Proficiency, language use and the debate over nativeness

A sociolinguistic survey of South Delhi English

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Abstract

This study examines the extent of the impact of proficiency and language use on sociophonetic variation in Indian English (IE). It is based on an oral corpus using the methods and tools of the PAC project and derived from a pool of South Delhi-based highly proficient speakers. The investigation was conducted using quantitative and qualitative methods and focused on two understudied variables: (1) the fricative realisation of /θ/, and (2) the realisations of the vowels in words of the NORTH and FORCE lexical sets. First, the results demonstrate that a significant amount of variation which cannot be accounted for by the traditional age, gender and social class factors can be explained by the language use parameter. A degree of correlation was found between the volume of use of English in a range of domains, and how speakers take advantage of the sociolinguistic potential of prestigious forms. This offers indications on the location of the leaders of the linguistic change. The second central feature of this study is derived from the investigation of the NORTH versus FORCE distinction. It is argued that the general maintenance of this distinction in IE provides evidence for the endo-normative nature of this variety. In the light of these findings, issues ultimately relating to the debate over nativeness are discussed.

Keywords

Indian English, proficiency, language use, native speaker, non-native varieties, sociolinguistic variation, endo-normativity, exo-normativity.
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1. Introduction

The principal source of controversies and debates in sociolinguistic approaches to the study of varieties such as Indian English (IE) comes from the difficulty faced by researchers in defining precisely their object of study. Whereas in contexts where English is principally spoken by monolingual speakers exposure and proficiency (to and in some variety) are not significant variables, the characterisation of English in multilingual situations is generally complicated by these factors. Thus, the term *non-native variety* was coined out of the felt necessity to encompass all the usages observed in such contexts under one and the same heading. Over the past twenty years, both the use of this term and the concept it refers to have been increasingly criticised.

Kachru was among the first scholars to problematise the questions of proficiency and language use in multilingual contexts in sociolinguistic terms. Yet, this was done in such a way that it also fostered the importation of concepts and tools from Second Language Acquisition (SLA) research (e.g. transfer, interference) into the study of world Englishes (WE) (Kandiah, 1991:281). For instance, Kachru's (1983:74) *cline of bilingualism* bears striking similarities to the *interlanguage* concept, as they both assume correlation between proficiency-level and the amount of individual transfer. Research on IE phonology and phonetics is probably the area which has been the most impacted by this, and countless studies were, and still are, conducted using contrastive approaches, thus obscuring the structural and sociolinguistic complexity of those systems (Mohanan, 1992:111). Comparatively, since Agnihotri & Sahgal's (1985) pioneering investigation, very few studies have tackled the problem of sociolinguistic variation empirically. What is more, these studies have remained quite tentative with regard to testing the effects of parameters other than those generally used in the studies of monolingual contexts (i.e. age, gender, class).

The purpose of this paper is to assess the extent of the impact of proficiency and language use on sociophonetic variation in IE. Although the aims presented above bear similarities with the study conducted by Sharma (2005a), this investigation does not intend to find empirical evidence for the *cline of bilingualism* (defined in 2.2.2). On the contrary, the present study places itself in Kandiah's (1991, 1998b) reconfigured approach to these varieties of English and is consequently based on a pool of highly proficient speakers. The investigation was conducted using quantitative and qualitative methods and focused on two understudied variables: (1) the fricative realisation of *th*, and (2) the realisations of the vowels in words of the NORTH and FORCE lexical sets (defined in 4.3).

This paper hopes to show that for one thing, the sociolinguistic situation of IE seems to be considerably more complex than what has been pictured in previous research; for another, that the study of variation can help disentangle some of the problems. In the light of the results, it is ultimately proposed that in situations where the languages are functionally distributed, the language use parameter has an effect on how speakers tend to participate in sociolinguistic variation. It is also argued against the use of contrastive methods since this paper brings evidence for IE to be considered an autonomous endonormative system.
2. The debate over nativeness

In sociolinguistic approaches to WE, the term *native* is often loaded with the metaphorical meaning of “ownership”. With the steady rise of varieties such as IE among the world's standard varieties of English, the relevance of the use of the term *non-native* as referring to them and their speakers is much debated. This term is deemed irrelevant by a large number of scholars, but given the insistence of its defenders on the fact that its use does not imply any superiority of certain speakers/varieties over others, this terminological choice is also sometimes seen as “a wish to distribute equality unequally” (Singh in Singh *et al.*, 1998:48). In the present section, the uses of the terms *native* and *non-native* as applied to (1) varieties, (2) speakers, will be reviewed and discussed.

2.1 A non-native variety?

To date, Kachru's (2005:14) *Three Concentric Circles* model – the original version goes back to 1985 – is the most widespread classification of WE as well as a building block for sociolinguistic approaches to the so-called non-native varieties of English. Kachru's three circles model distinguishes the *inner circle* (e.g. UK, USA, Canada, Australia...), the *outer circle* (e.g. India, Pakistan, Singapore, Kenya…) and the *expanding circle* (e.g. China, Egypt, Israel, Japan...) on the basis of criteria such as functional distribution, localized formal characteristics and acquisitional setting (Kachru, 1986:19). Varieties within each circle are also labelled according to these criteria. For instance, varieties from the outer circle such as IE are called in turn *L2* (function), *interference* (formal characteristics), or *non-native* (acquisition) varieties. The latest qualification has gained much currency and is still very commonly used.

Kachru's model is called socio-functional approach, and *L2 variety* is the label he employs the most for IE. Though in earlier studies he also used the term *non-native* quite readily, in his later work, Kachru (2005:11) expressed some discomfort regarding this designation thus acknowledging the necessity to remodel the concept. In the following pages I shall examine the reasons invoked for the current typology of WE as well as the related use of the expression *non-native variety*.

2.1.1 Functional criterion

The idea of *functional nativeness* (see Kachru, 2005:12) hinges principally around the two dimensions of *range* and *depth*: the former refers to the domains of use of the language, the latter to its degree of social penetration. These concepts have proved quite efficient and robust in descriptions of the role and status of English around the world and particularly in contexts, such as in India, where English coexists with other languages.

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1 In the Kachruvian terminology, “L2” has to be differentiated from “foreign language” and is a label which relates more to the function of a language in a certain setting than to its acquisition order.
Strictly speaking, the range of uses of IE does not differ from that of inner circle varieties since, as shown in Kachru (2005:17), English occurs virtually in all the domains of use. Nevertheless, the range parameter stresses an important point: individual IE speakers are multilingual and generally DO NOT use English for all purposes. The depth parameter, on the other hand, shows how the access to/use of English is distributed across the layers of society. It is generally assumed that in outer circle societies, the English language, which is assigned a high status, goes hand in hand with education and power, and it is thus mostly the elite who are fluent speakers. This is acknowledged by all, though opinions diverge as to the degree of social penetration of the English language in the rest of the society. D'souza's (2001) study, which is based on a wide variety of sources, shows for instance that the influence of English in India is more pervasive than has been claimed, as evidenced by code mixing and teen talk.

By posing the question of functional nativeness one asks whether English should be considered an Indian language or not. The Kachruvian concept of range and depth does double duty in this respect. On one hand, it helps understand from a functional standpoint how “non-native” varieties may differ from “native” (i.e. monolingual context) varieties. On the other hand, its use has revealed that IE's status is that of a truly Indian language rather than that of a mere additive. This statement has of course crucial political and ideological implications, but, despite their importance, I shall not develop them here.

2.1.2 Linguistic criterion

The question of whether formal characteristics may constitute a valid tool for the classification of WE has two opposing responses. The first consists in considering that outer-circle Englishes, whose salient features are said to result essentially from the influence of substrata and/or processes of simplification, have shared characteristics which differentiate them from inner-circle varieties. One of the major opponents of this position is Singh (Singh et al., 1998:47), who argues in substance that any enterprise intending to characterise Englishes according to their form needs to empirically demonstrate that:

(a) the Englishes in one of the classes differ in similar ways from all Englishes in the other; and, equally, (b) no two Englishes within the same class (in particular, within the class of transplanted and “stayed back home” Englishes) differ between them in those ways (Singh in Singh et al., 1998:47).

In Singh (2007), he defends this position by demonstrating that the features brought forward by researchers in order to illustrate IE's specificity derive usually from regular, productive rules of English and consequently that the linguistic reasons for positing a non-native class of Englishes do not hold. By extension, he claims that approaching varieties such as IE on the assumption that they are “substratum laden” is incorrect. In some respects, Singh makes something of a sweeping generalisation here. Although I believe with him that the distinction “[…] native variety/non-native variety cannot be structurally or grammatically sustained” (Singh, 2007:40), it is one thing to say that IE is no different from other varieties in this respect; it is something else to reject the fact that IE did undergo substratum influences. Considering substratum influences on IE as a
part of the phylogeny of this variety, in more or less exactly the same respect as they are part of Irish English (IrE) phylogeny for instance, is a perfectly valid point. Mesthrie (2010) for instance makes similar observations with regard to South African Indian English; a variety which has only recently undergone the language shift. The separate problem of individual transfer will be discussed in 3.1.

Singh's position has received much support although some expressed reservations regarding certain aspects such as the phonology (Agnihotri, 2008:53). Mesthrie (2010:596), on the other hand, considers Singh's formulation too rigid and asks whether the features that serve the classification would not be better looked at statistically and in clusters, rather than in isolation.

2.1.3 Acquisitional criterion

In the preceding section, it was a question of determining whether a separate classification of outer circle varieties is linguistically and sociolinguistically grounded. The sole conclusion that may be drawn so far is that the non-native label is not transparent and the criteria examined do not provide clear cut evidence that allow such classification. Nevertheless, as stated earlier, the term non-native is first and foremost relevant to acquisitional issues (see Paradis' definition in 2.2). Mohanan (in Singh et al., 1998), arguing that this is how the native speaker is the most commonly understood, proposes that the term non-native variety, as referring to a system which is most often acquired non-natively, is a perfectly legitimate concept. Consequently, the next principal focus will be on the native speaker – as opposed to native variety.

2.2 The native speaker

It is generally agreed that the native speaker is a concept whose contours have to be strictly defined in psycholinguistic terms. For instance, Paradis' (1998:216) definition of it is:

[...] someone who has been speaking a particular sociolect of a given topolect from the crib, i.e., has been exposed to it from birth, has acquired it incidentally and has continued to speak it as an adult (Paradis, 1998:216).

The alternative socio-political perspective is, as Backus (2007) and Mufwene (1998) highlight, highly variable and language community dependent. Although sociolinguistic and linguistic features can be used to make inferences about the nativeness (Mesthrie, 2010:595), taking them as defining criteria is generally considered a non-starter. For the purpose of the present work, I shall focus on three aspects of nativeness particularly relevant to multilingual contexts: age and order of acquisition, proficiency, and grammaticality judgement.

2.2.1 Age and order of acquisition

There seems to be an array of evidence, mostly established in SLA studies, suggesting that the age of acquisition plays a crucial role in acquiring a native, or at least a native-like command of a language. The original hypothesis, formulated for first language
acquisition, was labelled the \textit{Critical Period Hypothesis} (see review in Major, 2001). It basically states that when the onset of a language acquisition takes place after a certain age, it leads to limitations in terms of eventual outcomes. Though all the arguments of the original hypothesis may not be well accepted by all, several lines of evidence seem to converge towards the existence of maturational constraints (Hyltenstam & Abrahamsson, 2000). Yet, as pointed out by Singh (2007), this very criterion is extremely problematic in multilingual contexts where languages are functionally distributed, and the question of order of acquisition is complicated for the exact same reasons.

