

## Dialect acquisition of glottal variation in /t/: Barbadians in Ipswich

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*[All figures and maps at end]*

### **Introduction**

This paper considers dialect contact and second-dialect acquisition by adult and child Barbadian English speakers converging towards an East Anglian variety of English. We examine glottal variation in word-final /t/, comparing the local dialect of Anglo ('white') speakers in Ipswich to that of Barbados-born speakers living there, and to British English varieties more generally.

Glottal variants have been widely reported as diffusing across Britain. Indeed, Trudgill calls it 'one of the most dramatic, widespread and rapid changes to have occurred in British English in recent times' (1999: 136). Our main descriptive questions are:

1) Does its use by Ipswich Anglo urban speakers indicate diffusion?

and

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- 2) Does its patterning among Barbadian immigrant speakers reflect dialect acquisition?

Methodologically, we respond to the call of Docherty and Foulkes (1999, cf. also Docherty et al. 1997) to conduct instrumental analysis of consonantal variables, and to question the segmental representations that are the norm in sociolinguistic work. To the extent that this paper extends and validates the approach and results of their Tyneside studies of glottal variation – and to the extent that both studies’ results conflict with the auditory analyses and phonemic assumptions underpinning nearly all dialectological studies of this feature – it is also necessary to ask:

- 3) How secure is the received wisdom concerning one of Britain's most often-studied sociolinguistic variables of recent years?

We briefly consider social context for the English and Barbadian varieties, review the literature on glottal variants of /t/ in British urban dialects, and examine those environments most commonly studied for the variable, and the usual explanation for its relative frequency across them. Description of our methods precedes comparative analysis of the Ipswich Anglo and Barbadian data. The two patterns are reconciled in an interpretation which finds both ethnically-aligned contrasts and agreement on norms local to Ipswich. We

conclude by discussing larger implications for sociolinguistic methodology, British urban dialectology and second dialect acquisition.

## **The social and historical context**

Ipswich, the largest town in the eastern county of Suffolk, is situated 77 miles north of London and 45 miles south of Norwich. It has good road and rail networks to both. Post-1945 Ipswich saw immigration by Londoners, but not at the level of official government resettlements (Malster 2000). It was a site for relocation of insurance companies' head offices out of London in the 1970s. Broadly, the Ipswich variety resembles the well-studied Norwich case in having been influenced, but not overwhelmed, by London. However, the study of Suffolk speech has largely been restricted to traditional features, in such works as the *Survey of English Dialects* (Orton and Tilling 1970).

Barbados, the most easterly Caribbean island, was settled by the English in 1627. Nearly four centuries of uninterrupted colonisation by English speakers, in relatively high proportion to West African slaves (compared to other Caribbean settings), has produced the national vernacular, Barbadian Creole English (BCE). Though it is now uncontroversially recognised as a Caribbean Creole (Rickford 1992, Blake 1997), it bears high regional prestige

-- West Indians refer to Barbados as 'little England' -- and was once thought to be an uncreolized regional English dialect (Hancock 1980; Niles 1980 locates the provincial dialect sources of Barbadian speech in Southeast England, the West Country, and Irish English). BCE is easily distinguishable from other Caribbean English varieties on phonological grounds for its rhoticity, backing and raising of the vowel in *price*, and frequent glottal replacement of syllable-final /p, t, k/ -- all features that are unique within the West Indies (Wells 1982, Roberts 1988).

Creolists have focused much historical research on the significance of earlier European dialects as inputs to Caribbean creolization. Yet from the point of view of language and dialect contact, little is known about the outcome of intercourse between Creoles and contemporary metropolitan varieties of their lexifier languages (in this case, BCE and vernacular Ipswich English). There are few studies of the acquisition of modern North American or British English varieties, whether vernacular or standard, by Caribbean Creole speakers today. Even the literature on British Black English (e.g. Sutcliffe 1982, 1992, Edwards 1986) concentrates on speakers' maintenance of Creole, leaving their British English unexplored, especially phonology (but see Wells 1973, Sebba 1993, Patrick 2004). This is consistent with a more

general absence of ‘published work on the phonetics and phonology of the English spoken in ethnic subcommunities’ in Britain (Foulkes and Docherty 1999:16). Important questions thus arise concerning British Afro–Caribbeans, including the Barbadian speakers in Ipswich:

- 4) How closely do they align themselves with sound changes in progress among Anglos in their speech communities?
- 5) What are the effects of Caribbean regional origin, and generation (with respect to immigration), on British Afro–Caribbean English (BrACE) accents?
- 6) Is there evidence for the emergence and maintenance of distinct ethnic dialects of urban British English?

Straw (2001) compared Afro–Caribbean speakers living in Ipswich (Barbadians, Jamaicans, Nevisians) with the local Anglo population. Preliminary acoustic analysis suggested that glottal variation among the Barbadians differs from the Anglos, but also from other Afro–Caribbeans, in both environments and frequencies, perhaps due to influence from their island vernaculars. The present paper focuses therefore on the Barbadians as a distinct group, alongside the Anglos. It is a preliminary study with a speaker–base of 8 informants. For comparative purposes, we examine those

environments and constraints commonly reported by other British dialectologists. While this sample cannot hope to fully answer the above questions, further work is underway to expand the speaker base and variables to be studied.

### Distribution of glottal variation in /t/

British urban dialect studies have mainly focused on contact between native local, regional and national varieties, largely ignoring international contact from immigrant varieties. It is possible that the glottal variation studied here was transmitted to Barbados centuries ago (almost uniquely among colonial English varieties), and has recently returned via Barbadian immigration, though this will not be pursued here.<sup>2</sup> We focus now on an often-researched, but complex, linguistic feature prevalent in many urban vernaculars throughout the British Isles: glottal variation in word-final /t/ for items like *bet* and *what*.

We define the feature more precisely below but first comment on terminology, which in the literature is sometimes confusing, inconsistent, or

unsuited to our purpose. We aim for consistency in discussing the Ipswich data, so that conventional auditory analyses may be compared with that presented below, which differs in the organisation of the variation. We use ‘glottal features’, ‘glottal variants’, or ‘glottal variation in /t/’ to denote a range of phenomena including glottal substitution (i.e. total replacement of /t/ by a glottal stop, often called ‘T-glottalling’ after Wells 1982: 260–261), glottal reinforcement of /t/ (often called ‘T-glottalisation’ or ‘Pre-glottalisation’, *ibid.*), and other glottal phenomena.<sup>3</sup> ‘Glottalisation’ is sometimes used vaguely in the literature to refer to one or more such elements (e.g. now including complete stops, now excluding them), especially when generalising across studies; Docherty and Foulkes employ the label ‘glottal(ised)’ (1999: 54), and observe that ‘the auditory label ‘glottalised’ in fact covers two distinct [acoustic] types’ (1999: 57).

As will become clear, our reading of the Ipswich data inclines us to agree with their assessment (1999: 61) that ‘the articulatory basis of glottal

<sup>2</sup> Wells (1982) notes the occurrence of similar glottal features in Newfoundland, New York City, and Appalachia, and Roberts (2001) in Vermont, but in all cases they are much more restricted in distribution than in Barbados or Britain, and go largely unremarked by speakers.

<sup>3</sup> A handful of British dialect studies consider glottal variation with /p/ and /k/, which is also present in Island BCE (the variety spoken by Barbadians who have not lived overseas). We restrict our attention here to /t/. Variation of /t/ in word-medial environment is reported separately (Straw and Patrick 2003).

variants diverges from the received wisdom... acoustic parameters subtle enough to prevent robust auditory discrimination enter into [complex] sociolinguistic patterns.’ Prejudging the nature of the variants in Ipswich, or glossing over their distinctions, could lead to an apparent reduction or distortion of both linguistic variation and social patterning.

Ipswich and Suffolk speech has hardly been studied with modern sociolinguistic methods.<sup>4</sup> But since glottal variation in /t/ is common in southeast England and East Anglia, both in traditional rural dialects and modern urban vernaculars, one expects to find it here. According to the *Survey of English Dialects*, glottal stop substitution is traditionally found in Norfolk, London, and the Home Counties (Orton and Tilling 1970); below, we report it for Ipswich Anglos as well (though it is infrequent). Glottal reinforcement, however, is traditionally found in the East Anglian counties of Norfolk, Suffolk, Essex, and East Cambridgeshire, a roughly contiguous area (Map 1, from Trudgill 1974). In contemporary British urban dialectology, one or both of these glottal feature variants are reported – generally more often for young speakers and informal styles, with localized sex and class effects.

