(appearing in *Journal of Sociolinguistics* 8/1, 2004)

Internal and external motivation in phonetic change: dialect levelling outcomes for an English vowel shift

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This article is a contribution to the debate about the primacy of internal vs. external factors in language change (Farrar and Jones 2002; Thomason and Kaufman 1988). Taking Labov's Principles of Vowel Shifting (Labov 1994) as representing internal factors, we examine a vowel shift in Ashford, south-east of London. F1 and F2 measurements of the short vowels suggest a classic chain shift, largely following Labov's Principles II and III (though Labov's assumption that London short front vowels are rising is shown to be wrong). However, corresponding data from Reading, west of London, evidence no signs of a chain shift. The two datasets show identical targets for the changes in each town. Thus, there has been convergence between the two short vowel systems – from different starting points. We argue that a dialect contact model is more explanatory than internal factors in this case of regional dialect levelling in the south-east of England.

KEYWORDS
Dialect levelling, dialect contact, language change, chain shifts, internal and external factors

RUNNING HEADER
Dialect levelling in an English vowel shift

WORD COUNT
9242

INTRODUCTION: SOCIOLINGUISTIC APPROACHES TO EXTERNAL AND EXTRA-LINGUISTIC FACTORS

A trend in social dialectology has been to address the debate in historical linguistics surrounding the relative contributions of 'internal' (system-driven) and 'external' (contact-driven) factors in linguistic change (Croft 2000: 6; McMahon 1994: 13). To these can be added 'extra-linguistic' motivations, which Farrar and Jones (2002: 1) define as 'sociopolitical and economic', but under which we would include social-psychological factors, especially identities and attitudes. In this article, we use data on an English vowel shift, collected using established social dialectological methods, to explore whether the shift is internally motivated by general principles of vowel change, or whether other factors, particularly dialect contact, play a more decisive role in guiding the progress of the shift.

Milroy (2002: 4) criticises early work in social dialectology for dealing with 'intra-varietal' variation within a rather narrowly defined speech community composed of 'natives', pointing out that speakers have a wider set of repertoires than such a model would predict. Studies focused relatively little on the speakers' contact with members of other speech communities; indeed, in his book covering social factors in linguistic change, Labov (2001: 20) admits as much, stating that he is not concerned with dialect contact, but with 'those changes that emerge from within a linguistic system' – by which he clearly means not 'internal' change as conceptualised here, but social motivations generated *within* speech communities where dialect contact is not present. We must add that we find this position to be a serious underestimation of the role of dialect contact in change, as will become clear in this article. However, since the 1980s, at least in Europe, studies have increasingly concentrated on *dialect levelling*, which can be defined as the reduction in the number of realisations of linguistic units found in a defined area, usually through the loss of geographically and demographically restricted, or 'marked', variants, and the closely related notion of *dialect convergence*, by which two or more varieties becoming more alike through convergent changes. These are both seen as the outcomes of various, mainly contact-based, scenarios. Studies have demonstrated the loss of highly localised varieties, concomitant with the loss of close-knit, small-scale social networks. Replacing localised varieties we find distinctiveness at a larger, regional level, characterised by levelled varieties (Thelander 1982; Trudgill 1986: 98-102; Foulkes and Docherty eds. 1999; Kerswill 1994, 2002a; Hinskens 1996; Kerswill and Williams 2000). We return to the change from local to regional distinctiveness below. In practice, situations in which dialect levelling and dialect convergence take place also give rise to entirely new forms, which in the case of vowels may be phonetically intermediate between the older, more marked forms: this is what was found in a study of the New Town of Milton Keynes (Kerswill and Williams 2000). New, exogenous forms arriving from elsewhere by a process of geographical diffusion may also be found (see below). When we compare two varieties within an area thought to be subject to levelling, we see convergence through time; this was the case with a comparison of two south-east English towns, Reading and Milton Keynes (Williams and Kerswill 1999). Not only is there convergence, but the varieties can also be seen to adopt common innovations.

Trudgill (1986) sees dialect contact as causing levelling through the mechanism of short- and long-term accommodation by speakers in a contact situation. He has expanded this idea by arguing that one can make predictions about a levelling outcome, especially in a 'new dialect' such as the English of New Zealand, in a mechanistic way simply with knowledge of the proportions of speakers of particular dialects in the mix (Trudgill, Gordon, Lewis and Maclagan 2000; Trudgill 2001).

More recently, there have been attempts to relate levelling (and its obverse, dialect maintenance) to a greater range of social psychological motivations. Thus, moving beyond

contact issues, Milroy (2002: 4) argues that language attitudes and language ideologies must also be taken into account in a sociolinguistic account of variation, as well as cognitive constraints on acquiring a second dialect. In this vein, Watt (2000, 2002) favours an extra-linguistic (i.e. not necessarily contact-based) account and argues that, in dialect levelling, social and attitudinal factors take priority over systemic factors. His study of the Tyneside (Newcastle) vowel system shows phonetic variation in the vowels FACE and GOAT.[1] Older, localised variants, such as [ɪə] and [ʊə], are being supplanted by new variants common to a wider geographical area, in particular [eː] for FACE and [oː] or a fronted variant, [ɵː], for GOAT. Watt argues that the new variants reflect a local identity without the social stigma associated with the traditional variants. Even though some speech styles still maintain the marked variants to a certain degree, they are slowly disappearing from the sound system because of their social and geographical connotations. The levelled, but still clearly regional, variety is then a result of this process. Kerswill (2002b, forthcoming a) confirms the view that there is regional levelling through a study of the same vowels in the nearby city of Durham, and argues that regional identity is a factor in this levelling. In a study of dialect maintenance and loss in a rural north-east Scottish community, Marshall (2001, forthcoming 2003) finds that an attitudinal measure relating to orientation to the local community is a stronger predictor of dialect use in individuals than is a measure based on Milroy's social network scale (1980: 141-142). This means that contact, as encapsulated in this measure of a person's social network, is of much lesser importance than is a factor that is identity-based, in way that is related to Watt's account.

It must be said, however, that an understanding of the balance of 'contact' versus 'identity' or 'attitudes' in explaining the diffusion of change is in its infancy. This is especially true of the types of identification that lead to the levelling discussed by Watt and Marshall. Our best guess would be, based on Trudgill's work and Marshall's insight, that contact predicts the macro-level linguistic changes over a period of time, whereas individual responses are more governed by attitudinal and identity factors.

We turn to a question of definition and terminology. Kerswill (2002b) suggests that when the dialect levelling is observed over a relatively large geographical area such as the south-east of England, it should be referred to as *regional dialect levelling*. Britain (2002b: 63) discusses a process that is probably identical with this: *dialect supralocalisation* (cf. Milroy, Milroy and Hartley 1994). This is the linguistic consequence of supralocalisation, which is a set of social developments resulting from migration (Kerswill forthcoming b), mobility, an expansion in the tertiary economy and labour-market flexibility, leading to larger 'functional zones' (Britain 2002b: 62). Dialect supralocalisation, or regional dialect levelling, is then the formation of levelled supralocal varieties, with few local differences within a region, resulting from this wider social change.

From the discussion thus far, it is apparent that regional dialect levelling involves:

(i) *geographical diffusion*, a process which involves features spreading out from a populous, economically and culturally dominant centre to the surrounding areas (Britain 2002a; Trudgill 1983);

(ii) *levelling*, which can now be defined more narrowly as the reduction of the number of variants following speaker accommodation through face-to-face interaction – a definition focusing on the social psychological mechanism behind the levelling outcome and resulting from contact. Levelling (as distinct from regional dialect levelling/supralocalisation) is necessarily restricted to smaller geographical areas, such as new towns or compact regions;

(iii) *Non-contact, extra-linguistic factors* including identity, attitudes and ideology, leading to adoption of features speakers deem attractive, and the avoidance of features which are unattractive.

As we shall argue shortly, natural principles of vowel shifting will often conflict with the pressures of regional dialect levelling. The question then becomes: which wins out when there is a conflict?

INTERNAL FACTORS

Labov (1994) is perhaps the most detailed account yet published on internal, structural motivations for vowel shifts. He covers shifts in a number of languages, particularly English, and several of these are reported by him to have taken place in British English. A more recent study focusing on systemic factors involved in vowel change has been carried out by Watson, Maclagan and Harrington (2000) on New Zealand English short vowels. They argue that the changes are mainly due to overcrowding in the vowel space and the avoidance of misperception between phonetically similar vowels. This change, they claim, began as an innovation where KIT moved to a more central position and other front vowels followed on behind, in a drag chain (2000: 63). As with the English Great Vowel Shift, this is seen as an integrated chain shift, which does not require external explanation: no suggestions are made that this shift might be due to a process involving dialect contact or levelling, or even issues of identity.

A problem for the analyst, however, is the assumption that chain-shifts are a directly observable and unitary phenomenon. As Lass (1997: 38-39) points out, 'a chain is a second-order object, deduced from correspondences, not "observed"'. Following Lass, we can argue that the chain shift idea is a metaphor for a process by which vowels move, pushing other vowels away, or creating gaps which are then filled. The shifts are not observed directly; they are deduced from the apparent-time data and are consequently theoretical constructs. Despite these ontological arguments, vowels do change in a coordinated fashion. There can be little doubt that functional reasons partly underlie the 'chain', and constitute a type of internal change (Martinet 1955, discussed in McMahon 1994: 30).

There are, then, two possible approaches to the 'explanation' of a vowel shift: the idea of a chain shift as a 'natural' mechanism of phonetic change (notwithstanding the arguments just cited), and the idea that external and extra-linguistic factors, especially contact and attitudes, can override a natural shift. This article will address this issue by taking a specific context – the short vowels of the non-standard English of south-east England – and testing these notions.

LABOV'S PRINCIPLES OF VOWEL SHIFTING AS INTERNAL MOTIVATION

Labov's Principles of Vowel Shifting (1994: 116) are an explicit framework for the systematic exploration and comparison of chain shifts. A number of studies on English varieties have been carried out, informed by these principles (though few, if any, non-anglophone studies have made reference to them). Labov combines these principles into four observable 'patterns'. He also divides English varieties into three 'dialects' according to their vowel shifting patterns (Labov 1991). We will see whether these insights are valid for our data.

Labov's three principles are as follows (1994: 116):

PRINCIPLE I
In chain shifts, long vowels rise

PRINCIPLE II
In chain shifts, short vowels fall
PRINCIPLE IIA
In chain shifts, the nuclei of upgliding diphthongs fall
PRINCIPLE III
In chain shifts, back vowels move to the front

As this study will deal with the short monophthongs, we will be dealing with Principles II and III. Labov divides ongoing changes into four 'patterns'. Pattern 1 (Labov 1994: 123, 170) involves the raising of long vowels and the lowering of the onset of close long vowels to form rising diphthongs (e.g., [aʊ] and [aɪ] from [uː] and [iː], respectively). Pattern 2 (1994: 125, 177-201) is seen in the US Northern Cities Shift, and involves the fronting and raising of long back vowels (including, for these purposes, the vowel of LOT) in an anti-clockwise movement, and the lowering and centralisation or backing of short front vowels (Wolfram and Schilling-Estes 1998: 138). The change patterns most important for us, however, are Patterns 3 and 4.