When Singh (2007:37) states that a bilingual competence is not simply the addition of two monolingual competences\(^2\), he points out a reality of multilingual societies already stressed through the \textit{range} and \textit{depth} parameters, but which Kachru does not exploit in his model of bilingualism. The bi- or multilingual speaker in multilingual context develops competence and proficiency in languages which are used in different functional domains and, what is quite important, these functional domains do not necessarily overlap.

Several points may be drawn from this. First, the onset of acquisition may take place at home or at school, yet the development of a speaker's competence and proficiency comes to a large extent from the enactment of the languages in the different domains of use, and thus from normal interaction with other speakers. Second, as Dziubalska-Kołaczyk & Weckwerth (2007) point out, these domains of use change (some disappear and others are added) throughout the development of the individual. In consequence, many schoolchildren, particularly in English medium schools, acquire a full receptive competence in English quite early, although the communicative needs for using it appear later in life. Finally, it can be posited that in these circumstances, the relevant criteria for determining who is the fittest “arbiter of grammaticality and acceptability” (Paikeday, 1985/2003:64) – rather than for identifying the native speaker – are not acquisitional but based on proficiency (Mufwene, 1998) and/or language use. This is discussed in more details in a latter section of this work.

\subsection*{2.2.2 Proficiency}

Singh's argument shows that language acquisition in multilingual context cannot be characterised in purely additive terms. On the other hand, the question of the outcomes and particularly that of proficiency seems difficult to discount given the situation of varied proficiency and exposure that characterises IE. In this respect, Mesthrie (2010:599), who unlike Singh sees bilingualism in English in India as being largely additive, claims that part of the speakers who have fluency in English are still clearly not fluent enough to be counted as native speakers.

One of the first attempts at formalising the problem of proficiency in IE goes back to 1965 and was Kachru's famous \textit{cline of bilingualism}, on which English speakers are ranked according to their proficiency level. This cline is represented as a scale comprising three arbitrary measuring points, i.e. the zero point, the central point and the

\footnote{Hereafter, I use the expression “additive bilingualism” with this meaning of “addition of two monolingual competences”.

\begin{center}
\begin{tabular}{|c|c|c|}
\hline
Point & Description & Proficiency Level \hline
0 & Zero Point & Low \hline
5 & Central Point & Medium \hline
10 & Maximum Point & High \hline
\end{tabular}
\end{center}
ambilingual point (Kachru, 1983:25). Speakers ranking around the zero point are minimal bilinguals and are considered as not proficient. Speakers of standard IE, or educated IE, lie in between the central point and the ambilingual point. An ambilingual person is defined as someone with equal command of two or more languages (Kachru, 2005:215). Because of the functional distribution of the languages, ambilingualism as just defined seems unrealistic, and Kachru himself considers it rare, if not unattainable.

Nevertheless, if we accept Singh's view, the cline of bilingualism makes a series of claims which are problematic. By making ambilingualism the ultimate attainment, it fails to recognise that the competence in a language is significantly shaped by the communicative needs of the speaker and consequently, that English can also be the language in which an IE speaker is the most proficient in some, or even most, domains of use. To put things clearly, though the cline of bilingualism is a model of English acquisition, it makes assumptions about the overall multilingual speaker's repertoire, in which what is called the native language is necessarily an Indian language, and is also necessarily the language the speaker is the most proficient in. In all likelihood, what Kachru bases his paradigm on is statistically “the rule” rather than the exception. Yet, the model of individual bilingualism which arises from this (1) fails to recognise that the functional distribution of languages has consequences for bilingualism in India, and (2) seems too narrow to incorporate speakers who are more proficient in English than in any other languages in most domains. Even if these are a minority of the overall number of speakers who have acquired a command over English, they constitute nevertheless a sizeable and growing part of the urban English speaking population in India (D'souza, 1997:92).

2.2.3 Grammaticality judgements

In order to come to terms with these problems, Singh (2007) tackles the issue from the grammaticality judgement angle and proposes that native speakers/users and learners can be, and should be, clearly distinguished via this criterion. This is supported by Kandiah's (1991:280) observation that the members of the IE speech community are aware of what constitutes competent and incompetent usage, and clearly distinguish between them. Thus, Singh's definition of the native speaker is based on two notions, that is to say, stability and consistency of grammaticality judgements, and that these judgements be shared within the speech community:

Linguistically speaking, a native speaker of a language is a person who has relatively stable and consistent grammaticality judgements, which he shares with some other speakers, regarding structures alleged to be from his language (Singh, 2007:38).

The “sharedness” aspect, which appears to be central to this definition, raised a series of objections among scholars (Agnihotri, 2008:53). As noted by Mohanan (in Singh et al. 1998:51), these requirements of “sharedness” and stability of grammatical judgements are coterminous with the definition of variety but not of the native speaker. Whether this constitutes a serious objection against Singh's proposal or not, it is worth noting that it helps to clarify Singh's (1998:26) claim that the term non-native variety is “something of a contradiction in terms”. On the other hand, Dziubalska-Kołaczyk & Weckwerth
(2007) note for instance that though Singh proposes to differentiate learners from native speakers/users, his definition makes the distinction between the two quite fuzzy. Throughout this opening section, it was intended to show that remodelling the native speaker concept with regards to multilingualism into something similar to Singh's attempts is crucial, although departing from the “language from the crib” definition advocated by Paradis (1998:216) is necessarily fraught with difficulties. The ongoing debate over this issue may thus open brand-new perspectives for the study of WE in general, and of outer circle varieties such as Indian English in particular. In this, the questions of language use and proficiency which are the most often looked at in parallel with concepts such transfers, interference, or from a purely SLA viewpoint may also acquire a different status.

3. Proficiency and language use

Bolton (2008:11) noted that the very question of proficiency has polarised researchers into two camps: those tackling the issue from an SLA perspective, and those adopting a variety-based approach of WE. The absence of interface between these two domains of research was referred to as the Paradigm gap (Mesthrie & Bhatt, 2008:156, from Sridhar & Sridhar, 1986) which is characterised on one hand by a disregard for social parameters in SLA studies, on the other hand by a lack of attention for acquisition issues (Mesthrie & Bhatt, 2008:159), and over-reliance on idealisations (Bolton, 2008:11) in WE research. In the previous section, the role of proficiency and language use was discussed with regard to nativeness issues. In this section, I shall put the emphasis on their actual use in descriptions of IE.

3.1 Proficiency and transfer

As hinted at earlier, the characterisation of English in the Indian context is complicated by issues relating to proficiency and the degree of exposure. In WE studies, a predominant trend was to assume that the same “IE” heading could suitably encompass learner usages as well as usages of speakers who are native speakers by anyone's definition. This, according to Kandiah (1991:280, 1998b), is incorrect. In substance, it is argued that since a variety is strictly speaking the expression of a set of shared norms and rules, then:

Not all proficiency-related usage constitutes usages that validly defines the system that the community uses. (Kandiah, 1991:280)

In other words, the forms issued by learners (however systematic they may be) should be counted as deviations from the “set of shared norms and rules” rather than accepted as data that validly define IE. It is also argued that trying to accommodate all the usages observed under the same label only encourages scholars to characterise IE primarily in terms of transfer and interference. Some researchers such as D'souza (1997:93) made similar observations regarding this and noted that WE studies “got trapped in the discourse of SLA”. The cline of bilingualism constitutes an interesting illustration in
this respect since it has the same underlying principles as those governing the *interlanguage* phenomenon, where proficiency level and the amount of transfer are closely related (Kachru, 1983:74).

The importance which has been attributed to transfer in IE can be linked to the striking number of features that IE shares with local languages – very salient at the phonetic/phonological level – and to the medium of transmission which is generally assumed to be the classroom. The question has attracted a significant amount of attention, and resulted in the production of descriptive work where a contrastive bias is often adopted – this will be developed in the next section. An important characteristic of this type of approach is that it takes the role of transfer as a central and defining feature of the variety. Although the tenants of this position consider IE speakers as L2 speakers, they also claim by a strange twist of argumentation that the use of the term *interlanguage speakers* is inadequate. Basically, they argue that the transplanted status of systems such as IE grants them a stable and self-replicating nature (Wiltshire & Harnsberger, 2006:91) thus forbidding the use of a concept denoting incomplete acquisition of a target. This is untenable: if one considers that individual transfer is the principal factor in acquisition but that the variety is stable and self-replicating, then the only interpretation possible must be that speakers replicate the whole phylogeny while acquiring competence (ontogeny) in English (Kandiah, 1998a and 1998b). It is simpler to accept that a certain number of features passed from the substrata into the variety as part of its historical development, and there is no need to posit on top of this that their presence results from individual acquisition processes. Yet, this necessarily entails that, as advocated by Kandiah, IE can be only described using data derived from its native, native-like, or highly proficient speakers/users. It seems that this is also the position endorsed by Singh (2007:40):

> [a]nd perhaps so is the fact that what is being transmitted today may well have been coloured yesterday by the mother tongues of those who learnt it as a second language before transmitting it as a first language to the next generation. (Singh, 2007:40)

As discussed in a previous section, the position adopted by Singh (2007) is a quite trenchant one. It basically states (1) that if we accept that there are IE native speakers, there is no need to assume that they perform transfers from the other language(s) of their repertoire; (2) that IE should exclusively be characterised using data derived from these native speakers; and (3) that we should also accept that there are learners, that they are interlanguage speakers who do resort to transfer, and that in consequence, those are better studied from an SLA perspective.

To my knowledge, Chand (2009) is the first to have overtly acknowledged the potentially confounding effect of proficiency-related variation AND to adapt her sampling method in consequence, selecting only native-*from-the-crib*-speakers for her study. In this respect, Mufwene (1998:111) reminds us that in linguistic theory, the native speaker has traditionally been taken to be the provider of the most reliable grammaticality judgements on language. However, although he shares with Chand a *from the crib* definition of the native speaker, Mufwene also underlines that evidence from multilingual context shows that being a native speaker of a language does not
entail being proficient in it (i.e. attrition phenomenon, etc.). As a consequence, he also proposes that the proficient speaker should be the arbiter of language usage instead.

3.2 Proficiency and Sociolinguistic variation

Though most scholars recognize the issue of variable proficiency in IE, the impact it has on variation has, to say the least, rarely been empirically tested. Some of these rare attempts were conducted by Sharma (2005a and 2005b) whose studies of Indian immigrants in the US, although they use the tools and theoretical concepts developed within the frame of variationist sociolinguistics, relate primarily to SLA concerns as defined by Bolton (2008:11): i.e. the study of “the adaptation of immigrants to a host societies such as the US [...]”. No direct measurement of the speakers' proficiency level was performed in these studies. The proficiency level was computed via indices comprising language use and years of education in English parameters. Interestingly, the results tend to show no strict correlation between proficiency and the behaviour of any of the phonological variables tested. Sharma (2005a:195) concludes that this must be the result of an ongoing dialect stabilization that would encompass the whole proficiency continuum. Following Kandiah's objection, it may be possible to provide an alternate interpretation here. Briefly, what is observed at the “upper” end of the continuum may not denote a successful L2 acquisition but an L1 competence. Thus, comparing the different types of proficiency-related usages would be like comparing apples and oranges.

Nevertheless, the study of variation, proficiency and language use in multilingual contexts may in principle have interesting ramifications, provided that distance is taken from the proficiency/transfer diptych and its axiomatic character. It can be hypothesised both that even among speakers considered as highly proficient, not all react homogeneously to sociolinguistic variation, and, to reuse Prabu's terminology in Singh et al. (1998), that proficiency and language use have a determining effect on who participates in the shared system and, in particular, its (shared) transgressions.