<sup>4</sup> Discussions of East Anglian dialects (e.g. Trudgill 1974b, 1986; Britain 2002; Kingston Bray *fc.*) occasionally mention Ipswich.

This is generally true in the South of England, in RP speech, and in the London vernacular as well as the Home Counties (e.g. Tollfree 1999; Fabricius 2000, 2002), Reading (Williams and Kerswill 1999), Milton Keynes (Williams and Kerswill 1999), Norfolk (Trudgill 1999, 1974), and Essex (Baker 2002). We note the absence of such research on Suffolk, rather than the absence of the features *per se*.

Map 1. Glottal features and pronunciations noted in Southeast England by the *Survey of English Dialects* (adapted from Trudgill 1974:81)

Moving north of the TRAP–BATH split (a traditional dividing line for Northern and Southern English dialects), the variable is similarly reported for the West Midlands (Mathisen 1999), Derby (Docherty and Foulkes 1999), Sheffield (Stoddart et al. 1999), and Hull (Williams and Kerswill 1999), as well as Newcastle (Milroy, Milroy, Hartley and Walshaw 1994, Watt and Milroy 1999). In the Southwest it is noted for Cardiff (Mees and Collins 1999, Mees 1987), and in the Northwest for the Liverpool area (Newbrook 1999, 1986); in Scotland for Ayr (Macaulay 1991), Glasgow (Macaulay 1977, Stuart-Smith 1999), Edinburgh (Romaine 1975, Reid 1978), and Fife (Wells 1982); and in

Northern Ireland, for Ulster Scots in County Antrim (Gregg 1958), in Coleraine (Kingsmore 1995), and as far west as Derry (McCafferty 1999, 2000).

Among overseas dialects, glottal variation in /t/ is found in New Zealand (Holmes 1995) but not in Australia, South Africa, or generally in North America, according to Wells (1982; see note above). The variable appears to be entirely absent from Caribbean English, though descriptions of all but a few varieties are poor. The important exception is Barbados, where as noted glottal features are common and function as a stereotype identifying Barbadians to other West Indians, but have been little studied (Roberts 1988, Wells 1982; the exception is Blake 1994).

### **Linguistic environments, social patterns, and diffusion**

Previous auditory studies agree in reporting the favouring of certain environments, and a common ordering of them, for glottal variation in /t/. The feature is usually analysed in word-final position, and sometimes word-medial as well (e.g. Mathisen 1999), though only word-final is reported below. Some studies treat glottal substitution and glottal reinforcement together (e.g. Mees and Collins 1999), while others focus only on substitution (e.g. Fabricius

2002). Most attention has focused on the linguistic environment following the /t/, which is typically divided into three:

- Pre-consonantal, as in ‘I got my car serviced’;
- Pre-vocalic, as in ‘What are you doing?’
- Pre-pausal, as in ‘Do you know what? ...’.

The environment where glottal variants occur most frequently is almost invariably reported to be pre-consonantal /t/. They occur least frequently for pre-vocalic /t/, while the pre-pausal environment is often reported to be intermediate.

Table 1: Glottal variation by following environment in British urban dialects

Diffusion of glottal variants from London is often hypothesised to be the most likely reason for their rapid rise (Wells 1982, Foulkes and Docherty 1999), though Scotland and Norfolk have also been named as possible sources (Macaulay 1977, Trudgill 1999, Macafee 1997). Table 1 reports frequencies of word-final glottal variation in the three post-/t/ environments for a range of urban studies in England. Though not a comprehensive survey, it selects data that can be comparably reported across an area where diffusion

has been indicated; full details of sampling, variants and analysis for each study cannot be included here. The studies cited are at least consistent with gradual spread north and westward; except for RP, where it is still stigmatised, higher frequencies occur at the top (southern) end of the table.

As well as regional and linguistic factors, the pattern of diffusion is affected by social factors such as age, sex, social class, and style. Distributions are often highly complex, intersecting with local dialect patterns, e.g. the 'T-to-R' rule in Newcastle (Watt and Milroy 1999:29) and Derby (where the rule is favoured by older working-class women, Docherty and Foulkes 1999:51). Pre-vocalic and pre-pausal environments seem to allow the greatest play for social factors. Pre-consonantly, 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.

We refer to this ordering of environments as the *diffusion pattern*:

PreC > PreP > PreV,

since it has been argued that diffusion occurs both linguistically within a dialect (from one environment to another), and geographically between dialects (following this hierarchy of environments). While we do not regard the

process of diffusion from London as firmly established,<sup>5</sup> the hierarchy of environments generally found is consistent with these hypotheses.

The diffusion pattern regularly correlates with age, such that young speakers in areas outside London far outstrip older ones in their frequencies of use. In addition, the social location of speakers showing the highest frequencies often fits familiar patterns of language change (Labov 2001), despite considerable local complexity. Thus, Tollfree (1999:171) reports 'the phonologisation of T-glottalisation' among young speakers of SE London RP, while older speakers resist and stigmatise it; and in Reading, where it is a regional vernacular feature, working-class speakers lead in a change from below. In contrast, in Cardiff, Mees and Collins report recent acquisition of the feature as a prestige variable in a change from above 'led by young middle-class females' (1999:195). This is consistent with movement by upwardly mobile Cardiff youth 'away from Welsh-accented speech and towards south-eastern English varieties', where 'glottalisation is associated with London life, metropolitan fashions and trend-setting attitudes' (1999:201). In Newcastle, Milroy, Milroy and Hartley (1994) argue that diffusion of glottal substitution by

<sup>5</sup> The possibilities raised above of diffusion from Norwich and Scotland may require modification, and no geolinguistic modelling of the diffusion process has yet been advanced.

females is a supra-local change which actually brings about favourable evaluation. Holmes (1995) argues for a similar destigmatisation process in New Zealand.

We refer to cases in which pre-pausal glottal variation patterns with pre-vocalic, such as Sandwell or SE London RP, as the *early diffusion pattern*:

$$\text{PreC} > (\text{PreP}, \text{PreV})$$

The reasoning here is that the feature may enter into the single most favouring environment (PreC) first, with a time-lag before following pause begins to catch up. Where pre-pausal and pre-consonantal environments show similarly high rates, however, we refer to the *late diffusion pattern*:

$$(\text{PreC}, \text{PreP}) > \text{PreV},$$

e.g., for SE London vernacular English in Tollfree (1999), or Fabricius' (2000, 2002) findings for standard speakers in the Home Counties.

The environments have not previously been applied to glottal variation in East Anglia. Our hypotheses were (a) that these diffusion patterns, which have been found elsewhere in England, are occurring in Ipswich, and (b) that Barbadians and Anglos show distinct patterns.

### **Diversity in Scotland?**

While the diffusion pattern generally receives strong support from of dialect studies in England and Wales, the Scottish data are equivocal. Macaulay (1991) and Stuart-Smith (1999) review studies from Glasgow (Macaulay 1977, Stuart-Smith 1999), Edinburgh (Romaine 1975, Reid 1978) and Ayr (Macaulay 1991). All studies examined glottals intervocalically, and found this to be the most constraining environment, with the lowest frequency of glottal features. Similarly, all but Romaine's either found PreC to be the most frequent environment for glottal features, as is usual, or even excluded it because it was categorical. But the ordering of PreV and PreP was not stable.

Reid (1978) for Edinburgh, Macaulay (1991) for Ayr, and Stuart-Smith (1999) for Glasgow all found that a following vowel was less likely to promote glottal features, just as in the English studies that form the basis of the diffusion hypothesis. However, Macaulay (1977) for Glasgow and Romaine (1975) for Edinburgh found the opposite ordering: PreV > PreP. Romaine's data (reproduced in Macaulay 1991:32), for children aged 6 to 10 years, never show a difference of more than 3% between the two environments. Further, word-final glottal replacement for all age groups, in all environments, is never less than 84%, within the range commonly considered categorical by

variationists (Bailey 1973, Rickford 2002). Such a small difference should not be taken as representing an exception at all.

