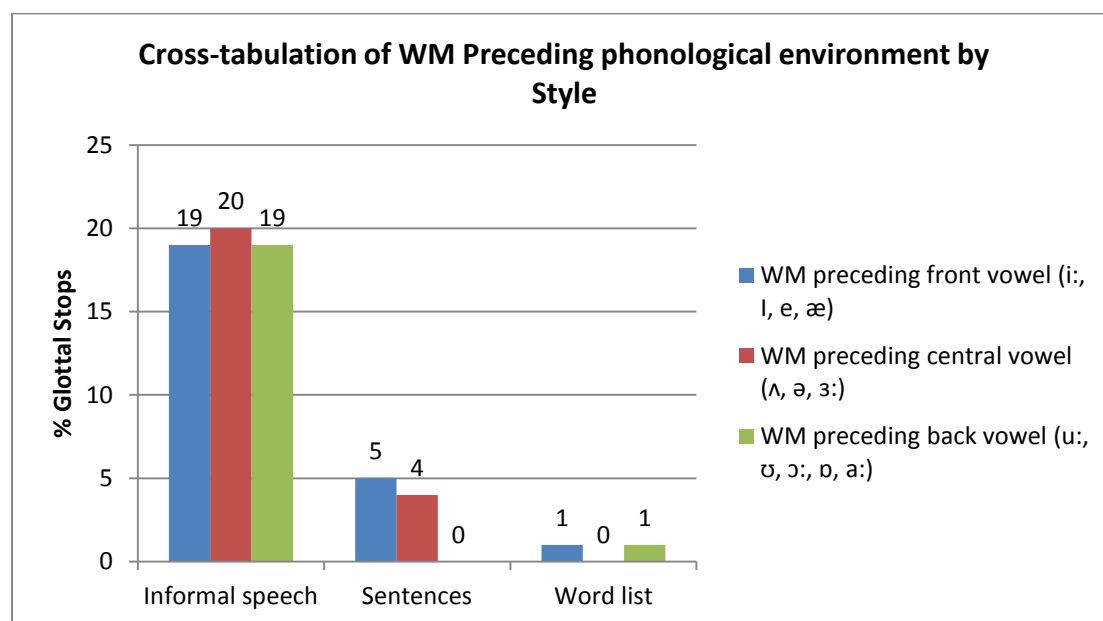
Figure 5.14 WM t-glottalling by Preceding phonological environment and Style

In figure 5.14, we can see how the WM preceding phonological environment is highly constrained by the speech style of the RP informants. In WM preceding phonological contexts, t-glottalling mainly occurs in informal speech, with much higher percentages (around 20%) than in formal speech (sentences and word list), where percentages are really low for the three types of WM preceding vowels (between 0 and 5%). Regarding the WF sample (figure 5.15), t-glottalling is also much more frequent in WF preceding phonological contexts in informal speech, but with much higher rates than word-medially (between 70 and 76%). As for the sentences and word list formal context across word boundaries, t-glottalling is much less present, with rates between 11 and 24%. These results for WM and WF t-glottalling by preceding phonological environment and style, agree with the results of the cross-tabulations of WM and WF following phonological environment, where RP speakers clearly style-shift in terms of t-glottalling according to the formality of the style in which they speak: much higher rates in informal speech and much lower rates in formal settings.
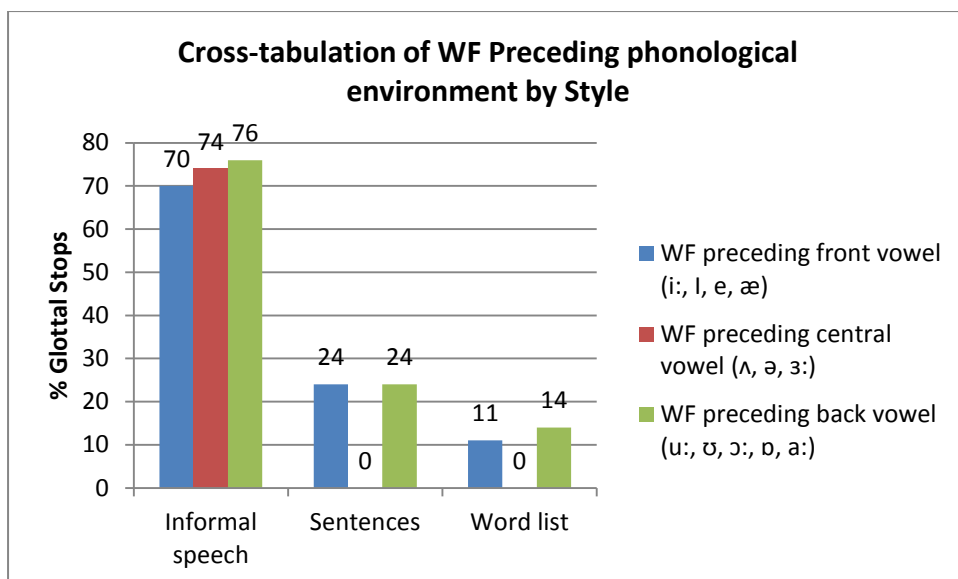
Figure 5.15 WF t-glottalling by Preceding phonological environment and Style

5.3.3.2 Preceding phonological environment and Gender

Figure 5.16 WM t-glottalling by Preceding phonological environment and Gender

In the cross-tabulation of preceding phonological environment and gender for the word-medial sample (figure 5.16), we can see a difference in terms of gender for the WM preceding central vowel and WM preceding back vowel contexts, in which males have

higher rates of t-glottalling than females (5% against 0-2%). However, in terms of the WM preceding front vowel environment, both genders show the same rate of t-glottalling (8%). As we saw in the cross-tabulations for style and gender (section 5.3.1.1) and following phonological environment and gender (section 5.3.2.2), the gender differences, even though significant, are much less strong than the age differences for t-glottalling in RP. And this is also true for the cross-analysis of WM preceding phonological environment and gender. Regarding the WF sample, the cross-tabulation of preceding phonological environment and gender did not display any informative pattern worthy of being commented upon.

5.3.3.3 Preceding phonological environment and Age
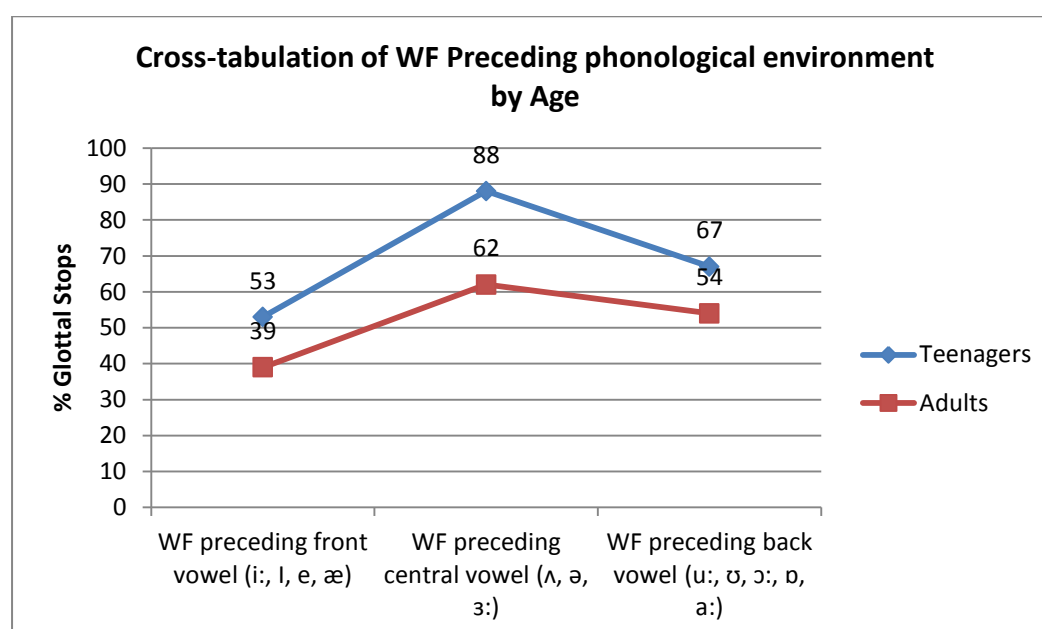
Figure 5.17 WF t-glottalling by Preceding phonological environment and Age

Figure 5.17 displays the results for the cross-analysis of WF preceding phonological environment and age[32]. We can observe how teenagers are clearly ahead in the production of t-glottalling in RP for all the three environments (WF preceding front vowel, WF preceding central vowel and WF preceding back vowel), with percentage differences of between 13 and 26%. Therefore, age seems to be an important social factor group in order to explain the distribution of t-glottalling in the WF preceding phonological environment.

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[32] Recall that the *age* factor group did not emerge as significant in the multivariate analysis for the WM sample.

5.3.3.4 Preceding phonological environment and Type of school

Cross-tabulation of WM Preceding phonological environment by Type of school
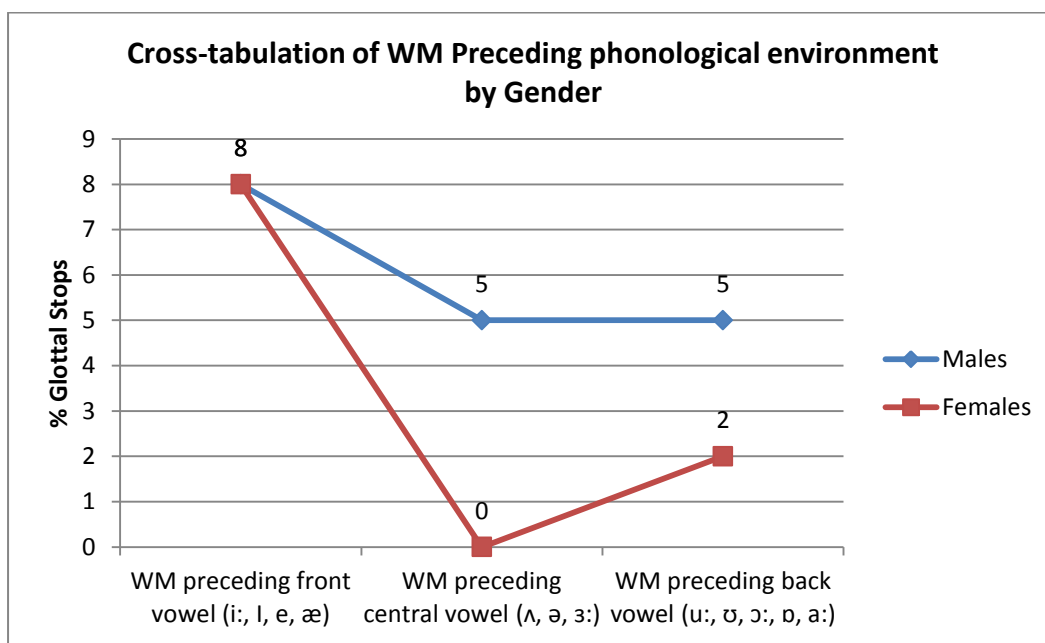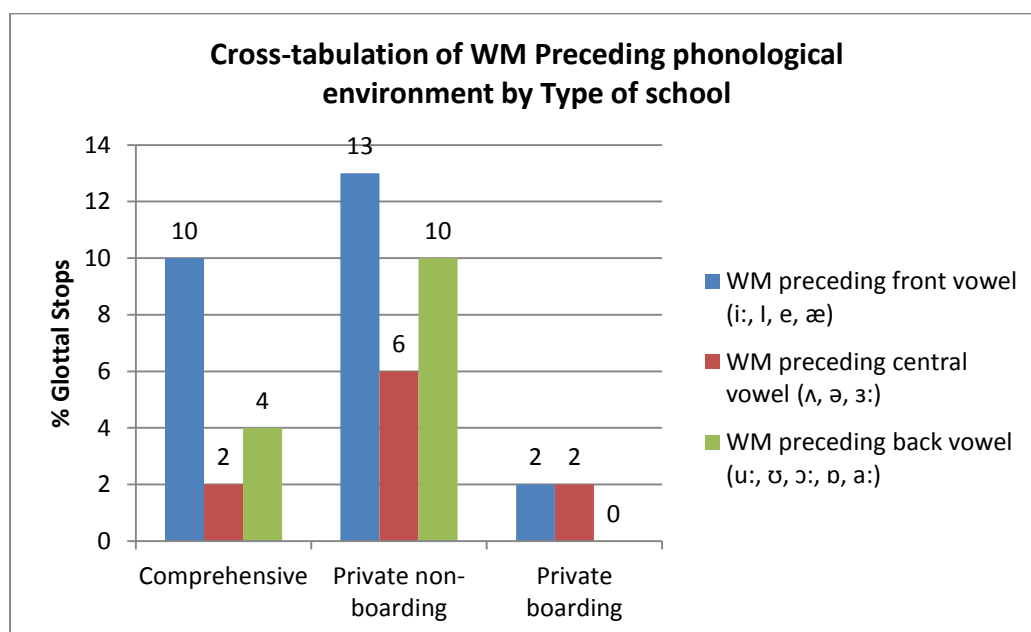
Figure 5.18 WM t-glottalling by Preceding phonological environment and Type of school

In the cross-tabulation of WM preceding phonological environment and type of school (figure 5.18), we can observe how the private non-boarding school is ahead in the production of t-glottalling in RP for the three types of WM preceding contexts (front vowel, central vowel and back vowel), followed by the comprehensive school. As for the private boarding school, the extremely low rates of the glottal stop in the WM preceding phonological environment (between 0 and 2%) set this school in a socially separate sphere.

Regarding the WF sample (figure 5.19), it is this time the comprehensive school which is ahead in the production of t-glottalling in RP for the WF preceding phonological environment, followed by the private non-boarding school. And again, the private boarding school sets itself socially apart in terms of the rates of glottal stops for the preceding phonological context across word boundaries, with the lowest percentages for t-glottalling; between 30 and 40% against 50 and 90% for the comprehensive and the private non-boarding schools.

Thus, type of school (like age), is an important social factor group in order to explain the distribution of t-glottalling in the WF preceding phonological environment. In the cross-tabulation of following phonological environment and type of school (section 5.3.2.4), we also observed similar behaviours in terms of type of school for the presence of t-glottalling in RP, with the comprehensive and private non-boarding schools patterning together most of the time (even though the private non-boarding school is ahead in WM contexts due to its geographical location in South-West London) and with the private boarding school displaying the lowest rates of t-glottalling both word-medially and across word boundaries, therefore setting this school socially apart from the other two.
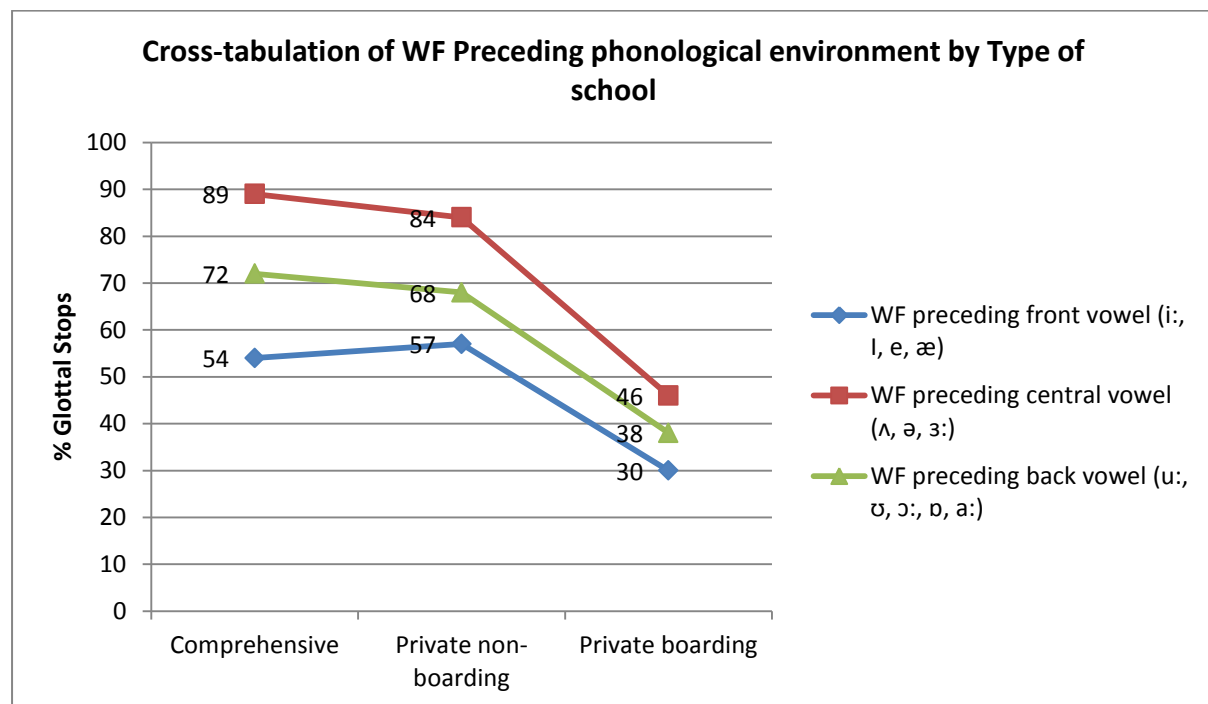

Figure 5.19 WF t-glottalling by Preceding phonological environment and Type of school

5.3.4 Grammatical category

Grammatical category is a linguistic factor group that has not traditionally been looked at in studies of t-glottalling in RP and other British accents. The only exception is the recent article by Schleef (2013) on t-glottalling in Edinburgh and London teenagers. In his study, grammatical category emerged as a significant factor in word-medial t-glottalling, but not in word-final position. Schleef (2013), in his results for grammatical category in word-medial /t/, found that function words, progressive verbs and past participles favoured glottal replacement, whereas other grammatical categories (such as proper nouns and verbs) had weak effects and others disfavoured the glottal stop (adjectives and nouns). Schleef (2013) claims that the phonological make up of past participles and progressive forms does not explain the variation of /t/, and he looks at the morphological compositionality of these words in order to explain t-glottalling in these two grammatical categories. He argues that "there are certain types of words, those in which /t/ occurs at the boundary of high-frequency bound morphemes, that seem to benefit from some boost for glottal replacement via their related and frequently glottalled word forms with word-final /t/" (Schleef 2013: 14).

In the present research, grammatical category was also included in the analysis of t-glottalling in RP, for both the word-medial and word-final samples. However, in the Varbrul multivariate analysis, grammatical category emerged as a non-significant factor group for both the word-medial and word-final datasets. In the WM dataset, the factor group grammatical category emerged as non-significant in the best Varbrul run (Chi-square/cell = 0.72). As for the WF dataset, when grammatical category was added to the best Varbrul run (Chi-square/cell = 1.41), the chi-square/cell was higher (1.5), and therefore the model overall was worse. Moreover, grammatical category was eliminated in one of the step runs conducted, and consequently, the factor group grammatical category was removed from the final best WF analysis (Chi-square/cell = 1.41). Thus, non-significant results from grammatical category will only be provided for the WM multivariate analysis (table 5.18).