4. Phonological variation in IE

This section aims to review the major trends in the analysis of phonological variation in IE, from the early prescriptive accounts to the latest studies using the quantitative variationist framework. Eventually, it will be shown that issues ultimately pertaining to nativeness and proficiency have oriented research in this domain, thus leaving potentially informative features under-described.

4.1 Early descriptions

The pronunciation of IE started being considered in the late 1960s and early 1970s with the first serious studies on IE phonology being carried out by Bansal (1969) and Masica & Dave (1972). Both studies, despite their pioneering status in the domain have been subjected to various criticisms. In a nutshell, it remains unclear whether the authors
wanted to describe IE pronunciation itself or if they aimed at issuing a pedagogical model (Sahgal & Agnihotri, 1988:52). Though this criticism is perhaps a little harsh on Bansal, whose work consisted more in an attempt at establishing an experimental design for measuring intelligibility rather than in a description of IE, it applies quite fittingly to Masica & Dave's report. In this report, the authors describe General Indian English (GIE), a supra-regional variety, devoid of particular substratum influence which:

[...] appears to be the de facto norm to which the majority of the 5,000,000-odd speakers of English in India aspire. Ought it not to be (perhaps with certain minor modifications) the de jure norm also, for mass teaching purposes? (Masica & Dave, 1972:2).

I do not intend to discuss this claim, whose object is more interesting from an applied linguistics perspective. However, this passage shows the type of orientation prevalent at the time, where variation tended to be considered more as a deviation from the norm rather than in its own terms.

4.2 Variation

The orientation taken by research on variation in IE depends by and large on how the variety as a whole is considered by those who undertake the enterprise. It relates ultimately to the debate over nativeness. Thus, some take transfer and deviation as being the central element, but others consider the variety amenable to the kind of idealisation quantitative variationist studies require.

4.2.1 The Kachruvian paradigm

Kachru's (1983) model, though still a deviationist account, is noticeably the first attempt at integrating variation into a sociolinguistics of IE, and proposes that variation can be explained basically on three parameters: ethnicity, geography and proficiency. The latter has been discussed at length in the previous sections and I shall just skim through the two others since they are only mildly relevant to the present study.

Geographical variation principally stands for the influence that the major regional languages have on English locally; regional varieties of IE are most often labelled according to these substrata (e.g. Hindi English, Tamil English, Punjabi English etc...). Thus, geographical variation differs strikingly from what traditional dialectology refers to through this term, since it corresponds to the “speakers' mother tongues” (Kachru, 1983:70) and consequently does not form a dialect continuum along which differences are cumulative (Chambers and Trudgill, 1998:5). This phenomenon has attracted a lot of attention over the years since the noticeable diversity raises the question of the accuracy of a term that would refer to a single entity called IE. As noted earlier, this concept generally overlaps with that of proficiency related variation in the practice of current linguistic analysis.

The bulk of the studies on the pronunciation of geographical subvarieties of IE was carried out in the late 1970s and early 1980s (see review in Bansal, 1990). In a great majority of cases, the study of geographical variation is done using contrastive approaches: the research sample is generally constituted of IE speakers with identical
language backgrounds (called $L1$), and either RP or the phonological inventory of the so-called L1 constitute the frame of reference. Both types of studies have been heavily criticised for being theoretically (see 3.1) and methodologically invalid. The criticism addressed to the first type of approach – it was called the RP fallacy by Mohanan (1992:112) – applies actually to both since, one way or another, the features which do not relate to the frame of reference selected are generally left unnoticed. The renewal of interest for this type of studies seems to be a fairly recent development in the field of IE pronunciation research (e.g. Maxwell & Fletcher, 2009 and 2010, Wiltshire, 2005 and Wiltshire & Harnsberger, 2006). Yet, the notable difference with earlier work is the use of instrumental methods.

The last type of variation to be discussed is relevant to ethnicity. As Kachru (1983:70) puts it, ethnic variation cuts across regional varieties and relates to English spoken by groups such as the Anglo-Indians for instance.Though Kachru expressed his concern for the lack of research in this domain as early as 1976 (revised version in Kachru, 1983), it gave rise to only a few studies over the thirty or so years that followed (see e.g. Bayer, 1986).

Despite the criticism formulated earlier against the cline of bilingualism, Kachru's approach to variation still goes a long way in explaining the diversity at the level of the subcontinent and opened up a wide range of domains of research. It also paved the way for later studies of variation in urban dialects.

4.2.2 Quantitative studies

Quantitative studies of phonological variation in IE using Labovian methods were undertaken for the first time by Agnihotri & Sahgal (1985), and later Sahgal & Agnihotri (1988). The field of WE was rather late to adopt this approach considering that the paradigm had been available since the late 1960s. Two reasons may be suggested for this. On one hand, IE being essentially seen as a deviant object, it was not considered amenable to this type of approach. On the other hand, the quantitative models were tailored against principally monolingual societies, and essentially focussed on parameters such as age, gender and socio-economic class. While it is perfectly conceivable to import the two first parameters into a study of IE, the socio-economic factor is more problematic since English is primarily spoken by the urban “elite”. Thus, the model requires substantial adaptations. The studies of Delhi IE by Agnihotri and Sahgal feature some of these re-adaptations, the most notable being the replacement of the social class factor by the closely related schooling factor which turned out to be quite statistically significant in predicting variation.

Regarding the choice of the dependent variables, there was a noticeable interest in “Indian-specific” features such as retroflexion and the /v/-/w/ merger, but also in features which are quite often, in other varieties, above the level of social awareness\(^3\) such as rhoticity and the Cot-Caught distinction. Interestingly, these studies are used as referents for later research on language change in IE, as in the last few years, certain

\(^3\) Labov (1994:78) distinguishes between change from above and change from below. Change from above concerns features which are usually imported from other speech communities to which the borrower attributes a higher prestige. These changes occur primarily in the speech of dominant classes and in careful speech.
scholars have shown a renewed interest for this type of variables and the use of quantitative methods (see e.g. Chand (2009) for the /v/-/w/ merger; Chand (2010) and Sharma, (2005a) for the rhoticity).

4.3 Potentially informative features

As outlined in the section above, the range of phonological features that have been studied in-depth is quite restricted. Many other features have been briefly touched upon in more descriptive studies; two of them in particular attracted my attention.

The first is the realisation of the RP /θ/ and /ð/ as inter-dental fricatives in IE. In most studies, these phonemes are said to be realised as the dental stops [t̪] and [d̪], or as aspirated dental stops [t̪ʰ] and (rarely) [d̪ʰ]. Aspiration being generally phonemic in Indo-Aryan Indian languages, it is thus often postulated that, for speakers with this language background, the aspirated stops constitute the favoured candidates as a result of the transfer process. This matter has remained unquestioned until Sailaja's recent (2009:21) description of Standard Indian English Pronunciation (SIEP), where it is said that (1) IE speakers actually do use inter-dental fricatives, though marginally, and (2) that while the /θ/ is occasionally realised as a fricative, it is almost never the case for /ð/. The fact that this feature went unnoticed until recently is probably of as much interest as the variation as such and raises a lot of questions. Firstly, one may wonder whether the use of inter-dental fricatives is a recent phenomenon or not, and whether its increase results from a language change in progress. If it is not the case, why were they not mentioned earlier? Finally, since stops have been said to be the default variants, one may also ask if this type of variation brings any indication that might be of interest to the debate over endo-normativity versus exo-normativity in IE.

The second point is the distinction between the Wells' (1982) NORTH and FORCE lexical sets in IE. In varieties which retain the distinction between NORTH and FORCE, the stressed vowels in the words from each set are realised as /ɔ(r)/ and /o(r)/ respectively (definition adapted from Wells, 1982:159). It is generally admitted that this distinction is “phonetically arbitrary” (Laferriere, 1979:604). However, the spelling of the words often provides an indication on whether they belong to one class or the other (Sundkvist, 2004:253): <orC> and <or + vowel other than “silent e”> are the only cases where the spelling is truly ambiguous. The rare mentions of the presence of this distinction in IE come from Wells (1982:626) himself in his chapter on the IE accent, and Gargesh (2004:996). That, to my knowledge, no studies attempted to test this distinction qualitatively/instrumentally is quite surprising. Perhaps it is sufficient to note that the study of this feature cannot be subjected to any kind of contrastive approach, and that this is the bias which is usually adopted for studies on the vowel system in IE. Yet, the study of the variation of this feature, that is of the maintenance or otherwise of the distinction, can be instructive with regards to the supposed influence extraneous models have on IE, since the merging of NORTH and FORCE is already complete in most British English (BE) accents and quite advanced in many American English (AmE) accents (Wells, 1982:160). Finally, the existence of connections between

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4 NORTH lexical set: e.g. chord, fortune, horse, normal, short, war, warm... FORCE lexical set: e.g. board, floor, hoarse, more, oral, pour, store...
phonological and orthographical competence (Carr, Durand & Pukli, 2004:9) is
generally acknowledged by researchers, and IE pronunciation in particular is said to be
heavily influenced by spelling. For the study of contexts, such as the IE context, where
speakers generally have a high level of literacy, investigating the NORTH versus
FORCE distinction could have interesting outcomes with regard to this question.

5. Problem statement, general research questions and operationalisation

It has been established that attitudes towards nativeness and the role attributed to
proficiency and language use in the study of so-called non-native varieties have largely
determined the directions taken in research on IE phonology. Conversely, little space
has been granted to phonological variation to inform us about these varieties. This issue
constitutes the axis of research of the present study: What insight do patterns of
proficiency and language use related variation provide to the sociolinguistic study of
these varieties? To tackle this question, I shall focus on two general issues.

1. What do proficiency and language use related variation reveal about “nativeness”? In
   particular, who participates in the variation and how?
2. What methodological implications do proficiency and language use related variation
   have for the study of the varieties of English in multilingual context, and in particular
   for corpus building?

For this study, these general questions are operationalised as follow:

1. What is the distribution among items and speakers of fricative and stop realisation of
   *th*?
2. To what extent and in what contexts do speakers of IE distinguish the realisations of the
   vowels in words of the NORTH and FORCE lexical sets?
3. Is the pattern of variation explicable in terms of contrastive analysis?

6. Methodology

The present study aims at determining whether proficiency level, language use, and
inter- and intra-speaker variation in usage are related in any respect. The variables
looked at are the realisation of *th* and the distinction between the NORTH and the
FORCE lexical sets. The project thus requires an experimental design which permits the
elicitation of a corpus displaying a range of proficiency levels and of language use, and
to elicit two or more distinctive styles for each speaker in a systematic way. These
methodological questions are addressed in the first two parts of this section. The last
part deals with the method used for the analysis of the data.
6.1 Sampling

The research questions broached in this study are sociolinguistic, but criteria such as age, gender and class are not central to my purpose. However, account must be taken of the considerable influence that such parameters have on the inter-speaker variation. In consequence, it was decided to control them in order to neutralise their confounding impact on the results. The corpus comprises 26 male informants, aged between 19 and 30 at the time of the recordings, and all from the South Delhi middle class (they all had been in Delhi at least since the 5th grade). For the present study, only 12 speakers were selected; I come back to the selection criteria in 6.3.1.1. The reasons for selecting only male speakers are twofold. First, strict comparability of the data along the proficiency cline must be maintained. Any textbook on sociolinguistics will recognise gender as a crucial social factor for inter-speaker variation in a community. Second, since I am an outsider to the community, it was a priori assumed that eliciting naturalistic data from people my own age and sex would lessen this bias.