Stuart-Smith speculates (1999: 192–193) that style factors, and the inclusion of utterance- and turn-final tokens, might possibly have depressed the rate of glottal features pre-pausally in Macaulay's results (1991: 32; the gap in rates between pre-P and pre-V ranges from 2% for fifteen-year-olds to 12% for adults). Stuart-Smith's own data for Glasgow, 25 years on from Macaulay's original study, show the ranking to be PreP > PreV consistently across age and class, except for middle-class adults where it is reversed (1999:193). Here again, she suggests a greater frequency of released stops turn-finally may explain the exception.

Stuart-Smith argues plausibly that at least the Glasgow data (and presumably any Scottish urban survey that covers a range of social classes) may well represent dialect mixing between two formerly-distinct linguistic systems. While this may carry explanatory value for the variation in Scotland, it is not likely to apply to the Anglo urban dialect of Ipswich. In any case, none of these potential Scottish exceptions approaches the magnitude and regularity of what we describe below as the *Ipswich pattern*.

## **The Ipswich Study**

We now turn to Ipswich, a town with the highest proportion of ethnic minority groups in the East Anglian dialect region of Norfolk, Suffolk and northeast Essex. The Afro-Caribbean community is the largest of these – though it is still small, at officially only 2.7% of the Ipswich population (Census 2001a), which overall stands at 117,000 (Census 2001b). Jamaicans are the largest subgroup, followed closely by Barbadians, each comprising about one-third of the Afro-Caribbean population (Peach 1996–97).

Both Afro-Caribbeans and Anglos in our study maintain dense and multiplex local networks focused on their respective ethnic communities. All have extended family members living in Ipswich. First-generation Barbadians came directly to Ipswich, rather than taking the usual route of arriving in larger cities and later moving to smaller towns. They came to take up specific job opportunities, or by invitation from family members already settled in the area. We analyse the interview speech of four Anglos and four Barbadians; Table 2 summarises each speaker's background. All speakers reside in the same working class neighbourhoods. The sample covers both sexes and two age-groups: 68–74 (retired) and 40–50 (middle aged). The retired Barbadians

came to Ipswich in the late 1950s as adults, while the middle-aged Barbadians came in the 1970s as children.

Table 2: Ipswich speaker characteristics

### Data collection and analysis of variants

This sample comprises a total of 402 minutes of recorded speech, with an average of 50 minutes per speaker. Recording took place in speakers' homes, workplaces, neighbourhood libraries and community centres. Wherever possible care was taken to minimise noise by finding quiet, well furnished rooms. Sometimes others were present (family, work colleagues, friends, members of the public) but did not participate directly in the conversations. This represents a subsample of recordings obtained for 30 speakers between December 2000 and May 2002. Recordings were made using a Sharp MD-SR60E minidisc and an omnidirectional lavalier microphone, and were digitised at a sampling rate of 11,025hz.

Tokens from the first five minutes of recordings were excluded. Given that eight lexical items (mainly function words such as *it*, *but*, *not*, *about*)

accounted for half of all possible tokens, we selected a maximum of four occurrences of the same lexical item per speaker. Subsequent work expanding the data base will separately examine function words which are known to exhibit frequency effects (Holmes 1995). We analysed a total of 250 tokens, averaging 31 per speaker (compare to Docherty and Foulkes' total of 549 tokens for an unknown number of speakers in Newcastle, 1999: 55, 61).

Acoustic analysis was conducted with the software package SpeechStation2 for PC (Sensimetrics 2000), using methods similar to the Newcastle project (P. Foulkes 2003, p.c.). We viewed spectrograms of all cases of word-final /t/ for one syllable on either side of the variable's occurrence, including F2 formant transitions of preceding vowels. Our purpose was to discover what is sociolinguistically significant for Ipswich, rather than to provide a full phonetic description of the data. Rather than code immediately for the usual glottal variants (i.e. glottal substitution and reinforcement), which themselves are complexes of features, we employed componential analysis to reduce the perceived glottal variation to a set of five parameters.<sup>6</sup>

<sup>6</sup> We also coded for preceding linguistic environment, and occurrence of non-glottal variants of /t/, but they are not reported here.

- *Phonetic components of glottal features:*
  - a) Presence or absence of a glottal occlusion, and
  - b) Duration of the gap (if any) in milliseconds;
  - c) Presence or absence of laryngealisation, and
  - d) Location of laryngealisation relative to any gap;
  - e) Presence or absence of voicing irregularity.

These parameters were visually identified from spectrograms and waveforms. We did not investigate the sources of (e), which appeared as e.g. constricted amplitude or irregularity in duration or frequency of successive pulses (aperiodicity, cf. Redi and Shattuck–Hufnagel 2001 for a detailed analysis), occurring either with a [t] or with what otherwise appears to be a glottal stop [ʔ]. Neither have we examined possible discourse or affective constraints on the presence of creak, though these may be relevant especially to the PreP environment (Docherty et al. 1997).

Two important dimensions included the degree of glottal constriction, and the relative timing of oral and laryngeal gestures. Laryngealisation (c) is commonly noted to precede oral stops accompanied by glottal closure, and may also affect following vowels (d). Indeed, the percept of a glottal stop may

be created by stiff phonation or creaky voice alone, in the absence of occlusion, since 'glottal stops are apt to fall short of complete closure' (Ladefoged and Maddieson 1996: 75). While it may often be reasonable to collapse these cases since they lie on a continuum, and some studies of the (t) variable do so, we distinguish them at the coding stage; this issue is discussed further in Docherty et al. (1997). In providing rich description we again follow the Newcastle study, which found few cases of classic glottal stops with voiceless occlusion, and important sociolectal differences between glottalised types which differed principally in timing of gestures (Docherty and Foulkes 1999).

The occurring combinations of the five phonetic components were then tabulated and recomposed into variants of the sociolinguistic variable (t). Our criteria were (i) that these variants make phonetic sense, and (ii) that they illuminate the sociolinguistic structure of the data. As is common in variation studies, such criteria may be satisfied by more than one arrangement. In the present analysis we focus on classic glottal stops vis-a-vis other types of laryngealisation, but exclude all forms including released [t], regardless of voicing, and zero (complete elision). The phonetic variants noted but excluded from our tabulations thus take in apical stops that are aspirated, unreleased,

ejective, voiced, creaky-voiced, flapped, deleted, or glottally-reinforced:<sup>7</sup>

- [t<sup>h</sup>] [t<sup>ʰ</sup>] [t<sup>ʰ</sup>] [d] [d̥] [r] [∅] [ʔt] [tʔ]

Acoustic analysis revealed that the picture regarding diffusion patterns was more complex than expected. Auditory results (Straw 2001) on the same data had appeared to confirm the diffusion patterns found by earlier studies: glottal variants appeared to be near-categorical in PreC, and high in PreP for many speakers. Pre-vocalic environments trailed behind, but were still relatively high compared to previous studies. However, the findings from the acoustic analysis suggest that auditory methods significantly overestimated the frequency of simple glottal stops, which are in fact relatively infrequent – i.e., several other types of glottal features had been auditorily coded as stops – while overall rates of glottal features were also lower than those in the auditory analysis. While acoustic analysis is hardly guaranteed to produce straightforwardly interpretable results, it certainly helped to correct our description of variation.

<sup>7</sup> Exclusion of glottally-reinforced [t] forms means our results can be compared only to some prior studies (e.g. Fabricius 2002) and not easily to others (e.g. Mathisen 1999). In current

### Glottal variants: Behaviour of Anglos

We examine the Anglo data first, to establish a baseline for the Ipswich urban vernacular. Figure 1 (infra) for the Anglo speakers shows stops only, with considerable individual variation. It is striking that Keith, the older male, has none in any environment. Patrick, the younger male, has moderate levels in all three, and somewhat resembles the younger female, Mary, while Betty differs notably in the high levels of glottal stops before vowels.