Contribution of grammatical category to the probability of word-medial (WM) t-glottalling in RP (non-significant)			
Input 0.008 Log likelihood -159.000			
Chi-square/cell = 0.72			
Total N 1105			
FACTOR GROUP	Factor Weight	%	N
Grammatical category adverb (pretty much) proper noun (Gatwick) past participle (forgotten) progressive verb (waiting, sitting) adjective (better) simple noun (water, bottle) pronoun (whatever)[33]	[.76] [.72] [.70] [.66] [.63] [.37] [.11]	17.6 12.7 16.7 36.2 6.7 2 15.8	17 71 6 47 389 555 19

Table 5.18 Contribution of grammatical category to the probability of WM t-glottalling in RP (non-significant)

In the cross-tabulations of grammatical category with the other linguistic and social factor groups, grammatical category (the largest factor group, with ten factors) produced a lot of empty cells, and this data imbalance for the individual factors within grammatical category could explain why it emerged as non-significant for t-glottalling in RP, for both the WM and WF samples. Moreover, grammatical category was added as a factor group in the research after the data had been collected, thus possibly contributing to this imbalance of the data, especially in more formal contexts, as in informal interview, it would in any case be very difficult to control which grammatical categories the informants used.

In table 5.18, for the WM sample, the grammatical categories that produced most tokens are *adjective* (with 389 tokens or 35%) and *simple noun* (with 555 tokens or 50%). For the *adjective* category, tokens such as *better* and *little* were included in the word list, as well as tokens such as *water* and *bottle* for the *simple noun* category. Therefore, the fact that tokens from the *adjective* and *simple noun* category were included in the word list for the

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[33] The 19 tokens that produced the *pronouns* category are only *whatever* tokens, which only occurred in informal speech. It would be very rare for other pronouns to be included in this category for WM tokens, as pronouns tend to be mainly monosyllabic words and the (t) would be word-final, as in the pronoun *it*.

data collection in the fieldwork, explains why these two grammatical categories display most of the tokens in the WM sample.

Thus, even though grammatical category emerged as a non-significant factor contributing towards the variability of t-glottalling in RP (for both the WM and WF samples), it was important to include it in the analysis as this factor group has been overlooked by the research of t-glottalling in British accents, with the exception of Schleef's (2013) study of t-glottalling in Edinburgh and London teenagers and the present research of t-glottalling in young RP speakers. For future research, I would suggest to reduce the grammatical categories included in the analysis, as it produced many empty cells in the cross-analyses with other factor groups. It may be better to code only for two categories: *content words* (nouns, main verbs, adjectives and adverbs) versus *grammatical words* (auxiliary verbs, pronouns, articles and prepositions). In any case, how t-glottalling relates to the grammatical compositionality of words should be explored further in future research.

5.3.5 Stress

Another linguistic factor group that has been overlooked in the analysis of t-glottalling in RP and other British accents is stress. Only Holmes (1995) and Tollfree (1999) give some accounts of it, but it is not very clear from their explanations how stress contributes to t-glottalling. Holmes (1995) claims that main stress favours t-glottalling more than reduced stress, and Tollfree (1999: 172) argues that in word-internal non-foot-initial onset position, where the preceding syllable is the more prominent, as in *guilty, Saturday,* "/t/ is properly syllabified as part of the preceding stressed syllables by means of a strategy which attracts to the stressed syllable as many consonantal entities as possible." Thus, she claims that "T-glottalisation is optional where the stress on the syllable following /t/ is less than that borne by the preceding syllable, i.e. in non-foot-initial onset position" (Tollfree 1999: 172).

In the present study, stress was also included in the analysis of t-glottalling in RP, for both the word-medial and word-final datasets. However, in the Varbrul multivariate analysis, stress emerged as a non-significant factor group for both the word-medial and word-final samples. In the WM dataset, stress emerged as non-significant in the best Varbrul run (Chi-square/cell = 0.72). As for the WF dataset, when stress was included in the best Varbrul run (Chi-square/cell = 1.41), the chi-square/cell was higher (1.5), and therefore the model did not improve. Furthermore, stress was eliminated in one of the step runs conducted, and therefore, the factor group stress was removed from the final best WF analysis (Chi-square/cell = 1.41). So, non-significant results from stress will only be provided for the WM multivariate analysis (table 5.19).

Contribution of stress to the probability of word-medial (WM) t-glottalling in RP (non-significant)			
Input 0.008 Log likelihood -159.000			
Chi-square/cell = 0.72			
Total N 1105			
FACTOR GROUP	Factor Weight	%	N
Stress following stressed syllable following unstressed syllable preceding stressed syllable preceding unstressed syllable	[.88] [.70] [.46] [.21]	33.3 7.7 5.9 3.1	12 181 880 32

Table 5.19 Contribution of stress to the probability of WM t-glottalling in RP (non-significant)

In the cross-tabulations of stress with the other linguistic and social factor groups, stress produced a lot of empty cells, and this data imbalance for the individual factors within stress could explain why this factor group emerged as non-significant for t-glottalling in RP, for both the WM and WF datasets. Furthermore, stress was added as a factor group in the research after the data collection, thus possibly contributing towards this imbalance of the data. In table 5.19, we can see how most tokens appear in the *preceding stressed syllable* category, with 880 tokens (80%), out of a total 1105 tokens for the whole WM dataset. The other category that also produced many tokens is the *following unstressed syllable* category, with 181 tokens (16%).

Thus, even though stress emerged as a non-significant factor contributing towards the variability of t-glottalling in RP (for both the WM and WF samples), it was important to include it in the analysis as this factor group has been overlooked by the research of t-glottalling, and the accounts given by Holmes (1995) on New Zealand English and by Tollfree (1999) on London English are not very conclusive. Further research on the effects of stress on t-glottalling might shed more light on its effects and perhaps improve the modelling of phonological explanations such as sonority theories.

5.3.6 Number of syllables

In the two previous sections (5.3.4 and 5.3.5), I discussed about two linguistic factor groups, grammatical category and stress, which have been traditionally overlooked in the analysis of t-glottalling, both in RP and other British accents. Even though both factor groups emerged as non-significant, for both the word-medial and word-final samples, I argued that it was important to have included them in the present research of t-glottalling in RP. Another linguistic factor group that has not been included in analyses of t-glottalling is number of syllables. No previous study of t-glottalling in RP looked at this linguistic factor group. Only Schleef's (2013) study of t-glottalling in Edinburgh and London teenagers included this linguistic factor group in his research.

In this section, I present and discuss the results of the multivariate analysis for number of syllables. This linguistic factor group emerged as significant for the variability of t-glottalling in RP, but only for the word-final sample. As for the word-medial sample, number of syllables emerged as non-significant[34]. This factor group was selected as the penultimate significant factor group for the word-final dataset (7th out of 8). This position towards the end of the hierarchy of significant factors means that number of syllables has a relatively weak influence on the variability of the glottal stop in RP.

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[34] The factor group *number of syllables* was excluded from the final best WM analysis, as the chi-square/cell was lower and therefore the model improved when this factor group was removed.

In the results displayed in table 5.20 and figure 5.20, we observe how two-syllable words favour t-glottalling the most in word-final position in RP, with a probability of .71, followed by one-syllable words with a .49 probability; at the borderline of the .50 threshold. It must be noted that one-syllable words constitute almost the entire word-final dataset, with 3994 tokens (96%), whereas two-syllable words have only 146 tokens. Other numbers of syllables were also considered in the analysis of the word-final sample, such as three-syllable words, four-syllable words and five-syllable words. Three and four-syllable words only displayed one token for each category, and both were glottalised; there were no five-syllable words in the word-final dataset.

Contribution of number of syllables to the probability of word-final (WF) t-glottalling in RP			
Input 0.556 Log likelihood -1892.532			
Chi-square/cell = 1.41			
Total N 4140			
FACTOR GROUP	Factor Weight	%	N
Number of syllables 2 (about) 1 (but) *Range*	.71 .49 *22*	65.8 55.2	146 3994

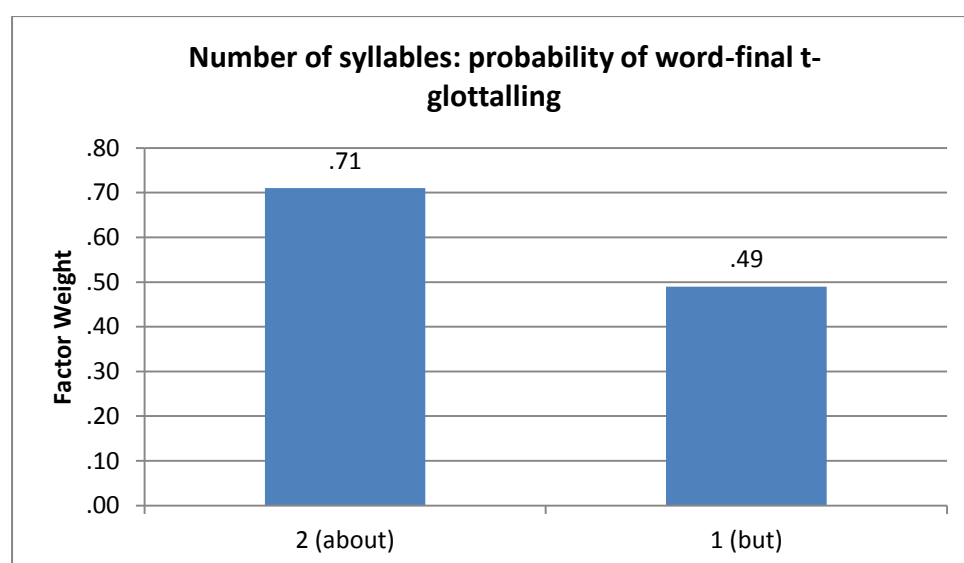Table 5.20 Contribution of number of syllables to the probability of WF t-glottalling in RP

Figure 5.20 Number of syllables: probability of word-final t-glottalling

As we have previously mentioned, the only study that has looked at number of syllables in t-glottalling is Schleef (2013). He found that number of syllables was only significant for word-medial (t) for the Edinburgh teenagers. Four and five-syllable words were the most favouring for t-glottalling and two-syllable words also had a favouring effect. On the other hand, three-syllable words had a disfavouring effect. It is difficult to compare my results with those of Schleef's (2013), as number of syllables in my researched emerged as a significant factor group only in the word-final sample, whereas for Schleef's (2013) results, number of syllables emerged as significant only for word-medial (t). However, from his results and my results, we can conclude that t-glottalling seems to be more common and more favourable in words with more syllables (2, 4 and 5 syllables) in word-medial contexts, whereas in word-final contexts, t-glottalling is more recurrent and more favourable in monosyllabic words and two-syllable words.

In fact, in my results for the word-final sample, one-syllable words make up for almost the entire word-final dataset, with 3994 tokens, whereas two-syllable words only account for 146 tokens. Examples of one-syllable words from my word-final sample are: *but, not, that, lot, out, at, it, bit, quite, yet, get, got, meet, met, sit, flat.* As for two-syllable words: *about, forget, forgot, quiet.* From these examples, we can see how word-final t-glottalling is very frequent in monosyllabic grammar words, such as pronouns (*it*), determiners (*that*), prepositions *(at)* and conjunctions (*but*), and also in monosyllabic content words, such as adverbs (*not, lot, quite, yet, out*), verbs (*get, got, meet, met, sit*) and nouns (*flat, bit*). Regarding two-syllable words in word-final contexts, t-glottalling mostly happens in four tokens: the preposition *about*, the adjective *quiet* and the verb forms *forget* and *forgot*. In the next sections, I describe and discuss the cross-tabulations of number of syllables with lexical frequency and with the social factors age and type of school. We will see how lexical frequency and number of syllables are related when explaining the variability of t-glottalling in RP in word-final contexts.

5.3.6.1 Number of syllables and Lexical frequency
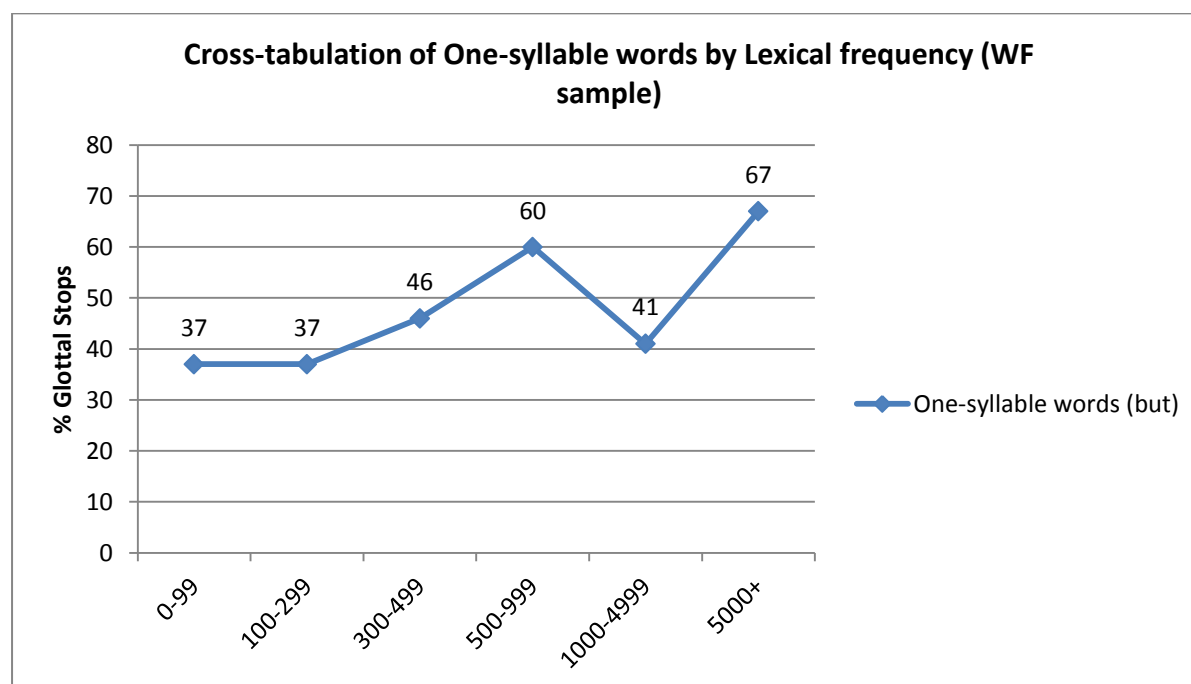
Figure 5.21 WF t-glottalling by One-syllable words and Lexical frequency

Figure 5.21 displays the results for t-glottalling by one-syllable words and lexical frequency for the word-final sample. We can observe how RP speakers glottalise the most in one-syllable words which are in the highest lexical frequency band[35] (5000+), with a 67% rate. As well, there is a high rate of t-glottalling in the medium-high frequency band 500-999, with a 60% rate. RP speakers glottalise less in the lowest frequency bands (0-99, 100-299 and 300-499), and also in one of the high frequency bands (1000-4999), with rates around 40%. Moreover, in the cross-tabulation, it emerged that most one-syllable word tokens in the word-final sample belong to the two highest frequency bands: 1295 tokens for the 1000-4999 band and 1858 tokens for the 5000+ band. As for the three lowest frequency bands and the medium band, they displayed much lower numbers of tokens: 223 tokens (0-99 band), 70 tokens (100-299 band), 48 tokens (300-499 band), 500 tokens (500-999 band).

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[35] Frequency per million word tokens (down to a minimum of 10 occurrences of a lemma per million). Frequency bands extracted from Leech, Rayson and Wilson (2001), based on the British National Corpus.

Therefore, in the cross-tabulation of one-syllable words and lexical frequency for the word-final sample, we can observe how these two linguistic factor groups seem to be related in the behaviour of t-glottalling. RP informants use t-glottalling the most in one-syllable words, which in turn, belong to the highest lexical frequency band in word-final contexts. In the previous section 5.3.6, we saw how word-final t-glottalling is very common in monosyllabic grammar words, such as pronouns (*it*), determiners (*that*), prepositions *(at)* and conjunctions (*but*), and also in monosyllabic content words, such as adverbs (*not, lot, quite, yet, out*), verbs (*get, got, meet, met, sit*) and nouns (*flat, bit*). Most of these one-syllable words belong to the two highest frequency bands (1000-4999 and 5000+): *at, not, quite, out, get* (for the 1000-4999 band) and *it, that, but, got* (for the 5000+ band). As for the other one-syllable words, they belong to the three lowest frequency bands and the medium band: *meet, met, flat* (for the 0-99 band), *sit* (for the 100-299 band), *yet* (for the 300-499 band) and *lot, bit* (for the 500-999 band).

In the cross-tabulation of number of syllables and lexical frequency, we have seen that t-glottalling is most common in the highest frequency band 5000+ (67%) and the medium-high band 500-999 (60%), for one-syllable words in word-final position. Thus, t-glottalling in RP informants is higher in words such as *it, that, but, got* (5000+ frequency band) and *lot, bit* (500-999 frequency band). In section 5.3.2, in the description and discussion of the results of t-glottalling for the following phonological environment, we argued that in word-final contexts RP informants display more advanced pronunciations in the pre-pausal and pre-vocalic (back vowels) environments than was attested in the previous literature of t-glottallling in RP (Fabricius 2000). Therefore, language change may be in progress in these two word-final environments: pre-pausal and pre-vocalic (back vowels). Then, if language change for t-glottalling in RP is happening in the word-final pre-pausal and pre-vocalic (back vowels) contexts, and if lexical frequency is a trigger and carrier of language change, it would be expected that the words containing word-final (t) would be high frequency words. Indeed, in this cross-tabulation, we have seen that t-glottalling for RP informants is more common in high and medium-high frequency words, which in turn are mainly one syllable-words.

Examples of these one-syllable high and medium-high frequent words containing word-final (t) which are commonly glottalised are:

- WF pre-pausal:

…I don't like IT (pause), …I was rubbish at IT (pause) (5000+ frequency band)

…and stuff like THAT (pause), …anything like THAT (pause), …I still remember THAT (pause) (5000+ frequency band)

…quite a lot BUT (pause) (5000+ frequency band)

…quite a LOT (pause), …they swear a LOT (pause) (500-999 frequency band)

…a little BIT (pause) (500-999 frequency band)

- WF pre-vocalic (back vowels):

that I, but also, but I (5000+ frequency band)

a lot of (500-999 frequency band)

Thus, these examples of one-syllable high and medium-high frequency words containing word-final (t) in the WF pre-pausal and WF pre-vocalic (back vowels) phonological environments may be the carriers of language change in t-glottalling for RP speakers.

Regarding two-syllable words in word-final contexts, in the cross-tabulation, it emerged that most tokens fall in the highest frequency band (5000+), 136 tokens out of a total of 146 tokens. As for the other 10 tokens, 9 belong to the lowest frequency band (0-99) and 1 token belongs to the second lowest frequency band (100-299). Most of the two-syllable words belonging to the highest frequency band (5000+) are examples of the preposition *about*, and two-syllable words that are found in the two lowest frequency bands (0-99 and 100-299) include the adjective *quiet* and the verb forms *forget* and *forgot*.