6.1.1 Population

The urban population of the National Capital Territory of Delhi was 12,905,780 according to the census 2001 (Directorate of Economics & Statistics, Government of National Capital Territory of Delhi, 2010:2) and constituted the second biggest city of the country after Mumbai. In terms of urban agglomeration Delhi also includes satellite cities (e.g. Gurgaon, Noida, etc.) from the bordering states of Haryana and Uttar Pradesh thus significantly increasing the figure given above. The population of Delhi Urban Agglomeration as redefined by the Population Reference Bureau was then estimated around 16.2 million in 2001 (Sharma & Haub, 2007).
Delhi is subdivided into nine administrative districts named after their geographical situations. Those are of no relevance for the present study because what is commonly referred to as “South Delhi” (Figure 1) includes areas such as Vasant Vihar, Vasant Kunj or Moti Bagh which are formally part of the South-West administrative division. This area is known for its upper middle class (Chand 2009:17) or “elite” (Sahgal & Agnihotri, 1988:53) population. Speakers from this socio-economic background who had spent most of their lives in these neighbourhoods constitute the target population of the present study.

6.1.2 Sampling Method

Milroy & Gordon (2003:30) and Chambers (1995:39) stress that judgement sampling, provided that it is well motivated, is now generally preferred and considered a solid alternative to strict random sampling, which is deemed unrewarding regarding the efforts involved and the relatively limited benefits it provides. The type of (judgement) sampling adopted in this study is called snowball sampling or the friend of a friend (Milroy, 1980:47) sampling method. This method, which consists in generating the sample through a social network which already exists, has considerable advantages.

Firstly, English is not used by each and every Delhiite. Thus, resorting to this method facilitates the task of finding English speakers and produces quick and effective results. Second, no assumption is made on the social class of the participants, and since the peer group becomes the social unit of reference, the method tends to produce socially homogeneous samples (Chand, 2009:65). Finally, it favours the setting of group interviews and thus helps reducing the effects of the observer’s paradox.

The first step consisted in recruiting three research assistants in my own social network. They were asked to introduce me to friends of theirs willing to participate in my survey, and to help me interview them. All three normally use the English language for interaction with their friends in Delhi, and this for different reasons: Sachitananda Bista, journalist, is a Nepali native speaker. He does not have a sufficient command of Hindi to use it as the language of intimacy. Vasundhara Vidalur, professional musician, uses English, with little or no code switching, as the default language of interaction with her friends. Gurshaan Singh, student, has spent most of his life in Canada and the UK, and also uses English because of his lack of proficiency in Hindi. As a consequence, all the interviews were naturally carried out in English and the naturalness of the data was not altered too much by the fact that I am not fluent in Hindi. It has to be noted that in the procedure adopted here, in contrast to Milroy’s (1980:47) original friend of a friend method, the initial “link” contact remains at the centre of the sample which, as a consequence, consists of her/his first order network zone (Milroy, 1980:46).

6.2 Interviews

All the interviews were carried out in South Delhi between the 25th of January and the 25th of March 2011. Each participant signed an informed consent form, designed along Bowern’s (2008:219) model (see Appendix A), before the beginning of each recording. At no moment were the participants unaware that they were being recorded; even when left alone with the research assistants it was always made clear that the recorder was on.
Finally, none of the participants received any monetary compensation for their contribution.

6.2.1 The PAC protocol

The oral corpus was built on the basis of the protocol designed for the PAC project\(^5\) (Phonologie de l’Anglais Contemporain: usages, variétés et structure - The Phonology of Contemporary English: usage, varieties and structure). This protocol, which comprises various reading tasks and proposes guidelines for formal and informal conversation, is designed to elicit a range of styles for each speaker. In this respect, the protocol is suitable for sociolinguistic studies. Yet, as explained in Carr, Durand & Pukli (2004:11), PAC does not focus on a limited number of variables as a sociolinguistic protocol would do. Instead, it intends to cover the whole phonemic inventory of the speakers and in this respect, is closer to the designs of traditional dialectology. This makes PAC perfectly adapted to my purpose because:

- Instances of the \(th\) variable, in both lexical and grammatical words, are abundant in the various reading tasks of the protocol.
- Vowel extrinsic normalisation procedures require information from multiple vowels across the speakers' overall vowel spaces (Flynn, 2011:5) – the Gerstman normalisation procedure was adopted in the present study. This is developed in section 6.3.3.
- It is intended to test the FORCE and NORTH distinction against the LOT, THOUGHT and GOAT lexical sets – this point is developed in section 6.3.3.
- It makes systematic inter-speaker and cross-varieties comparisons possible; a wide range of varieties of English having already been investigated by PAC researchers.

6.2.1.1 Wordlists

The protocol comprises two wordlists including 192 tokens altogether, which are designed to elicit a number of potential minimal pairs. The first one (see Appendix B) aims at uncovering the vowel inventory of the speakers, while the second (see Appendix C) is focused on the consonants. It can be objected that the pairs are not placed unobtrusively and thus may tend to bias the results. However, the reading passage which includes tokens from the lists, aims at determining whether the distinctions which are made by the speaker result from conscious hypercorrection or not (Carr, Durand & Pukli, 2004:7).

While carrying out the pilot study for this investigation in 2008, I noticed that item 28 in the second wordlist (i.e. \(loch\)) was problematic for most of the participants and was very often pronounced, after some hesitation, \([l\text{ɒʧ}]\). Even if it is strongly advised against modifying the wordlists (Durand & Pukli, 2004:7), it was decided to replace \(loch\) by \(vet\). The reasons for this are, that the systematic misinterpretation of this word does not bring any relevant information on the phonological inventory of the participants, that the potential minimal pair it constitutes with \(lock\) is very unlikely to provide results in

\(^5\) The PAC project is funded by the FEDER European fund (Fond Européen de Développement Régional). It is coordinated by Jacques Durand (University of Toulouse II) and Philip Carr (University of Montpellier III).
the Indian context, and that *vet* and *wet* on the other hand constitute a minimal pair well known in the literature (Bansal, 1990: 225; Kachru, 1994:515; Hickey, 2004:544).

6.2.1.2 Text

As mentioned above, the reading passage (Appendix D) allows us to cross-check the phonemic distinctions elicited via the wordlists. Though artificial, the data elicited provide an overview of the connected speech at a high level of formality. For the present study, it proved very useful in the process of determining the influence of the preceding and following contexts on the realisation of *th* at the word boundaries.

Again, words such as *vicar* or *evangelist* were problematic for a number of speakers. However, it was decided against modifying the text or replacing it by another one, as it would have been detrimental to the methodology.

6.2.1.3 Formal and Informal conversations

Those constitute the bulk of the data. In the PAC protocol, it is recommended to keep the two activities discrete, but this proved to be difficult for practical reasons. For instance, it happened that interviews took place in a one-room accommodation where having a face-to-face interview would have been impossible without asking someone to go out. Consequently, the research assistants and I decided to adopt another strategy. Formal and informal conversations were carried out as one and the same activity. The beginning of the interviews starts with the fieldworker (myself) questioning the participants on general topics (e.g. schooling, life in the neighbourhood, leisure and cultural activities). Basic knowledge of the participant's background and interests is acquired by filling in the *information sheet* prior to the recording. As the (formal) conversation goes on, the research assistant, who is a friend of the participants, gradually takes over thus leading the informal part of the interview.

This design was expected to produce usable results because I am roughly the same age as the participants and the research assistants, and thus could interact with them as a peer. Eliciting casual speech with older people via this method would have been much more difficult. Again, despite the efforts to reduce the impact of the observer's paradox, one has to be careful with what is labelled *informal*. For Durand & Pukli (2004:7), the informal conversation is a style which is more casual than the other styles elicited; however, the term *informal* should not be taken at face value.

6.2.1.4 The information sheet

The information sheet (see Appendix E), allows us to gather crucial elements on the background of the participants such as, level of education, language background, social class, etc. Its format is almost exactly the same as the one provided with the PAC protocol. Nevertheless, slight modifications were made to it in order to have a finer-grained overview of the informant's reported language use. This part of the questionnaire is inspired by Sahgal's (1991) study and is designed to replace PAC's original section on reported language proficiency.
6.2.2 Proficiency

To account for the proficiency level in English of the speakers, the choice was settled on a direct assessment. However, it was necessary to adopt a measurement method quick enough to be run during the interviews without taxing the participant's patience. Consequently, it was impossible to run a full fledged proficiency test. Besides, as the investigation did not require any SLA depth, a quick measurement which could be performed systematically and enabling us to discriminate the participants in two or three level groups was deemed sufficient.

The test chosen focused only on one aspect of the speaker's language talent, namely, vocabulary breadth. In previous research, it has been highlighted that the speakers' vocabulary breadth correlates quite well with their overall proficiency level (see e.g. Golkar & Yamini, 2007). This is the rationale behind Meara’s X_Lex (2006) and Meara and Miralpeix (2006) Y_Lex vocabulary testing softwares. They function on the same principle as the YES/NO vocabulary tests developed in Meara (1992/2010): a set of words is presented to the test-takers who have to decide whether they know them or not. In order to measure the accuracy of the answers given, a certain number of non-existant words are included among the real words. A “corrected score” is then computed via a formula.

The test chosen is Y_Lex. It comprises 120 tokens and tests vocabulary in the 6000-10000 word range. For a better portability, the test was presented on sheets of paper (see Appendix F) instead of a computer. It took usually between 5 and 10 minutes for the participants to perform. Besides being quickly run, this test also offers the advantage of computing a numerical value between 0 and 5000, thus facilitating the ranking of the participants. Again, the scores should not be taken at face value. Moreover, as Meara (2006) puts it, the test is designed to make a “quick and dirty” evaluation of the speakers' competence and is suitable for establishing groups for an experiment.

6.2.3 Recordings

The final corpus includes the participation of 26 people and consists of 23 hours 55 minutes of recordings in total. Each interview produced 55 minutes of recordings on average, though the actual meetings could last up to 2 or 3 hours (i.e. getting sufficiently acquainted with the participants before starting the recordings, filling in the information sheets and performing the written tasks).

6.2.3.1 Equipment

For the recordings, a digital recorder ZOOM H4n was used. The recorder was set to issue wave files at a sampling rate of 44 Khz with a 16 bits resolution. Those are easily transferable on a computer via SD flash memory cards or USB. The ZOOM H4n offers the possibility of recording four channels simultaneously, two of which correspond to the inputs dedicated to external microphones. These inputs distribute the phantom power required for the functioning of good condenser microphones. The recorder was operated on batteries since using it on AC power seemed to be responsible for a light buzz in the signal. One or two lapel microphones AKG C417 pp were used depending
on the number of participants. Those are omnidirectional condenser microphones which offer a good response in the 20-20,000 Hz frequencies, ideal for voice recording.

6.2.3.2 On the quality of the recordings

The quality of the recordings, that is the presence or absence of ambient noise, is very variable throughout the recordings. In this respect, the fact that the fieldwork took place during winter time was a considerable advantage. Chand (2009:82), for instance, reports having had problems during the monsoon season because of the noise generated by AC units and by fans. My recordings were occasionally altered by the storm and the rain on one or two occasions. Another commonly reported problem (Chand, 2009:82) comes from the street sounds. Delhi is a notoriously noisy city, and despite my efforts to control this factor (closing all the windows, recording away from the noise sources) the resulting data is often intermittently altered by loud car engines, honks, nearby building sites or even fireworks. Each and every place where the interviews were carried out were checked in order to find the most adequate configuration. Thus, placing the participant back towards the main noise source turned out to be effective.