Figure 1. Anglo speakers, glottal stops only

Figure 2 (infra) combines other types of glottal variants, leaving out glottal stops. Note the contrast between the men, whose highest rates are pre-vocalic, and the women. The pre-consonantal environment is slightly favoured for all speakers, while glottal variants are least frequent overall before pauses. Only Betty, who favours both PreC and PreP, approximates the (late) diffusion

work we survey other relevant variants of (t) and redefine the envelope of variation (Straw & Patrick 2003). In general, released and glottally-reinforced [t] was infrequent.

pattern found elsewhere (the direction of the arrow in Fig 2 indicates the expected hierarchy of environments ).

Figure 2. Anglo speakers, other glottal variants only

Wolfram (1993) has suggested clarifying controversy over the nature and utility of the linguistic variable and variable rules by distinguishing between two independent tasks commonly pursued in sociolinguistic variation research: (a) investigating the linguistic processes which constrain the occurrence of variant forms, and (b) illuminating patterns of social and linguistic co-variation. The latter precisely echoes our second criterion for recomposing phonetic features into linguistic variants, and is reflected in the research questions we posed at the beginning. As Wolfram notes, 'patterns of social variation are not held captive by linguistic boundaries' (1993: 199). Accordingly we do not hesitate now to combine the two types of glottal features distinguished in Figures 1 and 2, for the following reasons:

- Comparability to other studies that did so (e.g. Mees and Collins 1999 on Cardiff, Tollfree 1999 and Fabricius 2000 on London and the Home Counties).
- A phonetic continuum exists, from glottal stop to creaky voice to modal voice. Although glottal stops are at one end of the continuum, it is not logically necessary that they be isolated and opposed to other forms.
- Perceptually, too, complete glottal occlusion can be difficult to separate from other types of glottal variation. This may reflect the preferences of speakers and listeners for interpreting them as, in some sense, 'the same thing'.
- Combining types may achieve greater regularity across speakers in our sample, which in turn may correspond to social factors.

The combined results in Figure 3 (infra) give a more consistent picture.

Figure 3. Anglo speakers, all glottal variants

PreC and PreP environments generally do pattern together, as in the late diffusion pattern, but at a lower level than PreV, which is the most favoured environment for glottal variation – especially for males. This result has not previously been reported in the sociolinguistic literature (but see discussion of Romaine 1975 above). Note that Betty has exceptionally high rates for glottal stops in PreV position (Figure 1) but low rates there for other glottal features (Figure 2), while Patrick contrarily has high rates for stops before pauses (Figure 1) but low rates for other glottal features (Figure 2). When the two sets of variants are united, the frequencies are balanced and in line with those of other Anglo speakers. Keith's overall rate remains low for PreC and PreP, but not for PreV, which may be locally most salient.

The Newcastle research found traditional dialectal variants conserved by older males. This group showed the highest frequency of 'type 2 glottalised tokens', a variant which differs from others both acoustically (Docherty and Foulkes 1999: 57–61) and in its social distribution (Watt and Milroy 1999: 29, Docherty et al. 1997). However, we will see below that Ipswich contrasts with Newcastle in this respect: the older Barbadian male Gary's overall rate is also low.

As the number of tokens is small, with a mean of 10 per environment per speaker, no strong claims can be sustained for these data. However, since it is clear that Ipswich Anglo speakers do not follow either of the expected diffusion patterns, we refer below to their distribution as the Ipswich pattern:

PreV > PreC, PreP

### Glottal variants: Behaviour of Barbadians

Figure 4 (infra) plots glottal stops for Barbadian speakers, again displaying considerable individual variation. Only Gary, the older male, appears to match the diffusion pattern reported in the literature (PreC > PreP > PreV, illustrated once more by the arrow). For the other Barbadians, the incidence of glottal substitution is noticeably higher in PreP than in either PreC or PreV.

Figure 4. Barbadian speakers, glottal stops only

In contrast, in Figure 5 (infra) PreP is uniformly the *least* favourable environment for the occurrence of other types of glottal variation. Once again (as in Figure 2), gender most sharply differentiates the speakers. Both men display frequent glottal variants in PreV, which resembles the Ipswich Anglo

pattern. The women also show high rates in this environment, but not as high as in PreC.

Figure 5. Barbadian speakers, other glottal variants only

In Figure 3, combining the two types of glottal variation for the Anglo data produced a unified overall pattern, which perhaps represents the baseline Ipswich dialect. For the Barbadians, in contrast, combining variants does little or nothing to reduce the considerable degree of individual variability (Figure 6, *infra*). The women show the early diffusion pattern, with PreC leading both PreP and PreV. The men however show neither the diffusion patterns reported in the literature, nor the Ipswich pattern (though they do display frequent use of glottal variants before vowels). Nor, indeed, do they behave similarly to each other: we cannot easily give a unified explanation for Gary and Edward, nor account for Edward's lower rate of glottals before consonants, as this is expected to be the least stigmatised environment.

Figure 6. Barbadian speakers: all glottal variants

If we compare both groups, in Figure 7 (*infra*), the resemblance of pattern and level is striking at first glance.<sup>8</sup> For both, PreC is marginally higher than PreP, as is generally found in the literature reviewed earlier (see Table 1). The principal difference is in the high frequency of glottal features in PreV, the previously unattested result which suggests an Ipswich pattern, and only the Anglos can be said to display this clearly. We observed above that this finding requires us to merge at the level of sociolinguistic analysis the variant forms (glottal stops and other glottal variants) which were kept distinct at the level of phonetic description – again, only for the Anglos.

Figure 7. Both groups, all glottal variants

The resemblance of the Barbadian speakers to the Anglos is not illusory, but is only partial (Figure 8, *infra*).<sup>9</sup> That is, only for ‘other glottal variants’ (OGV in Figure 8) do the Barbadians exhibit frequent glottal features pre-

<sup>8</sup> Figures 7 and 8 should not be read as representing continuous environments, but rather as distinguishing speaker groups and variants across environments.

<sup>9</sup> Note that values in figure 8 are lower than those in figure 7 because the latter are cumulative.

vocalically, the Ipswich pattern not previously reported.<sup>10</sup> They distinguish themselves from the Anglos in the patterning of glottal replacement: not only in their infrequent use of PreV stops, a common pattern in Southeast England and generally, but in their uncommonly high incidence of stops before pauses. The latter may perhaps be a feature of Barbadian English as it is spoken on the island, though that remains inadequately studied at present. It may also contribute to our qualitative perception of their glottal variation as distinctive.

Figure 8. Both groups, glottal stops vs. other glottal variants

Thus, on the present evidence – and we repeat our cautions about sample size – it is plausible to interpret the Ipswich Barbadian speakers' accent as exhibiting glottal features with several aspects:

- o one peculiar to the local Anglo pattern (high OGV in PreV),
- o one shared with British dialects generally (low GS in PreV), and

<sup>10</sup> At the first presentation of this paper, David Britain reported (pc) that undergraduate projects at the University of Essex appear to have recently found higher glottalisation rates in PreV position than in PreC, for speakers from Colchester, near Ipswich and the Suffolk border.

- o an idiosyncratic one (highest GS in PreP), possibly featured in Island Barbadian.

## **Discussion**

This study suggests implications for three areas: sociolinguistic methodology, British dialectology, and second dialect acquisition.

The first point is methodological. Auditory analysis of the Ipswich data produced very similar findings to the British studies described earlier. However, the acoustic results gave rise to radically different findings:

- The overall frequency of glottal stops (complete closure) was lower than suggested in the auditory studies, a finding also reported in the only other comparable acoustic study, conducted in Newcastle (Docherty and Foulkes 1999).
- The hierarchy of environments favouring glottal variation in /t/ among Ipswich Anglo speakers has not been previously reported.

However, a regional exception to the diffusion pattern was also found in Newcastle, where glottal variants are absent in PreP.<sup>11</sup>

This study has posited that the dialect spoken by Ipswich Anglos, in its patterning of glottal variation, serves as a baseline which incoming Barbadian-born speakers are exposed to, and are under some pressure to assimilate to. The method of componential analysis allowed us to empirically conclude that for the Anglos the various types of glottal features, including stops, may be merged as a single variant (pending further research into orally-articulated variants), while the same is not true for the Barbadians. Though the sequence of steps followed -- fine initial description and subsequent reorganisation of variation -- is a general one in variation research, it is supported by careful use of instrumental analysis for variables such as (t), where auditory coding alone has been recognised as difficult.