Examples of the high frequency two-syllable word *about* in the word-final sample are: *…I was ABOUT (pause), …and lunch is ABOUT (pause), …it takes ABOUT (pause), …and things to worry ABOUT (pause), …to learn ABOUT (pause).* Most examples of the high frequent two-syllable preposition *about* are found in the WF pre-pausal environment, therefore also contributing to the progression of t-glottalling in this context in RP.

5.3.6.2 Number of syllables and Age
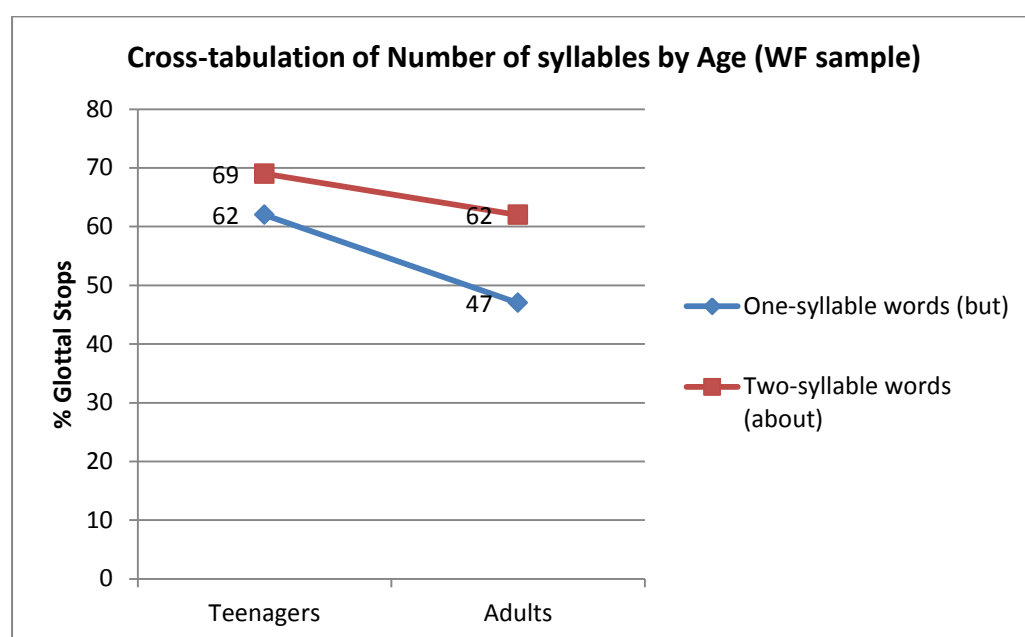
Figure 5.22 WF t-glottalling by Number of syllables and Age

After having described and discussed the cross-tabulation of number of syllables and lexical frequency, I now turn to analyse the cross-tabulation of number of syllables in relation to age for the word-final sample. In the graphical display of the data (figure 5.22), we can observe how teenagers display higher rates of t-glottalling for both one-syllable and two-syllable words. Therefore, teenagers seem to use the glottal stop more than their older counterparts. Remember that in previous cross-tabulations of other linguistic factor groups with age, we have seen how teenagers are always ahead in the production of t-glottalling in RP and adults fall behind[36].

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[36] The cross-analysis of *number of syllables* and *gender* did not display any informative pattern.

5.3.6.3 Number of syllables and Type of school
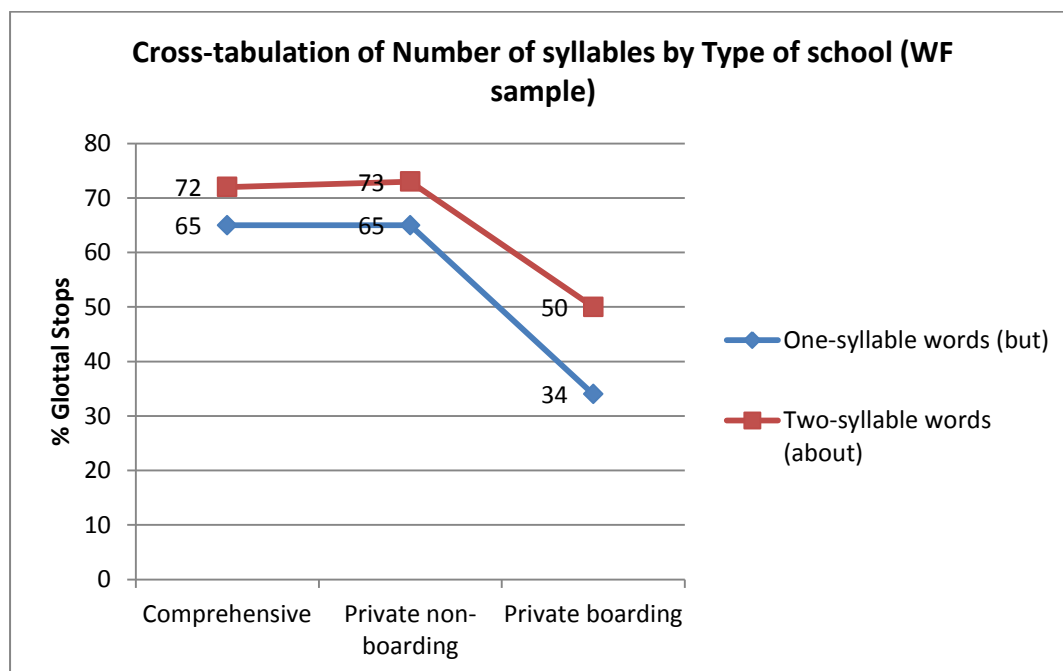
Figure 5.23 WF t-glottalling by Number of syllables and Type of school

Figure 5.23 displays the results of t-glottalling for the cross-analysis of number of syllables and type of school for the word-final dataset. In the graphical display of the data, we can clearly see how the comprehensive and private non-boarding schools have identical high rates of t-glottalling for one and two-syllable words, whereas the private boarding school shows the lowest rates of glottal stops. Thus, as we have observed in previous cross-analyses of linguistic factor groups with type of school, the comprehensive and private non-boarding schools again pattern together in their behaviour of production of t-glottalling and the private boarding school stands on its own, producing lower rates of the glottal stop.

5.3.7 Lexical frequency

Lexical frequency is another linguistic factor group that has not been included in the analysis of t-glottalling, either in RP or other British accents. The only study that has taken this factor group into account is Schleef's (2013) research on t-glottalling in Edinburgh and London teenagers. He found a lexical frequency effect for the London speakers in word-final (t) (more frequent words favour glottal replacement in word-final position), but not for the Edinburgh speakers in this context. As for word-medial position, he found lexical frequency to be significant in both locations.

In this section I describe and discuss the results of the multivariate analyses for lexical frequency, for the word-medial and word-final samples, for t-glottalling in RP. Lexical frequency emerged as a significant factor group, for both the word-medial and word-final datasets. In the multivariate analysis for the word-medial sample, lexical frequency emerged as the 4th most significant factor group, out of a total of 6 factor groups. In terms of the linguistic factor groups, lexical frequency appears in the significant hierarchy after style and WM following phonological environment, therefore making it an important linguistic factor group for explaining the variability of t-glottalling. Regarding the word-final dataset, lexical frequency emerged as the 5th most significant factor group (out of a total of 8 factor groups) in the multivariate analysis. Lexical frequency is also an important linguistic factor group for explaining the variable behaviour of t-glottalling in RP in word-final contexts, as lexical frequency appears in the significant hierarchy for linguistic factor groups after style and WF following phonological environment.

Table 5.21 and figure 5.24 display the results of the multivariate analysis for lexical frequency for t-glottalling in RP for the word-medial sample. We can observe how high frequent words[37] (500-999) favour t-glottalling the most with a probability of .92 in word-medial contexts. As for low frequency words in the 100-299 and 0-99 bands, they disfavour the glottal stop word-medially, with a probability of .45 and .38 respectively.

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[37] Frequency per million word tokens (down to a minimum of 10 occurrences of a lemma per million). Frequency bands extracted from Leech, Rayson and Wilson (2001), based on the British National Corpus.

Contribution of lexical frequency to the probability of word-medial (WM) t-glottalling in RP			
Input 0.008			
Log likelihood -159.000			
Chi-square/cell = 0.72			
Total N 1105			
FACTOR GROUP	Factor Weight	%	N
500-999	.92	21.3	150
100-299	.45	4.1	294
0-99	.38	4.1	661
Range	*54*		

Table 5.21 Contribution of lexical frequency to the probability of WM t-glottalling in RP
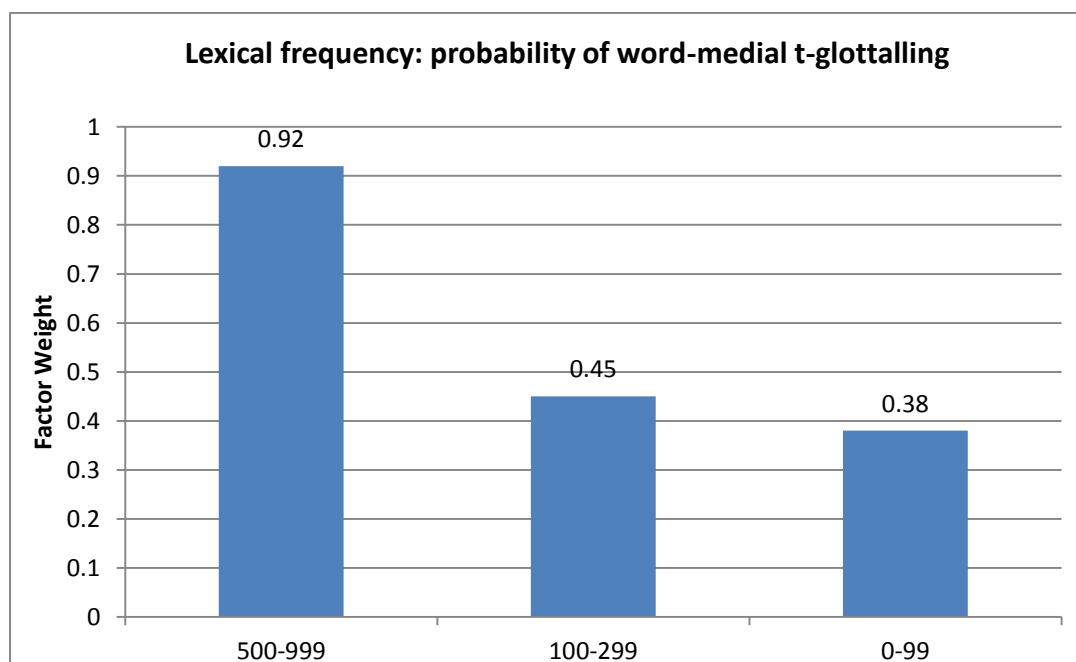
Figure 5.24 Lexical frequency: probability of word-medial t-glottalling

As explained in section 4.5 in the methodology (chapter 4), in this research I used 6 frequency bands which are extracted from Leech, Rayson and Wilson's (2001), in which they provide frequency lists for written and spoken present-day English, based on the British National Corpus. In the word-medial dataset (table 5.21), we can see how tokens occurred for only three of the six frequency bands used in the coding of the data, and from these three bands, two fell into the lowest frequency bands and one into a medium-high frequency band. Moreover, we can observe how most word-medial tokens (661 out of a

total of 1105, or 60%) are found in the lowest frequency band (0-99), followed by the second lowest frequency band (100-299), with 294 word-medial tokens (table 5.21). In terms of the medium-high frequency band, it displays the lowest amount of word-medial tokens, with 150 (table 5.21). Therefore, (t) tokens found in the word-medial dataset for RP informants fall mainly in categories of low frequency bands.

Regarding the word-final sample (table 5.22 and figure 5.25), the results of the multivariate analysis show a rather more complex picture in relation to the effects of lexical frequency on t-glottalling in RP speakers. Whereas for tokens in the word-medial dataset, t-glottalling displays an increasing steady pattern from low frequency bands to higher frequency bands, tokens in the word-final sample do not display this increasing steady pattern for the glottal stop. However, still another pattern emerges. The highest frequency band (5000+) favours t-glottalling at a probability rate of .60 in word-final contexts. Moreover, a medium-high band (500-999) and a medium-low band (300-499) also favour t-glottalling, with a .56 and .65 probability rate respectively. On the other hand, the two lowest frequency bands (0-99 and 100-299) disfavour the glottal stop word-finally with a .36 and .38 probability rates respectively. Finally, there is another frequency band which disfavours t-glottalling in word-final contexts; however, it is a high frequency band (1000-4999) and it is disfavouring with a .36 probability rate.

Thus, even if lexical frequency does not display a steady increasing pattern from low to high frequency bands in word-final contexts, it does show another pattern, with the highest frequency band (5000+) favouring t-glottalling in RP informants, as well as medium frequency bands (300-499 and 500-999). On the disfavouring side for the glottal stop word-finally, we find the two lowest frequency bands (0-99 and 100-299), and surprisingly, also a high frequency band (1000-4999)[38].

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[38] In a separate Varbrul run, I combined the two highest frequency bands (1000-4999 and 5000+) in the WF dataset. However, the chi-square/cell was higher (1.51) and therefore the model did not improve.

Contribution of lexical frequency to the probability of word-final (WF) t-glottalling in RP			
Input 0.556			
Log likelihood -1892.532			
Chi-square/cell = 1.41			
Total N 4140			
FACTOR GROUP	Factor Weight	%	N
Lexical frequency			
300-499	.65	45.8	48
5000+	.60	67.2	1858
500-999	.56	59.6	500
100-299	.38	38	71
0-99	.36	37.9	232
1000-4999	.36	43.1	1431
Range	*29*		

Table 5.22 Contribution of lexical frequency to the probability of WF t-glottalling in RP
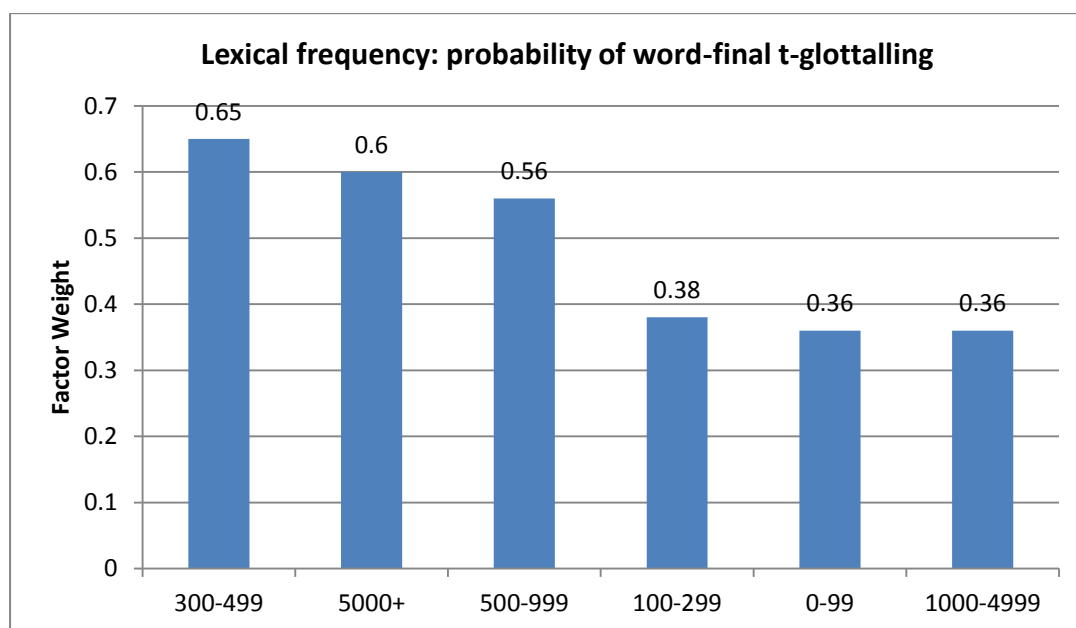
Figure 5.25 Lexical frequency: probability of word-final t-glottalling

In the description of the lexical frequency results for the word-medial sample, we saw how word-medial (t) tokens fell mainly in categories of low frequency bands for RP informants. On the other hand, the word-final sample displayed (t) tokens in all the 6 frequency bands included in the coding protocol of the data. However, if we look at table 5.22, we can observe how word-final (t) tokens fall mainly in the two highest frequency bands: 1858

tokens (45%) for the 5000+ frequency band and 1431 (35%) for the 1000-4999 frequency band. Thus, 3289 tokens (out of a total of 4140) belong to the two highest frequency bands in the word-final dataset. Hence, only 851 word-final (t) tokens are distributed along the other four frequency bands (two medium frequency bands and two low frequency bands). Therefore, when looking at the distribution of (t) tokens in the word-medial and word-final samples, we can clearly notice how word-medial (t) tokens tend to belong to low frequency categories of words, whereas word-final (t) tokens belong mostly to high frequency lexical categories.

This distribution of tokens along frequency lines, together with the lexical frequency results of the multivariate analyses, could help explain why t-glottalling in RP speakers appears to be in a much more advanced state in word-final environments (in which (t) appears mainly in high frequency words) and in a less developed state in word-medial contexts (in which (t) occurs mostly in low frequency words).

The results obtained for lexical frequency for the word-medial and word-final samples in relation to t-glottalling in RP go in line with Schleef's (2013) findings for London English. He found that higher frequency words favour t-glottalling and that London speakers exhibited a lexical frequency effect both in word-medial and word-final contexts, whereas Edinburgh informants only exhibited a lexical frequency effect word-medially. In the present research, RP speakers also favour t-glottalling in higher frequency words, whereas lower frequent words disfavour t-glottalling, both word-internally and across word boundaries. Schleef (2013: 15) argues that "the absence of a word-final frequency effect in what is known to have been reductive sound change is an indication that the process is now stable or nearing completion in Edinburgh, while it remains on-going in London." Indeed, word-final t-glottalling in Edinburgh seems to be a stable and almost completed sound change (but not word-medially), whereas in London, t-glottalling is still a sound change in progress, both word-medially and word-finally.

T-glottalling is an on-going sound change in many accents in the UK and also in RP, the standard British accent. The results described above for lexical frequency clearly demonstrate that t-glottalling in RP is also affected and constrained by frequency effects, like other accents in the UK and therefore, it shows that it is still a sound change in progress both word-medially and word-finally.

T-glottalling is classified as a reductive sound change and this type of change is commonly related with lexical diffusion (Bybee 2002). Bybee (2002) affirms that lexical diffusion for reductive phonetic change is highly conditioned by word frequency. She further claims that reductive sound change usually affects high-frequency words before low-frequency words. Bybee (2002: 261) argues that "phonetically conditioned changes that affect high-frequency words before low-frequency words are best accounted for in an exemplar model of phonological representation that allows for change to be both phonetically and lexically gradual." The results for lexical frequency in the present research of t-glottalling in RP can be explained with Bybee's (2002) views.