6.3 Analysis

The object of the preceding sections was to present the method adopted for the building of the oral corpus. Variables such as social class, gender, age and geographical origins were said to have been controlled. In the following, the focus will be, first on the setting of the independent variables used in the analyses of both the inter-dental fricatives and the distinction NORTH/FORCE; second on the specific method and tools used for each analysis.

6.3.1 Independent variables

It was mentioned above that all the participants had been in Delhi at least since the 5th grade. For the present study, the working corpus was reduced from 26 to 12 people, paying attention to obtaining a sample homogeneously distributed in terms of age, proficiency and range of language use.

6.3.1.1 Proficiency and reported language use

Both scores and language use indices for each participants are given in Table 1. As explained above, the proficiency level of the participants was scored automatically via the Y_Lex software. For the reported language use however, the process was more complex. As part of the interviews, each participants had to give an estimation of their language use frequency in a range of situations (see Appendix E). These situations belong to three domains of language use namely, family, friendship and institutional domain (Sahgal, 1991). For each of these three overarching domains, a score out of 10 is computed. They are obtained by calculating the average scores of each respective sub-domains (if a speaker scores 10 in one domain this means that he uses English 100% of the time in this domain. If he scores 6, then it is 60% of the time, etc.). These
### Table 1 Sample summary

<table>
<thead>
<tr>
<th>Participant</th>
<th>Y_lex score</th>
<th>language use</th>
<th>Age</th>
<th>Language background</th>
</tr>
</thead>
<tbody>
<tr>
<td>vm</td>
<td>1300</td>
<td>16.70</td>
<td>26</td>
<td>Hindi</td>
</tr>
<tr>
<td>an</td>
<td>2300</td>
<td>17</td>
<td>23</td>
<td>Hindi</td>
</tr>
<tr>
<td>aa</td>
<td>2400</td>
<td>16</td>
<td>24</td>
<td>Hindi</td>
</tr>
<tr>
<td>ab</td>
<td>2800</td>
<td>24.50</td>
<td>28</td>
<td>Bengali, Hindi</td>
</tr>
<tr>
<td>nr</td>
<td>3100</td>
<td>23</td>
<td>19</td>
<td>Hindi</td>
</tr>
<tr>
<td>sa</td>
<td>3300</td>
<td>16</td>
<td>20</td>
<td>Hindi</td>
</tr>
<tr>
<td>eg</td>
<td>3350</td>
<td>16</td>
<td>26</td>
<td>Hindi</td>
</tr>
<tr>
<td>nc</td>
<td>3600</td>
<td>27.20</td>
<td>26</td>
<td>Hindi</td>
</tr>
<tr>
<td>gp</td>
<td>3700</td>
<td>24</td>
<td>31</td>
<td>Hindi</td>
</tr>
<tr>
<td>at</td>
<td>3750</td>
<td>28</td>
<td>21</td>
<td>Hindi, Marathi, Konkani</td>
</tr>
<tr>
<td>vs</td>
<td>3950</td>
<td>21.30</td>
<td>20</td>
<td>Hindi</td>
</tr>
<tr>
<td>is</td>
<td>4250</td>
<td>13.70</td>
<td>25</td>
<td>Hindi, Punjabi</td>
</tr>
</tbody>
</table>

Average scores are summed up, thus yielding an index of language use out of 30. Although the domains of use investigated do not picture the whole speakers' range of uses, those have the advantage to be central productive, as opposed to receptive, domains of use. Finally, equal loading was attributed to each domain of use: this makes the calculated index a rather imprecise measurement tool, but devising a more nuanced loading was impossible considering that the participants spend different amounts of time in different domains.

As Sharma (2005a) highlighted, proficiency and reported language use are two very close variables. The Spearman rank correlation coefficient was computed in order to determine if there was a significant degree of correlation between the two sets of variables. This does not seem to be the case ($r_s = 0.119$). Yet, neither the Y_Lex test nor the language use index are precise means of measurement. As a consequence, it seemed realistic to use only two variables in each factor group: (1) $Y_{lex} \text{ score} < 3325$ and $Y_{lex} \text{ score} > 3325$ for the proficiency parameter. Proficiency scores range from 1300 to 4250. By setting the median value (3325) as the limit, we have two groups of six speakers each. (2) language use index < 20 and language use index > 20 for the language use parameter. There is a gap between 17 and 21.30. The limit was arbitrarily set at 20 (the median is 19.15), thus making two groups of six speakers each. It can be noted that since the number of variables is quite limited the possibility of an overlap between these two factor groups cannot be discarded.

Though often associated to the question of proficiency in SLA studies, the participants' language backgrounds (reported in Table 1) are not taken into account in this study. It will be remembered that the experimental variables were chosen to have limited impact from the language background factor (i.e. transfer), thus enabling the study to highlight the sociolinguistic variation if any.
6.3.1.2 Age

Originally, it was intended to control the age factor. Yet, it appeared while compiling the corpus that most, if not all the participants above 25 years old had been working for at least one year at the time of the recordings. The younger participants were still students or had just left college. It was decided then that age would constitute another independent variable. Since school may have a normalising effect on the speech production, two age groups (i.e. above 25 years old and under 25 years old) were set in order to avoid the effect of this potentially confounding factor. Basically, it is assumed that the nearer one is to school, the more likely the school norms have an impact on her/his speech production.

6.3.1.3 Style

Again, this factor group contains only two variables: formal and informal speech. Under the formal heading are the data elicited via the reading tasks. Under the informal heading are the data collected during the informal part of the interview, including the first minutes of the recordings. Although the methodology used prepared for a distinction between formal and informal conversation, the present study does not exploit this level of detail.

6.3.2 Fricative th realisation

For the analysis of this variable, it was decided to run a multivariate analysis of the data using GoldVarb X (Sankoff, Tagliamonte & Smith, 2005). In order to test if the variants of these fricatives are normal allophonic realisations conditioned by the phonetic context or by any other internal factors, an extra set of independent variables was tested (Table 2). The internal factors tested are inspired by those employed by Childs et al. (2010) in their study of Newfoundland English. The whole coding sheet for this study is available at the end of the document (Appendix G).

Table 2: Internal factors

<table>
<thead>
<tr>
<th>Groups</th>
<th>Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left context</td>
<td>Voiceless stops, voiced stops, voiceless fricatives, voiced fricatives, nasals, liquids, vowels, pauses.</td>
</tr>
<tr>
<td>Voicing</td>
<td>Voiced, unvoiced.</td>
</tr>
<tr>
<td>Position</td>
<td>Word-initial, word-medial, word-final.</td>
</tr>
<tr>
<td>Word class</td>
<td>Grammatical, lexical.</td>
</tr>
</tbody>
</table>

About 230 tokens per participants were analysed (around 70 in the reading tasks, and 160 in the informal conversation). Each token was annotated and checked auditorily and visually on a spectrogram using the PRAAT software (Boersma & Weenink, 2011) with a view range from 0 to 8000 Hz and the dynamic range set at 50 db. Inter-dental fricatives are notoriously hard to identify on a spectrogram. Although stop realisations were generally unproblematic (both auditorily and spectrographically), there were also several cases which were deemed unclear. Those were not taken into account.
A first VARBRUL analysis was performed determining whether any factor group had a significant impact on the occurrence of fricative \( th \) realisations. Second, a set of VARBRUL analyses was performed on each group of speakers (in the non-linguistic factor groups) which were revealed to be significant in the first analysis.

### 6.3.3 NORTH versus FORCE

All the words belonging to the NORTH and FORCE lexical sets were collected throughout the wordlists and the conversation and classified according to Wells' (1982 and 2000) classification. The vowels of THOUGHT and GOAT, being prototypical of the realisation of NORTH and FORCE respectively, were also looked at (see Table 3). Vowels from the LOT set were also examined in order to determine if the speakers had a third back vowel in their inventory. For each vowel, the formants F1, F2, F3 and the fundamental frequency F0 were measured using PRAAT (Boersma & Weenink, 2011) with a view range from 0 to 5000 Hz and the dynamic range set at 40 db. Formants were measured at a median point where they are the most steady, thus minimizing the effect of preceding and following phonetic contexts on it. It appeared while collecting these data that the value of F1 was the most, if not the only, relevant feature for the present study. To improve inter-speaker comparability, the formants were normalised using the Gerstman normalisation procedure as explained in Flynn (2011:5). This procedure is called “vowel extrinsic” and requires to measure extremities of each speaker's vowel space. From each formant value \( F_i \) there can be determined a \( D_i \) value ranging from 0 to 999 which stands for a proportion of the speaker's vowel space. For this study, it appeared that only the \( D1 \) differed significantly between the words from the two sets.

<table>
<thead>
<tr>
<th></th>
<th>NORTH</th>
<th>FORCE</th>
<th>THOUGHT</th>
<th>GOAT</th>
<th>LOT</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wordlists</td>
<td>48</td>
<td>120</td>
<td>72</td>
<td>108</td>
<td>60</td>
<td>408</td>
</tr>
<tr>
<td>Conversation</td>
<td>96</td>
<td>111</td>
<td>125</td>
<td>214</td>
<td>172</td>
<td>718</td>
</tr>
</tbody>
</table>

As mentioned in 4.3, the distinction between the NORTH and FORCE sets is purely lexical, that is to say, “phonetically arbitrary” (Laferriere, 1979:604). Thus, even if the two sets happen to be merged, the actual contrast between \( /o/ \) and \( /\bar{o}/ \) is not amputated nor does it cease to exist, as it is still fully instantiated in the THOUGHT versus GOAT distinction. Consequently, the approach for this study is by and large the one adopted in Carr and Brulard (2006) and requires that each element from NORTH and FORCE be sorted based on the actual realisation of the vowel. To this end, one table functioning as a matrix was designed for each style (i.e. citation form and conversation), in order to decide whether the items under study belong to one class or the other. The tables as well as explanations on how they were designed and used are found in Appendix H.

---

\(^6\) Since IE is variably non-rhotic (Chand, 2010; Sahgal & Agnihotri, 1988) it might appear incorrect to presuppose this. Yet, as shown in Appendix H Table 1.a and 1.b, there is actually a very good correspondence between the acoustic realisation of the vowels in NORTH and THOUGHT words on one hand, and the vowels in FORCE and GOAT words on the other hand.
First of all, tokens from the minimal pairs for each lexical set were compared in order to
determine whether the speakers keep the distinction between the two classes at a high
level of formality. Second, this analysis was generalised to all the tokens from each
lexical set in the wordlists. Finally, the tokens in conversational style were analysed and
compared in order to see whether tendencies of variation emerged across speakers
and/or across styles.

7. Results

This section examines the realisation of the two sets of experimental variables, namely:
the th realisation, and the NORTH versus FORCE lexical sets distinction. Each group of
variables is dealt with individually.

7.1 Fricative th realisation

The occurrence of the fricative variant in the corpus under study turns out to be a rather
rare phenomenon and it constitutes only 13% of the total number of tokens (voiced and
voiceless together) looked at in the corpus. However, there is no speaker who does not
produce these fricatives (see Figure 2 in 7.1.2). The results of the multivariate analysis
(Table 4) seems to highlight the primacy of the linguistic factors on the realisation of /ð-
θ/ as fricatives. On the other hand, the language use factor is the only extra linguistic
parameter to be statistically significant and ranks third (ranking done by calculating the
difference between the highest and the lowest weight in each group, i.e. the range). Both
internal and external factors will be looked at in detail in the next sections.

Table 4: Realisation of /ð-θ/ as fricatives, VARBRUL analysis (p = .000; Input .074; Log likelihood
= -854.145). Word class, Style, Age and Proficiency not significant.