Pattern 3 is a combination of Principles I and III and states that open vowels become more close and back whilst back close and mid vowels become more front (1994: 201-208). Labov reports this type of shift in several varieties of English, calling it the Southern Shift. Labov cites the vowel system of Marie Colville, a 'Cockney' (vernacular London) speaker interviewed in 1968, as evidence for this shifting pattern,. As we shall see, Labov's failure to carry out a diachronic investigation of London vowels, either in real or apparent time, led him to some erroneous conclusions about the direction of any changes. Colville has a 'fronted' GOOSE vowel (following Principle III), with THOUGHT 'rising' to take its place. If we take Labov's word for the idea that Marie Colville's vowel system is a stage in a vowel shift, then there is a tension at this point between Principles I and III, in that THOUGHT could be propelled either front or up: the latter is what happens in this case. It seems (to us) that the integrity of Pattern 3 and the two principles can be preserved if we regard THOUGHT as an open-mid vowel and therefore susceptible to raising. Further, Principle III predicts the fronting of (the onset of) GOAT and fronting of FOOT. Marie Colville, however, has a GOAT vowel that is not fronted, but has a mid onset, and no fronting of FOOT (Labov 1994: 169). GOAT fronting is, however, a pattern that can be seen in many varieties in England, having a fronted monophthongal (Watt and Tillotson 2001) or diphthongal (Kerswill and Williams forthcoming) realisation, regardless of the presence or otherwise of a vowel shift. There is no universal agreement about what is the driving force behind changes in the diphthong. Stockwell and Minkova (1999: 90) argue that there is an intrinsic process of dissimilation between the elements of the diphthong and this is the dynamic behind the change. Wells (1982: 308-309) regards the movement as part of a wider process of diphthong shift. A fronted FOOT vowel has also been reported across several varieties in England; see e.g. Torgersen (1997), and below. Labov claims that the most extensive examples of fronting are found in the phonology of Norwich, at least as compared to London and some US cities he describes. However, it is clear that Labov could not have noted the fronting that has been found in the years since he conducted his (very limited) fieldwork in England in the 1960s. He does note the fronting of GOOSE, for which there is much earlier evidence than for that of GOAT (Bauer 1985; Kerswill and Williams forthcoming).

According to Labov (1994: 208-218), Pattern 4 is the most commonly observed pattern in English varieties which, like those of south-east England, Australia, New Zealand and the American South, are said to be following the Southern Shift. It involves the downward movement of the onsets of FLEECE and FACE to a more centralised position. In addition, short front vowels rise, apparently contradicting Principle II. This will happen when

the short vowels can be regarded as peripheral, meaning that they are located at the periphery of the speakers' vowel space. Labov backs up the claim of peripherality by pointing to his finding that the vowels of KIT, DRESS and TRAP have a higher F2 (second formant) than long vowels and diphthongs with a similar height (as measured by F1) (Labov 1994: 209-210). Labov then recasts Principles I and II in terms of tenseness/laxness in place of length, and maps this dimension onto peripherality. This leads to the following restatement of these two principles (1994: 176):

PRINCIPLE I
In chain shifts, tense nuclei rise along a peripheral track.
PRINCIPLE II
In chain shifts, lax nuclei fall along a non-peripheral track.

The short vowels of KIT, DRESS and TRAP, now considered 'tense', will then rise along the peripheral track. A diachronic raising of these vowels is fully supported by recent instrumental findings in New Zealand, where raising has been found to have occurred during the 20th century, reflecting a post-settlement innovation (see Maclagan, Gordon and Lewis (1999), Watson, Maclagan and Harrington (2000) and Evans (1998)). As we shall see shortly, there is no evidence for such raising in southern England – rather, the converse.

COUNTEREVIDENCE FOR LABOV'S VOWEL CHANGE PATTERNS: KIT, DRESS AND TRAP IN SOUTH-EAST ENGLAND

Counterevidence for Pattern 4 short vowel changes is reported in a number of studies. Wells (1982: 305) states that, although the London monophthongs do not differ much from those found in RP (Received Pronunciation), KIT may be somewhat central and TRAP may be slightly lowered. STRUT has a very wide distribution ranging from a fronted [ɐ+] to a quality like that of cardinal vowel four ([a]). Closer realisations, however, of e.g. DRESS, are found in an environment preceding a voiced consonant. Wells (1982: 304) gives [e] as the vowel of DRESS, while, for Norwich, Trudgill (1999b: 127) gives [ɛ].[2] This does, at the very least, indicate variation within the south-east. Wells also reports lowering of DRESS in the north of England. Finally, he regards a close DRESS vowel as a feature of old fashioned speech in RP and Cockney (the usual label for working class Londoners and their speech) (1982: 128). Neither Wells nor Trudgill, then, provides any evidence of the raising of KIT, though Wells claims a fairly close DRESS vowel for London, with no mention of lowering.

TRAP may be lowered to an [a] quality in the West Country (south-west England). Also, there is lengthening of [æ] in some TRAP words in the south-east area (Wells 1982: 130). For TRAP, the current trend is towards an open monophthong [a] in England, as opposed to a closer quality in the US. Wells (1982: 129) even hypothesises that the development in England may be a reaction against the closer realisation of TRAP in Cockney. In sum, there is no evidence of raising of the two highest vowels, and there is ample evidence of the lowering of TRAP. This seems to run counter to Labov's Pattern 4.

Bauer (1985, 1994) reports an instrumental study of the RP short vowels TRAP and STRUT. There seems to be backing of TRAP (lowering of F2): 'the figures for /æ/ show a retraction and possibly a lowering of this vowel over the century' (Bauer 1994: 117). For STRUT, there seems to be little realisational change. According to Bauer, this was unexpected as contemporary descriptions of RP describe this as an open centralised front vowel. His data are not clear enough to draw any safe conclusions for this vowel (Bauer 1985). However, when both TRAP and STRUT are compared there seems to be a slight backing of both (Bauer 1985).

Tollfree (1999), likewise, provides no evidence of the raising of short vowels in South East London English (spoken by working-class people in her sample). Indeed, she uses transcriptions that suggest quite open realisations of both DRESS and TRAP amongst non-standard speakers in the Greater London area. According to her, younger speakers have [ɛ] or an even more open [ɛ̝] as their DRESS vowel – a much more open quality than Wells allows for; we will see below that other authors have noted a relatively open quality for this vowel. TRAP has [æ] or [æː] for all speakers – which puts it only just below DRESS, and slightly lower than the [ɛ̝] reported for TRAP by Hughes and Trudgill (1996). To judge from Tollfree's transcriptions, the DRESS and TRAP vowels seem to be occupying almost the same phonetic space. As we shall see shortly, for Tollfree, TRAP may also occupy the open-front region.

OTHER VOWELS IN SOUTH-EAST ENGLAND

Except for FOOT, the remaining short vowels are not closely implicated in Labov's patterns. STRUT is of considerable interest, because it has been subject to variability and change over a long period. As with other authors, Tollfree reports a relatively front STRUT vowel in the region of [a] or [ɐ]; this is similar to Hughes and Trudgill's (1996) use of [a̟] for London, and distinct from the [ɐ] or [ʌ+] which Tollfree gives for 'South East London Regional Standard'. She does not specify how STRUT is kept distinct from TRAP in working class speech: presumably speakers with an open TRAP vowel will have the more central of the two variants she lists.

Trudgill (1986: 51, 1999b) reports an ongoing lowering and fronting of STRUT in East Anglia, the area stretching out from the north-east of London. Rural accents show a gradient realisation from a back [ʌ] to an RP type [ɐ]. Urban accents may have an even more fronted quality in the region of [a̟-]. The degree of fronting is dependent on age and proximity to London. However, to judge from recent data gathered north-west of London, this process may in fact have been reversed in the London area: in the New Town of Milton Keynes, Kerswill and Williams (2000) found few London-style front realisations of STRUT.

The vowels of GOOSE and FOOT are covered by Pattern 3. In accord with this pattern, Torgersen (1997) found strong fronting of both vowels amongst the younger informants in a study of middle class south-eastern British speech. Similar results were reported for Milton Keynes by Kerswill and Williams (2000). More generally, they found a levelling of vowels in both Milton Keynes and Reading, especially those of PRICE, MOUTH and PALM, in the direction of qualities that did not have a strongly local affiliation and which were phonetically intermediate between local variants and those of RP (Williams and Kerswill 1999).
The evidence so far presented suggests that the short front vowels in southern British English are lowering, not rising, as implied by Labov in his presentation of Pattern 4 (1994: 209-214). There is evidence of the fronting of GOOSE, GOAT and FOOT vowels, and this supports Principle III. This is arguably a natural shift, motivated by the smaller auditory space available for back vowels than for front vowels. For STRUT, however, the data are conflicting, as both fronting and backing have been reported. In addition, we notice that dialect levelling seems to be having an impact on the vowel systems.

WHAT IS THE EVIDENCE FOR CHANGE?

A problem we encounter when describing processes such as 'fronting' and 'raising' is that these terms presuppose a diachronic process. In hypothesising that south-eastern British English had closer realisations of KIT, DRESS and TRAP than are current now, we do in fact find some support in southern-hemisphere English vowel systems. Trudgill (forthcoming)

argues that southern-hemisphere English has retained a conservative short vowel system with quite close front vowel realisations. Typically, this is noticed in DRESS and TRAP. Immigrants to Australia and New Zealand came mainly from the south-east of England and they would have retained their close realisations of the short front vowels, preserved (with modifications) in those countries. Trudgill adduces evidence in support of this account from traditional dialects in East Anglia that have retained a close DRESS vowel. Trudgill also provides evidence for close realisations in the south-east by quoting *Survey of English Dialects* (*SED*) material from around London (Orton and Tilling 1970), as well as Ellis (1889) and Wright (1905). Based on these vowel qualities, Trudgill argues that a chain shift involving the short front vowels has taken place in the south-east. The shift is a drag chain which started with the lowering of TRAP.

Indeed, descriptions of vowels in London have found variation, though the evidence for the time-scale of any lowering is not clear. To remedy this, we now turn to some older empirical studies.

Hurford (1967) studied phonetic variation in one East End (London) family. The three-generation family members he studied were born in the period 1885 to 1953, and were all characterised as Cockney speakers. Hurford finds a classic London short vowel system. He states that there is little variation amongst the speakers for the short vowels, even though he records quite a phonetic range for many of them. KIT has mainly a realisation in the [ɪ] area, but he notes variation from [i] to [ɛ], as well as [ə] (1967: 348). DRESS is typically in the region of [ɛ], but some speakers have closer realisations (1967: 353) – though Beaken (1971: 150), working with a younger sample of speakers, argues that the *lowering* of the DRESS vowel is a feature of modern Cockney. TRAP has realisations from [e] and [ɛ] to [a], majority realisations being [ɛ], [æ] and [a], indicating that the vowel is more often lowered than raised. The vowel may also be retracted to [ə] or [ɐ] (1967: 362). Hurford notes that one of the young informants actually has closer realisations for KIT, DRESS and TRAP than the others, thus contradicting Beaken's finding. It is interesting to note that the recordings were made in the mid-sixties at approximately the same time as Labov's recordings in the area. It is tempting to posit a temporary raising of vowels amongst younger people in the London at that time, though this is, perhaps, unlikely.