In addition, Bybee (2002) states that a word's context of use also affects the rate of change. Predictability in discourse also influences sound change and predictable words are more reduced. In section 5.3.6, we saw how word-final t-glottalling is very common in monosyllabic grammar words and content words. I also claimed that most of these one-syllable words belong to the two highest frequency bands (1000-4999 and 5000+). In the cross-tabulation of number of syllables and lexical frequency (section 5.3.6.1), we saw that t-glottalling for RP informants in word-final contexts was more common in high frequency and medium-high frequency words, which in turn are mainly one syllable-words. These monosyllabic high and medium-high frequent grammar and content words which contain word-final (t) and that are usually glottalled by RP speakers, they are also words that belong to phrases commonly used in conversational speech, such as *I don't like IT, and stuff like THAT, quite a LOT, THAT I, BUT also, BUT I, a LOT of*. Therefore, Bybee's (2002) argument of the importance of a word's context and the predictability in discourse in sound change (besides lexical frequency) can be applied to these concrete examples found in the word-

final sample for RP speakers. Thus, t-glottalling in RP is not only affected by lexical frequency, but may also correlate with predictability of these monosyllabic grammar and content words in spoken discourse. Further research on how t-glottalling operates from a discursive point of view would be very enlightening for this issue.

5.3.7.1 Lexical frequency and Style

I now turn to describe and discuss the cross-tabulations of lexical frequency with other linguistic and social factor groups. In this section, I look at the cross-tabulation of lexical frequency and style, for the word-medial and word-final samples. In figures 5.26 and 5.27 we can observe how t-glottalling is most common in informal speech style in terms of lexical frequency, followed by the sentences reading task and the word list reading task. Therefore, the more formal the context, the less t-glottalling there is in relation to lexical frequency. Thus, t-glottalling in terms of lexical frequency is mainly driven by informal settings and conversational speech.
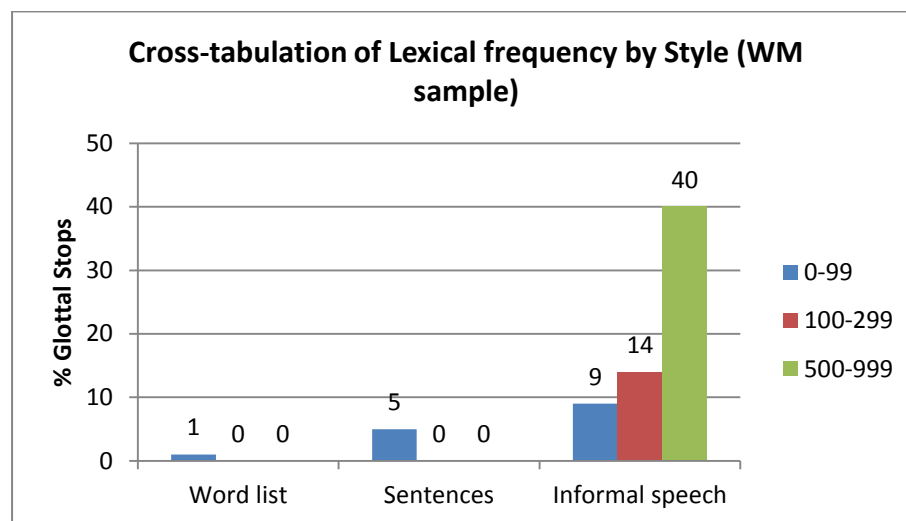
Figure 5.26 WM t-glottalling by Lexical Frequency and Style

Cross-tabulation of Lexical frequency by Style (WF sample)

	0-99	100-299	300-499	500-999	1000-4999	5000+
Word list	6	0	0	16	11	13
Sentences	21	6	31	44	17	29
Informal speech	56	69	85	74	66	77
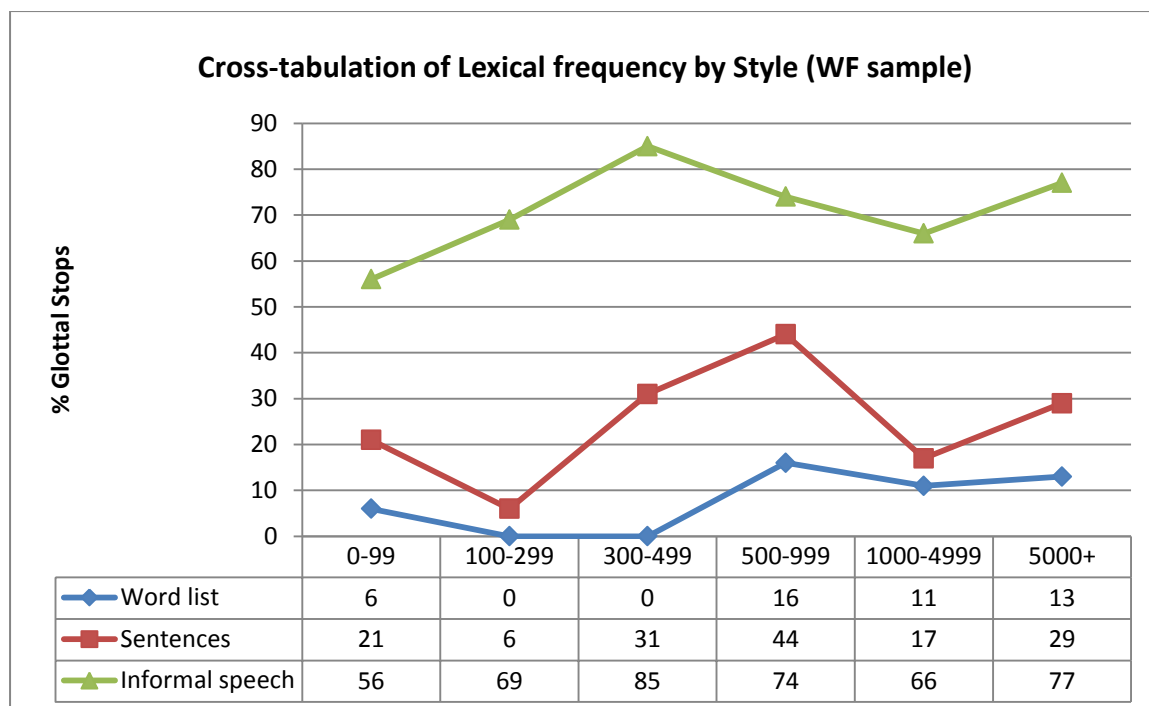
Figure 5.27 WF t-glottalling by Lexical Frequency and Style

5.3.7.2 Lexical frequency and Following phonological environment

In this section I describe the cross-tabulation of lexical frequency and following phonological environment for the word-final sample. Regarding the word-medial sample, the cross-tabulation with lexical frequency did not provide any informative pattern. In section 5.3.2, when discussing the results obtained from the multivariate analysis for the linguistic factor group following phonological environment, I concluded that RP speakers in word-final contexts display more advanced pronunciations in terms of t-glottalling and change seems to be in progress in the pre-pausal and pre-vocalic (back vowels) environments in relation to the previous sociolinguistic literature of RP (Fabricius 2000).

If we look at these two specific word-final following phonological environments in relation to lexical frequency[39], we can observe two main facts. First of all, the highest rates of t-

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[39] In this cross-tabulation no table or figure are displayed, as I only focus my attention to two word-final following phonological environments: WF pre-pausal and WF pre-vocalic (back vowels). Therefore, the results found are only described in text.

glottalling are displayed in the highest frequency band (5000+), with a 67% rate for the WF pre-pausal context and a 75% rate in the WF pre-vocalic (back vowels) environment. And secondly, the majority of tokens for these two WF following phonological environments fall also into the highest frequency band (5000+), with 369 tokens in the WF pre-pausal context (out of a total 683 tokens) and 276 tokens in the WF pre-vocalic (back vowels) environment (out of a total 377 tokens).

Thus, in these results for the cross-tabulation of lexical frequency with these two word-final following phonological environments, we can conclude that lexical frequency is playing a crucial role for the higher rates of t-glottalling. Therefore, in the WF pre-pausal and WF pre-vocalic (back vowels) phonological environments, where we have previously argued that change is in progress (see section 5.3.2) in terms of t-glottalling for RP speakers, in the cross-tabulation with lexical frequency we have discovered that for these two environments, most tokens fall into the highest frequency band (5000+) and these tokens display the highest percentage rates of t-glottalling in the highest frequency band (5000+). High frequency words then, in these two word-final following phonological contexts, are driving (along with other linguistic and social factor groups) the higher rates of t-glottalling in RP speakers analysed in this research.

5.3.7.3 Lexical frequency and Age[40]

In this section, I look at the cross-tabulation of lexical frequency and age for the word-final sample. Remember that age came up as a non-significant social factor group in the multivariate analysis of the word-medial dataset. Figure 5.28 displays the results of word-final t-glottalling by lexical frequency and age. We can clearly observe how teenagers are further ahead in their production of t-glottalling in word-final contexts in all categories of lexical frequency than their older counterparts. Especially, if we look at the highest frequency band (5000+), teenagers show a 77% rate of t-glottalling, against a 58% rate of adults. Thus, in the highest frequent words that contain a final (t), teenagers glottal almost

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[40] Cross-tabulations of lexical frequency and gender were also conducted, for both the word-medial and word-final datasets. However, they did not display any informative pattern.

20% more than adults, therefore placing teenagers at the front leading the changes and progression of t-glottalling in word-final contexts in the RP speech community. Even if teenagers are leading, in nearly every case, they mirror the pattern of adults, suggesting lexical frequency is fairly uniform in its effects.

Cross-tabulation of Lexical frequency by Age (WF sample)

	0-99	100-299	300-499	500-999	1000-4999	5000+
Teenagers	45	44	61	66	49	77
Adults	30	27	25	53	36	58
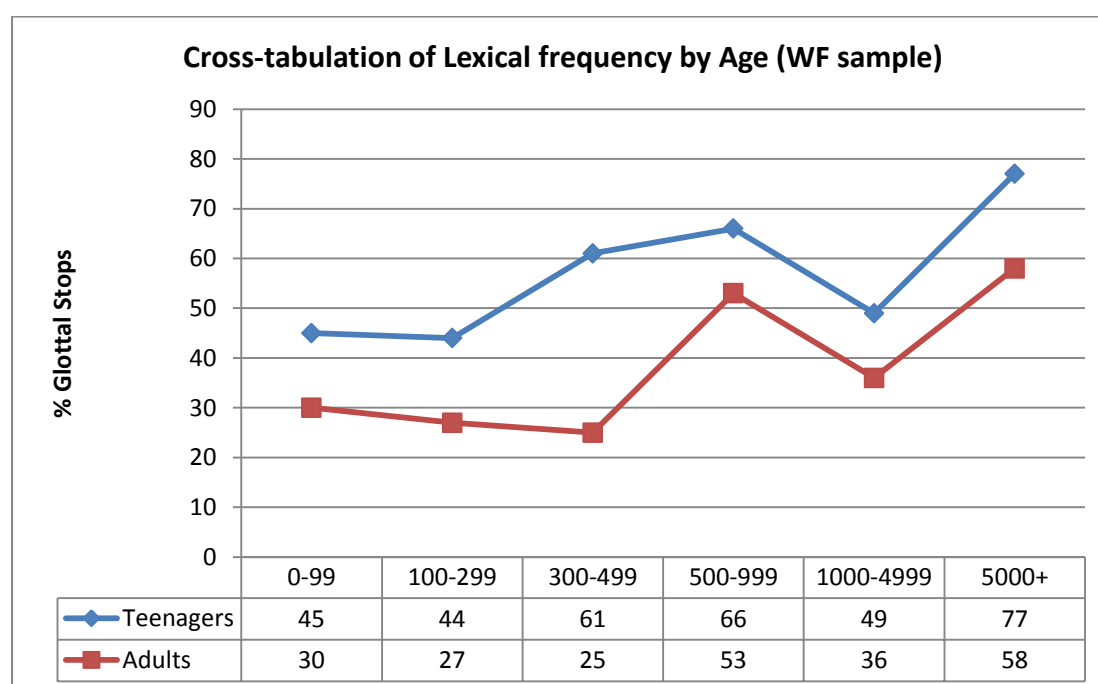
Figure 5.28 WF t-glottalling by Lexical Frequency and Age

5.3.7.4 Lexical frequency and Type of school

In these final cross-tabulations of lexical frequency, we will see how this linguistic factor group interacts with the social factor group type of school in terms of t-glottalling, for the word-medial and word-final samples. Regarding the word-medial dataset (figure 5.29), RP speakers from the private non-boarding school display the highest rates of t-glottalling in terms of lexical frequency (for the three frequency bands), followed closely by RP informants of the comprehensive school, and in a considerable distance, we find the most socially exclusive school, the private boarding, which displays extremely low rates of t-glottalling in relation to lexical frequency.

If we look at the highest frequency band for the word-medial sample 500-999 (figure 5.29), we observe the largest difference for the rates of t-glottalling in terms of type of school, with the private non-boarding school displaying a 31% rate, the comprehensive school a 27% rate and the private boarding school an extremely low 2% rate. Thus, with regard to lexical frequency, RP speakers from the private non-boarding and comprehensive schools seem to be more influenced by high frequent words containing medial (t), whereas RP informants from the private boarding school appear to be resistant to the influence of high frequency words that contain medial (t).

Cross-tabulation of Lexical frequency by Type of school (WM sample)
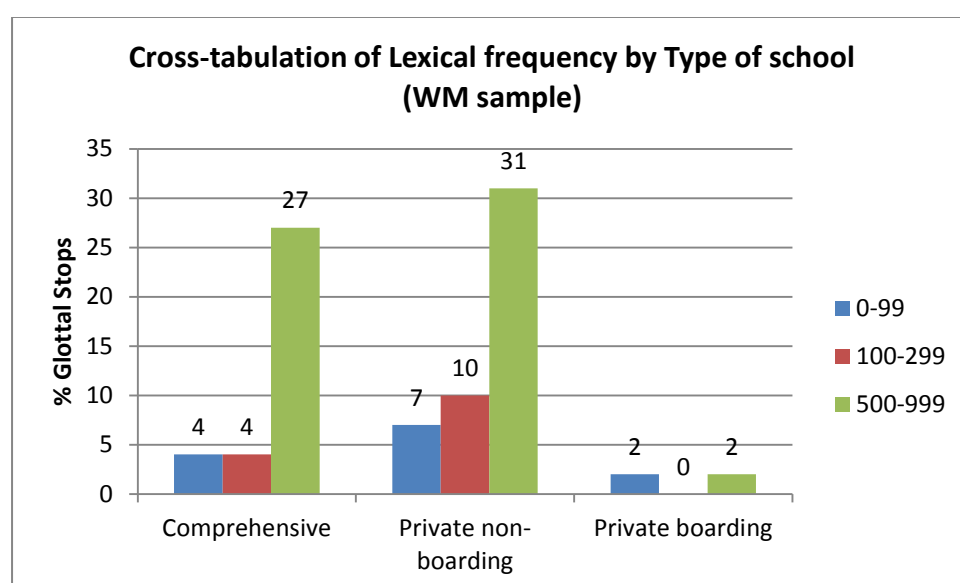
Figure 5.29 WM t-glottalling by Lexical Frequency and Type of school

As for the word-final sample (figure 5.30), we can observe how the private boarding school also displays a complete separate pattern in terms of the rates of t-glottalling in relation to lexical frequency, as we have previously seen in the results for the word-medial sample. In word-final contexts, the private boarding school also has the lowest rates of t-glottalling in terms of lexical frequency, for all the six frequency bands. Regarding the two other schools, which have much higher rates of t-glottalling, they pattern together in the rates of t-glottalling in the three highest lexical frequency bands (500-999, 1000-4999 and 5000+) in word-final contexts, whereas in the three lowest lexical frequency bands (0-99, 100-299 and

300-499), the private non-boarding school is slightly ahead in the rates of t-glottalling than the comprehensive school, in word-final environments.

Cross-tabulation of Lexical frequency by Type of school (WF sample)

	0-99	100-299	300-499	500-999	1000-4999	5000+
Comprehensive	45	32	47	70	51	79
Private non-boarding	52	56	58	73	53	75
Private boarding	16	22	35	32	24	46
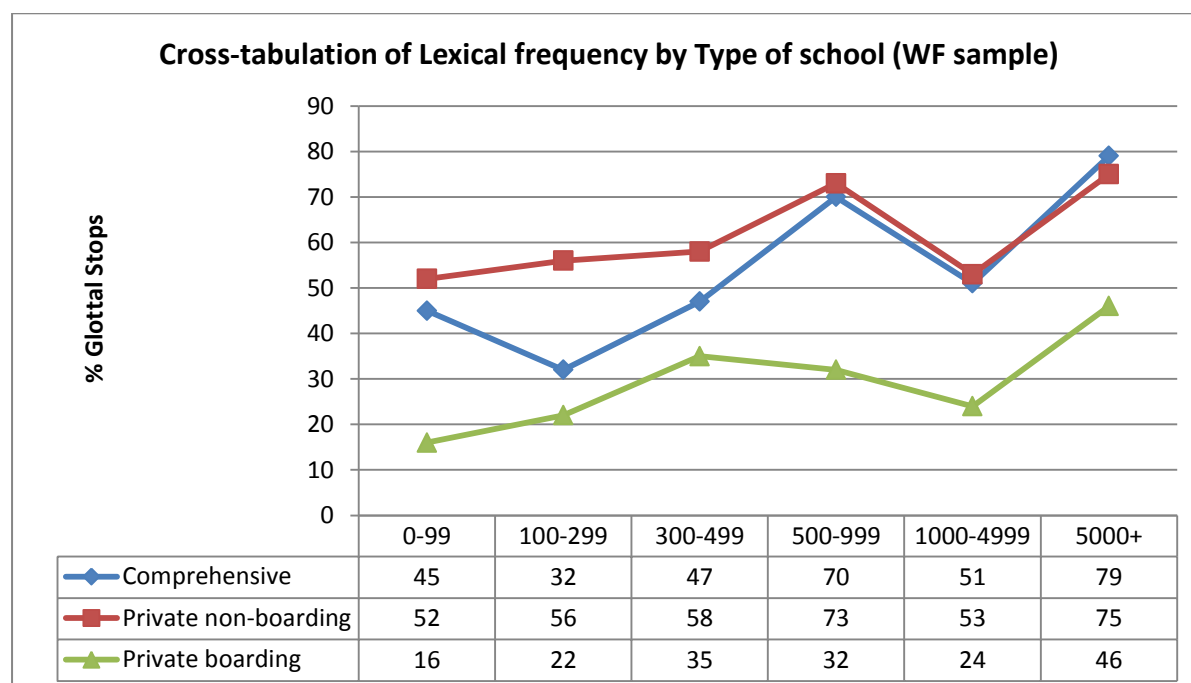
Figure 5.30 WF t-glottalling by Lexical Frequency and Type of school

If we look at the highest frequency band for the word-final sample 5000+ (figure 5.30), we can notice how the comprehensive and private non-boarding schools pattern together, with a 79% and 75% rate of t-glottalling respectively, whereas the private boarding school falls much behind, with a 46% rate of t-glottalling, making it a difference of 30% with respect to the other two schools. Therefore, in terms of lexical frequency, as we have seen in the word-medial sample, RP informants from the comprehensive and private non-boarding schools appear to be more open to influences of high frequent words containing final (t), whereas RP speakers from the private boarding school seem to be in a social environment which is more resistant to the influence of high frequent words containing final (t).