<table>
<thead>
<tr>
<th>Factors</th>
<th>Factor weight</th>
<th>%</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preceding context</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voiced fricatives</td>
<td>.86</td>
<td>30.1</td>
<td>56/186</td>
</tr>
<tr>
<td>Voiceless fricatives</td>
<td>.83</td>
<td>29.3</td>
<td>49/167</td>
</tr>
<tr>
<td>Vowels</td>
<td>.69</td>
<td>20.8</td>
<td>211/1012</td>
</tr>
<tr>
<td>Liquids</td>
<td>.54</td>
<td>9.5</td>
<td>7/74</td>
</tr>
<tr>
<td>Voiceless stops</td>
<td>.33</td>
<td>3.8</td>
<td>11/287</td>
</tr>
<tr>
<td>Pauses</td>
<td>.24</td>
<td>2.6</td>
<td>16/608</td>
</tr>
<tr>
<td>Nasals</td>
<td>.23</td>
<td>3.6</td>
<td>12/330</td>
</tr>
<tr>
<td>Voiced stops</td>
<td>.20</td>
<td>2.0</td>
<td>2/99</td>
</tr>
<tr>
<td>Voicing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unvoiced</td>
<td>.62</td>
<td>19.8</td>
<td>102/515</td>
</tr>
<tr>
<td>Voiced</td>
<td>.47</td>
<td>11.7</td>
<td>262/2246</td>
</tr>
</tbody>
</table>

29
Table 4 (Continued)

<table>
<thead>
<tr>
<th>Factors</th>
<th>Factor weight</th>
<th>%</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Position</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Word-medial</td>
<td>.74</td>
<td>33.9</td>
<td>100/295</td>
</tr>
<tr>
<td>Word-initial</td>
<td>.49</td>
<td>10.8</td>
<td>244/2251</td>
</tr>
<tr>
<td>Word-final</td>
<td>.29</td>
<td>9.3</td>
<td>20/215</td>
</tr>
<tr>
<td>language use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Index &gt; 20</td>
<td>.64</td>
<td>18.9</td>
<td>269/1427</td>
</tr>
<tr>
<td>Index &lt; 20</td>
<td>.35</td>
<td>7.1</td>
<td>95/1334</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>13.2</td>
<td>364/2761</td>
</tr>
</tbody>
</table>

7.1.1 Linguistic factors

Out of the four groups of factors coded for testing the influence of the internal factors on the realisation of inter-dental fricatives, only the word class factor is not significant in predicting the phenomenon under study. The other three are ranked as follow: (1) Preceding context; (2) Position; (4) Voicing.

First, the VARBRUL analysis reveals that the phonetic context is the most significant factor group in predicting the realisation of /ð-θ/ as fricatives (range = .60). Preceding voiced and voiceless fricatives are the factors which most strongly favour the phenomenon (.86 and .83 respectively). The consonantal clusters /sθ/ and /fθ/ being quite rare and limited to final position (e.g. sixth, fifth), and other clusters involving /ð-θ/ with a preceding fricative being impossible phonotactically, it clearly appears that this context principally occurs at word boundaries (e.g. these things), that is, in about 40% of the cases where /ð-θ/ occur in word-initial position and are realised as fricatives (see Table 4). In third and last position among the factors influencing the phenomenon, come preceding vowels (.69); this context is numerically the most frequent. Finally, although the effect of preceding liquids, /l/ and occasionally /r/ (IE is variably rhotic, (see Chand, 2010)), is unclear (.54), all the other factors seem to have the contrary effect on the variables.

The second most powerful internal factor group relates to the position in which the fricatives occur (range = .45). Inter-dental fricatives in word-final position are very rare and this context is clearly unfavourable (.29). The status of the word-initial position is unclear (.49), yet it has been established that preceding fricatives, which have a significant effect on the realisation of the variables, impacted the realisation of /ð-θ/ mostly in this position. This casts doubt on the independence of this factor as an explanatory factor, and should perhaps be considered as having a limiting influence instead. The word-medial position (.74) has the strongest effect.

The last factor to be significant is whether the tokens are voiced or not (range = .15). The unvoiced phoneme favours the realisation as a fricative (.62), while its voiced counterpart does not seem to have any particular impact. These findings are in line with Sailaja's (2009:21) description of SIEP though much less categorical with regard to the realisation of the voiced phoneme as a fricative. Although in principle, this factor group
overlaps with the word-class factor group, Goldvarb X did not seem to have any difficulty identifying the significant factor groups. A look at the Chi-square per cell confirmed that the fit was acceptable (below 1.5). Another potentially confounding factor, namely word-stress, was not tested. Because of the prosodic characteristics of this variety, identifying the stress in IE proves to be extremely difficult (see e.g. Pickering & Wiltshire, 2000).

These preliminary results show the prime importance of the linguistic factors on the pronunciation of /ð-θ/. With regard to its scarcity and the major influence of the preceding fricatives on it, the phenomenon might also be explained in terms of coarticulation. If this were the case one would also expect instances of fricativisation of /t/ as /s/ to take place; perhaps more importantly, this would leave the large number of post-vocalic fricatives unexplained. Finally, as it will be shown in the next section, the analysis highlighted a great inter-speaker heterogeneity of the sample with respect to this phenomenon.

7.1.2 External factors

A close inspection of the collected data reveals that the sample is quite heterogeneously distributed, with regard to inter and intra-speaker variation. As mentioned previously, only the language use factor seems to predict the variation significantly among the external variables tested. Parameters such as age and proficiency appear to be non-significant. If the former allows us to rule out the normalising effect of school on the production of the consonant, the status of the proficiency factor is less clear because of the possible overlap with the language use parameter. In Figure 2 below, where the speakers are ranked according to their English use index, two groups clearly appear: is to an (i.e. language use index < 20 group) and vs to at (i.e. language use index > 20 group).

![Figure 2: th fricative realisation per speaker in formal and informal styles. The speakers are ranked according to their language use index.](image)

With a range of .29, the language use parameter is ranked third in the overall ranking of the statistically significant factor groups selected via the VARBRUL analysis. The
language use index < 20 is an unfavourable factor to the occurrence of the fricative allophone (.35) while the other group of speakers has the contrary effect on the variables (.64). It has to be added that the number of fricatives produced in the language use index > 20 group amounts to approximately 74% of the overall number found in the corpus. As far as the style factor is concerned, it was mentioned earlier that it was not selected because it was not significant in predicting the occurrence of interdental fricatives. As observed in Figure 2, a high rate of fricatives in formal styles usually goes together with a high rate in informal style and vice versa. In other words, the VARBRUL analysis does not provide any evidence to support this variable being a sociolinguistic marker. Yet, a more fine grained analysis shows a different picture.

Figure 3 below illustrates the patterns of variation across styles for the two statistically significant groups highlighted in the analysis. Here, the wordlists and the text, conflated under the formal heading in the multivariate analysis, are kept apart in order to allow a better appreciation of the dynamics of variation.

![Figure 3](image)

**Figure 3**: Variation across styles for the groups language use index >20, and language use index < 20.

The graph suggests significant differences in the patterns of variation across styles. On one hand, the group with the highest language use index shows a decrease of the production of fricatives from the most to the least formal style. It ranges from 28% in the wordlists to 16% in conversation. On the other hand, it can be seen that the group with the lowest language use index has the lowest rate of fricatives in the wordlists. There is a decrease from the text to the conversation style, but it is very limited (i.e. from 9% to 6% respectively). The pattern of this latter group is interesting, and particularly the fact that the wordlist context, supposedly the context in which speakers are the most conscious about their speech (Labov, 1972:85), triggers a lower rate of interdental fricatives than the others. I propose two explanations. First, in the wordlists, words are in citation form and thus do not undergo the influence of the phonetic context provided by preceding words, i.e. essentially preceding [s] and [z] sounds as highlighted.
above. Second, the decrease between the text and the conversation contexts is not substantial enough to assume that the speakers of this groups tend to produce more fricative allophones while exerting particular attention on their speech production. These elements seem to converge towards the following point: even though both groups are aware that /ð-θ/ is a variable class, only the group of speakers using the English language the most takes advantage of its sociolinguistic potential. In order to test this hypothesis, each group of speakers was tested independently. The results provided by both VARBRUL analyses are presented in Table 5 and compared.

Table 5: Realisation of /ð-θ/ as fricatives tested by language use group, internal factors only.

<table>
<thead>
<tr>
<th>Factors</th>
<th>language use index &lt; 20</th>
<th></th>
<th></th>
<th>language use index &gt; 20</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Factor weight</td>
<td>%</td>
<td>N</td>
<td>Factor weight</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Preceding context</td>
<td>Voiced fricatives</td>
<td>.91</td>
<td>21.2</td>
<td>21/99</td>
<td>.83</td>
<td>39.1</td>
</tr>
<tr>
<td></td>
<td>Voiceless fricatives</td>
<td>.89</td>
<td>17.1</td>
<td>13/76</td>
<td>.82</td>
<td>39.1</td>
</tr>
<tr>
<td></td>
<td>Vowels</td>
<td>.79</td>
<td>11.8</td>
<td>55/467</td>
<td>.65</td>
<td>28.7</td>
</tr>
<tr>
<td></td>
<td>Liquids</td>
<td>.47</td>
<td>2.8</td>
<td>1/36</td>
<td>.58</td>
<td>15.8</td>
</tr>
<tr>
<td></td>
<td>Voiceless stops</td>
<td>.38</td>
<td>1.6</td>
<td>3/192</td>
<td>.36</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Nasals</td>
<td>.19</td>
<td>0.7</td>
<td>1/151</td>
<td>.29</td>
<td>6.1</td>
</tr>
<tr>
<td></td>
<td>Pauses</td>
<td>.11</td>
<td>0.3</td>
<td>1/313</td>
<td>.29</td>
<td>5.1</td>
</tr>
<tr>
<td></td>
<td>Voiced stops</td>
<td>***</td>
<td>***</td>
<td>***</td>
<td>.13</td>
<td>2</td>
</tr>
<tr>
<td>Word class</td>
<td>Lexical</td>
<td>ns</td>
<td>ns</td>
<td>ns</td>
<td>.65</td>
<td>33.6</td>
</tr>
<tr>
<td></td>
<td>Grammatical</td>
<td>ns</td>
<td>ns</td>
<td>ns</td>
<td>.45</td>
<td>14</td>
</tr>
<tr>
<td>Position</td>
<td>Word-medial</td>
<td>.73</td>
<td>20</td>
<td>26/130</td>
<td>.69</td>
<td>44.8</td>
</tr>
<tr>
<td></td>
<td>Word-initial</td>
<td>.48</td>
<td>5.6</td>
<td>61/1090</td>
<td>.49</td>
<td>15.6</td>
</tr>
<tr>
<td></td>
<td>Word-final</td>
<td>.43</td>
<td>7</td>
<td>8/114</td>
<td>.29</td>
<td>13.9</td>
</tr>
<tr>
<td>Total</td>
<td>7.1</td>
<td>95/1334</td>
<td></td>
<td>18.9</td>
<td>269/1427</td>
<td></td>
</tr>
</tbody>
</table>

* There was messiness in the data because of an important overlap between voicing and word class. The word class factor group was selected both in stepping up and down, but not the voicing factor group.

* Voiced and voiceless stops are conflated. The analysis yielded aberrant results for the weight of the voiced stops because of their scarcity in this group (1/48).
For this study, all the initial internal and external factors were tested. Because of the small number of speakers in each group, it appeared that some external factors, among which proficiency, yielded statistically significant results although they resulted only from the influence of one or two speakers. As a matter of caution only the internal factors were tested. As in the first VARBRUL analysis, in both groups, *Preceding context* ranks first and *Position* is second.