For STRUT, some of Hurford's speakers have a central [ɐ], though most have an open central variant [ɐ̟] (Hurford uses the symbol [A] for this quality). Only one of the oldest speakers had a front [a] (1967: 382), suggesting (it seems to us) that, at least in the capital, extreme STRUT fronting had been reversed by the middle of the 20th century. STRUT fronting probably originated in London and spread out from there; as we shall see from our own data, a fairly front STRUT can still be found elsewhere in the south-east. As we shall see, too, the reversal of STRUT fronting appears to be spreading outside London.

Finally, for LOT and FOOT there is relatively little variation, the speakers having mostly [ɔ] and [ʊ], respectively. However, for FOOT, variants such as [ʉ] and [ɜ] are occasionally found. It may be significant that one of the oldest informants, in fact the speaker with the front [a] in STRUT, has exclusively [ʊ] (Hurford 1967: 399); this suggests that FOOT fronting may have begun between the time of the oldest and youngest of Hurford's generations.

Older Cockney had (and to some extent still has) items belonging to different lexical sets from those used in RP and the standard written language, including 'git' for *get*, 'cimitery' for *cemetery*, 'whan' for *when* and 'Fanchurche' for *Fenchurch* (Matthews 1938: 169). Matthews also mentions 'sech' for *such* and 'jist' for *just* (1938: 171) . He transcribes *cab* as

[keb] and *ban* as [ben], stating that this realisation is very close to the 'standard short e' (1938: 79). It is likely that he is referring to a lexical, not a realisational difference, since this would otherwise yield a very close TRAP vowel and a phonetic overlap with DRESS – though, as we see below, we cannot exclude the latter possibility.

Beaken (1971: 192-193) writes that there may be some confusion between TRAP and STRUT and that, in general, there is crowding in the vowel space of the short vowels DRESS, TRAP and STRUT, leading to an overlap of DRESS and TRAP in the [ɛ] area (as Matthews hinted at above). Beaken argues that a feature of adult Cockney is therefore to lengthen TRAP in some positions.

Sivertsen (1960: 47) has a KIT quality close to RP, between front and central and between close and mid-close. She describes DRESS as front and between mid-close and mid-open, [e] (Sivertsen 1960: 53). She also gives quite a close realisation of TRAP, using the symbol [ɛ] and stating that it is slightly closer than RP (Sivertsen 1960: 59). In addition, she states that some speakers indeed replace the TRAP vowel with the DRESS vowel. For the STRUT vowel, she uses [ʌ], but describes it as a front vowel which is between open-mid and open. She states that it is not very different from the RP TRAP vowel, but not as front (Sivertsen 1960: 83). Sivertsen is here at odds with Matthews, who wrote that the STRUT vowel was 'more central than the standard sound. It is a vowel between the standard short u and the standard vowel in bird, worse, etc.' (Matthews 1938: 80). If we take 'standard short u' to represent a fully back, older RP [ʌ], then the picture Matthews gives for older Cockney speakers in the 1930s is of the open-mid central vowel which is commonly cited for modern RP. Fronting is probably under way by the end of the 19th century (if we assume RP to be conservative), since Sivertsen's description suggests that it was complete in the speech of her informants, who were perhaps 25 years younger than some of those Matthews was observing. Hurford's oldest informant, of the same generation as Sivertsen's, seems to match hers with respect to having a front STRUT. As we have seen, STRUT fronting seems to have been reversed by the time of the next generation: those who, like Labov's Marie Colville, reached adulthood in mid-century. We provide more evidence of this in the instrumental data we present later.

Sivertsen finds LOT also having a slightly closer realisation than in RP. For FOOT, there is a little more fronting. She states that the vowel is between central and back and between close and mid-close (1960: 79).

Hodneland (1998) has systematised the *SED* materials for the two localities in London, Harmondsworth (Middlesex, in the west of the conurbation) and Hackney (in the traditional East End). For KIT, the overwhelming number of realisations are given as [ɪ], though there are four occurrences of [ɛ], probably due to lexical incidence (Hodneland 1998: 12). DRESS also shows very little variation, with near-categorical realisations as [ɛ]. Of the 388 tokens recorded (without pre-vocalic /l/), 43 are raised and 15 lowered (1998: 17). For TRAP, there is more variation. The most frequent realisation is [æ], but the materials also show [æː] (lengthening before a voiced consonant, mostly nasals), and [ɛ] and [a] (1998: 89). Of the latter two realisations, [ɛ] is most frequent, occurring 59 times out of a total of 421 tokens. An [a] type vowel occurs 20 times. Very little variation is indicated in STRUT, LOT and FOOT. It is interesting to note that there are no explicit indications of a fronted STRUT vowel; STRUT has a near-categorical [ʌ] realisation (1998: 27). This is surprising, given the observations of Sivertsen, Hurford and others. It is likely that the fieldworker was not concerned to note finer phonetic detail, and used a 'generic' symbol for an open-mid vowel.

Examining the acrolectal variety, RP, in the second half of the 20th century reveals that it has seen considerable stability. Acoustic measurements of RP vowels recorded more than 30 years apart have been published by Wells (1962) and Deterding (1997). Both studies measured formant values for male RP speakers. As can be seen from Figure 1, Deterding generally has more centralised realisations for all vowels, probably due to the fact that Wells examined words in isolation whilst Deterding dealt with connected speech. The striking feature of this figure is the almost identical relative positions of the vowels in both studies.

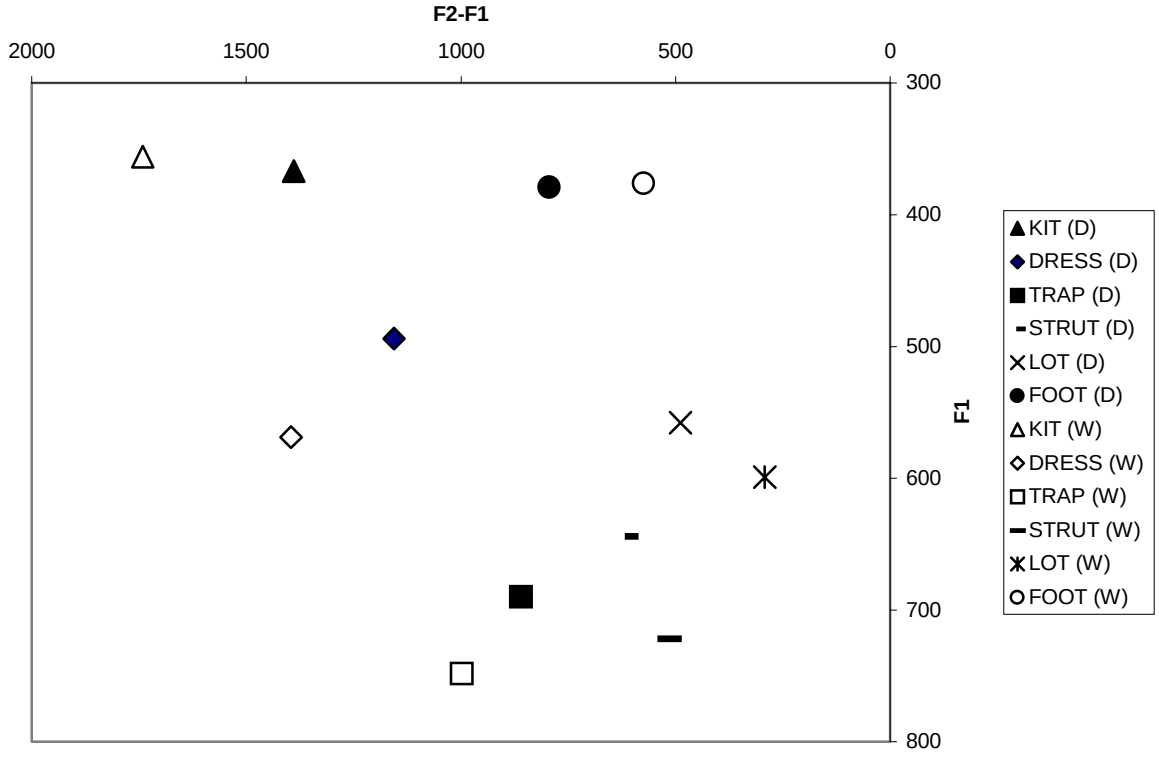

Figure 1 Short monophthong qualities for male RP speakers (D=Deterding, W=Wells)

Harrington, Palethorpe and Watson (2000) measured F1 and F2 for the monophthongs in nine of the Queen's Christmas broadcasts from the 1950s to the 1980s. They find a higher F1 for STRUT and TRAP in the 1980s broadcasts, in line with both sets of RP measurements above. In the case of TRAP, this corresponds, they argue, to the lowering trend noted for this vowel in RP. A decrease in F2 is found for DRESS, TRAP and STRUT, which indicate a backing of these three vowels compared to the 1950s qualities.

To summarise, the clearest evidence we find is that, in almost all the research cited, there is a more back FOOT realisation than that usually found today. For the other short vowels, the picture is more diffuse. However, it seems as if STRUT, in the first half of the 20th century, had undergone fronting from a central to a front vowel, only to be backed again in the second half. DRESS and TRAP had rather similar, even overlapping realisations, though both were closer than they are now.

LOCALITIES

In order to examine vowel changes we have chosen two towns in the east and the west of the south-east region, situated roughly the same distance from London. Ashford is in Kent about

50 miles south-east of London, whilst Reading lies about 40 miles west of the capital. The locations are shown in Figure 2.

Figure 2 Location map

A basis for hypotheses concerning differences between accents in these two areas may be found in the *Survey of English Dialects* (Orton and Wakelin 1967; Orton and Tilling 1970). Two Kent locations near Ashford were investigated, Warren Street and Appledore, as well as two locations close to Reading, Swallowfield in Berkshire and Binfield Heath in Oxfordshire. The speakers in the *SED* were elderly and rural, and by and large represent 'traditional' dialect speech (Trudgill 1999a), rather than 'mainstream', urban dialects.

Table 1 SED Short vowel system

	Warren Street, Kent	Appledore, Kent	Swallowfield, Berkshire	Binfield Heath, Oxfordshire
KIT	ɪ	ɪ	ɪ̞	ɪ
FOOT	ʊ	ʊ	ʊ	ʊ
DRESS	ɛ, ɛ̞	ɛ, ɛ̞	ɛ	ɛ
TRAP	ɛ	ɛ, æ, æ̞	æ, a̲	a
STRUT	ʌ	ʌ	ʌ	ʌ
LOT	ɒ, ɒ̟	ɒ	ɒ̝, ɒ̟ˁ	ɒ

As Table 1 shows, for STRUT and FOOT the *SED* transcription used does not give any obvious indication of differences. For STRUT, we find [ʌ] used throughout, though in Swallowfield [ɒ] appears for some items, probably representing a difference in lexical incidence. For FOOT, [ʊ], or rather its kidney-shaped antecedent [ʊ̡], is used throughout. However, for KIT, DRESS, TRAP and to a certain degree LOT the story is quite different. KIT has a more open quality in Swallowfield compared to the two Kent locations, while DRESS and TRAP have more close realisations in Kent compared to the realisations west of London. LOT has the primary realisation [ɒ] in all four localities, but note that the more close quality [ɒ̝] also is reported in Swallowfield. The east-west differences are fairly clear, and seem not

to have been confounded by the fact that the first three localities in the table were investigated by the same fieldworker, with a different one for the fourth.