On the basis of these differences, we argue that instrumental analysis should be a standard technique in the study of glottal variation in /t/, as it is now for vowels. While it is still rare to carry out acoustic analysis of

<sup>11</sup> 'In pre-pausal positions a fully released or spirantised [t] is invariably used... although [ʔ] is making some inroads into sentence tags in this context' (Watt and Milroy 1999:29).

conversational speech, given the difficulties in obtaining recordings of the necessary quality, this obstacle can be overcome by taking care to minimise extraneous noise, and to increase the quantity of data.

Our second conclusion concerns British dialectology. The diffusion pattern reported by other studies in the UK is strikingly absent among Ipswich Anglos. This is surprising, as influence from supra-regional sources is expected. Ipswich is the largest town in Suffolk; it is not isolated, and is an hour's distance from London by commuter rail.

Moreover, Trudgill has been tracking London influences on Norwich since the 1970s. Norwich has a slightly larger population than Ipswich at 122,000 (Census 2001), but is more geographically remote (see Map 1). The 'gravity model' of diffusion (Trudgill 1974), developed precisely for the task of estimating the linguistic influence of London on East Anglian dialects, takes into account distance between two urban centres, relative population, and a measure of linguistic similarity. Updating Trudgill's calculations with 1991 Census figures yields a relative index of circa 1.8 for London/Ipswich, compared to 1.0 for London/Norwich, implying that the influence of the capital ought to be nearly twice as great on the Suffolk town. Consequently,

one would expect Ipswich to reflect a widespread South Eastern pattern of diffusion more closely than it does on the evidence above.<sup>12</sup>

The question of how similar Ipswich and Norwich are remains open. Trudgill argues that glottalling in Norwich may be an endogenous change (1999: 136), but does not comment on the phonological environments relevant to diffusion. More research is needed to find out whether Ipswich speakers are retaining their own local pattern, whether it shows signs of diffusion from Norwich, and whether they are resisting other South Eastern varieties. It might also be that the very existence and homogeneity of a diffusion pattern, which derives from studies using auditory methods, has been exaggerated.

Our final conclusion relates to second dialect acquisition. Recall that all the Barbadian speakers were born in Barbados: the two older ones immigrated as mature adults, but Michelle came at 14 and Edward at 9.<sup>13</sup> They are therefore at different stages of acquiring a second (British English) variety with glottal variation. Age of first exposure to a new dialect has been identified as

<sup>12</sup> Of course the influence need not have a single source in London. Trudgill (1974, 1999) notes that the conservative Norwich rural dialect has for a long time showed several features, including /t/-glottalling, commonly perceived as diffusing from London.

a significant predictor of acquisition, depending upon the type of feature encountered (Payne 1980, Chambers 1992, Labov 1994). Labov (1989) demonstrated that very young children acquire linguistic features in their historically preserved patterns of social variation. Observing Canadian English-speaking children who moved to Britain, Chambers found that 'Children seven or under will almost certainly acquire a new dialect perfectly... People over the age of 14 almost certainly will not' (Chambers 2002: 179). Payne, comparing local and immigrant children in a suburb of Philadelphia, showed that children who moved when less than 10 years old acquired low-level sound changes with a very high rate of success, while adults 'preserved their basic phonetics and phonology intact' (Labov 1994: 338). Foulkes et al. (1999) demonstrated the emergence of structured variation for the (t) variable among Newcastle children between 2 and 4 years old. This age contrast is undoubtedly related to the well-known biological decline in language-learning abilities as children become adults.

What matters overwhelmingly for normal language change is the perception ability of children, and it is unlikely that the older Barbadians were

<sup>13</sup> Michelle was actually born in Ipswich but returned to Barbados, aged two years, with family. We do not consider this early exposure to Ipswich (in the midst of Barbadian English-speaking

able to match the younger in terms of perceiving the subtle phonetic distinctions made by Ipswich Anglo speakers. Indeed, considering age-based pairings of the Barbadians with the Ipswich Anglos, the only pair that shows significant resemblance between patterns is Edward and Patrick. For glottal stops alone, the two exhibit the same pattern (compare Figures 1 and 4), though with exaggerated contrast for Edward between PreP and other environments; the same holds true for other glottal variants as well (compare Figures 2 and 5), again with a wider range for Edward. He may be the only one in the Barbadian sample to have acquired the local pattern; this makes sense in light of previous studies of dialect acquisition.

### **Issues for future research**

Despite the proliferation of sociolinguistic studies of glottal variation in (t), numerous questions remain before we can claim to understand its main features, either for local British vernaculars such as the Ipswich dialect or for the more complex cases of dialect contact, acquisition, and perhaps creation exemplified here by the Barbadian speakers. We focus on three areas of relatives) to have been sufficient to acquire the local phonology.

investigation for the future: expanding and enriching the database, phonological constraints, and social factors.

First and foremost, more data on a wider range of speakers is required (see below), while other variant forms and environments must be studied. Our current work considers word-medial environments, including intervocalic, and constraints, including syllable-position and prominence (Straw *fc.*, Straw and Patrick 2003). Lexical incidence has yet to be studied closely: while limiting the occurrence of high-frequency items may be sufficient for phonetic and phonological analysis, in the investigation of salience and discourse patterns such items must be studied at naturally-occurring frequencies. Researchers must bring an open mind to delimiting the envelope of variation, especially for newly-studied dialects: categorical constraints posited for London by Wells (1982) and Tollfree (1999) hold in Ipswich only for glottal stops with complete occlusion, and are violated in the case of oral stops accompanied by laryngealisation (Straw and Patrick 2003).

The assumption in many dialectological studies seems to have been that following environment is the chief linguistic factor explaining glottal variation in (t) (see however Tollfree 1999). Yet it is apparent that a range of other possible constraints deserve close examination. These include stress: it is

clear that Barbadians have different stress and intonation patterns from SE England speakers – and for that matter, East Anglians also have distinctive rhythm, vowel lengthening, shortening and reduction (Trudgill 1999: 124). Pierrehumbert and Frisch (1997) have found location within intonational phrase to significantly constrain glottalisation in American speech, though this was not limited to forms of /t/. Stuart-Smith (1999) speculates that pre-pausal turn-final utterances may favour released stops, and Local et al. (1986) and Docherty et al. (1997) show that the salient absence of glottals here serves as a turn-delimitation device in Newcastle, while Baker (2002) also highlights the role of discourse functions for /t/-glottals. Further research into such possibilities obviously requires systematic investigation of word-internal contexts alongside the word-final environment studied here.

Still, if upon reexamination – using instrumental methods, and finer-grained distinctions (Fabricius 2002) – following environment does remain a major constraint, answers will be required for these questions, at least:

- Why is the diffusion pattern so nearly ubiquitous?
- Does it reflect underlying, natural phonetic motivating factors?
- If so, what influences sometimes cause this effect to be submerged?

From a variationist perspective, it would be no surprise if such factors played a role; yet neither would one expect phonological explanations to account for all of the variation. Such constraints may reasonably be expected to surface, but one also expects them to be taken up and adumbrated by social evaluations and tensions within the speech community.

Full consideration of social constraints on (t) requires comparison with other local groups. Ipswich Anglos must be contrasted with other East Anglian speakers, supplementing Trudgill's (1999) observations of Norwich with instrumental analysis and further attention to phonological constraints. For Barbadians, three relevant comparisons include:

- a) Barbadian speakers who have never left their home island,
- b) speakers of British Afro-Caribbean English (BrACE) in other regions of Britain, and
- c) other local Afro-Caribbean groups in Ipswich (e.g. Jamaicans and Nevisians, Straw *fc.*).

There may well be substrate effects from Island Barbadian English (as suggested above), whose patterns of glottal variation have not yet been explored in detail. It is equally possible that Ipswich Barbadian speech is modelled on supra-local contacts with in-group speakers elsewhere in

England. Distinction and even competition between major Caribbean nations is a well-known feature of life among West Indian migrants, attested via ethnographic observation in Ipswich; while the linguistic contrast between the home dialect of Barbadians, with its salient glottal substitution, and that of other islanders suggests differences in acquisition of the Ipswich pattern. Jamaicans and Barbadians are the two largest Afro-Caribbean groups in Ipswich, and Britons of Jamaican descent are to date the best-documented group of BrACE speakers (Sutcliffe 1982, Edwards 1986, Sebba 1993, Patrick 2004). There may be issues of mutual resistance to complete integration with the local Anglo community. On the other hand, one might expect convergence by the younger generation to Anglo patterns, either local or supra-local. Such information for the Barbadians may help determine whether they have a coherent community pattern for glottal variation, which is in turn related to our earlier question regarding the potential emergence of distinct ethnic dialects of urban British English.