It was hypothesised above that the effect of the phonetic constraints on the realisation of the fricative allophone was the strongest for the language use index < 20 group. The results obtained do not falsify this. It can be seen that the factors favouring the occurrence of the fricative variant, although they are by and large the same in both groups, have a stronger effect among the speakers with the lower language use index. The same can be observed, though less importantly, with respects to the position in the word. These findings are reinforced by the fact that the word class factor group is significant only for the speakers with a higher English use index. Content words tend to favour the occurrence of fricatives while function words do the reverse. The fact that this parameter is only significant here tends to confirm that this type of variation in this particular group goes beyond the mere influence of phonetic factors as it resembles the patterns of variation that can be observed in the other varieties of English.

### 7.2 NORTH versus FORCE

For this study, the approach which is adopted is qualitative rather than quantitative. As will be shown, the distinction between the NORTH and FORCE lexical sets is surprisingly systematic and consistent for a number of participants, while others only partially maintain this distinction or completely merge the two classes. Besides, the variation affecting this feature seems to be exclusively situated at the inter-speaker level, whereas variation across styles is almost non-existing. Finally, it will be shown that the frequency factor, and by extension the language use factor, can provide the beginning of an explanation to the variation.

#### 7.2.1 Preliminary observations

In the PAC wordlists, *four, fore, for* and *horse, hoarse* are, strictly speaking, the only minimal sets/pairs designed to test the distinction between NORTH and FORCE. Here, it has to be noted that the pronunciation of these words is predictable from the spelling since most of them belong to subclasses which, spelling-wise, do not overlap: *<our>, <ore>* and *<oar>* for the FORCE category, and *<or#>* for the NORTH category. *<orC>* in *horse* is the only item which is ambiguous in this respect. However, since *horse* and *hoarse* are not placed unobtrusively in the list, this is also likely to have an impact on the maintenance of the distinction. Table 6 below illustrates how the speakers individually respond to these minimal pairs/sets. Again, the speakers are ranked according to their English use index. Two criteria were observed for composing this table, that is: (1) auditory identity/difference between two adjacent tokens, and (2) D1 similarity/dissimilarity. The D1 data points are represented in Figure 4 (next page).
Table 6: NORTH vs. FORCE distinction in the minimal set/pair four, fore, for and horse, hoarse.

<table>
<thead>
<tr>
<th>Language Use Index &lt; 20</th>
<th>Language Use Index &gt; 20</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>four</strong></td>
<td><strong>fore</strong></td>
</tr>
<tr>
<td>is 0 sa 0 cg 0 aa 0 vm 0</td>
<td>0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td><strong>for</strong></td>
<td><strong>horse</strong></td>
</tr>
<tr>
<td>is 0 sa 0 cg 0 aa 0 vm 0</td>
<td>0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td><strong>horse</strong></td>
<td><strong>hoarse</strong></td>
</tr>
<tr>
<td>is 0 sa 0 cg 0 aa 0 vm 0</td>
<td>0 0 0 0 0 0 0 0</td>
</tr>
</tbody>
</table>

Though less strikingly than in the preceding study, two tendencies seem to emerge; and again, they seem to correspond to the groups settled previously (i.e. English use index < 20, and > to 20). In effect, it can be seen that the first half of the sample maintains almost systematically the distinction between the NORTH and FORCE vowels. Vm is the only exception to this as he uses the open variant for fore. It also has to be noted that this is the only case in this group where the two categories are neither completely distinct nor completely merged. Horse and hoarse are kept distinct all throughout.

Figure 4 four, fore, for and horse, hoarse D1 values in the wordlists.

35
The second half of the sample appears to be much more unpredictable. For three speakers (vs, nc and at), there is auditory and D1 identity between horse and hoarse. While for vs and at this looks quite self evident from Figure 4, in the case of nc this is much less obvious. Yet, it can be seen from Appendix H, Table 1.a, that for nc the hoarse D1 in Figure 4 still belongs to the /ɔ/ interval. Besides, from auditory checking, the two vowels sound identical; nc apparently intends to distinguish the two words and produces a stronger frication of the initial segment in hoarse. Finally, four speakers merge four/fore and for, that is, gp, ab, nc and at. Yet again, the pattern is not uniform among the speakers, and while for nc and at the merging results from the lowering of the vowel of four and fore to /ɔ/, gp and ab on the other hand raise the vowel of for to /o/. In this group, nr is the only one who seems to keep all the distinctions. Though the evidence is too scarce yet to definitely conclude that this speaker systematically maintains the distinction, it can be noted that he also had the lowest rate of inter-dental fricatives in this group (see Figure 2). Conversely, at and nc seem to be the only speakers who completely merge the two vowels.

First, what these preliminary observations suggest is that, while the speakers having a lower English use index more consistently maintain the distinction between NORTH and FORCE, inter-speaker variation seems to be more salient among speakers using English the most. Second, regarding the fact that some speakers merge horse and hoarse but not four and for for instance, it seems unlikely that the phenomenon is binary – i.e. that all the vowels of a category be affected or not – but rather that the merging process affects items individually. These two hypotheses will be examined in the next section. Finally, it is difficult to derive from the present data whether the spelling has an impact on the maintenance of the distinction or not, although it presumably does considering what was stated at the beginning of the present section (p. 35). This will also be cross-checked in the following section.

7.2.2 Variation across styles

The study of the NORTH/FORCE distinction was extended to all the elements in the wordlists and in the conversation. The results are presented in Table 7 and 8. The building of those tables was based on acoustic criterion only. As hinted at in the methodology section, for each table, the vowels from the GOAT and THOUGHT lexical sets constitute the referents against which the FORCE and NORTH vowels are tested. Table 1.a and 1.b in Appendix H present the critical values for each speaker in each style.

7.2.2.1 Citation form

First, it can be seen that the raising of the vowel in war is a quite recurring phenomenon. It is difficult to decide whether this can be principally attributed to phonetic factors, that is to the influence of the preceding context, or whether it is a lexical distinction. Second, except for two occurrences of category switching of for, it seems that the variable class is the FORCE lexical set. The data show that the presence
versus absence of distinction is more categorical than hypothesised in the previous section. Only five speakers show inconsistencies in strictly maintaining the FORCE class. Out of these five speakers, three merge only one or two items out of ten with NORTH. As for the remaining two, 90% of their FORCE tokens are merged with NORTH. It was also hypothesised in 7.2.1 that speakers with a higher English use had merged the two categories more. Although the speakers with the highest English use index are the only two that almost completely merge the two categories, this is only meagre evidence and, as a consequence, should be handled with care.

7.2.2.2 Conversation

The conversation style offers interesting perspectives. First, it allows us to check the tokens on multiple occurrences and thus verify if their realisation is consistent for each speaker. In Table 8, a number in between brackets indicates that a realisation is not consistent and to what extent. Second, it also offers the possibility to examine the word-frequency parameter. For the present study it is not the raw frequency, but the currency of the words – i.e. the distribution of their use across speakers – which was taken into account. It is presupposed that the words which are the most current are also the most frequent. Finally, it allows us to cross-check whether the data elicited in the wordlists resulted from conscious hypercorrection influenced by the spelling or not.

As evidenced in Table 8, the comparison between formal and informal context does not highlight any striking difference in the patterns unveiled in the preceding section. As far as the NORTH vowel is concerned, again war is very consistently raised to /o/. The fact that this does not affect warm or quarter may suggest that the distinction is lexically embedded and not immediately dependent on phonetic factors. The other words in this
Table 8: NORTH vs. FORCE distinction in conversation style.

<table>
<thead>
<tr>
<th></th>
<th>language use index &lt; 20</th>
<th>language use index &gt; 20</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>is  sa  cg  aa  vm  an</td>
<td>vs  nr  gp  ab  nc  at</td>
</tr>
<tr>
<td>NORTH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>north</td>
<td>o o o o o o o o o o</td>
<td>o o o o o o o o o o</td>
</tr>
<tr>
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38
class are maintained with the open variant thus confirming that variability is essentially a feature of the FORCE class.

The FORCE class is also very steady across styles. In effect, as in the wordlist style, *sa*, *vm*, *vs*, *nc* and *at* are the speakers who merge items from FORCE with NORTH the most. All the others strictly maintain the distinction to the notable exception of *ab* who merges *course* with NORTH. Despite this remarkable regularity, a few inconsistencies can be underlined and, contrary to what happened in the wordlists, *sa* and *vs* respectively lower *more* and *four* to /ɔ/. This may be linked to hypercorrections due to the spelling in the wordlist style. On the other hand, it can be noted that *nc* maintains *sport* and *four* with FORCE in conversational style whereas these items were merged with NORTH before. Yet, suggesting that *nc* consciously merges *sport* and *four* with NORTH in the wordlist would entail a degree of awareness towards this variable which – this is discussed below – is at least not corroborated by the rest of the data.

Three levels of merging can be drawn: no merging (*is, cg, aa, an, nr* and *gp*), partial merging (*sa, vm, vs, ab, and nc*), complete merging (*at*). First, these observations suggest by their regularity that the variables looked at in this study are situated below the level of (social) awareness (Labov, 1994:78). The same type of conclusion was dawn by Sahgal & Agnihotri (1988:62) with regard to the question of the Cot-Caught merger in IE. Second, the consistency of individual speakers both within and across styles supports the hypothesis of the lexical diffusion of this feature. Besides, as it can be seen in Table 8, the variation is not homogeneously distributed across the table, and four of the five most current words across the sample, *more*, *four*, *of course* and *before* display a high concentration of /ɔ/ realisations. The phenomenon also seems to affect more significantly speakers with a larger use of English language, with 2/3 of the *language use index > 20* group merging elements of FORCE with NORTH while only 1/3 of the *language use index < 20* group does so.

These results tend to show the importance of the frequency factor and they are in line with Bybee's (2002) observation that lexical diffusion of a phonological features is carried by the words which are the most frequently used. In consequence, three parameters can be established and ranked as follow by way of ultimate hypothesis:

1. A variable class: FORCE is variable, NORTH is not.
2. Word frequency: The most frequent words are more variable.
3. Language use: Speakers with a higher English use merge the two classes more often.

Finally, Bybee's study also shows that the lexical diffusion of a sound change is generally phonetically conditioned, whereas this parameter does not seem to have any significance in the present case. Moreover, as mentioned in preamble, the present study is qualitative and consequently results in hypothesis formulation. Support for this hypothesis must be sought after using truly quantitative methods.

7.2.3 Additional observations

In this section, peripheral features to the NORTH and FORCE lexical sets, that are the rhoticity and the LOT vowel, are briefly examined. It is intended (1) to determine whether there is a parallel between one or both features and the observed variation, and
(2) to ensure that one or more speakers do not differ too strikingly from the others in any closely related aspects.

7.2.3.1 Rhoticity

When dealing with the NORTH and FORCE lexical sets, it is difficult not to talk about rhoticity. Many studies give contradictory accounts on the question, and from what has been observed in the present data, the results seem to coincide with Chand's (2010). All the speakers are variably non-rhotic, the largest number of non-prevocalic /r/ occurring in the reading tasks. This trend is particularly salient in the wordlists, where the participants generally produce a high rate of non-prevocalic /r/ when reading the words, but not when reading the numbers that precede them.