METHOD OF ANALYSIS

The present study investigated all stressed short monophthongs, KIT, DRESS, TRAP, LOT (some speakers only), STRUT and FOOT. Both words containing the vowels in a word list read by the informant and words excised from continuous interview speech were selected for analysis, and the cassette and minidisc recordings were then digitised at 16 bits using a 22,050 Hz sampling rate. All vowels for which there was a clear formant structure were used in the analysis, and F1 and F2 were measured using the SIL Speech Analyzer package. For each vowel for each informant, between 15 and 40 tokens were analysed, with vowels before /l/ excluded. In total, around 3,000 vowel tokens were analysed. The formants were measured in the middle of the steady state vowel on the spectrogram. A control measure of these frequency values was taken on the spectrum window.

Two age groups were selected for analysis, speakers 14-15 years of age and speakers in their 70s and 80s. The adolescents were sampled through schools known to have working class catchment areas, the elderly through local day centres in working class districts. A breakdown of the informants is shown in Table 2.

Table 2 Informants

	Girls	Women	Boys	Men
Ashford	4	4	4	2
Reading	4	3	4	2

We present the findings as traditional plots with F1 (degree of openness) on the vertical axis and F2-F1 (degree of fronting) on the horizontal axis (Ladefoged 1992: 197). Other instrumental studies of vowels by Watt and Tillotson (2001) and Fabricius (2002) have presented vowel plots for individual speakers. We have chosen to examine the relative positions of vowels in an individual's vowel space, following Milroy and Gordon (2003: 148-153). There are obvious disadvantages to displaying unnormalised data for several individuals on the same plot, not least because any systematic differences between groups will be obscured. However, by plotting aggregate values (using the median to remove the effect of outliers) for speakers of the same sex (thus reducing the effect of sex-related differences in vocal tract), we are still able to detect general patterns of shift. Backing up this decision is the fact that the plotted values are supported by our joint auditory impressions, and by the fact that the specific vowel changes we argue for are very much in line with what has been observed in the literature we have reviewed and discussed. The median formant measurements for all informants can be found in the appendix.

SHORT VOWEL CHANGES IN ASHFORD

Female informants

A pair-wise comparison of two representative female informants reveals a movement in the vowel space of the short vowels. Figure 3 presents the data for Mrs C, each data point representing one stressed vowel.

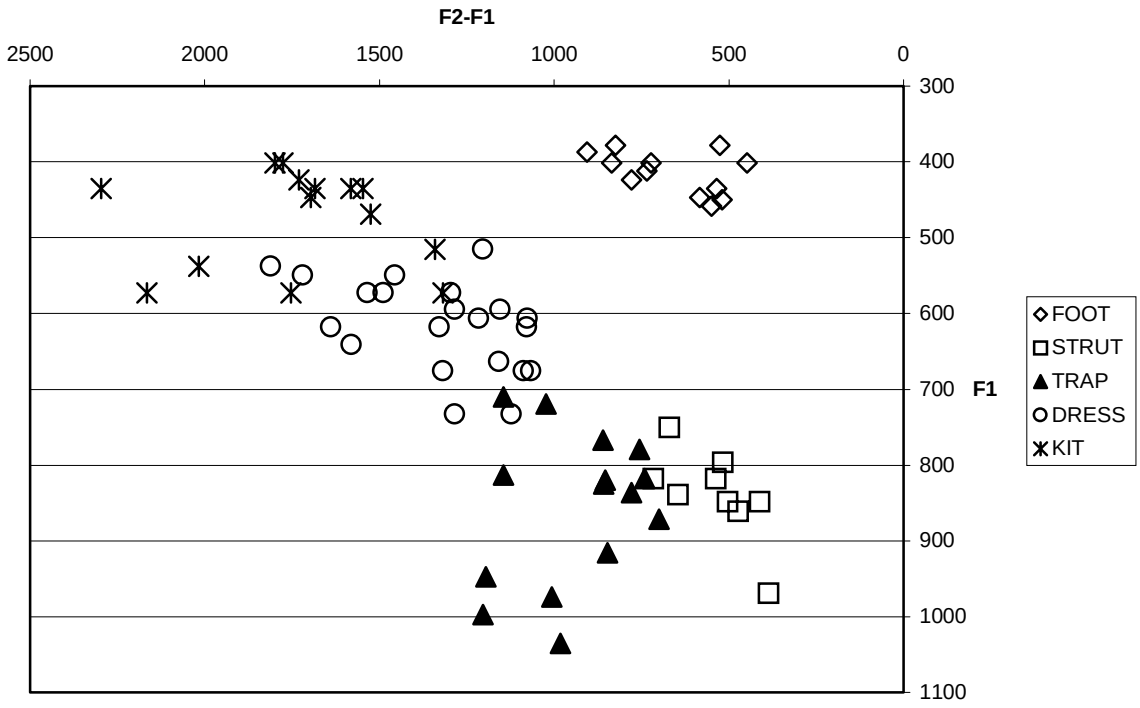

Figure 3 Mrs C, Ashford

The plot shows TRAP as a front, possibly mid vowel with STRUT placed directly behind it at the same level. The FOOT tokens are not fronted, but have a central to back realisation. KIT is a front close front vowel, whilst DRESS is front and close-mid. Notice also that there is some overlap between KIT and DRESS.

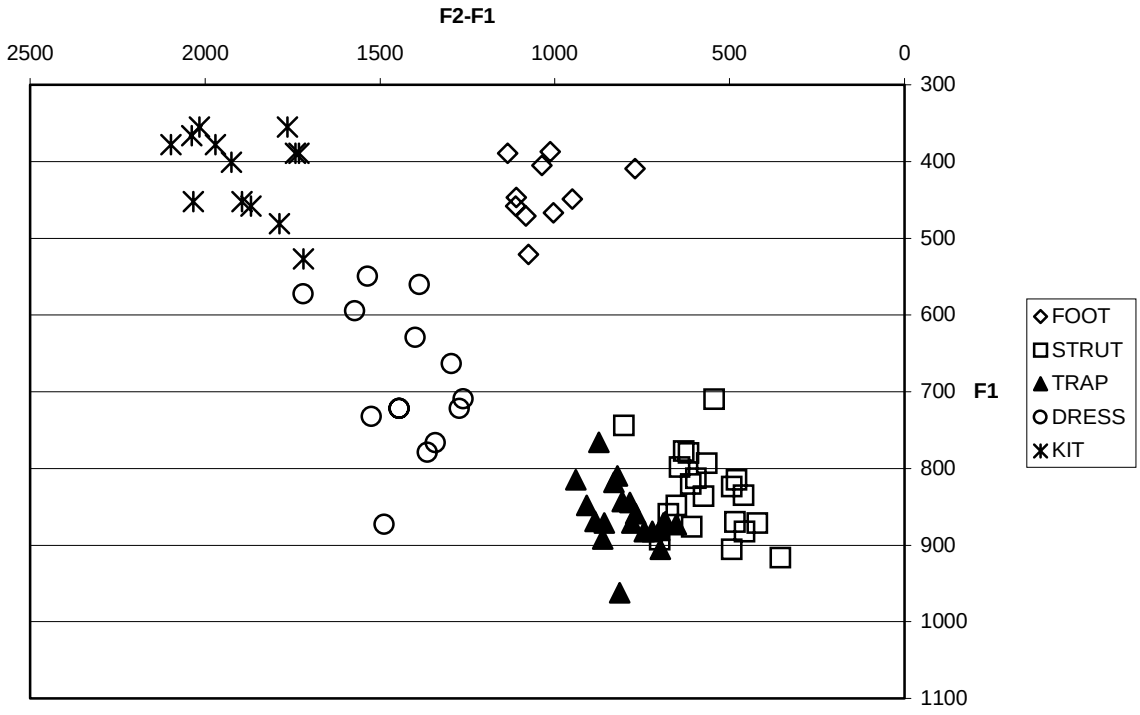

Figure 4 Emma, Ashford

Emma's vowels, which are presented in Figure 4, identify TRAP as a front, mainly open vowel. STRUT sits directly behind, and slightly above it. FOOT is a central vowel. KIT is a close front vowel, and DRESS is a mid front vowel. Note that there now is no overlap between KIT and DRESS, as found with Mrs C.

Finally we present a plot (Figure 5) showing the median formant values for all the female informants.

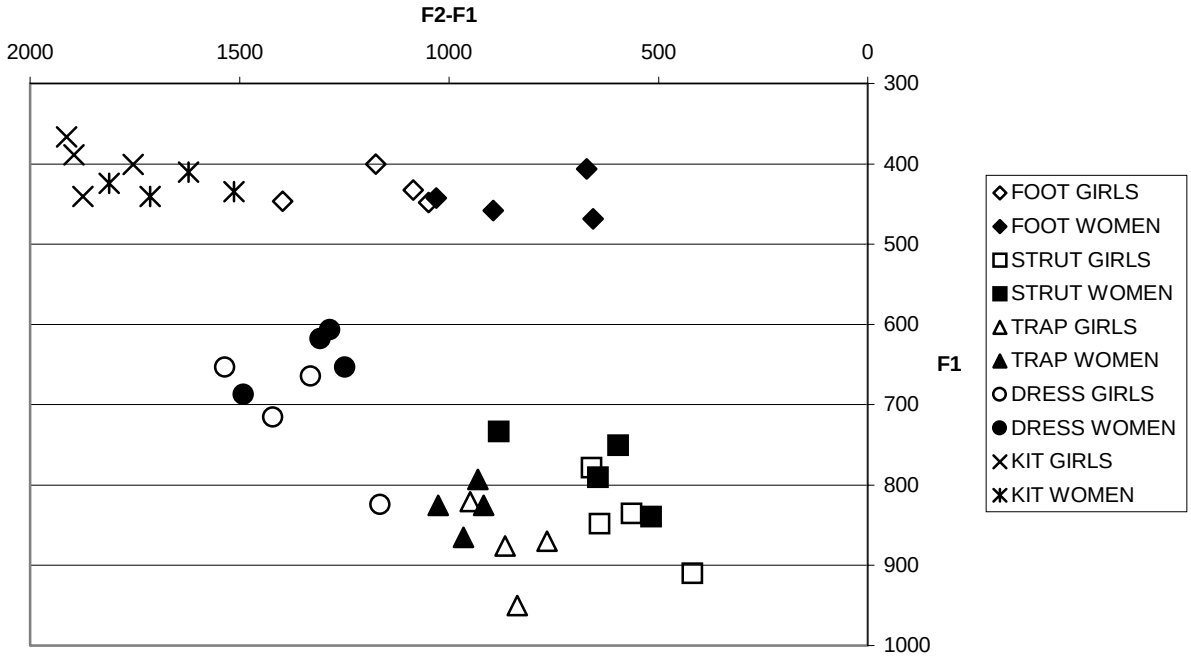

Figure 5 Female informants, Ashford

One data point represents the median values for one informant for each vowel. The figure indicates clear FOOT fronting and KIT fronting. The vowels DRESS and TRAP are slightly lowered, whilst STRUT is slightly backed. Taken together, this suggests the presence of an anti-clockwise shift.

Male informants

A comparison between the older and younger male informants also indicates systematic vowel changes. The representative older informant presented in Figure 6 reveals that Mr W has the STRUT vowel behind TRAP, which is mainly a mid-front vowel.