In section 5.3.10, in the description and discussion of the results for t-glottalling for the type of school social factor group, I explore further the social make up of these three schools and

discuss why the comprehensive and private non-boarding school are more open to external linguistic influences rather than the private boarding school, which belongs to a very enclosed social environment, which considerably resists external linguistic influences.

5.3.8 Gender

After having described and discussed the results of the multivariate analyses and the cross-tabulations for all the linguistic factor groups included in this research of t-glottalling in RP (style, following phonological environment, preceding phonological environment, grammatical category, stress, number of syllables and lexical frequency), I now turn to discuss the three social factor groups of this sociolinguistic analysis. In this section I describe and discuss the results of the multivariate analyses for gender, for the word-medial and word-final samples, for t-glottalling in RP, and in the next two sections, I describe and discuss the results for age (section 5.3.9) and type of school (section 5.3.10).

Gender emerged as a significant factor group, for both the word-medial and word-final datasets. In the multivariate analysis for the word-medial sample, gender was the 5th most significant factor group, out of a total of 6 factor groups. Regarding the word-final dataset, gender was the 4th most significant factor group (out of a total of 8 factor groups) in the multivariate analysis. Males favour the glottal stop in word-medial position more than females, with a probability of .62. Females, on the other hand, disfavour t-glottalling in word-medial position, with a probability of .33 (table 5.23 and figure 5.31). However, the rates are low for both[41].

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[41] The percentage rates in table 5.23 for *gender* are low because the input of the multivariate analysis for the word-medial dataset is also very low (0.008). That explains the low percentages generally found in the WM analysis.

Contribution of gender to the probability of word-medial (WM) t-glottalling in RP			
Input 0.008 Log likelihood -159.000			
Chi-square/cell = 0.72			
Total N 1105			
FACTOR GROUP	Factor Weight	%	N
Gender male female *Range*	.62 .33 *29*	7.3 5.3	634 471

Table 5.23 Contribution of gender to the probability of WM t-glottalling in RP

Figure 5.31 Gender: probability of word-medial t-glottalling

Regarding the word-final sample, as table 5.24 shows, males also favour t-glottalling more in word-medial contexts, with a probability rate of .58, whereas females disfavour the glottal stop with a probability of .40 (see figure 5.32 for a visual display of the data).

Contribution of gender to the probability of word-final (WF) t-glottalling in RP			
Input 0.556			
Log likelihood -1892.532			
Chi-square/cell = 1.41			
Total N 4140			
FACTOR GROUP	Factor Weight	%	N
Gender			
male	.58	55.6	2173
female	.40	55.5	1967
Range	*18*		

Table 5.24 Contribution of gender to the probability of WF t-glottalling in RP
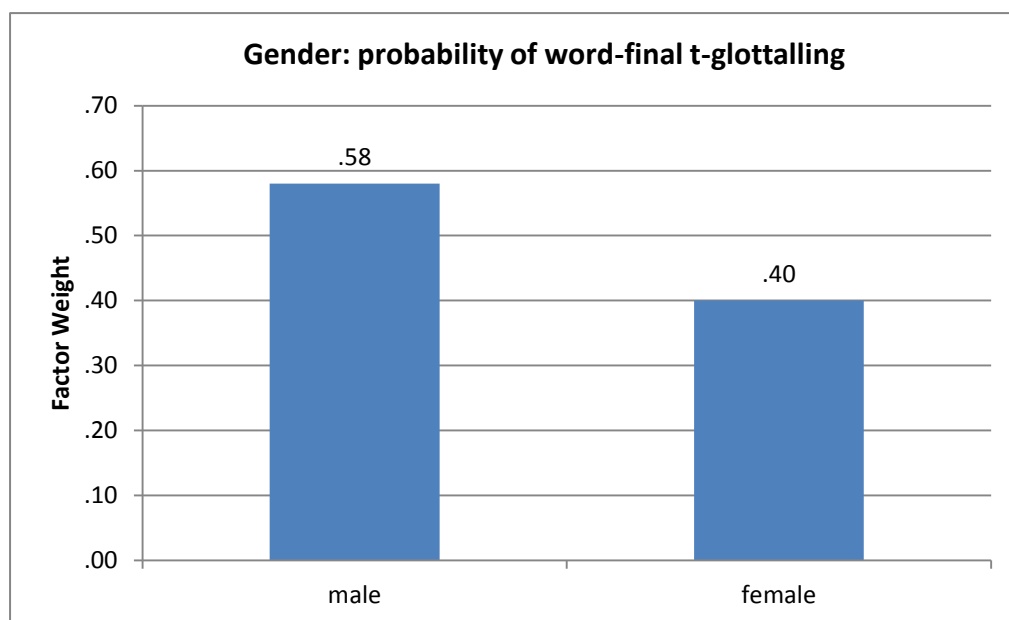
Figure 5.32 Gender: probability of word-final t-glottalling

As we have seen in the description of the results, gender has emerged as a significant social factor group, both in word-medial and word-final contexts, for t-glottalling in RP. Males seem to be ahead in the production of the glottal stop in RP and females seem to be a bit behind.

Results on the behaviour of gender in previous studies of t-glottalling, either for RP or other English accents, seem to vary from study to study. For instance, while some studies find a gender difference, others do not. In terms of the RP accent, Fabricius (2000) found no difference in her speakers in terms of gender. Thus, my results differ from hers in that respect. Altendorf's study (2003) only analysed the speech of females, so we cannot compare our results with hers. As for Przedlacka's (2001, 2002) study, she only looked at two male RP speakers, so we cannot compare our results with hers either in terms of gender.

For studies on other British accents, such as Williams and Kerswill's (1999) research on Reading, Milton Keynes and Hull, they did find a gender difference in their informants in the production t-glottalling, as well as those studies of Collins and Mees (1999) on Cardiff English, Milroy et al. (1994) on Newcastle English and Holmes (1995) on New Zealand English. Schleef (2013) and Stuart-Smith et al. (2007), on the other hand, did not discover a significant difference in terms of gender in their data of t-glottalling for Edinburgh/London and Glasgow English respectively.

How can these differences in the results for gender be explained? Foulkes and Docherty (2007) argue that early studies in sociolinguistics, such as Trudgill (1974), show that men produce more vernacular forms than women, and women's speech tends to be more influenced by the norms of the standard language. Later studies, however, showed that the gender difference in speech could be explained in relation to a local/supralocal dimension (Milroy and Milroy 1985). This view argues that "men are typically more oriented to local norms, while women show more extensive usage of forms with supralocal currency, whether or not these are aligned with the standard language" (Foulkes and Docherty 2007).

Milroy et al. (1994) argue in their study of glottalisation in Newcastle that the glottal stop has become a supra-local form in its use and it is now widespread across most British accents and other English accents. They claim that early studies in t-glottalling suggested

that the glottal stop was a male norm, with a long-standing negative social evaluation. However, they state that this male norm is not found where glottalisation is emerging as an innovation or it is increasing. Indeed, in their study of t-glottalling in Newcastle, Milroy et al. (1994) found that females favoured the stigmatised variant (glottal stop) instead of reacting against it.

Other studies have found similar results: Collins and Mees (1999) on Cardiff English, Holmes (1995) on New Zealand English and Williams and Kerswill (1999) on Reading, Milton Keynes and Hull English. Thus, according to Milroy et al. (1994), females seem to be instrumental in diffusing the glottal stop and they argue that females do not favour prestige forms, but they create them (the forms that females favour become prestige norms). Female speakers, then, are instrumental in the diffusion of supra-local changes in the direction of a supra-local prestige norm.

Finally, in terms of gender, it must be noted that in the teenagers' sample of the present research females are absent from the most elitist boarding-only private (public) schools, whereas there are females present in the private non-boarding schools and the comprehensive schools. This imbalance of the data is due to the non-existence of high-prestige girls-only public schools. As we have seen in Chapter 1 (section 1.2), the major public boarding schools in England were originally and still are only male, as the main objective of these schools was to educate the sons of the British elite and not the daughters.

Regarding the possible effect that this data imbalance may have had in the analysis of gender, I would predict that if these top girls-only boarding schools actually existed, the linguistic isolation effect I have found in the most prestigious male-only boarding schools would most likely be the same. As we have seen in the cross-tabulations when Type of School was taken into account, the most elitist private boarding school consistently displayed the lowest amounts of t-glottalling in relation to all the linguistic factor groups analysed. Furthermore, in section 5.3.10, where the results of type of school are presented and discussed, I will argue that the most socially exclusive school, the private boarding

school, belongs to a very enclosed social environment, which considerably resists external linguistic influences.

However, as we have previously commented, the results of gender when it comes to t-glottalling are not so straightforward in variationist studies, either for RP or other English accents. In the present research, the effects of gender seem to be much less strong than the effects of age (section 5.3.9) and type of school (section 5.3.10). Even though males favour t-glottalling more than females in WM and WF position for t-glottalling in RP, this gender difference is not very wide, as we have seen in the cross-tabulations in previous sections of Chapter 5.

It seems that t-glottalling in RP is not an incoming prestigious supra-local feature favoured by female speakers like it is in the case of Cardiff English (Collins and Mees 1999) and New Zealand English (Holmes 1995). Indeed, authors such as Collins and Mees (1996) argue that glottalisation (pre-glottalisation and glottal replacement) had been a feature of English upper-class speech as far back as the mid 19th century, even though it is now clearly on the increase and expanding to previously less favourable phonological environments. Therefore, nothing in the literature reviewed suggests that elite RP females are likely to be innovators favouring glottals ahead of males.

5.3.9 Age

In this section, I present and discuss the results of t-glottalling for age in RP. In the multivariate analyses, age only came up as a significant factor group in the word-final sample, whereas for the word-medial dataset, age emerged as a non-significant factor group. In the hierarchy of significant factor groups for the word-final sample, age emerged as the 6th most significant factor group out of a total of 8 significant groups. There seems to be a clear division between teenagers and adults in the production of the glottal stop across word boundaries. Teenagers clearly favour the glottal stop in this context with a .59

probability, whereas adults clearly disfavour the use of the glottal stop with a probability of .39 (table 5.25 and figure 5.33).

Contribution of age to the probability of word-final (WF) t-glottalling in RP			
Input 0.556 Log likelihood -1892.532			
Chi-square/cell = 1.41			
Total N 4140			
FACTOR GROUP	Factor Weight	%	N
Age teenagers adults *Range*	.59 .39 *20*	62.6 47.9	2163 1977

Table 5.25 Contribution of age to the probability of WF t-glottalling in RP

Figure 5.33 Age: probability of word-final t-glottalling
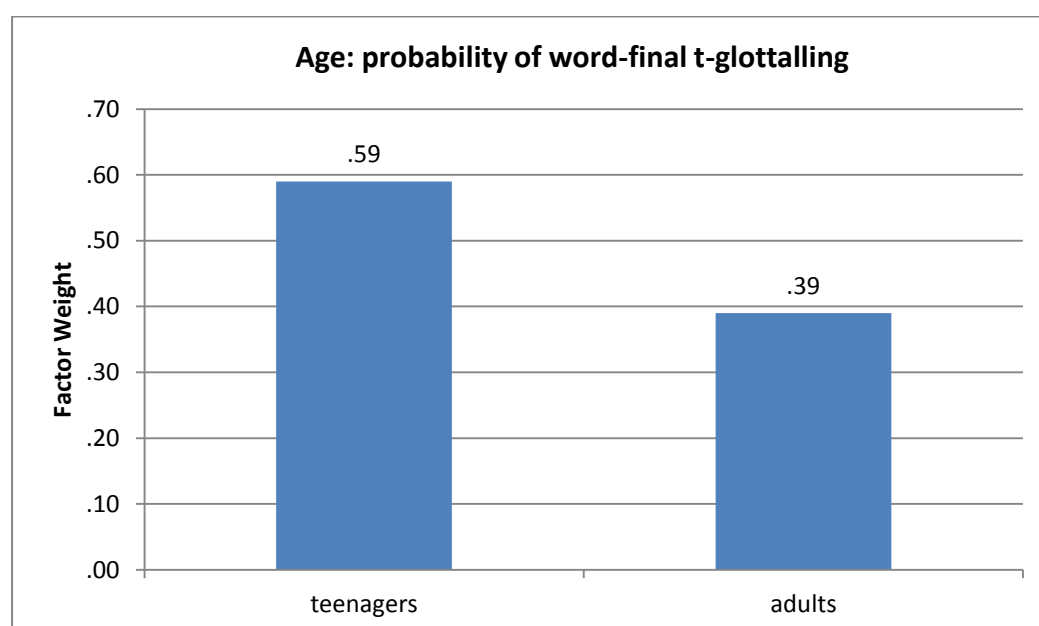
Contrary to gender, which we have previously seen that has produced heterogenous results for t-glottalling, when it comes to age, most studies (if not all) show an age difference in the variability of the glottal stop in British accents, with younger speakers favouring the glottal stop much more than older generations of speakers. Foulkes and Docherty (2007) state how

the adolescent peer group is key in the transmission of vernacular forms. They claim that "adolescence is a time at which conformity to the peer group norms becomes especially important. The vernacular takes on a special role: its use becomes symbolic of the construction of identity, a means by which adolescents can align themselves with some speaker groups and differentiate themselves from others" (Foulkes and Docherty 2007: 57).

Indeed, Williams and Kerswill's (1999) study on Reading, Milton Keynes and Hull showed that adolescents displayed the greatest use of vernacular forms. Williams and Kerswill (1999) argue that a set of consonantal variables, which have originated in London, have been spreading very rapidly across British accents and they have been adopted mainly by young speakers. Among such consonantal features, there are t-glottalling and TH-fronting. They claim that these consonants "seem to constitute a set of "youth norms" adopted by young people in many areas of Great Britain" (Williams and Kerswill 1999: 159).

As for the results for the RP informants in this research, we have seen that age has come up as a significant factor group in the multivariate analysis, but only for word-final position, and not for word-medial position. In word-final contexts, teenagers visibly favour t-glottalling, whereas adults appear to disfavour the glottal stop. Therefore, it seems that the glottal stop is in a more advanced stage and more widely spread in the speech of the RP teenagers, rather than in the speech of their older counterparts. These results are in line with the previous findings on age variation for t-glottalling in British accents. However, it must be noticed that our results for RP in terms of age cannot be compared to those of Fabricius (2000), as in her study she only looked at one age group and not two.

Indeed, in the cross-tabulations of the linguistic factor groups with age, the age difference in terms of t-glottalling in RP was very consistent, with teenagers showing much higher rates of glottal stops than adults, when it comes to style, following phonological environment, preceding phonological environment, number of syllables and lexical frequency. Thus, it

seems that the youngest generations of RP speakers, those who are in their teenage years, are instrumental in the diffusion of t-glottalling in RP.

In the cross-tabulation of age and type of school, I discovered a small gap in the data. There are no data from adults who formerly went to the London private non-boarding school and therefore data from adults belong only to the private boarding school and the comprehensive school, which are both located in Hampshire. In terms of teenagers though, the data are spread across the three schools. This gap was found three months before submission of this thesis. I contacted the girl who had put me in touch with the London school, but it was not possible to reach her. I obtained no response. Thus, it was decided that it was too late in order to be able to collect, transcribe, code and analyse adult data from the London school. For future publication purposes though, these extra data from adults from the London school will be collected and I will have to use other paths in order to have access to these data, possibly by contacting the ex-alumni society of the school.

This small gap in the data has an effect for the results of gender and age obtained in this research. In terms of gender, the apparent overall gender pattern is an artefact and it does not exist. The overall results for gender show that males glottal slightly more, but in the cross-tabulations, the gender pattern is not very robust and males either glottal slightly less or a lot more. This is a bimodal distribution. As for age, we can't fully confirm whether there is a distinct age pattern at the London private non-boarding school.

5.3.10 Type of school

In this last section, I describe and discuss the results of t-glottalling in RP for type of school, for both the word-medial and word-final samples. As stated in section 4.5, in the methodology chapter, type of school has been considered in this research as a proxy for social class. In the multivariate analyses, type of school emerged as the second most significant factor group, for both the word-medial (out of 6 factor groups) and word-final

(out of 8 factor groups) datasets. Therefore, type of school has the strongest contribution towards the variability of t-glottalling in RP after style and it is the most important of all the three social factor groups.

In table 5.26 and figure 5.34, we can observe that RP speakers from the private non-boarding school are the group that favours t-glottalling the most in word-medial position, with a probability of .72, whereas RP speakers from the private boarding school are the ones who disfavour the glottal stop the most, with a .19 probability rate. As for the RP informants from the comprehensive school, they also favour t-glottalling in word-medial contexts and they fall in an in-between position in relation to the other two schools, with a probability rate of .65.

Contribution of type of school to the probability of word-medial (WM) t-glottalling in RP			
Input 0.008			
Log likelihood -159.000			
Chi-square/cell = 0.72			
Total N 1105			
FACTOR GROUP	Factor Weight	%	N
Type of school			
private non-boarding	.72	11.7	266
comprehensive	.65	7.5	455
private boarding	.19	1.6	384
Range	53		

Table 5.26 Contribution of type of school to the probability of WM t-glottalling in RP
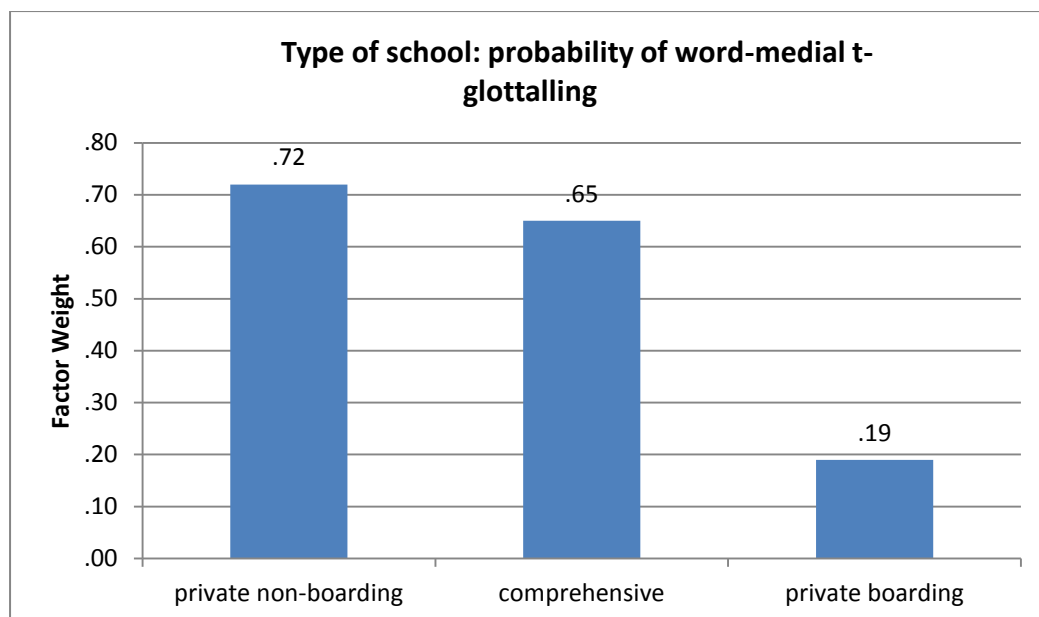
Figure 5.34 Type of school: probability of word-medial t-glottalling

As for the word-final sample (table 5.27 and figure 5.35), now it is RP speakers from the comprehensive school who favour t-glottalling the most, with a probability of .67, whereas this time RP informants from the private non-boarding school fall in an in-between category, with a .53 probability, also favouring t-glottalling in word-final position. With respect to RP speakers from the private boarding school, they are also the group that disfavours the glottal stop the most with a .24 probability rate in word-final contexts, as we have seen in the word-medial results.