For both Anglos and Afro-Caribbeans, understanding the linguistic changes in progress requires more information on distribution according to age and gender. For example, Figures 2 and 5 above are suggestive of parallel gendered patterns across ethnic groups, compatible with the finding that

males sometimes emphasise local variants while females are instrumental in the increase and spread of supra-local ones (Milroy, Milroy, and Hartley 1994, once again for (t) in Newcastle). Young people are central to the study of change in Ipswich (the youngest in this study was 40, Table 2), as always, but a range of age groups are critically involved, due to immigration and nativisation. Among Caribbean diaspora speakers in Britain, the role of age and generation in speech variation is so far poorly understood, but given the complexities of migration and transnational Caribbean family structures, the two factors are clearly distinct and worthy of research. Straw (fc.) compares four age groups representing at least three generations of Afro-Caribbeans in Ipswich to Anglos living in the same neighbourhoods.

## **Conclusions**

Although glottal variation in /t/ is the subject of several dozen research reports, we find that we must conclude as we began, by problematising the received wisdom concerning one of Britain's most often-studied sociolinguistic variables (question 3 above). Despite the scale of the current investigation, however, we venture tentative answers to the main descriptive questions (1 and 2). The use of the (t) variable by Ipswich Anglo urban

speakers does not suggest diffusion from the London area – not, at any rate, as supported by the literature to date – while the partial resemblance between Barbadian immigrant and Anglo speakers argues for dialect acquisition. Issues surrounding the nature and progress of sound change among Afro-Caribbean speakers, and the maintenance or emergence of distinctive ethnic dialects (4–6), are worthy of answers that can only be provided through broader and deeper investigation.

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## Figure Captions

Map 1. Glottal features and pronunciations noted in Southeast England  
by the *Survey of English Dialects* (adapted from Trudgill 1974:81)

Table 1: Glottal variation by following environment in British urban dialects

Table 2: Ipswich speaker characteristics

Figure 1. Anglo speakers, glottal stops only

Figure 2. Anglo speakers, other glottal variants only

Figure 3. Anglo speakers, all glottal variants

Figure 4. Barbadian speakers, glottal stops only

Figure 5. Barbadian speakers, other glottal variants only

Figure 6. Barbadian speakers: all glottal variants

Figure 7. Both groups, all glottal variants

Figure 8. Both groups, glottal stops vs. other glottal variants

Map 1. Glottal features and pronunciations noted in Southeast England by the  
*Survey of English Dialects* (adapted from Trudgill 1974:81)

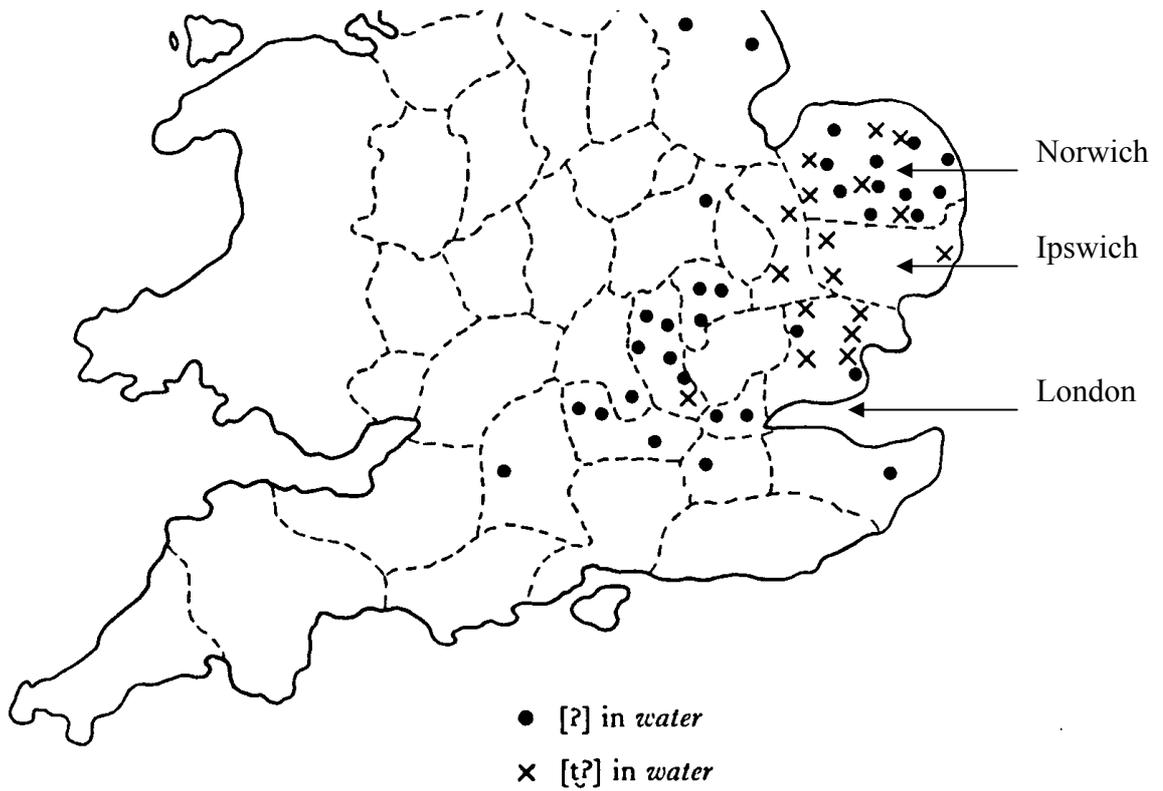


Table 1: Glottal variation by following environment in British urban dialects

| Variety   | Pre-C  | Pre-P                        | Pre-V                     | Speakers  | Variants   |
|---|--|------------------------------|---------------------------|---|------------|
| <b>Southeast:</b>                                       |  |                              |                           |   |            |
| SE London RP <sup>1</sup><br>(Tollfree 1999)            | frequent<br>frequent                               | slight                       | slight                    | older<br>young                                  | [ʔ] + [ʔt] |
| SE London Eng<br>(Tollfree 1999)                        | near-<br>categorical                               | near-<br>categorical         | high                      | all   | [ʔ] + [ʔt] |
| Reading<br>(Williams and<br>Kerswill 1999) <sup>2</sup> | categorical<br>categorical<br>frequent<br>frequent | n.d.<br>n.d.<br>n.d.<br>n.d. | 100%<br>92%<br>14%<br>30% | WC boys<br>WC girls<br>MC boys<br>MC girls      | [ʔ] only   |
| Milton Keynes<br>(Williams and<br>Kerswill 1999)        | categorical<br>categorical<br>frequent<br>frequent | n.d.<br>n.d.<br>n.d.<br>n.d. | 83%<br>75%<br>49%<br>25%  | WC boys<br>WC girls<br>MC boys<br>MC girls      | [ʔ] only   |
| <b>Midlands and North:</b>                              |  |                              |                           |   |            |
| Derby<br>(Docherty and<br>Foulkes 1999)                 | near-<br>categorical                               | 81%<br>61%                   | 60%<br>9%                 | young<br>older                                  | [ʔ] only   |
| Hull<br>(Williams and<br>Kerswill 1999)                 | categorical<br>categorical<br>frequent<br>frequent | n.d.<br>n.d.<br>n.d.<br>n.d. | 83%<br>72%<br>20%<br>31%  | WC boys<br>WC girls<br>MC boys<br>MC girls      | [ʔ] only   |
| Sandwell <sup>3</sup><br>(Mathisen 1999)                | 26–54%   | 16%                          | 13–19%                    |   | [ʔ] only   |
| <b>Southwest:</b>                                       |  |                              |                           |   |            |
| Cardiff <sup>4</sup><br>(Mees and<br>Collins 1999)      | 79%<br>85%<br>32%                                  | 51%<br>83%<br>45%            | n.d.<br>n.d.<br>12%       | MC girls 1976<br>MC girls 1981<br>WC girls 1990 | [ʔ] + [ʔt] |

<sup>1</sup> Tollfree distinguishes between a regionalised form of RP ('SE London Regional Standard') and the local vernacular. We refer to the former as 'SE London RP'.