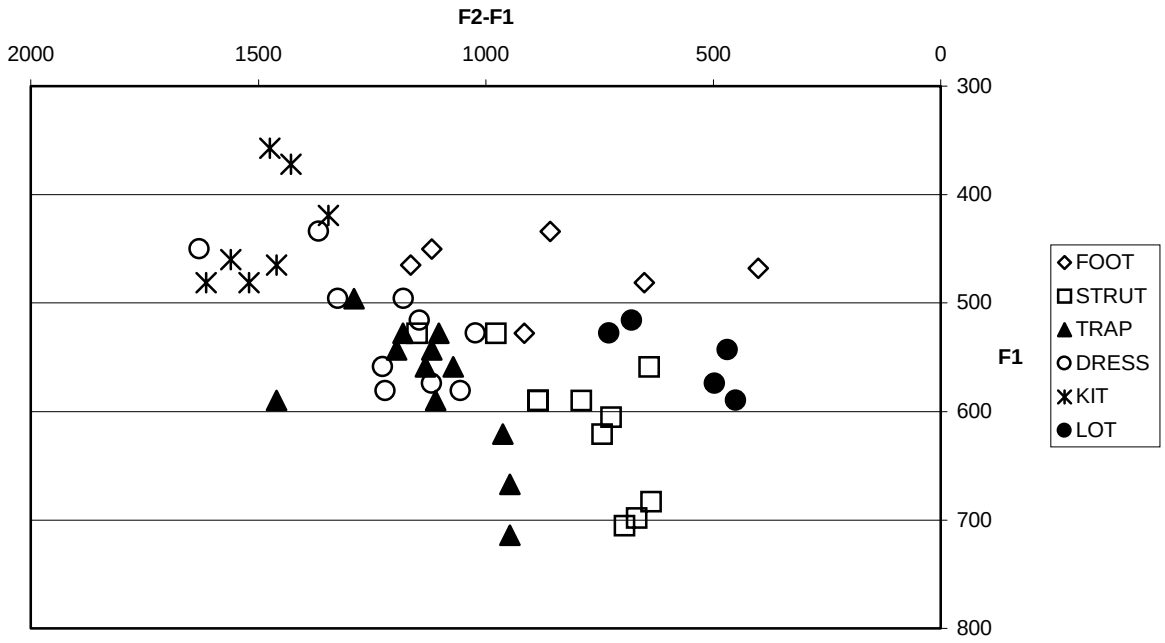

Figure 6 Mr W, Ashford

STRUT and TRAP have the same height. LOT is a mid-back vowel, FOOT is spread from back to front and KIT is a front vowel. The data also suggest some overlap between DRESS and TRAP, and to a lesser extent also KIT. David, presented in Figure 7, has STRUT behind and above TRAP. LOT is a close-mid back vowel. FOOT is fronted and KIT is a front vowel. DRESS is a mid-front vowel, and there is some overlap between KIT and DRESS.

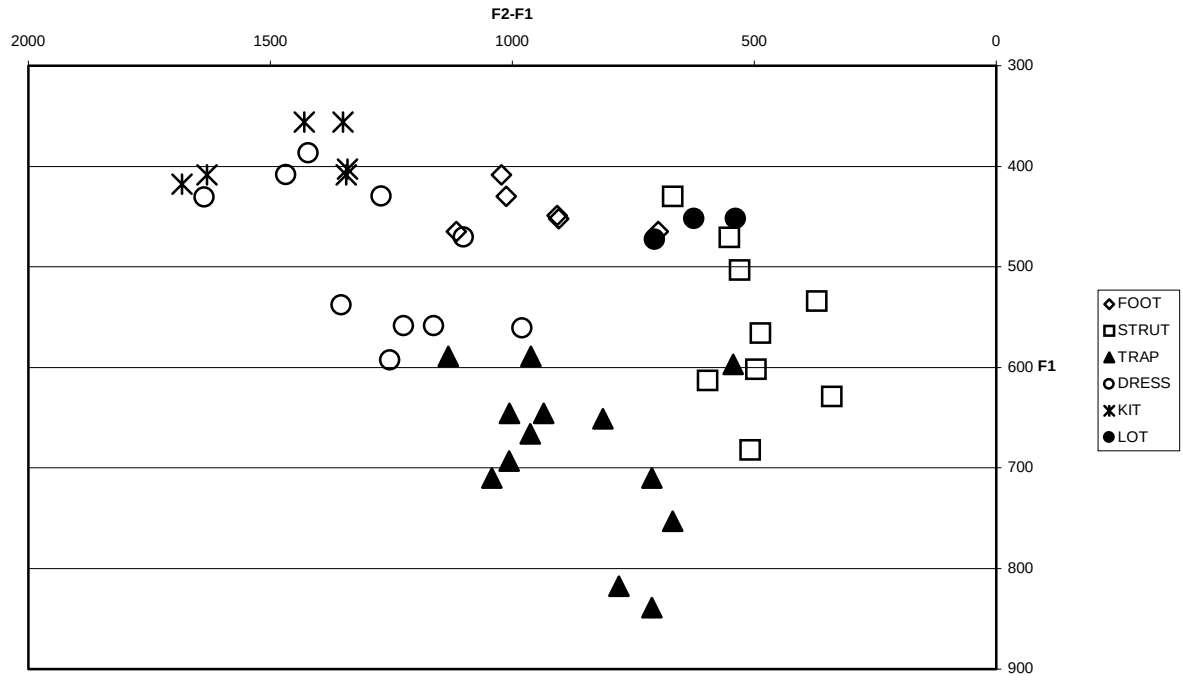

Figure 7 David, Ashford

The median measurements (Figure 8) indicate FOOT fronting, whilst there is no movement of KIT. DRESS and TRAP are slightly lowered. STRUT is moving slightly up and back. Finally, LOT is also moving up. As with the female informants, this also suggests a systematic chain shift.

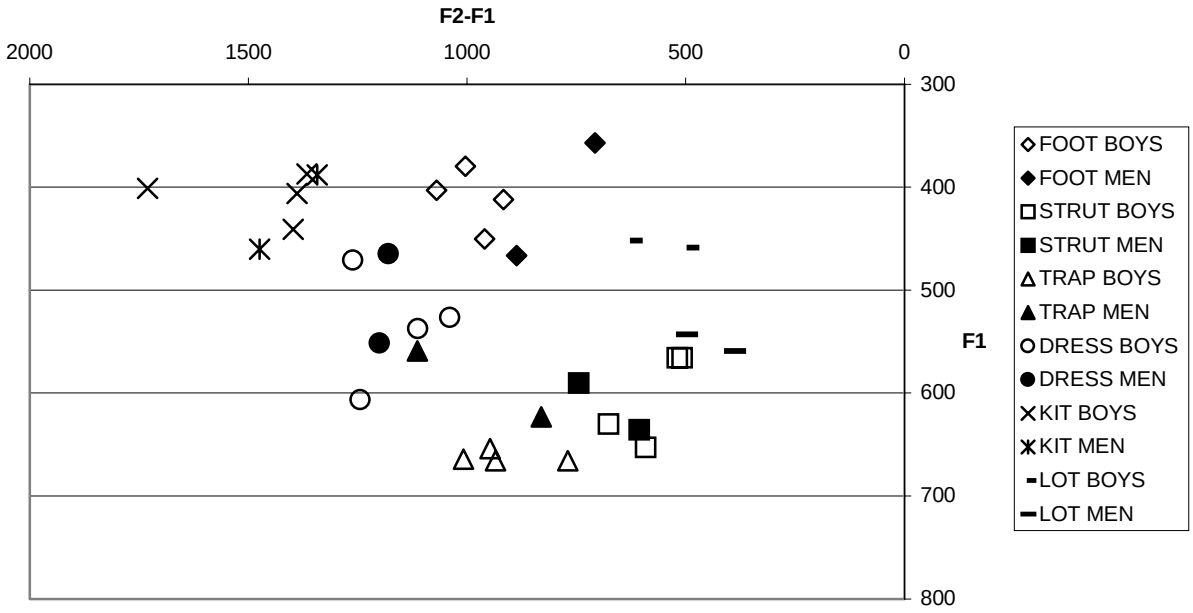

Figure 8 Male informants, Ashford

Summary of the findings in Ashford

When the data from the younger and older female and male informants are compared, a movement largely following Labov's vowel shift Principles II and III can be observed. First, the back vowel of FOOT moves to the front. Second, we find lowering of the front vowels involving DRESS and TRAP. Finally, a slight backing and raising of STRUT can be observed. These movements in the vowel space are shown in Figure 9, the arrows representing the direction and extent of the changes.

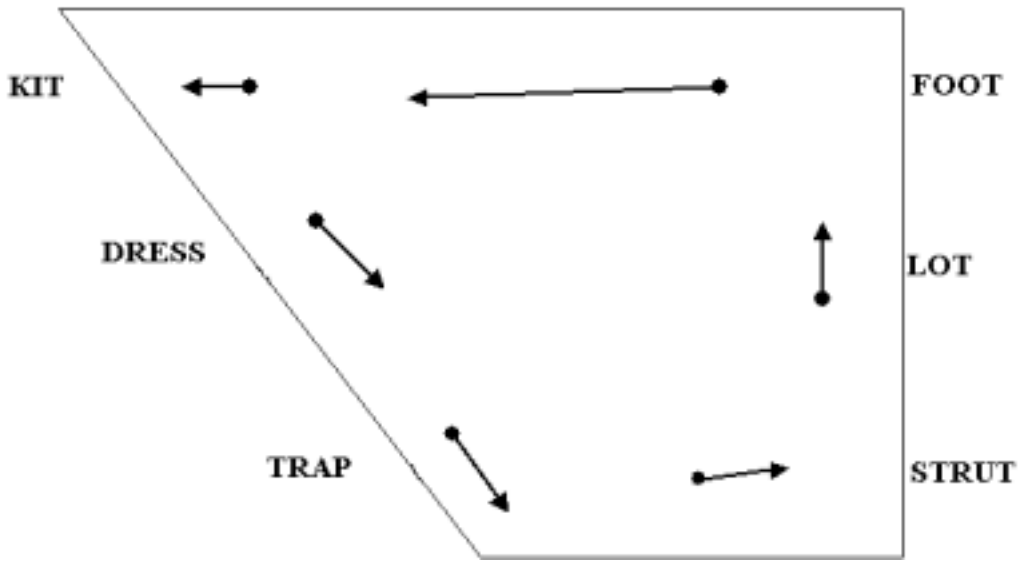

Figure 9 Short vowel changes in Ashford

LOT is also included, though measurements were only made for the male informants. However, when we try to model our findings according to Labov's Patterns 3 and 4, it is not possible to get a positive match, apart from the fronting of FOOT.

With the exception of the fronting of FOOT (Pattern 3), there is little similarity with Labov's vowel change patterns. Front vowels are lowered (not raised) and we find no evidence of fronting of back vowels (of STRUT, say). Our results are thus more or less similar to the findings reported by others (e.g. Bauer 1985; Tollfree 1999; Torgersen 1997). In terms of the longer-term shift we argued for in London, the older informants here appear to be in line with the mid-20th century cohort of Londoners, such as Labov's Marie Colville (1994: 169), in having a somewhat lowered DRESS and TRAP, a STRUT that is central (as with Hurford's younger speakers, who are from this cohort) and placed immediately behind TRAP (and not front and beneath TRAP, as for Sivertsen's informants), and the beginnings of FOOT fronting. The younger informants have taken these developments a step further: DRESS and TRAP have moved down a little further, STRUT is slightly more back, and FOOT is much more front. All this, of course, contradicts Labov's claim that Marie Colville represents a stage in the Pattern 4 raising of front vowels. This is especially true when we take into account the evidence that the short front vowels were closer in the late nineteenth century.