Contribution of type of school to the probability of word-final (WF) t-glottalling in RP			
Input 0.556 Log likelihood -1892.532			
Chi-square/cell = 1.41			
Total N 4140			
FACTOR GROUP	Factor Weight	%	N
Type of school comprehensive private non-boarding private boarding *Range*	.67 .53 .24 *43*	65.2 65 34.9	1740 1092 1308

Table 5.27 Contribution of type of school to the probability of WF t-glottalling in RP

Type of school: probability of word-final t-glottalling

```
.80 ┤
.70 ┤        .67
.60 ┤       ┌───┐
.50 ┤       │   │      .53
.40 ┤       │   │     ┌───┐
.30 ┤       │   │     │   │          .24
.20 ┤       │   │     │   │         ┌───┐
.10 ┤       │   │     │   │         │   │
.00 ┤───────┴───┴─────┴───┴─────────┴───┴───────
     comprehensive  private non-boarding  private boarding
```

Figure 5.35 Type of school: probability of word-final t-glottalling

As stated in Chapter one, one of the main objectives of this thesis was to study RP where historically it has been nurtured and perpetuated: the major public boarding schools. Moreover, as we have discussed in chapter three, the British education system still shows sharp divisions in terms of social class (Cannadine 1999, Reay 2006, Bell 2013). Therefore, type of school was selected as a key social factor group to be included in the analysis and it was considered as a proxy for social class. I was interested in comparing RP speakers from an upper-middle class background in private schools (boarding and non-boarding) to RP speakers from a middle-class background, in a comprehensive school in a prosperous rural area in Southern England (for more details about the schools and schools' selection see chapter four, section 4.2).

Indeed, when we look at the results obtained in the multivariate analyses, type of school has emerged as the second most significant factor group after style for the variability of t-glottalling in RP, both word-medially and word-finally, making it the most significant social factor group and a crucial factor group overall to understand the variable nature of the

glottal stop in RP. In the cross-tabulations of the linguistic factor groups (style, following phonological environment, preceding phonological environment, number of syllables and lexical frequency) with type of school, the school difference in terms of t-glottalling in RP shows very consistent and very robust effects. In word-medial contexts, RP informants from the private non-boarding school are usually leading in the rates of t-glottalling, followed by the comprehensive RP speakers. On the other hand, in word-final settings, the results for these two schools are inverted and it is now the RP speakers from the comprehensive school who lead, usually followed closely by the private non-boarding RP informants. Regarding the RP speakers from the private boarding school, both word-medially and word-finally, they always consistently show the lowest rates of t-glottalling, with consistently broad stratification.

Altendorf (2003), in her study of teenagers in London, also found a difference in terms of school for t-glottalling, for her RP informants. However, her study was only limited to 10 female speakers and her dataset for t-glottalling for RP London informants was rather small, as the main focus of her thesis was the analysis of Estuary English. In any case, my research also shows a difference in the rates of t-glottalling for RP speakers in terms of type of school, along the lines of Altendorf's (2003) findings, but with a more detailed exploration of the relationship of type of school and the linguistic factor groups presented in the cross-tabulations in previous sections.

Of the five cross-tabulations presented for type of school, two have given very revealing findings. In the cross-tabulation of type of school with following phonological environment (section 5.3.2.4), we argued that it is the private non-boarding school who is leading the change in the WF pre-pausal environment and regarding the WF pre-vocalic (back vowels) environment, it is the comprehensive school who is ahead in the change. Therefore, speakers with the lowest social profile (those belonging to the comprehensive school) are the ones who are driving the progression of the glottal stop within the RP speech community in the WF pre-vocalic (back vowels) environment and speakers from the school with the in-between social profile (private non-boarding school) are also leading the

advancement of t-glottalling within the RP speech community in the WF pre-pausal context; two environments which have often been treated as non-favourable and "stigmatised" by the literature of RP. Moreover, in the cross-tabulation of type of school with following phonological environment, we saw that speakers with the highest social profile (those belonging to the private boarding school) are the ones who are resisting the progression of the glottal stop within the RP speech community in the WF pre- vocalic (front and central vowels) environment; an environment which has also traditionally been considered as "stigmatised" by the literature of RP.

Regarding word-medial contexts, the cross-tabulation of type of school and following phonological environment revealed that RP speakers remain conservative and change is not visible, and that the percentage rates for t-glottalling are much lower overall than those found in word-final environments. However, we observed how the private non-boarding school, which is located in London, is well ahead in the production of t-glottalling in the WM following front vowel/central vowel and WM following syllabic /l/ phonological environments. These two contexts have often been considered as non-favourable and "stigmatised" in the literature of RP (Wells 1982, Wells 1997, Cruttenden 2001, Trudgill 2005, Altendorf 2003, Tollfree 1999).

Such results for word-medial t-glottalling could be explained in terms of the geographical location of the schools. The private non-boarding school selected for this study is located in the outskirts of London (South-West), whereas the comprehensive school and the private boarding school are located in Hampshire, much further away from London. The closer proximity of the private non-boarding school to London, where the diffusion of t-glottalling seems to be much more advanced in some contexts, such as in word-medial position (Cruttenden 2001, Altendorf 2003, Tollfree 1999), could account for the fact that the RP informants from the private non-boarding school display higher rates of t-glottalling in word-medial contexts than their counterparts from the comprehensive school and the private boarding school, that are both located in Hampshire, much further away from London.

The other cross-tabulation that has proven revealing is type of school with lexical frequency (section 5.3.7.4). The cross-tabulation unveiled that in word-medial contexts RP speakers from the private non-boarding school display the highest rates of t-glottalling in terms of lexical frequency, followed closely by RP informants of the comprehensive school, and in a considerable distance, we found the most socially exclusive school, the private boarding, which displays extremely low rates of t-glottalling in relation to lexical frequency. Furthermore, when looking at the highest frequency band for the word-medial sample (500-999), we could observe the largest difference for the rates of t-glottalling in terms of type of school. Therefore, in relation to lexical frequency, RP speakers from the private non-boarding and comprehensive schools seem to be more influenced by high frequent words containing medial (t), whereas RP informants from the private boarding school appear to be resistant to the influence of high frequent words that contain medial (t).

In word-final contexts, the private boarding school also displays the lowest rates of t-glottalling in terms of lexical frequency, for all the six frequency bands. Regarding the two other schools, which have much higher rates of t-glottalling, they pattern together in the rates of t-glottalling in the three highest lexical frequency bands (500-999, 1000-4999 and 5000+). Thus, in terms of lexical frequency, as in the word-medial sample, RP informants from the comprehensive and private non-boarding schools seem to be more open to influences of high frequency words containing final (t), whereas RP speakers from the private boarding school appear to be in a social environment which is more resistant to the influence of high frequency words containing final (t).

During the interviews, informants from the private non-boarding school, when asked about their friends and what activities they normally do with them, they mentioned that they had friends not only from the school they were attending, but also from a nearby sixth-form college (both located in South-West London). On the other hand, during the interviews in the private boarding school, students mentioned that their friends from home were also attending boarding school elsewhere in England.

Therefore, from these comments, it can be suggested that the RP teenage informants in the private non-boarding school, in their social occasions, experience contact with a wider range of teenagers from potentially different social backgrounds. However, as for the RP teenage informants from the private boarding school, they live and socialise in a very enclosed and homogeneous social setting, and their friends from home also experience the same environment, therefore having a much smaller chance to interact with speakers from more heterogeneous social backgrounds.

The sociologist Courtois (2013), as we have mentioned in Chapter 3 (section 3.2), defines these elite boarding institutions as a closed world and a microcosm, in which there is isolation and social segregation from the community where these schools are geographically located. This isolation helps to reinforce the consciousness of its pupils of being part of a separate and a superior group. Moreover, as we have seen in this chapter in the results for Type of school in relation to other linguistic factor groups, this social isolation also has linguistic effects, with RP speakers from the exclusive private boarding school always consistently showing the lowest rates of t-glottalling.

Regarding the comprehensive school, even though it is located in a prosperous rural area in Hampshire, the teenagers mentioned in the interviews that some students came from catchment areas with council housing and mostly a working-class population. Thus, even if the student population from the comprehensive school comes mainly from middle-class families, the social make-up of the school is far more heterogeneous than a private school (boarding or non-boarding).

So, not only do these three schools appear to have very different social compositions, but the contact their students have with external linguistic influences varies considerably as well. Lexical frequency may play a crucial role here. The comprehensive and private non-boarding schools are visibly more open to external linguistic influences than the private

boarding school, which seems to belong to a very enclosed social environment, which significantly resists external linguistic influences.

Thus, in this section I have shown that type of school is a key factor in explaining the variability of t-glottalling in RP, especially in relation to following phonological environment and lexical frequency, where the findings may lead to a more comprehensive understanding of language change in terms of t-glottalling in the RP accent.

5.4 Results for taps

In section 5.3, I have extensively presented and discussed the multivariate results and the cross-tabulations on the glottal variant [ʔ] of the sociolinguistic variable (t) for RP, which is the main object of study of this thesis. In this last section of chapter 5, I present some results on the tap variant [ɾ] for RP, as it displayed an interesting pattern worthy of being highlighted and commented upon. As we saw at the beginning of section 5.3, a total of 5248 tokens of (t) were examined in this research. Out of these 5248 tokens of (t), 317 tokens (6%) belong to the tap variant [ɾ] (93 tokens for the WM dataset and 224 tokens for the WF dataset).

Results for taps [ɾ] – 35 RP speakers Application value: taps Total N = 317		
FACTOR GROUP	%	N
Style Informal speech Sentences Word list	 9.5 1.4 0.2	 300 15 2
Phonological context WF pre-vocalic WM intervocalic WM syllabic /l/	 12.7 11.2 9.2	 224 73 18

WM Lexical frequency		
100-299	10.8	27
300-499	9.0	18
0-99	7.3	48
WF Lexical frequency		
500-999	11.8	47
100-299	8.6	52
5000+	6.8	31
300-499	5.5	31
1000-4999	3.2	61
0-99	1.0	2
Age		
Adults	8.1	201
Teenagers	4.2	116
Gender		
Male	7.1	200
Female	4.8	117
Type of school		
Private boarding	9.6	163
Comprehensive	5.1	112
Private non-boarding	3.1	42

Table 5.28 Percentage results for taps for the 35 RP speakers

Table 5.28 shows the percentage results[42] for taps for the 35 RP speakers, including linguistic and social factor groups. After having widely analysed and discussed t-glottalling in the speech of RP speakers in section 5.3, we now turn to discuss a minor variant of (t) which was also found in the speech of these informants: taps [ɾ]. Even though it was only found in 317 tokens out of a total of 5248 tokens, the patterns found seem to be quite revealing and worth commenting upon.

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[42] The results for taps are presented only in percentages. No multivariate analysis was conducted, as the amount of data is not very large and therefore many knockouts were produced. Furthermore, the word-medial and word-final data for taps were merged, as it created a larger dataset, except for *lexical frequency*, in which the WM and WF distinction was kept for comparison purposes.

As we can observe in table 5.28, taps mainly occur in informal speech for RP speakers, with a percentage of 9.5. In terms of formal speech, taps rarely occur (1.4% for sentences and 0.2% for list of words). As for phonological environment, taps are found more frequently in word-final pre-vocalic contexts (12.7%) and word-medial intervocalic contexts (11.2%). As well, they are quite frequent in word-medial syllabic /l/ contexts (9.2%). With respect to lexical frequency, in word-medial position, the two highest frequency bands (100-299 and 300-499) promote taps the most, with a 10.8 and 9.0 percent rates respectively. As for word-final position, the effect of lexical frequency is not that straight forward, and data reveal that it is medium frequencies (500-999 with a 11.8% rate) that promote taps the most, rather than higher frequencies.

Regarding social factor groups, taps occur more frequently in the speech of the adults (8.1%), rather than in the speech of the teenagers (4.2%). In terms of gender, taps are observed more often in males' speech (7.1%) rather than in females' speech (4.8%). As for type of school, private boarding speakers display the highest rate of taps (9.6%), followed by informants from the comprehensive school (5.1%) and informants from the private non-boarding school (3.1%).

What stands out from these results for taps, found in the speech of the 35 RP speakers analysed, is the fact that taps are found most of the time in informal speech and the phonological environments[43] in which they occur. Taps are mainly accounted for in word-final pre-vocalic, word-medial intervocalic and word-medial syllabic /l/ contexts; three environments that have been traditionally regarded as "stigmatised" positions in which to produce a glottal stop for RP speakers. Therefore, the choice for taps by certain young RP speakers in these environments would indicate that they are trying to find an "in-between" variant half way between the "stigma" of the glottal stop [ʔ] and the "stiffness" of the full alveolar [t].

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[43] Examples of words displaying taps in the WM sample: *pretty, whatever, getting, little, better* and *putting*. Examples of words displaying taps in the WF sample: *quiTe a lot, a biT of, a loT of, buT it was, we goT everything, buT again, buT I've been, I'm noT a fan, whaT I really like, thaT I want, whaT iT is, people thaT are, I goT a job, noT exactly, iT is important.*

In terms of the social factor groups, it is interesting the distribution of taps according to the type of school. According to the results, it seems that the RP informants that use taps the most in their speech are the ones from the most socially exclusive school, the private boarding school. This is quite revealing, as in terms of t-glottalling, as we have extensively reported in section 5.3, RP speakers from the private boarding school have consistently displayed the least amount of t-glottalling in their speech in relation to the different linguistic factor groups. Besides type of school, two other social factor groups (age and gender) further reveal the social distribution of taps in RP; it is adult males who produce taps the most, with percentage rates of twice as high as teenagers and females.

In relation to the previous literature on taps, the distribution of taps in British English is not very clear and some studies report it to be mainly a feature of older male speech in the North of England (Milroy et al. 1994). As for tap variants in accents in Southern England and RP, there are almost no reports on it. Fabricius (2000) does not report any instances of taps in her analysis of t-glottalling in young RP speakers. The only study that mentions taps in a Southern English accent is Tollfree's (1999) study on South-East London English. She reports that both SELRS (South East London Regional Standard) and SELE (South East London English) speakers produce taps mainly in two environments: intervocalically across a word boundary (particularly in phrases containing commonly used lexical items such as *but I, lot of, get a, quite a, what is, that is*) and intervocalically word-internally (in items such as *getting, better*). Therefore, my results for taps in terms of phonological environment are in line with Tollfree's (1999) results for South-East London English.

Two studies of Northern English varieties, Broadbent (2008) for West Yorkshire English and Clark and Watson (2011) for Liverpool English, investigate the relationship of the variable production of taps in Northern British English with regard to lexical frequency. This phonological process is commonly referred to as *t-to-r* and Wells (1982: 370) argues that it is "a widespread but stigmatised connected-speech process in the middle and far north which involves the use of /r/ instead of /t/ in phrases such as *shut up* and *get off*".

Broadbent (2008) employs a usage-based model of phonology and she argues that *t-to-r* occurs more often in high frequency words and high frequency phrases and collocations. Broadbent (2008: 166) claims that "*t-to-r* remains in a small group of words [in West Yorkshire English] because these words are used frequently by WY speakers and because they share phonological shape. As a result, these forms can maintain lexical strength and it is only because they have lexical strength that they continue to exist". On the other hand, Clark and Watson (2011) do not seem to find the same effects for Liverpool English as Broadbent (2008) finds for West Yorkshire English. Clark and Watson (2011) argue that their *t-to*-r Liverpool data do not show gradient frequency effects, but these effects are categorical patterns. Furthermore, the Liverpool data do not show evidence that high frequency collocations promote *t-to-r* either.

In section 5.3.7, in the presentation and discussion of the results for lexical frequency for t-glottalling in RP, we saw that lexical frequency is a significant linguistic factor group for explaining the variability of the glottal stop in the RP accent, with lower frequency words and a lower presence of t-glottalling in word-medial contexts and with higher frequency words and a much higher presence of t-glottalling in word-final environments. I argued that a set of commonly occurring phrases in conversational speech contained high frequency monosyllabic words in word-final contexts, which in turn were driving the language change in the WF pre-pausal and WF pre-vocalic (back vowels) environments.

However, the influence of lexical frequency in the distribution of taps in RP is not as comprehensible as for t-glottalling. In word-medial contexts, higher frequent words seem to promote taps, but lexical frequencies in word-medial environments are still low in comparison to word-final contexts. As for word-final environments, it seems that it is medium frequency words that promote taps the most, whereas in t-glottalling it was high frequent and medium frequent words that favoured the glottal stop the most.

Thus, results of lexical frequency for taps in RP do not seem to be very conclusive and therefore, further research on it would be needed. Two tasks would probably be needed. First of all, the dataset for taps should be much larger as it is a variant not occurring as often as the glottal stop is in RP. So, more data should probably have to be collected. Secondly, frequency bandings for word-final contexts should be explored and possible causes for non-linear frequency effects hypothesised.

In any case, what is interesting about taps in RP is that they are found in phonological environments which the literature on RP has long considered as "stigmatised" for the presence of the glottal stop. Therefore, RP speakers seem to resort occasionally to taps in word-medial intervocalic, word-medial syllabic /l/ and word-final pre-vocalic contexts as an alternative to t-glottalling; most likely as an in-between substitute for the "stiffness" of the full alveolar [t] and the "roughness" of the glottal stop.

It seems that in these phonological environments, in the RP accent, two variants of (t) are competing against each other: the glottal stop [ʔ] and taps [ɾ]. However, the glottal stop is much more common than taps, and as we have seen in the analysis and discussion of t-glottalling in section 5.3, the glottal stop is a common feature of the RP accent, and while it is less frequent in word-medial contexts, in word-final contexts, language change appears to be in progress, especially in the WF pre-pausal and WF pre-vocalic (back vowels) environments.

Thus, even though the glottal stop seems to be winning the space of the alveolar [t] in RP in certain contexts, the tap [ɾ] variant is perhaps also trying to make itself a space in the phonology of RP. Those at the linguistic forefront of the new tap [ɾ] variant seem to be male adults from the most socially exclusive private boarding schools, in informal speech – a group which traditionally benefited from the exclusiveness of RP. On the other hand, those at the linguistic front line for the glottal [ʔ] variant have a completely different social make-up: they are still males, and still mostly in informal speech, but they are teenagers from the

private non-boarding school (leading the change in WF pre-pausal contexts) and comprehensive school (leading the change in WF pre-vocalic -back vowels- contexts).