<sup>2</sup> It is unclear whether data for Reading, Milton Keynes and Hull combine word-final pre-vocalic with word-medial intervocalic. Pre-consonantal environments 'favour the process the most' (Williams and Kerswill 1999: 147) everywhere, but the authors give no figures for them or for pre-pausal environments.

<sup>3</sup> Data summed over all informants (WC and MC, ages 16–70). Mathisen examined a range of consonantal and vocalic environments.

<sup>4</sup> Data for WC girls show the highest levels of three time periods sampled (1976, 1981, 1990).

Table 2: Ipswich speaker characteristics

| <b>Pseudonym</b> | <b>Ethnicity</b> | <b>Age</b> | <b>Sex</b> | <b>Age arrived in Ipswich</b> |
|------------------|------------------|------------|------------|-------------------------------|
| Keith            | Anglo            | 71         | m          | born                          |
| Patrick          | Anglo            | early 40s  | m          | born                          |
| Betty            | Anglo            | 74         | f          | born                          |
| Mary             | Anglo            | 40         | f          | born                          |
| Gary             | Barbadian        | 68         | m          | adult                         |
| Edward           | Barbadian        | 48         | m          | child, 9                      |
| Margaret         | Barbadian        | 71         | f          | adult                         |
| Michelle         | Barbadian        | 43         | f          | adolescent, 14                |