We will now move on to the results from Reading to see if these vowel shift patterns are found across a greater area of south-east England.

SHORT VOWEL CHANGES IN READING

Female informants

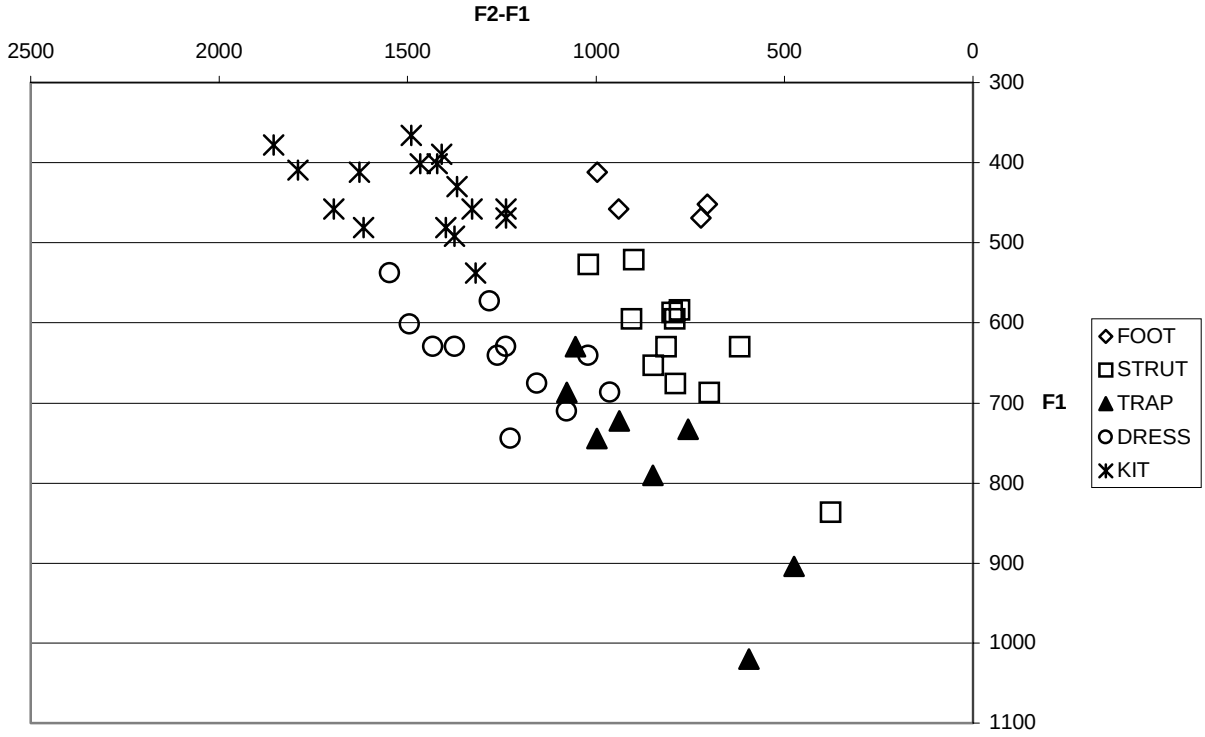

Figure 10 Mrs B, Reading

Mrs B, shown in Figure 10, has TRAP as a central, often open vowel placed behind and below DRESS. STRUT sits directly above it. FOOT is centralised and KIT is front. DRESS is a mid, front vowel.

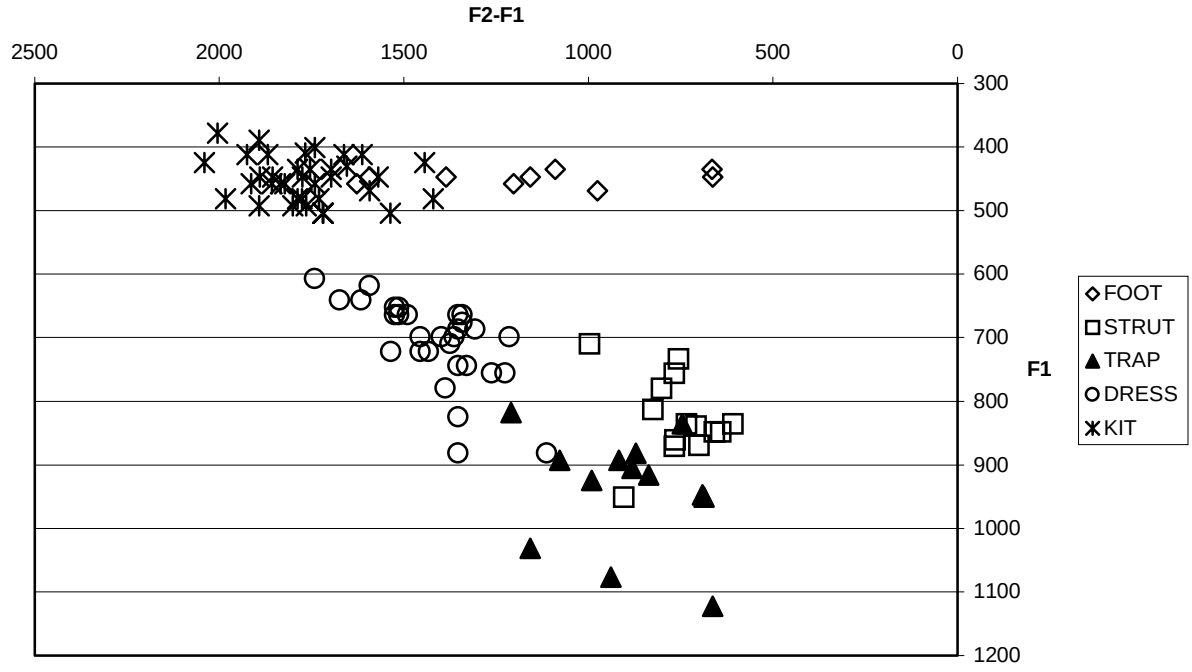

Figure 11 Claire, Reading

Claire, presented in Figure 11, has STRUT above and slightly behind TRAP. The FOOT tokens are very spread out, and some of them are quite front. KIT is a front vowel. DRESS is a mid vowel and seems to be moving down and back.

The median measurements presented in Figure 12 reveal that the Reading female informants have FOOT fronting, but no movement of KIT and DRESS. There is also no movement of TRAP. Finally, STRUT is moving down and back from a mid-central position. This indicates that there is no *systematic* shift in the short vowels. With two exceptions, the vowels are stable.

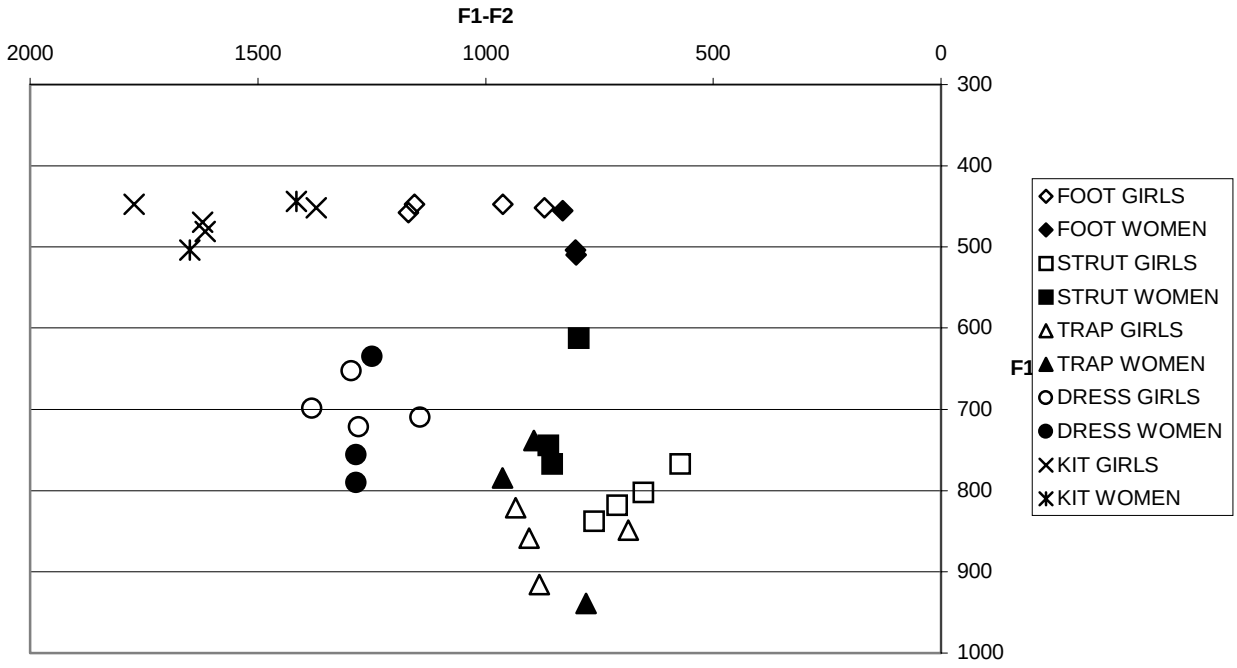

Figure 12 Female informants, Reading

Male informants

Mr R's vowel system presented in Figure 13 shows STRUT placed immediately above TRAP, with FOOT above STRUT as a central vowel.