Conclusions

Trudgill (in Foulkes and Docherty 1999: 136) claims that t-glottalling "is one of the most dramatic, widespread and rapid changes to have occurred in British English in recent times." What is interesting of this change is that it is spreading in three directions: *socially*, from lower to higher-class accents; *stylistically*, from informal to formal speech; and *phonologically*, from more favoured to less favoured environments. In this thesis, I have found that RP speakers are also participating of this language change, but the RP accent remains peculiar in some features of this change.

Socially, RP informants from the school with highest social profile (private boarding) are considerably resisting t-glottalling in both word-medial and word-final contexts. On the other hand, RP informants from the other two schools, private non-boarding and comprehensive, indeed show progression in the rates of t-glottalling, mainly word-finally.

Stylistically, t-glottalling is not progressing in word-medial contexts, but in word-final contexts for RP speakers. In word-medial contexts, for the three styles (informal speech, sentences and word list), the overall rates are very low and RP speakers do clearly style-shift in their production of t-glottalling. As for word-final contexts, the overall rates of glottal stops are much higher (especially in informal speech) and even if RP speakers also style-shift, there is a significant increase in the sentences formal context, where change may happen, led by the London private non-boarding school teenagers.

Phonologically, T-glottalling is also spreading to less favourable environments in RP, but mainly in word-final contexts, as in word-medial contexts, RP remains still very conservative for the glottal stop and change is not visible. WM syllabic /l/ and WM intervocalic remain as non-favourable environments for t-glottalling in RP and it is speakers from the school with the highest social profile (private boarding) who are resisting the glottal stop the most in

these contexts. However, RP speakers from the London private non-boarding school are more advanced in word-medial pronunciations of t-glottalling in environments that are less favourable for RP speakers elsewhere.

Word-finally, though, RP is experiencing language change and t-glottalling is progressing in two environments: WF pre-pausal and WF pre-vocalic (back vowels). Type of school and age are two crucial social factors in explaining these phonological developments: teenagers from the London private non-boarding school are leading the change in progress in the WF pre-pausal context and teenagers from the Hampshire comprehensive school are leading the change in progress in the WF pre-vocalic (back vowels) context.

Moreover, the change in progress in the WF pre-pausal and WF pre-vocalic (back vowels) contexts is being influenced by a set of commonly occurring phrases in informal speech, which contain high frequency monosyllabic words. On the other hand, in word-medial contexts, (t) tokens mostly belong to low frequency words, therefore possibly contributing to the slow progression of t-glottalling in these environments.

Thus, RP as an accent remains conservative in word-medial environments in terms of t-glottalling, but is innovative in word-final contexts, especially in WF pre-pausal and WF pre-vocalic (back vowels), where the glottal stop is progressing at a fast rate. Therefore, it is important to study RP form a quantitative sociolinguistic point of view because we have seen in this research that this speech community also participates in language change.

Social differentiation within RP in terms of t-glottalling is retained by differences in frequency and distribution of the glottal variant in different phonetic contexts by different social sectors of this speech community. The private boarding school, which is the most socially exclusive of the three schools, consistently displays lower rates of t-glottalling across the linguistic and social factor groups analysed. Thus, in a way, these findings for the private

boarding school confirm the historical accounts of RP in the major public (private) boarding schools (Mugglestone 2003), which have contributed to create a socially isolated linguistic setting for the RP accent, resisting linguistic innovations much more than RP speakers found in other educational settings, such as private non-boarding schools and comprehensive schools.

Hence, this research has discovered that the most elitist sectors of RP, those belonging to the upper-classes, who have attended the major public (private) boarding schools, are considerably resisting the influence of linguistic innovations such as t-glottalling in certain environments (mostly word-medially, but also word-finally). On the other hand, those RP speakers from the upper-middle classes and middle-classes, which have attended private non-boarding schools and outstanding rated comprehensive schools in prosperous areas in Southern England, are the speakers of the RP speech community more open to the influence of linguistic innovations and the ones who are driving the language changes in RP in terms of t-glottalling, especially in word-final environments (WF pre-pausal and WF pre-vocalic –back vowels-).

Besides t-glottalling, which is the main object of study of this thesis, a minor variant of (t) has also been discovered in the analysis of RP speakers: taps [ɾ]. Two facts are interesting about taps in RP. First of all, they are found in phonological environments traditionally considered as "stigmatised" for t-glottalling in the literature of RP, such as word-medial intervocalic, word-medial syllabic /l/ and word-final pre-vocalic contexts. RP speakers seem to resort to taps as an alternative to t-glottalling, probably as an in-between substitute for the "stiffness" of the full alveolar [t] and the "roughness" of the glottal stop. Secondly, those RP speakers leading the new tap [ɾ] variant appear to be male adults from the most socially exclusive private boarding schools, in informal speech; a completely different social make-up from the speakers who are leading the glottal [ʔ] variant (male teenagers from the private non-boarding and comprehensive schools).

This thesis has addressed three research questions:

What is the current state of t-glottalling in young RP?

Are there any differences in terms of t-glottalling between RP middle-class youth and RP upper-middle and upper-class youth?

Are there any changes in progress in young RP?

This research has shown that the current state of t-glottalling is that of a well-established feature in RP, but mainly in word-final contexts, as in word-medial contexts, the rates of glottal stops remain very low for RP speakers. I also have found significant differences for t-glottalling between middle, upper-middle and upper-class RP speakers, with those belonging to the most socially exclusive group of RP speakers (upper-class) consistently displaying much lower rates of glottal stops word-medially and word-finally than those RP speakers belonging to the middle and upper-middle class sectors. As for the third research question, this thesis has unveiled some changes in progress in the RP accent: the progression of t-glottalling in word-final environments (WF pre-pausal and WF pre-vocalic – back vowels-) and the increasing usage of the tap variant.

Moreover, this thesis has provided a discussion about how language variation as a discipline has incorporated notions of social class in their sociolinguistic studies, by analysing how sociolinguistics and the sociology of social stratification and social class have evolved theoretically and methodologically from a macro perspective towards a micro perspective. As well, I have approached RP from a sociological perspective, which has not been done before, by drawing on concepts and ideas from the sociology of education and the sociology of the elites in order to understand RP not from a linguistic perspective, but as a social accent.

RP has indeed been long neglected in the sociolinguistic literature. However, in light of the language changes found in this variationist research, I would advocate for a future research agenda on RP, looking both into vocalic and consonantal variables and prosodic, lexical and discourse aspects. The global crisis of 2008 has widened the gap between social classes and has enriched and made more powerful those at the top of the society. Therefore, the group of people who belong to the elite and the upper-classes appears to be more vibrant than ever. I believe this is also a powerful enough reason for sociolinguists to investigate the elite accents of British English and other elite English accents.

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Appendix 1

Interview questionnaire teenagers

Personal information

1. Tell me about yourself: name, age, hometown, year of study…

2. Could you describe me your hometown and where you lived before attending (boarding) school? Where did you attend primary school?

3. Tell me about your family. How many brothers and sisters do you have? How old are they? Are they studying or working? And about your parents? What age are they and what do they do?

Neighbourhood information

1. What made your parents move here? Because of work, community roots…?

2. Is this the kind of neighbourhood where people talk to each other? Do you know any of your neighbours? What are they like?

3. Is there any neighbourhood place where people get together? For a coffee/tea in the afternoon? Or a drink in the evening?

4. Do you often go to your friends' house to visit/play? And do they come to your house?

5. Which activities do you do after school? Do you do them with your school friends?

6. At the weekend, do you spend time with your school friends? What do you like doing?

7. Do boys and girls play different types of games?

School information

1. How far is school from your house? How do you get to school?

2. What do you like the best from your school? And the least?

3. What is your favourite subject? Why? And the least favourite one?

4. Do you have any teachers that are really tough? Do you have a teacher that you really like?

5. Have you ever been blamed for something you didn't do?

Module on teenagers daily life

1. Do you have lots of homework? In what subjects? How much time do you usually spend doing homework?

2. Are there any gangs/groups in your school? What are the different gangs called and who would be in them? (for instance, jocks, nerds, goths, gangstas, geeks…)

3. How can you tell if someone's in a gang/group? What do they wear? Do they speak differently? Can members of different gangs hang out together?

4. Do you spend a lot of time surfing the web? How do you communicate with your friends when you are not at school? Texting, chatting online…?

5. Do you like to chat with your friends on MSN? How much time do you spend on MSN? Do your parents let you chat as long as you like? Did you ever have an argument with a friend on MSN? What happened?

6. Do you like to play video games? How do your parents feel about it? What's your favourite game? How do you play it? What was your highest score?

7. What kind of music do you like? Have you ever been to a concert to see one of your favourite groups? How was it? Who's your favourite artist? Why?

8. Have you ever gone on a school trip? Where did you go? Did anything interesting happen?

10. Is there a bunch of kids you hang around with, that you see almost every day? Are they friends from school or your neighbourhood? Where do you hang out and what do you usually do?

Language information

1. How would you label/describe your accent? Do you speak any other languages besides English?

2. And the accent of your parents? Where do they come from? Have you and your family always lived in the same place or have you lived in other places?

4. Do you think young people's speech in the south of England is more and more influenced by London speech? If yes, in what sense?

5. A lot of people think that English has changed a lot/is changing a lot, do you think so? Have you noticed any changes?

6. Can you tell by the way people talk around here that they come from here?

7. How about the difference between old and young speakers? Do you sound the same as your parents, or do you sound differently? Do you use different words and expressions?

8. Do you speak the same when talking to your teachers and when talking to your friends at school? Or do you speak differently? In which ways?

9. Has anyone ever told you, "you sound different"? Why?

10. Have you ever tried to change the way you talk? Why? What did you do?

11. Do you think that how you sound plays a role in how others perceive you? Do you think that you try to change how you sound when you are in certain environments? Which ones? Why?

Appendix 2

Interview questionnaire adults

<u>**Personal information**</u>

1. Tell me about yourself: name, age, hometown, studies, work…

2. Could you describe me your hometown and where you lived before attending (boarding) school? Where did you attend primary school?

3. Tell me about your family. How many brothers and sisters do you have? How old are they? Are they studying or working? And about your parents? What age are they and what do they do?

4. Which memories do you have from (boarding) school? What was the school like? Was it only for boys/girls or was it mixed? And the teachers? What did you do in a normal day? Were you a member of any sports or cultural society?

5. Tell me about your friends there. Are you still in touch with them?

6. According to you, what are the advantages of studying in a boarding/state school (if any)? What did you like the most and least there (both in academic and personal terms)?

7. How was life at university? In which college/halls/house did you live? Were you a member of any society? Tell me about your friends during that time. Are you still in touch with them?

8. After university, where did you move? Where you working there?

9. Can you tell me a little bit about your daily life here in London (or other name of current living city)? Where do you work? What do you like the most of your job? Why did you choose to live in this area? How do you like spending your leisure time?

Module on Friendship

1. Do you have a bestfriend? Or a very close friend? Tell me about him/her.

Why do you think you are so close to him/her?

2. Have you ever broken a friendship with someone? Why did it end?

3. What activities do you do with your friends?

4. How important is friendship in your life? What does friendship mean to you?

5. Do you still keep friendships from you school days? Tell me about them.

6. Some people believe that a friendship between a man and a woman is not possible. What do you think? Have you ever been in such a situation?

7. Nowadays, a lot of people use new technologies, like internet, to make new friendships. What is your view on that? Do you think it can work out?

Language information

1. How would you label/describe your accent? Do you speak any other languages besides English?

2. And the accent of your parents? Where do they come from? Have you and your family always lived in the same place or have you lived in other places?

3. Do you think having a standard accent is an advantage or rather a disadvantage in your professional life? Do you think a standard accent is being less valued nowadays than some years ago?

4. Do you think young people's speech in the south of England is more and more influenced by London speech? If yes, in what sense?

5. A lot of people think that English has changed a lot/is changing a lot, do you think so? Have you noticed any changes?

6. How about the difference between old and young speakers? Do you sound the same as your parents, or do you sound differently? Do you use different words and expressions?

7. Has anyone ever told you, "you sound different"? Why?

8. Have you ever tried to change the way you talk? Why? What did you do?

9. Do you think that how you sound plays a role in how others perceive you? Do you think that you try to change how you sound when you are in certain environments? Which ones? Why?

Appendix 3

List of words

-mattress	-bit	-beat
-button	-witness	-Gatwick
-butter	-not sure	-beautiful

-quite good	-little	-meeting
-quite likely	-bottle	-that summer
-quite easy	-better	-quite big

-that!	-that man	-out there
-quite!	-that apple	
-nights	-bitter	

-that part	-water
-not funny	-put
-bit late	-not only

List of sentences

-I lost one button of my jacket.

-Can you pass me the butter, please?

-How many bottles of wine do we need for the party?

-He could do better in his exams.

-You should drink one litre of water every day.

-My plane arrives at Gatwick at 10pm.

-His jokes are not funny.

-She was a witness in that trial.

-She did quite well in her exams.

-The cake you made is quite good.

-It's quite likely that I'll come to the party tonight.

-He's a bit late for the conference.

-That man is staring at you.

-That apple was delicious.

-You look beautiful today!

-Tomorrow I have a meeting at 3pm.

-What a lovely little dog you have!

-I eat a lot and I drink a lot.

-Have you met them yet?

-She needs to get over it.

-She goes out every night.

-She's looking for a new flat.

-That summer was amazing!

-Can you get their attention?

-This house is quite big.

-She is out there, in the garden.

Appendix 4

List of the 35 informants[44]

TEENAGERS	ADULTS
Winchester College	**Private boarding school**
1.Alfred	21.Spencer
2.Harold	22.Francis
3.Luke	23.Sebastian
4.Ethan	24.Lawrence
	25.Edward
Hampton School	26.Grace
5.Michael	27.Olympia
6.Daniel	28.Victoria
7.Gabriel	
8.Andrew	**Comprehensive school**
	29.Nicholas
Lady Eleanor Holles' School	30.William
9.Lillian	31.Benjamin
10.Sofia	32.Maria
11.Lauren	33.Jasmine
12.Olivia	34.Sarah
	35.Lucy
Robert May's School	
13.Thomas	
14.Charles	
15.Adrian	
16.Sam	
17.Rachel	
18.Claire	
19.Emma	
20.Natalie	

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[44] These are not the original names. They have been changed in order to protect the informants' privacy.

Appendix 5

Coding protocol for the (t) dependent variable and the independent variables

1.Dependent variable (t)	Code	7.Grammatical category	Code
Alveolar stop [t]	t	simple noun	s
Glottal stop [ʔ]	g	proper noun	p
Pre-glottal stop [ʔt]	p	pronoun	r
Alveolar tap [ɾ]	a	adjective	j
2.Style		adverb	d
word list	l	preposition	o
sentences	b	conjunction	c
informal interview	i	verb	v
3.WM Following phonological environment		progressive verb	g
WM following consonant	m	past participle	l
WM following front vowel	o	**8.Stress**	
WM following central vowel	e	preceding stressed syllable	p
WM following back vowel	a	preceding unstressed syllable	d
WM following syllabic /l/	l	following stressed syllable	s
WM following syllabic /n/	n	following unstressed syllable	u
4.WF Following phonological environment		**9.Number of syllables**	
WF pre-stops	t	1	o
WF pre-nasals	s	2	t
WF pre-liquids	q	3	h
WF pre-fricatives/affricates	f	4	f
WF pre-glides	g	5	v
WF pre-front vowel	r	**10.Lexical frequency**	
WF pre-central vowel	c	0-99	a
WF pre-back vowel	b	100-299	b
WF pre-pausal	p	300-499	c
5.WM Preceding phonological environment		500-999	d
WM preceding front vowel	i	1000-4999	e
WM preceding central vowel	w	5000+	f
WM preceding back vowel	u	**11.Gender**	
WM preceding nasals	n	male	m
WM preceding liquids	l	female	f
6.WF Preceding phonological environment		**12.Age**	
WF preceding front vowel	f	teenagers	t
WF preceding central vowel	c	adults	a
WF preceding back vowel	b	**13.Type of school**	
WF preceding nasals	n	comprehensive	c
WF preceding liquids	l	private non-boarding	p
		private boarding	b

Appendix 6 Participants' consent form

UNIVERSITY OF ESSEX

FORM OF CONSENT TO TAKE PART IN A RESEARCH PROJECT

CONFIDENTIAL

Title of project / investigation: A Sociolinguistic Study of Young RP

Brief outline of project, including an outline of the procedures to be used:

Received Pronunciation (RP) has been widely described, although little research has been carried out on its younger speakers. Over the last few years, a new trend has been observed in young RP speakers to incorporate non-standard features in their accent. This research will analyse to what extent these features are present in the speech of young RP speakers. Class, gender and age will be the social variables involved in this project.

The present research will be carried out analysing the speech of current and former students of comprehensive and public schools. The research will consist of individual interviews of up to 45 min, involving an informal conversation with the participants about an every day topic, and they will also have to read a list of sentences and a text. As well, there will be group interviews, which will last around 45 min.

I, ... *(**participant's** full name)

agree to take part in the above named project / investigation, the details of which have been fully

explained to me and described in writing.

Signed ....   Date...
    (Participant)

I, ... *(**Investigator's** full name)

certify that the details of this project / investigation have been fully explained and described in writing

to the subject named above and have been understood by him / her.