Figure 1. Anglo speakers, glottal stops only

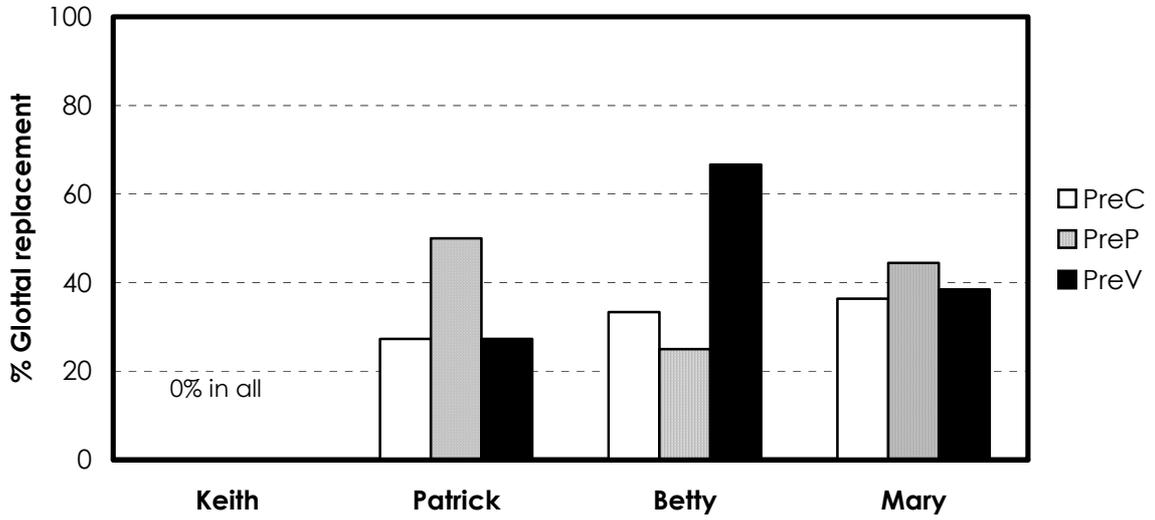


Figure 2. Anglo speakers, other glottal variants only

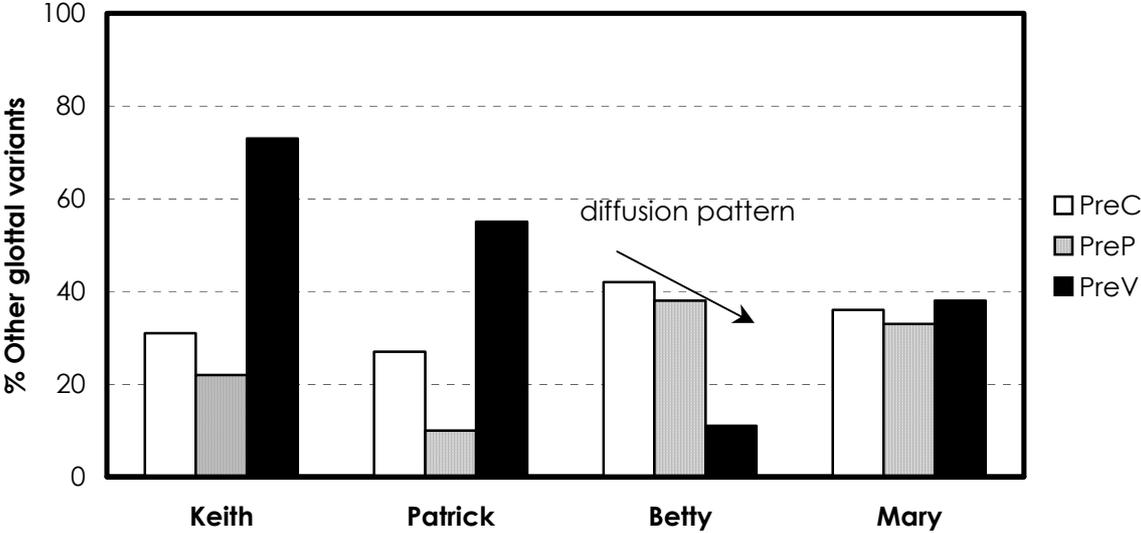


Figure 3. Anglo speakers, all glottal variants

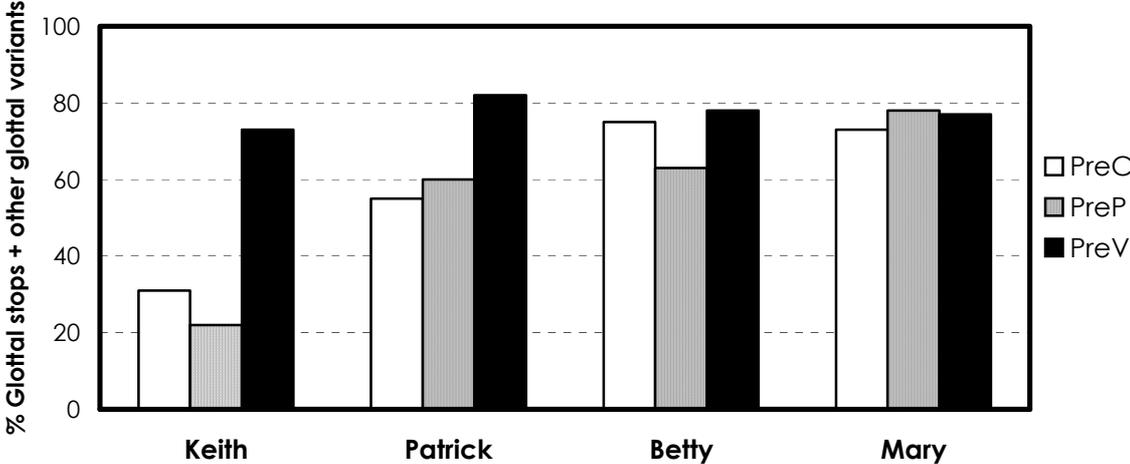


Figure 4. Barbadian speakers, glottal stops only

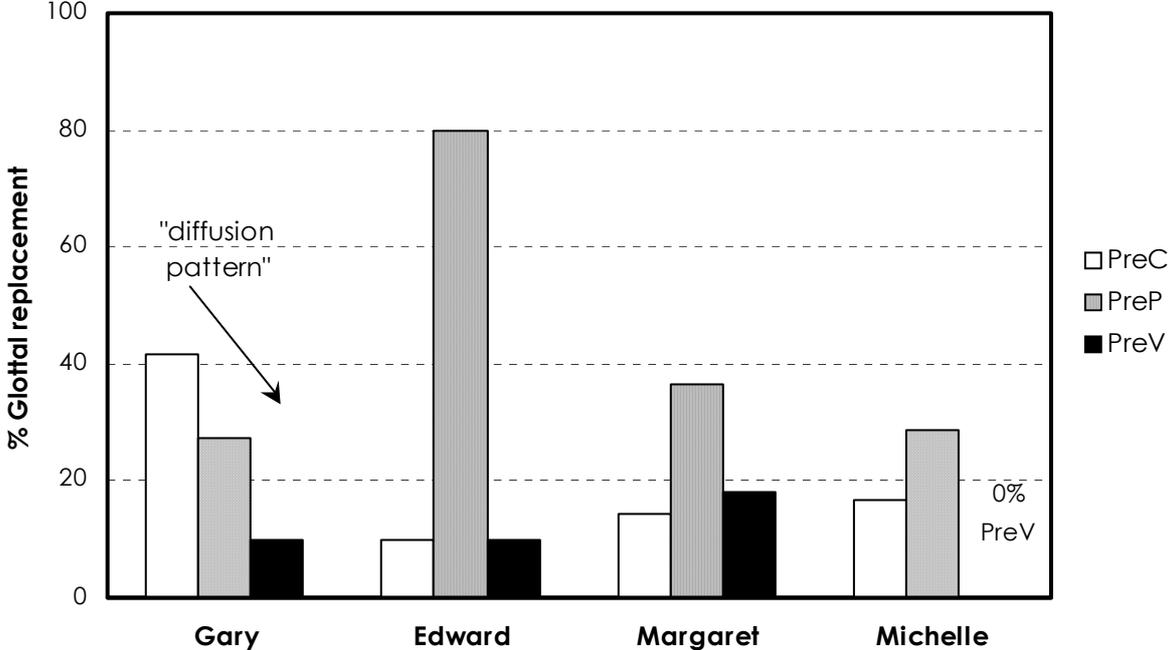


Figure 5. Barbadian speakers, other glottal variants only

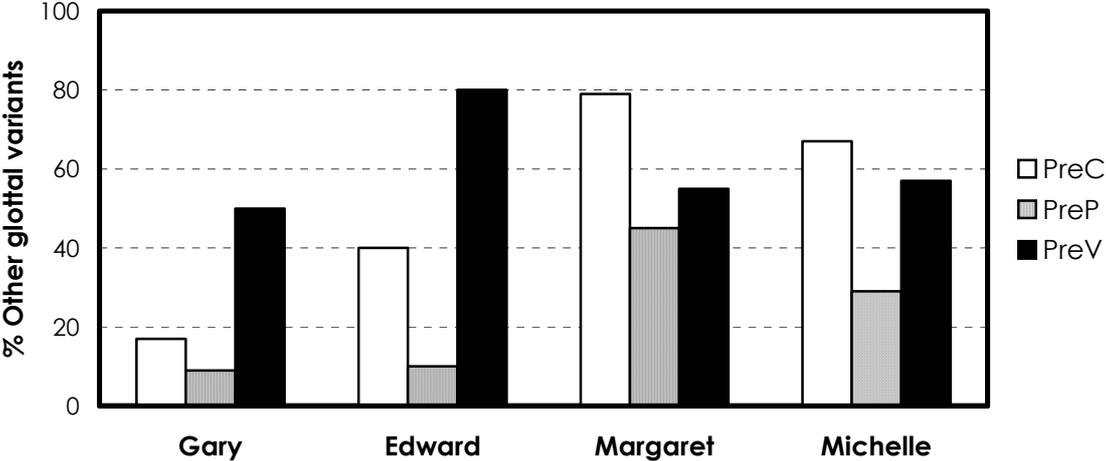


Figure 6. Barbadian speakers: all glottal variants

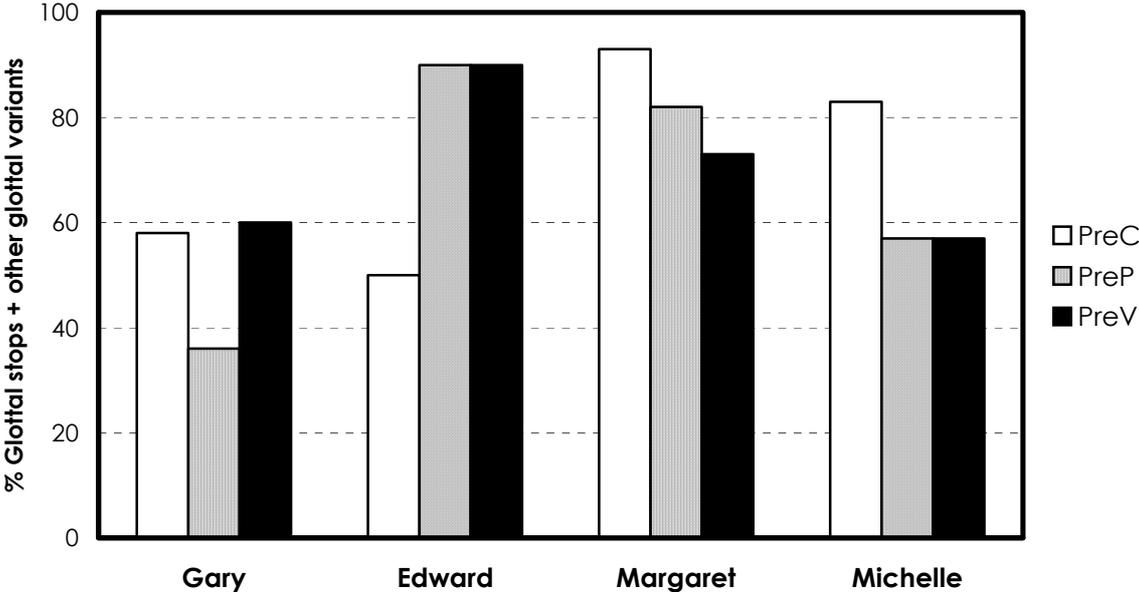


Figure 7. Both groups, all glottal variants

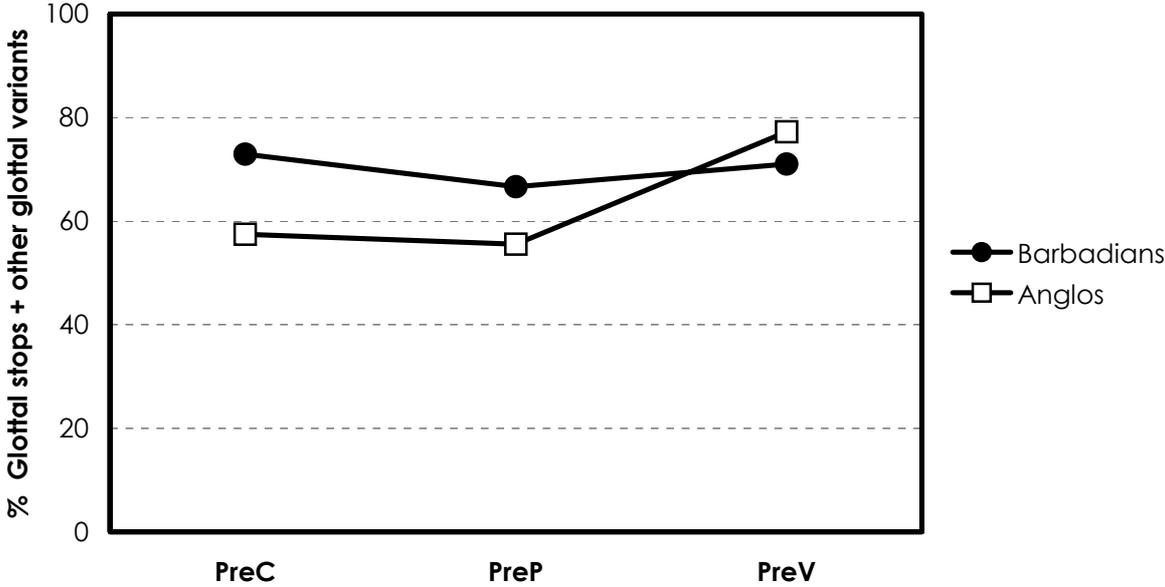


Figure 8. Both groups, glottal stops vs. other glottal variants