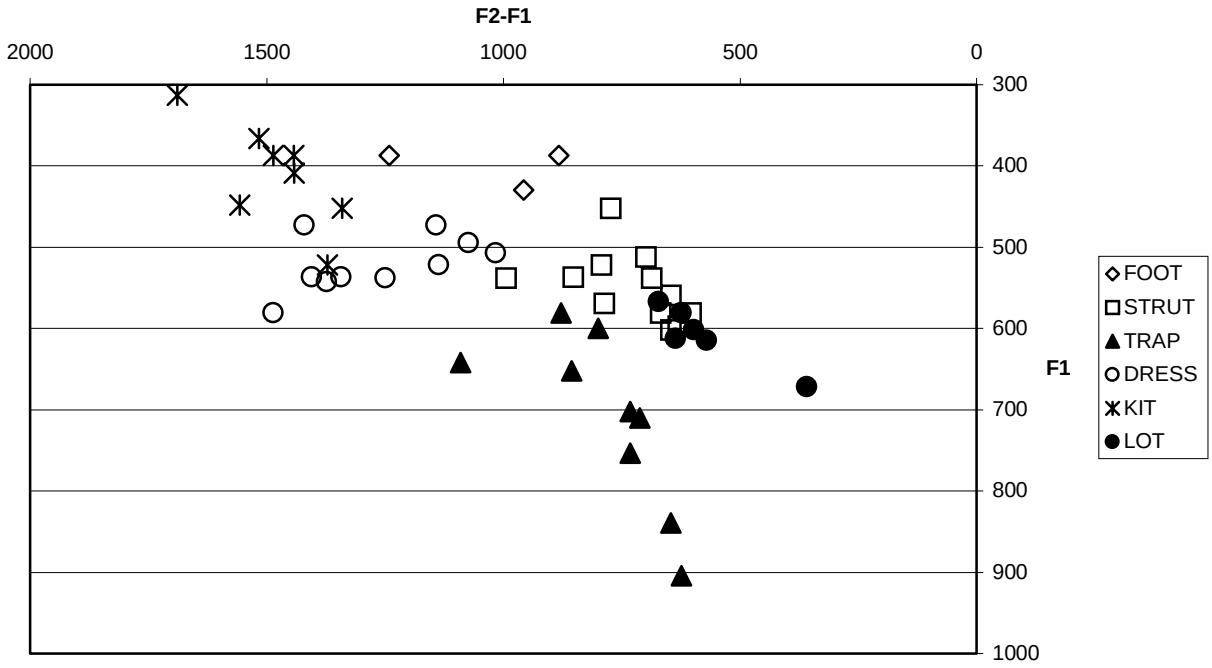

Figure 13 Mr R, Reading

TRAP is here a very open vowel, in fact more so than the same speaker's BATH vowel. Mr R has STRUT as a mid-back vowel, whilst KIT is front and DRESS is a close-mid front or central vowel. LOT is a mid-back vowel. Matthew's vowel system, shown in Figure 14, reveals that STRUT sits behind and slightly above TRAP. FOOT is spread right across the top from back to front. KIT is a front vowel, whilst DRESS is a mid vowel.

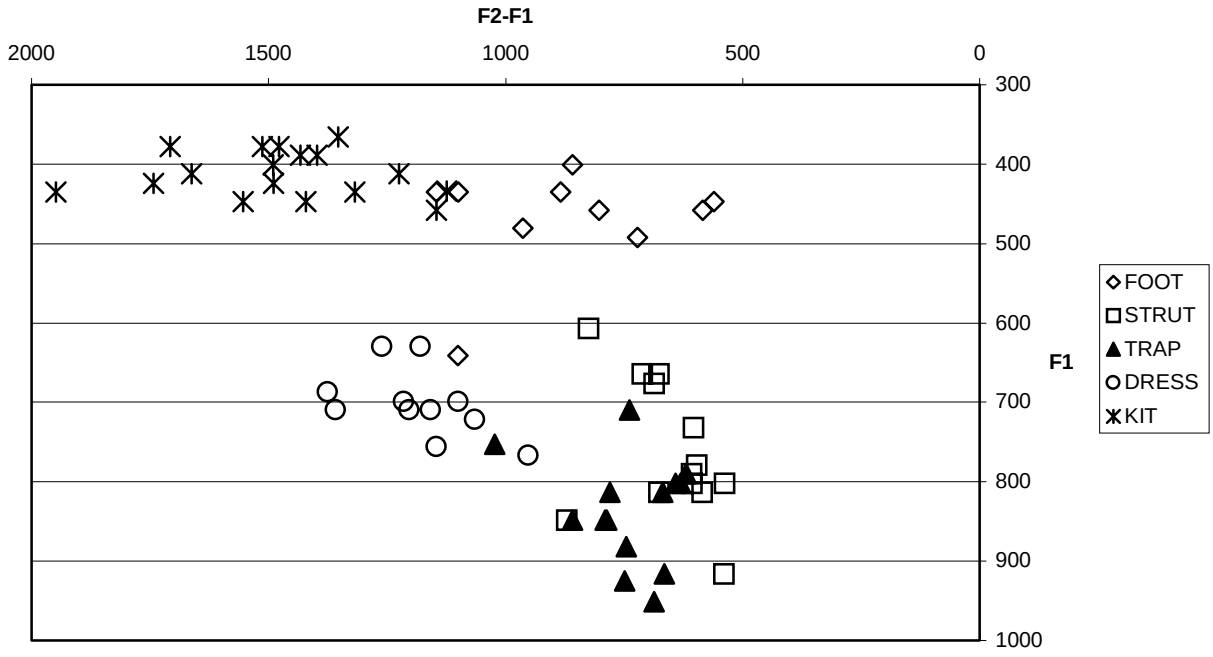

Figure 14 Matthew, Reading

The median formant values presented in Figure 15 show that there is a very wide FOOT distribution. One of the male informants had only one token of FOOT, and this is the reason for the unexpected location of one of the data points. The median values shown for LOT include measurements for the two older male informants and two of the boys, but not including Matthew. The figures show there is little movement of LOT. There is no movement of KIT. DRESS is slightly centralised, whilst there is no movement of TRAP. STRUT, however, is moving slightly down from a mid-back position.

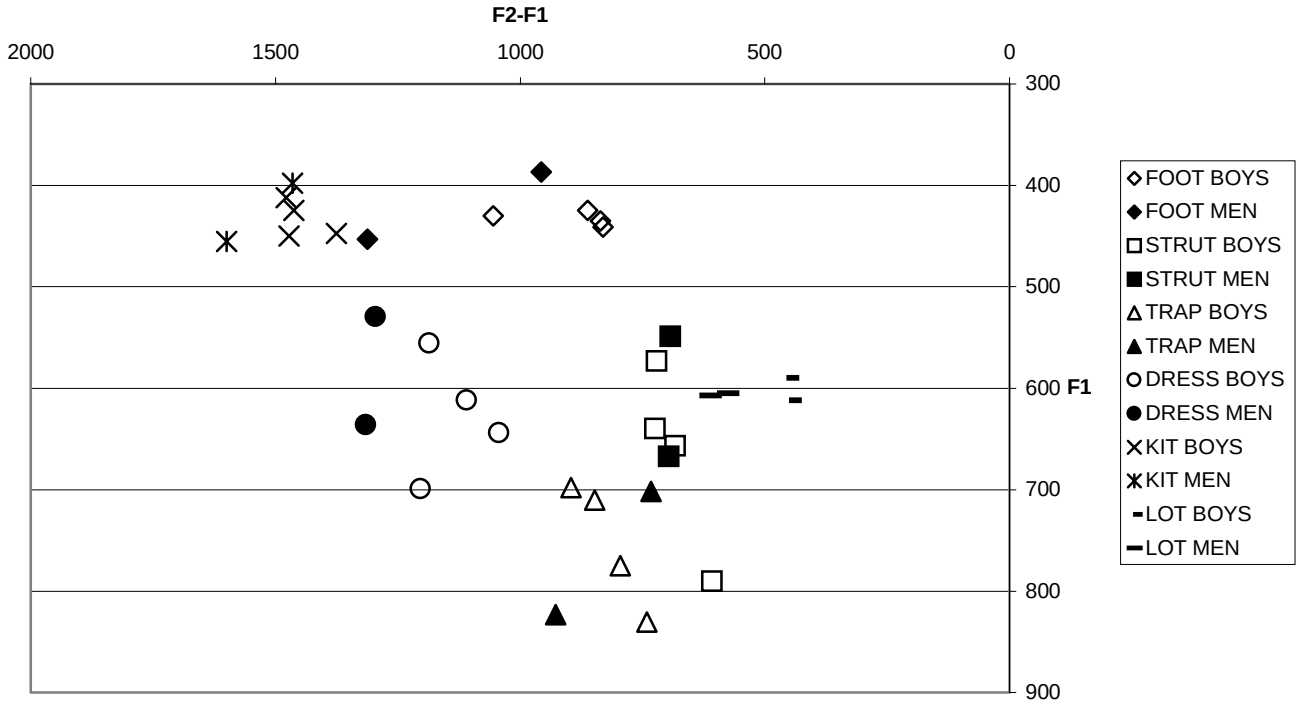

Figure 15 Male informants, Reading

Again, as noted with the female informants in Reading, there does not seem to be a systematic change in the vowel system. The change only seems to concern the FOOT vowel, which is fronted, and the STRUT vowel, which is slightly lowered and backed.

Summary of the findings in Reading

For Reading, there does not seem to be any particular pattern to the vowel changes, by sharp contrast with the situation in Ashford. Indeed, two of the vowels, FOOT and STRUT, appear to be moving in opposite directions, running counter to any chain shift. No changes are observed for the other short vowels. This pattern is shown in Figure 16.

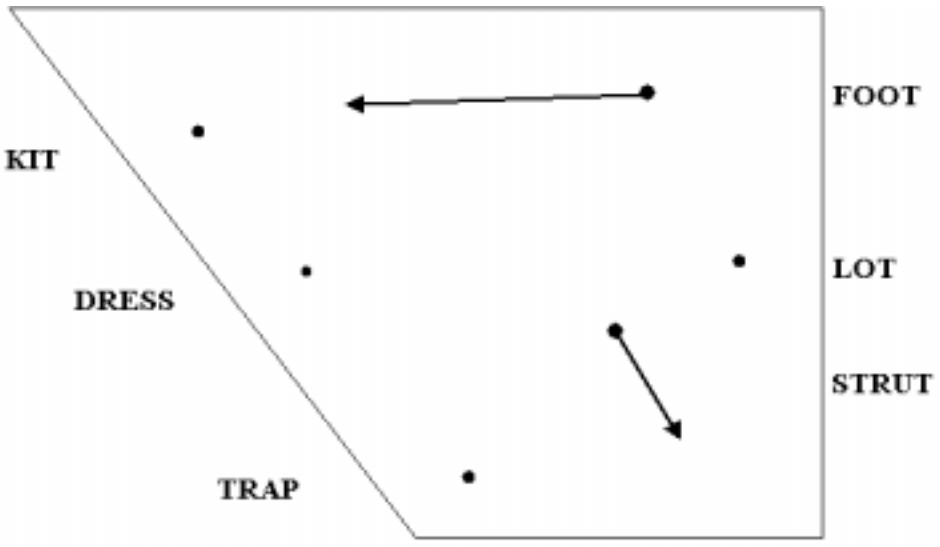

Figure 16 Vowel changes in Reading

Turning to the *SED* from Swallowfield and Binfield Heath (Table 1), we see that, in fact, there has been little or no change in these vowels in the Reading area.

PARALLELS ELSEWHERE

Other studies have reported similar developments in south-east England, as we documented earlier. Lowering of front vowels has also been found in Canada and California (Clarke, Elms and Youssef 1995). Fronting of GOOSE (and often FOOT and GOAT) is found in southern England, Australia, Canada and USA, regardless of vowel system differences and any chain shifts (Ash 1996; Clarke et al. 1995; Torgersen 1997). Ash (1996) has shown that GOOSE fronting can take place without there being any structural pressure for the vowel to change its location. Fought (1999) has found that GOOSE fronting is also present in Chicano English, spoken by a minority group within California.