Signed ....   Date...
    (Investigator)

Appendix 7 Cross-tabulations' tables (percentages and token numbers)

WF dataset	Word list	Sentences	Informal Interview	Total
	N - %	N - %	N - %	N - %
WF pre-pausal				
Glottal	7 – **5**	41 – **29**	310 – **77**	358 – **52**
Non-glottal	133 – 95	99 – 71	93 – 23	325 – 48
Total	140	140	403	683
WF pre-vocalic (back vowels)				
Glottal	0 – **0**	17 – **49**	237 – **69**	254 – **67**
Non-glottal	0 – 0	18 – 51	105 – 31	123 – 33
Total	0	35	342	377

Table 7.1 WF t-glottalling by Following phonological environment and Style

WM dataset	Word list	Sentences	Informal Interview	Total
	N - %	N - %	N - %	N - %
WM following consonant				
Glottal	3 – **2**	8 – **11**	3 – **100**	14 – **7**
Non-glottal	137 – 98	62 – 89	0 – 0	199 – 93
Total	140	70	3	213
WM following syllabic /n/				
Glottal	0 – **0**	3 – **9**	0 – **0**	3 – **4**
Non-glottal	35 – 100	32 – 91	3 – 100	70 – 96
Total	35	35	3	73
WM following front vowel				
Glottal	1 – **1**	0 – **0**	28 – **15**	29 – **9**
Non-glottal	69 – 99	70 – 100	158 – 85	297 – 91
Total	70	70	186	326
WM following central vowel				
Glottal	0 – **0**	0 – **0**	7 – **13**	7 – **2**
Non-glottal	140 – 100	105 – 100	46 – 87	291 – 98
Total	140	105	53	298

WM following syllabic /l/				
Glottal	0 – **0**	0 – **0**	18 – **33**	18 – **9**
Non-glottal	70 – 100	70 – 100	37 – 67	177 – 91
Total	70	70	55	195
Total				
Glottal	4 – **1**	11 – **3**	56 – **19**	71 – **6**
Non-glottal	451 – 99	339 – 97	244 – 81	1034 – 94
Total	455	350	300	1105

Table 7.2 WM t-glottalling by Following phonological environment and Style

WF dataset	Males	Females	Total
	N - %	N - %	N - %
WF pre-pausal			
Glottal	212 – **56**	146 – **48**	358 – **52**
Non-glottal	167 – 44	158 – 52	325 – 48
Total	379	304	683
WF pre-vocalic (back vowels)			
Glottal	132 – **67**	122 – **68**	254 – **67**
Non-glottal	66 – 33	57 – 32	123 – 33
Total	198	179	377

Table 7.3 WF t-glottalling by Following phonological environment and Gender

WM dataset	Males	Females	Total
	N - %	N - %	N - %
WM following consonant			
Glottal	7 – **6**	7 – **8**	14 – **7**
Non-glottal	113 – 94	86 – 92	199 – 93
Total	120	93	213
WM following syllabic /n/			
Glottal	3 – **8**	0 – **0**	3 – **4**
Non-glottal	37 – 92	33 – 100	70 – 96
Total	40	33	73
WM following front vowel			
Glottal	19 – **10**	10 – **8**	29 – **9**
Non-glottal	174 – 90	123 – 92	297 – 91
Total	193	133	326
WM following central vowel			
Glottal	6 – **4**	1 – **1**	7 – **2**
Non-glottal	165 – 96	126 – 99	291 – 98
Total	171	127	298

WM following syllabic /l/			
Glottal	11 – **10**	7 – **8**	18 – **9**
Non-glottal	99 – 90	78 – 92	177 – 91
Total	110	85	195
Total			
Glottal	46 – **7**	25 – **5**	71 – **6**
Non-glottal	588 – 93	446 – 95	1034 – 94
Total	634	471	1105

Table 7.4 WM t-glottalling by Following phonological environment and Gender

WF dataset	Teenagers	Adults	Total
	N - %	N - %	N - %
WF pre-pausal			
Glottal	253 – **64**	105 – **37**	358 – **52**
Non-glottal	143 – 36	182 – 63	325 – 48
Total	396	287	683
WF pre-vocalic (back vowels)			
Glottal	135 – **75**	119 – **61**	254 – **67**
Non-glottal	46 – 25	77 – 39	123 – 33
Total	181	196	377

Table 7.5 WF t-glottalling by Following phonological environment and Age

WF dataset	Comprehensive	Private non-boarding	Private boarding	Total
	N - %	N - %	N - %	N - %
WF pre-pausal				
Glottal	134 – **55**	148 – **69**	76 – **34**	358 – **52**
Non-glottal	108 – 45	67 – 31	150 – 66	325 – 48
Total	242	215	226	683
WF pre-vocalic (back vowels)				
Glottal	140 – **80**	66 – **69**	48 – **44**	254 – **67**
Non-glottal	34 – 20	29 – 31	60 – 56	123 – 33
Total	174	95	108	377

Table 7.6 WF t-glottalling by Following phonological environment and Type of school

WM dataset	Comprehensive	Private non-boarding	Private boarding	Total
	N - %	N - %	N - %	N - %
WM following consonant				
Glottal	7 – **8**	3 – **6**	4 – **6**	14 – **7**
Non-glottal	83 – 92	48 – 94	68 – 94	199 – 93
Total	90	51	72	213
WM following syllabic /n/				
Glottal	1 – **3**	1 – **5**	1 – **4**	3 – **4**
Non-glottal	29 – 97	18 – 95	23 – 96	70 – 96
Total	30	19	24	73
WM following front vowel				
Glottal	14 – **11**	15 – **21**	0 – **0**	29 – **9**
Non-glottal	109 – 89	56 – 79	132 – 100	297 – 91
Total	123	71	132	326
WM following central vowel				
Glottal	4 – **3**	3 – **4**	0 – **0**	7 – **2**
Non-glottal	124 – 97	72 – 96	95 – 100	291 – 98
Total	128	75	95	298
WM following syllabic /l/				
Glottal	8 – **10**	9 – **18**	1 – **2**	18 – **9**
Non-glottal	76 – 90	41 – 82	60 – 98	177 – 91
Total	84	50	61	195
Total				
Glottal	34 – **7**	31 – **12**	6 – **2**	71 – **6**
Non-glottal	421 – 93	235 – 88	378 – 98	1034 – 94
Total	455	266	384	1105

Table 7.7 WM t-glottalling by Following phonological environment and Type of school

WM dataset	Word list	Sentences	Informal Interview	Total
	N - %	N - %	N - %	N - %
WM preceding front vowel				
Glottal	3 – **1**	8 – **5**	46 – **19**	57 – **8**
Non-glottal	277 – 99	167 – 95	201 – 81	645 – 92
Total	280	175	247	702
WM preceding central vowel				
Glottal	0 – **0**	3 – **4**	1 – **20**	4 – **3**
Non-glottal	70 – 100	67 – 96	4 – 80	141 – 97
Total	70	70	5	145
WM preceding back vowel				
Glottal	1 – **1**	0 – **0**	9 – **19**	10 – **4**
Non-glottal	104 – 99	105 – 100	39 – 81	248 – 96
Total	105	105	48	258
Total				
Glottal	4 – **1**	11 – **3**	56 – **19**	71 – **6**
Non-glottal	451 – 99	339 – 97	244 – 81	1034 – 94
Total	455	350	300	1105

Table 7.8 WM t-glottalling by Preceding phonological environment and Style

WF dataset	Word list	Sentences	Informal Interview	Total
	N - %	N - %	N - %	N - %
WF preceding front vowel				
Glottal	51 – **11**	125 – **24**	877 – **70**	1053 – **47**
Non-glottal	404 – 89	400 – 76	384 – 30	1188 – 53
Total	455	525	1261	2241
WF preceding central vowel				
Glottal	0 – **0**	0 – **0**	547 – **74**	547 – **74**
Non-glottal	0 – 0	0 – 0	192 – 26	192 – 26
Total	0	0	739	739
WF preceding back vowel				
Glottal	19 – **14**	42 – **24**	640 – **76**	701 – **60**
Non-glottal	121 – 86	133 – 76	205 – 24	459 – 40
Total	140	175	845	1160
Total				
Glottal	70 – **12**	167 – **24**	2064 – **73**	2301 – 5**6**
Non-glottal	525 – 88	533 – 76	781 – 27	1839 – 44
Total	595	700	2845	4140

Table 7.9 WF t-glottalling by Preceding phonological environment and Style

WM dataset	Males	Females	Total
	N - %	N - %	N - %
WM preceding front vowel			
Glottal	34 – **8**	23 – **8**	57 – **8**
Non-glottal	368 – 92	277 – 92	645 – 92
Total	402	300	702
WM preceding central vowel			
Glottal	4 – **5**	0 – **0**	4 – **3**
Non-glottal	77 – 95	64 – 100	141 – 97
Total	81	64	145
WM preceding back vowel			
Glottal	8 – **5**	2 – **2**	10 – **4**
Non-glottal	143 – 95	105 – 98	248 – 96
Total	151	107	258
Total			
Glottal	46 – **7**	25 – **5**	71 – **6**
Non-glottal	588 – 93	446 – 95	1034 – 94
Total	634	471	1105

Table 7.10 WM t-glottalling by Preceding phonological environment and Gender

WF dataset	Teenagers	Adults	Total
	N - %	N - %	N - %
WF preceding front vowel			
Glottal	650 – **53**	403 – **39**	1053 – **47**
Non-glottal	567 – 47	621 – 61	1188 – 53
Total	1217	1024	2241
WF preceding central vowel			
Glottal	303 – **88**	244 – **62**	547 – **74**
Non-glottal	42 – 12	150 – 38	192 – 26
Total	345	394	739
WF preceding back vowel			
Glottal	401 – **67**	300 – **54**	701 – **60**
Non-glottal	200 – 33	259 – 46	459 – 40
Total	601	559	1160
Total			
Glottal	1354 – **63**	947 – **48**	2301 – **56**
Non-glottal	809 – 37	1030 – 52	1839 – 44
Total	2163	1977	4140

Table 7.11 WF t-glottalling by Preceding phonological environment and Age

WM dataset	Comprehensive	Private non-boarding	Private boarding	Total
	N - %	N - %	N - %	N - %
WM preceding front vowel *Glottal* *Non-glottal* *Total*	29 – **10** 258 – 90 287	23 – **13** 151 – 87 174	5 – **2** 236 – 98 241	57 – **8** 645 – 92 702
WM preceding central vowel *Glottal* *Non-glottal* *Total*	1 – **2** 61 – 98 62	2 – **6** 32 – 94 34	1 – **2** 48 – 98 49	4 – **3** 141 – 97 145
WM preceding back vowel *Glottal* *Non-glottal* *Total*	4 – **4** 102 – 96 106	6 – **10** 52 – 90 58	0 – **0** 94 – 100 94	10 – **4** 248 – 96 258
Total *Glottal* *Non-glottal* *Total*	4 – **1** 451 – 99 455	11 – **3** 339 – 97 350	56 – **19** 244 – 81 300	71 – **6** 1034 – 94 1105

Table 7.12 WM t-glottalling by Preceding phonological environment and Type of school

WF dataset	Comprehensive	Private non-boarding	Private boarding	Total
	N - %	N - %	N - %	N - %
WF preceding front vowel				
Glottal	495 – **54**	344 – **57**	214 – **30**	1053 – **47**
Non-glottal	430 – 46	255 – 43	503 – 70	1188 – 53
Total	925	599	717	2241
WF preceding central vowel				
Glottal	278 – **89**	162 – **84**	107 – **46**	547 – **74**
Non-glottal	36 – 11	32 – 16	124 – 54	192 – 26
Total	314	194	231	739
WF preceding back vowel				
Glottal	362 – **72**	204 – **68**	135 – **38**	701 – **60**
Non-glottal	139 – 28	95 – 32	225 – 62	459 – 40
Total	501	299	360	1160
Total				
Glottal	1135 – **65**	710 – **65**	456 – **35**	2301 – 5**6**
Non-glottal	605 – 35	382 – 35	852 – 65	1839 – 44
Total	1740	1092	1308	4140

Table 7.13 WF t-glottalling by Preceding phonological environment and Type of school

WF dataset	One-syllable words
	N - %
0-99 *Glottal* *Non-glottal* *Total*	82 – **37** 141 – 63 223
100-299 *Glottal* *Non-glottal* *Total*	26 – **37** 44 – 63 70
300-499 *Glottal* *Non-glottal* *Total*	22 – **46** 26 – 54 48
500-999 *Glottal* *Non-glottal* *Total*	298 – **60** 202 – 40 500
1000-4999 *Glottal* *Non-glottal* *Total*	528 – **41** 767 – 59 1295
5000+ *Glottal* *Non-glottal* *Total*	1249 – **67** 609 – 33 1858

Table 7.14 WF t-glottalling by One-syllable words and Lexical frequency

WF dataset	One-syllable words	Two-syllable words	Total
	N - %	N - %	N - %
Teenagers			
Glottal	1297 – **62**	57 – **69**	1354 – **63**
Non-glottal	783 – 38	26 – 31	809 – 37
Total	2080	83	2163
Adults			
Glottal	908 – **47**	39 – **62**	947 – **48**
Non-glottal	1006 – 53	24 – 38	1030 – 52
Total	1914	63	1977
Total			
Glottal	2205 – **55**	96 – **66**	2301 – **56**
Non-glottal	1789 – 45	50 – 34	1839 – 44
Total	3994	146	4140

Table 7.15 WF t-glottalling by Number of syllables and Age

WF dataset	One-syllable words	Two-syllable words	Total
	N - %	N - %	N - %
Comprehensive			
Glottal	1096 – **65**	39 – **72**	1135 – **65**
Non-glottal	590 – 35	15 – 28	605 – 35
Total	1686	54	1740
Private non-boarding			
Glottal	675 – **65**	35 – **73**	710 – **65**
Non-glottal	369 – 35	13 – 27	382 – 35
Total	1044	48	1092
Private boarding			
Glottal	434 – **34**	22 – **50**	456 – **35**
Non-glottal	830 – 66	22 – 50	852 – 65
Total	1264	44	1308
Total			
Glottal	2205 – **55**	96 – **66**	2301 – **56**
Non-glottal	1789 – 45	50 – 34	1839 – 44
Total	3994	146	4140

Table 7.16 WF t-glottalling by Number of syllables and Type of school

WM dataset	Word list	Sentences	Informal Interview	Total
	N - %	N - %	N - %	N - %
0-99				
Glottal	4 − **1**	11 − **5**	12 − **9**	27 − **4**
Non-glottal	311 − 99	199 − 95	124 − 91	634 − 96
Total	315	210	136	661
100-299				
Glottal	0 − **0**	0 − **0**	12 − **14**	12 − **4**
Non-glottal	105 − 100	105 − 100	72 − 86	282 − 96
Total	105	105	84	294
500-999				
Glottal	0 − **0**	0 − **0**	32 − **40**	32 − **21**
Non-glottal	35 − 100	35 − 100	48 − 60	118 − 79
Total	35	35	80	150
Total				
Glottal	4 − **1**	11 − **3**	56 − **19**	71 − **6**
Non-glottal	451 − 99	339 − 97	244 − 81	1034 − 94
Total	455	350	300	1105

Table 7.17 WM t-glottalling by Lexical Frequency and Style

WF dataset	Word list	Sentences	Informal Interview	Total
	N - %	N - %	N - %	N - %
0-99				
Glottal	2 – **6**	15 – **21**	71 – **56**	88 – **38**
Non-glottal	33 – 94	55 – 79	56 – 44	144 – 62
Total	35	70	127	232
100-299				
Glottal	0 – **0**	2 – **6**	25 – **69**	27 – **38**
Non-glottal	0 – 100	33 – 94	11 – 31	44 – 62
Total	0	35	36	71
300-499				
Glottal	0 – **0**	11 – **31**	11 – **85**	22 – **46**
Non-glottal	0 – 0	24 – 69	2 – 15	26 – 54
Total	0	35	13	48
500-999				
Glottal	11 – **16**	46 – **44**	241 – **74**	298 – **60**
Non-glottal	59 – 84	59 – 56	84 – 26	202 – 40
Total	70	105	325	500
1000-4999				
Glottal	34 – **11**	52 – **17**	531 – **66**	617 – **43**
Non-glottal	281 – 89	263 – 83	270 – 34	814 – 57
Total	315	315	801	1431
5000+				
Glottal	23 – **13**	41 – **29**	1185 – **77**	1249 – **67**
Non-glottal	152 – 87	99 – 71	358 – 23	609 – 33
Total	175	140	1543	1858
Total				
Glottal	70 – **12**	167 – **24**	2064 – **73**	2301 – **56**
Non-glottal	525 – 88	533 – 76	781 – 27	1839 – 44
Total	595	700	2845	4140

Table 7.18 WF t-glottalling by Lexical Frequency and Style

WF dataset	Teenagers	Adults	Total
	N - %	N - %	N - %
0-99			
Glottal	54 – **45**	34 – **30**	88 – **38**
Non-glottal	66 – 55	78 – 70	144 – 62
Total	120	112	232
100-299			
Glottal	20 – **44**	7 – **27**	27 – **38**
Non-glottal	25 – 56	19 – 73	44 – 62
Total	45	26	71
300-499			
Glottal	17 – **61**	5 – **25**	22 – **46**
Non-glottal	11 – 39	15 – 75	26 – 54
Total	28	20	48
500-999			
Glottal	160 – **66**	138 – **53**	298 – **60**
Non-glottal	81 – 34	121 – 47	202 – 40
Total	241	259	500
1000-4999			
Glottal	392 – **49**	225 – **36**	617 – **43**
Non-glottal	412 – 51	402 – 64	814 – 57
Total	804	627	1431
5000+			
Glottal	711 – **77**	538 – **58**	1249 – **67**
Non-glottal	214 – 23	395 – 42	609 – 33
Total	925	933	1858
Total			
Glottal	1354 – **63**	947 – **48**	2301 – **56**
Non-glottal	809 – 37	1030 – 52	1839 – 44
Total	2163	1977	4140

Table 7.19 WF t-glottalling by Lexical Frequency and Age

WM dataset	Comprehensive	Private non-boarding	Private boarding	Total
	N - %	N - %	N - %	N - %
0-99				
Glottal	11 – **4**	11 – **7**	5 – **2**	27 – **4**
Non-glottal	251 – 96	142 – 93	241 – 98	634 – 96
Total	262	153	246	661
100-299				
Glottal	5 – **4**	7 – **10**	0 – **0**	12 – **4**
Non-glottal	121 – 96	64 – 90	97 – 100	282 – 96
Total	126	71	97	294
500-999				
Glottal	18 – **27**	13 – **31**	1 – **2**	32 – **21**
Non-glottal	49 – 73	29 – 69	40 – 98	118 – 79
Total	67	42	41	150
Total				
Glottal	34 – **7**	31 – **12**	6 – **2**	71 – **6**
Non-glottal	421 – 93	235 – 88	378 – 98	1034 – 94
Total	455	266	384	1105

Table 7.20 WM t-glottalling by Lexical Frequency and Type of School

WF dataset	Comprehensive	Private non-boarding	Private boarding	Total
	N - %	N - %	N - %	N - %
0-99 *Glottal* *Non-glottal* *Total*	43 – **45** 53 – 55 96	33 – **52** 30 – 48 63	12 – **16** 61 – 84 73	88 – **38** 144 – 62 232
100-299 *Glottal* *Non-glottal* *Total*	9 – **32** 19 – 68 28	14 – **56** 11 – 44 25	4 – **22** 14 – 78 18	27 – **38** 44 – 62 71
300-499 *Glottal* *Non-glottal* *Total*	9 – **47** 10 – 53 19	7 – **58** 5 – 42 12	6 – **35** 11 – 65 17	22 – **46** 26 – 54 48
500-999 *Glottal* *Non-glottal* *Total*	157 – **70** 66 – 30 223	93 – **73** 35 – 27 128	48 – **32** 101 – 68 149	298 – **60** 202 – 40 500
1000-4999 *Glottal* *Non-glottal* *Total*	309 – **51** 299 – 49 608	200 – **53** 180 – 47 380	108 – **24** 335 – 76 443	617 – **43** 814 – 57 1431
5000+ *Glottal* *Non-glottal* *Total*	608 – **79** 158 – 21 766	363 – **75** 121 – 25 484	278 – **46** 330 – 54 608	1249 – **67** 609 – 33 1858
Total *Glottal* *Non-glottal* *Total*	1135 – **65** 605 – 35 1740	710 – **65** 382 – 35 1092	456 – **35** 852 – 65 1308	2301 – **56** 1839 – 44 4140

Table 7.21 WF t-glottalling by Lexical Frequency and Type of School