EXPLANATIONS: THE INTERDEPENDENCE OF MOTIVATIONS

The existence of these parallels may suggest an internally motivated explanation of the vowel changes, that is, a chain shift according to the principles described above. Clearly, the fronting of FOOT (and that of GOOSE and GOAT) are widely observed in present-day English throughout the world. Given the very great differences in the sociolinguistic set-ups, as well as in the vowel systems, of the varieties concerned, we can safely say that there is something 'natural' about these changes, neatly encapsulated in Principle III, even though the presence of a chain shift seems not to be a precondition. Likewise, although it does not fit Labov's Pattern 4, the anticlockwise chain shift we have observed in Ashford fits extremely well with Principles II and III. On the basis of the disparate evidence from previous studies, it appears to be common to much of south-east England. It is very much a 'classic' chain shift, involving all the vowels within the short vowel subsystem. It meshes with the pervasive FOOT fronting found in varieties outside the geographical area of the chain shift. Trudgill (forthcoming), looking only at the three front vowels, considers this to be a drag chain beginning with TRAP. We suggest that the crowding of the vowel space, perhaps caused by the lowering of TRAP, forced STRUT to move back. If this is correct, the chain shift is one beginning in the middle of the chain, initiated by the lowering of TRAP.

Where does this leave Reading? In common with other accents west of London, DRESS and TRAP have long been relatively open, and they remain so today. There have, however, been two changes in Reading: the fronting of FOOT and the lowering of STRUT. We can, perhaps circularly, account for a structurally unmotivated fronting of FOOT as 'natural', by pointing to its very widespread distribution and referring to Principle III.

The lowering of the centralised mid short vowel of STRUT is covered by Principle II; it is, with the same proviso about circularity, 'natural'. Again, it is structurally unmotivated, since the move does not make STRUT notably more distinct from neighbouring vowels. However, in this case, there is a very clear geographical connection. As already noted, Trudgill (1986: 50-52) describes a phonetically and geographically gradual diffusion, radiating north and east from London, of a lowered fronted STRUT in East Anglia, where in the far north of the region the traditional realisation is a close-mid back [ɤ]. We can see the development in Reading as parallel to that, with an incoming more peripheral, lower vowel. However, there is a difference: we do not see any sign of fronting in Reading, rather the opposite. The target vowel, in the Reading case, is an open back vowel. With the new information gained from the present study, and from e.g. Kerswill and Williams (2000), we can see that STRUT in the London area is now being backed, a process that, we have argued, started in the middle of the 20th century. The East Anglian and Reading data fit very well:

both regions are receiving open, London-type pronunciations. Part of this involved fronting, at least in East Anglia where the original vowels were high and back. Now, the fronting has been arrested as a result of the newer backing of the vowel in the London area, evidenced by our data from Ashford and by observations in Milton Keynes – both towns which have received a large influx of Londoners in the last 30 years (Kerswill and Williams 2000; Rudiman 1994).

All this leads us to either an external, dialect contact explanation, or else an extra-linguistic explanation: the avoidance of stigmatised forms. The convergence between Ashford and Reading suggests regional dialect levelling of precisely the form discussed earlier. If we look carefully at the summary vowel charts for the two towns, we see that the apparent-time changes over the past two generations have resulted in two vowel systems which are remarkably similar. In Ashford this involved participation in the south-east English short vowel chain shift, in Reading it did not. The reason for the absence of the chain shift in Reading is, simply, that the front vowels already had the positions in the vowel space which were the targets for the change farther east in London, Kent and East Anglia (represented by Norwich: Trudgill 1999b: 127).

This might lead us to suppose that Reading (and the area west of London generally) is the focal point from which the change is radiating outwards. On demographic grounds, this is highly unlikely. This view is supported by the fact that, where Reading did not already have vowels corresponding to the end-point of the chain shift, as was the case for STRUT and FOOT, it has simply adjusted its vowels in order to conform to the new system. In both cases, the resulting changes were not part of a chain. In sum, we are dealing with geographical diffusion from London, combined with a measure of levelling (resulting from face-to-face contacts and accommodation) at the local level.

Clearly, 'natural' factors, encapsulated by principles of chain shifting such as those of Labov, are important motivators of phonetic change, and largely predict its direction. However, in cases, as in Reading, where dialect contact (here manifested as diffusion from a metropolitan centre) actually conflicts with natural changes, the result may be independent, structurally unmotivated, change. Labov states, in the context of exceptions to his principles and patterns (1994: 116): '[W]e will ultimately accept the finding that there are no directions of vowel shifting that are forbidden to speakers of human language'. However, he immediately adds: 'but we will establish that some directions are taken far more often than others' (ibid.). Our position is that, while the latter observation is true on a global scale, in individual cases contact and extra-linguistic factors ultimately have the capacity to override natural motivations.

This leads us to consider an important theoretical discussion in historical linguistics, already alluded to: the dialogue between a 'primacy of internal motivation' view and an 'interdependence of motivations' view. Lass is a strong proponent of the primacy view (cf. Farrar and Jones 2002: 2-3). He considers a range of (mainly phonological) changes in the history of Germanic languages, and concludes that: '[…] neither language-users nor their internal states ought to be the main focus of attention, if our aim is to explain […] change, since change itself is a built-in property of the kind of system that a human language […] happens to be' (Lass 1997: 386; quoted in Farrar and Jones 2002: 2-3). He goes on to say: 'The individual/social perspective is at best complementary to the system perspective' (Lass 1997: 386). This, in our view, leads him into difficulties when trying to account for the counter-functional preservation of highly irregular noun morphology in Modern Icelandic, while in English the same irregularities were levelled out by the Middle English period (344-345; 387). He states (387): 'Neither Icelandic retention of consonant-stem umlaut nor English levelling of it require any explanation'. This is because they may simply be 'possible

(neutral) states for a system', a position he reaches having exhausted functional, language-internal motivations.

Lass states that he does not exclude the social dimension, but does not regard it as primary. This is an unhelpful approach, since it leads him away from what may be the most explanatory approach to the phenomenon. His position entirely neglects non-internal motivations for the preservation of the morphology in one language and its loss in the other. Trudgill (2002) discusses the conservatism of Faroese and Icelandic morphology in terms of long isolation in the Middle Ages, with low population numbers and little external contact. This is contrasted with the high degree of language contact in Continental Scandinavia (where the same simplifications occurred as in English) and in England in the Middle Ages, leading to imperfect second-language learning by adults and, subsequently, morphological simplification. Sandøy (2003) takes this argument a step further by differentiating between two sorts of isolated, small community: the Faroese type, where it is known that most people lived in villages of about 150 individuals, and the Icelandic type, where the population lived in isolated family units of about 10 people. In Faroe, a small degree of social marking of language could take place within villages, while communities remained very close-knit. This led to linguistic differentiation between, rather than within, villages, perhaps as a marker of local allegiance. In Iceland, there was neither social stratification nor, for the children, any peer groups, a situation which inhibited linguistic differentiation both within a family unit and across the country itself.

This kind of detailed argumentation is typical of the 'interdependence' model, and has proved fruitful not just in historical cases, but also in the studies of contemporary societies reviewed earlier in this article. These studies reveal the interplay of factors, and suggest the primacy (in the end) of contact/isolation and extra-linguistic motivations. We subscribe to the view, expressed by Farrar and Jones (2002: 8), that we must not assume an 'unspoken hierarchy of explanatory adequacy', favouring internal factors. They go on to say that our 'naivety' in terms of the sociolinguistic part of the explanation should not lead us to look harder for internal explanations. We disagree with the proposition that social dialectologists suffer from such naivety. We would go further and say that, now, social dialectology is able to provide quite detailed insights into some of these external and extra-linguistic factors, as well as the relative importance of the factors in particular cases. It takes studies such as those reviewed, as well as the data presented in this article, to provide firm evidence for claims about the social and linguistic embedding of change. This is, of course, a statement of Labov's position; where we differ from him is in the belief that dialect contact is not simply exceptional, but (along with extra-linguistic factors) is integral to the understanding of this embedding.

NOTES

[1] These and other keywords are used mnemonically following Wells (1982).

[2] Trudgill has suggested that he has used this symbol for vowels closer than the cardinal quality (personal communication).

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APPENDIX

Median formant measurements for all informants sorted according to gender, lexical keyword, informant group and location.

Female informants

Keyword	Ashford			Reading		
	F1	F2	F2-F1	F1	F2	F2-F1
FOOTG	400	1575	1175	452	1323	871
	447	1845	1398	447	1409.5	962.5
	433	1518	1085	447	1604	1157
	448	1497	1049	458	1627	1169
FOOTW	406	1077	671	504	1306	802
	469	1125	656	509.5	1310.5	801
	458	1352	894	455	1286	831
	443	1474	1031			
STRUTG	910	1329	419	767	1340	573
	848	1489	641	802	1456	654
	778	1438	660	837.5	1598.5	761
	835	1399	564	818	1529	711
STRUTW	839	1356	517	744	1606	862
	750	1346	596	767	1621	854
	733	1615	882	612.5	1407.5	795
	790	1435	645			
TRAPG	950	1787	837	849	1535.5	686.5
	876	1742	866	821.5	1755.5	934
	821	1770	949	916	1798	882
	870	1635	765	859	1764	905
TRAPW	825	1742	917	784.5	1747.5	963
	793	1724	931	939	1718.5	779.5
	865	1831	966	738.5	1632.5	894
	825	1851	1026			
DRESSG	824.5	1988.5	1164	710	1853.5	1143.5
	716	2137	1421	653	1948	1295
	664.5	1994	1329.5	699	2080	1381
	653	2188	1535	722	2000	1278
DRESSW	618	1925	1307	756	2040	1284
	687	2178	1491	790	2074	1284
	653	1902	1249	635.5	1885	1249.5
	607	1891	1284			
KITG	366.5	2280.5	1914	452	1824.5	1372.5
	389	2284	1895	481	2097	1616
	401	2155	1754	447	2218.5	1771.5
	441	2315	1874	469.5	2091	1621.5
KITW	435	1948	1513	504	2154	1650
	424	2235	1811	444	1859.5	1415.5
	410.5	2032.5	1622			
	441	2154	1713			

Male informants

Keyword	Ashford			Reading		
	F1	F2	F2-F1	F1	F2	F2-F1
FOOTB	380	1384	1004	441	1271.5	830.5
	412	1329	917	435	1271	836
	403	1473	1070	424.5	1286.5	862
	450.5	1410	959.5	430	1485	1055
FOOTM	466.5	1353.5	887	387	1344	957
	357	1064	707	453	1765	1312
STRUTB	653	1244	591	790	1398	608
	630	1306.5	676.5	573	1295	722
	566	1086	520	656.6	1339.6	683
	566	1074	508	639.5	1364	724.5
STRUTM	590	1335	745	548.5	1241.5	693
	636	1242	606	667	1363	696
TRAPB	654	1602	948	830.5	1572	741.5
	664	1672	1008	710	1558	848
	666	1436	770	698	1594	896
	666	1601	935	775	1571	796
TRAPM	559	1673	1114	702	1434	732
	623.5	1454	830.5	823	1750	927
DRESSB	538	1650	1112	699	1902	1203
	606.5	1850.5	1244	555.5	1741.5	1186
	527	1566	1039	644	1687	1043
	471	1732	1261	612	1721	1109
DRESSM	552	1752.5	1200.5	529.5	1825.5	1296
	465	1644	1179	636	1952	1316
KITB	441	1839	1398	412	1890	1478
	401	2132	1731	447	1822	1375
	387	1753	1366	450	1922	1472
	406	1795.5	1389.5	424.5	1887.5	1463
KITM	460	1935	1475	398	1862.5	1464.5
	388	1731	1343	455	2055	1600
LOTB	452	1076	624	612	1060	448
	458.5	954	495.5	590	1043	453
LOTM	543	1040	497	607	1218	611
	559	947	388	605	1180	575