7.2.3.2 The LOT vowel

The LOT vowel seems to be generally merged with the NORTH/THOUGHT sets, and this concurs with the findings in Sahgal & Agnihotri (1988:62). As it can be seen in Figure 5, next page, there is a clear overlap between the two categories for all the speakers but two, at and nr. At seemingly has a significantly lower LOT vowel, though only in citation form style. His case is rather interesting since he seems to be the only one in the sample to show awareness with regards to this variable. Yet, it has to be

![Figure 5 Averaged D1 for the NORTH, THOUGHT and LOT sets. Citation form style (above) and conversation style (below).](image-url)
noted that although there does not seem to be any significant differences between the two classes in any case, the overlap is much more striking in conversational style. The stronger acoustic variability in citation form style might be the result from length distinction, particularly in the case of *is, sa, vm, and gp*. This remains to be tested. Finally, *nr* apparently keeps a lower LOT vowel in both styles. Whether the distinction with NORTH/THOUGHT is significant or not remains unclear.

8. Discussion and conclusion

At the end of the initial sections of this work, two general issues were set. The first, a theoretical point, relates ultimately to nativeness issues. It was intended to determine whether sociolinguistic variation is homogeneously distributed amongst highly proficient speakers or not; and if this is not the case, to establish what the relevant factors are and which form it takes. The second is a methodological point. It was intended to determine whether methodological consequences for the study of these varieties could be drawn from the impact that proficiency and language use have on variation.

8.1 Sociolinguistic variation

The study of sociolinguistic variation has highlighted two essential points. First of all, it shows that both inter- and intra-speaker variation is distributed quite heterogeneously; the study of fricative *th* realisation in particular yields striking results in this respect. The fact that the language use factor seems to be the only one to be significant is discussed in the present section. Second, the two features investigated seem to have opposite implications for endo- and exo-normativity. However, it will be shown that it can be reasonably advanced that IE is an autonomous endo-normative variety.

8.1.1 Proficiency and language use related variation

The results of this investigation have shown a certain inter-speaker heterogeneity with regard to variation, in particular with respect of the realisation of */θ-*ð/* as inter-dental fricatives. In both studies, two distinct groups of speakers react in different ways with regard to the experimental variables, and the relevant factor, as highlighted in the multivariate analysis, is the language use factor.

Interestingly, the proficiency parameter, as tested in this study, did not produce any significant results. Several reasons may be postulated for this. The principal one may be in fact a limitation of the experimental design itself and relates to the accuracy of the test used. The *Y_Lex* test was designed to be used within classroom setting, yet it had already been made clear in previous sections that assessing the proficiency level of speakers in multilingual situation was complicated because of the functional distribution of the languages. For one thing, the input involved in the tested speakers' language acquisition is probably much more diverse than the one received when the principal, and perhaps only, acquisition setting is the classroom. For another, since the speakers use
English to various extents in the different domains of use, then their proficiency level may presumably not be directly comparable. This, together with the fact that only the language use index yielded results, may be interpreted as a piece of evidence in support of Singh's (2007) position on nativeness issues.

The results of the study of fricative th realisation suggest that only the speakers with the highest language use index take advantage of the sociolinguistic potential of this variable. Speakers from the language use index >20 group had a significantly higher rate of inter-dental fricatives than the others, and most importantly, their rate of fricatives seemed to increase in formal context. This, to paraphrase Prabhu in Singh et al. (1998:54), is the indication that these speakers, by altering the shared system, assert their status as full participants in the shared system. In other words, by participating in the variation, the speakers perform what is referred to as an “act of identity” (Labov, 2001:191 from Le Page & Tabouret-Keller, 1985), through which the use of a particular linguistic form is associated to the membership in a given social group. In the present case this particular instance of “act of identity” seems to have initiated a sound change.

First, as already noted in 4.3, the first and only mention of the use of inter-dental fricatives in IE is very recent (Sailaja, 2009:21). Second, the phenomenon investigated fulfills the criteria characterising changes from above (Labov, 1994:78): the variant is borrowed from another speech community, prestige is attached to it, and it occurs primarily in careful speech. The inter-dental fricative variant has also possibly made its way into IE via Indian English speaking media such as NDTV, where several journalists use it quite profusely.

A few remarks should be made regarding the notable differences between the results obtained in the study of the NORTH-FORCE distinction and the study of fricative th realisation. Although the two groups based on the language use index seem to differ in maintaining the NORTH-FORCE distinction, it appears nevertheless that this feature is below the level of social awareness for both groups. The results show that it is the most frequent words from the FORCE set which are generally merged with NORTH, and that the merging seems to be also more frequent in the language use index >20 group. First of all, since it seems that the phenomenon affects primarily the most frequent words, it may be postulated that the merging of certain items results from the influence of extraneous sources via foreign English speaking media or increased contact with speakers of other varieties of English. Nevertheless, it has to be mentioned that the maintaining of NORTH and FORCE as two separate classes seems to be relatively stable. Although as stated in 4.3 it may be postulated that the partial predictability of the distinction on the basis of the spelling plays a role in the general maintenance of this distinction in the variety, the present study does not bring any piece evidence that may confirm or falsify this.

8.1.2 Endo-normativity versus Exo-normativity

As stated above, the results of the study of fricative th realisation and of the NORTH/FORCE distinction have opposite implications for the question of endo- and exo-normativity. On one hand, the pair /ð-θ/ whose default realisation has long been considered to be [d̪] and [t̪ʰ] seems to be undergoing a change towards inter-dental fricative realisation. This phenomenon undoubtedly results from the influence of
extraneous models. On the other hand, the relative stability of the NORTH-FORCE
distinction, which Wells (1982:626) called a “striking archaism” from an RP point of
view, is considered evidence of endogeneity of the IE system, since, as mentioned in
4.3, all the potential extraneous models have merged, or quasi-merged, NORTH and
FORCE. The question of the endo-normativity of IE is not uncontroversial. Schneider
(2007:171), for instance, considers that the elements supporting what he refers to as the
“endonormativity stabilisation” of IE (Phase 4 in his Dynamic Model of the evolution of
Postcolonial Englishes) are rather weak. While Schneider's discussion seems to be more
focused on attitudes towards the variety, its status, the production of dictionaries, etc., I
suggest on the other hand that evidence from the linguistic form indicates that IE is de
facto endo-normative.

The change affecting th realisation originates in all likelihood from the influence of
other varieties. Yet, taking evidence from this phenomenon, which is an instance of a
change from above, to postulate exo-normativity would be premature. As defined in the
previous section, changes from above necessarily entail borrowings from external
sources. One of the best examples of this phenomenon is that of the history of the
rhoticity in New York City (Labov, 1972:145), which became r-less by the middle of
the 19th century from the simultaneous influence of London and New England. In the
present case, the maintaining of NORTH and FORCE as two separate classes suggests
that IE is an autonomous system. I propose that the change affecting th realisation does
not imply the contrary. If anything, this just shows that IE behaves like any other
varieties of English.

8.2 Methodological implications

Two methodological consequences for the study of varieties of English in multilingual
context can be drawn from the points developed above. On one hand, the heterogeneity
of the distribution of variation has implications for corpus building. On the other hand,
the autonomous character of IE requires that the relevance of contrastive approaches to
this variety be questioned.

8.2.1 The fittest "arbiter"

Singh (2007) and Kandiah (1991) have convincingly argued that trying to accommodate
the whole range of usages (i.e. from learner to native usages) under the one and same
“IE” heading is incorrect. Consequently, a much narrower scope was adopted for the
present investigation. Taking into account Mufwene's (1998) claims regarding the
“fittest arbiter” of language usage, only highly proficient speakers were taken into
account.

Although I subscribe to most of their points regarding this question, this study has
shown that determining what proficiency is, given the functional distribution of
languages, can prove very difficult. Moreover, even if all the participants could
generally be deemed highly proficient, the language use factor was shown to be quite
efficient in highlighting a certain type of variation which would have certainly not been
accounted for through the use of the traditional age, gender or social class parameters.
In consequence, corpus building, and in particular data collection and sampling, can
definitely benefit from controlling the language use parameter. In other words, taking advantage from the flexibility of the variationist sociolinguistic paradigm by integrating parameters which are relevant to multilingual situations, is a prerequisite for analysing some patterns of variation which otherwise could only be explained, if at all, by resorting to post-hoc claims.

8.2.2 Contrastive approaches

When talking about a contrastive approach to IE phonology one generally refers to studies contrasting IE with speakers' so-called “L1s” and with the emphasis put on transfer processes. A second type of approach, which endeavours to compare IE with RP, is also contrastive. Evidence from this work suggests that both methodologies are inappropriate.

As previously stated, discussing the relevance of transfer to IE phonology does not necessarily mean rejection of substratal influences. As in Kandiah (1998a and 1998b) and Singh (2007), it was argued that what is generally attributed to the ontogeny level (i.e. transfers) is best viewed from a phylogeny standpoint. In the same respect, the fact that British English had an influence on IE, from which the NORTH-FORCE distinction is obviously a remnant, does not mean that IE should be considered a deviant or simplified form of present-day RP. As developed above, the maintenance of the NORTH-FORCE distinction seems to indicate that IE is endogenous and that RP does not constitute the target any longer. Therefore, describing IE by contrasting it with RP, as regularly done until recently, may lead to a misleading picture of IE. The historical reasons behind the maintenance of British English features (as the NORTH-FORCE distinction) on one hand, and those behind the development of genuinely endogenous ones on the other hand, are blurred or even lost. Consequently, the insistence with which researchers have been trying to account for diachronic phenomena by means of synchronic processes brings support to the criticism formulated by D'souza's (1997:93) about WE studies being trapped in SLA discourse. Had features like the NORTH-FORCE distinction, which have been there for everyone to see, not been overlooked, and had the right consequences been drawn from their study, our discipline would have certainly gained in clarity and scientific rigour.

8.3 Conclusion

The purpose of this study was primarily to determine how sociolinguistic studies of varieties of English in multilingual situation could benefit from the study of proficiency and language use factors. To this end, it was decided to focus on the study of the variation of two features in IE, namely, (1) the realisation of /θ-ð/ as fricatives, and (2) the maintaining/merging of the vowels in the NORTH and FORCE lexical sets.

Two major findings emerge from this investigation. First, it was established that in multilingual situations, that is, in contexts where the languages are distributed across a range of domains of use, the study of variation provides indications of the extent to which speakers identify themselves as users of a particular language. The determining factor related ultimately to a question of “volume of use” conveyed by what was referred to throughout this study as the language use parameter. In other words, it was
found that the more the volume of use of English in a range of domains was important, the more speakers tended to participate in the sociolinguistic variation, thus asserting their status through “acts of identity”. Second, the study of the realisation of the vowels in words from the NORTH and FORCE lexical sets revealed that the distinction is generally maintained and stable. This, it is argued, provides strong evidence for the endo-normativity of the system.

Parallel to these central findings, a series of interesting developments also came from the study of the dependent variables themselves. First, the VARBRUL analysis of fricative *th* realisation revealed that a sound change in progress seems to be affecting this feature. These results must nevertheless be handled with care because of the problems of overestimation of the significance of external factors for which VARBRUL analyses are sometimes criticised (see e.g. Gorman, 2009), and also because the problems of interaction between factors such as word-frequency and word-class were difficult to avoid. Second, the relevance of contrastive methods of analysis of this variety was questioned. Evidence seems to suggest that they are maladapted to their object of study. Further quantitative evidence from a larger pool of participants would be necessary in order to either falsify or give more weight to the present findings.
References


Appendix A: Informed Consent form

Consent Form

I, ..........................................................................................................., agree to participate in the interviews conducted by Raphaël Domange in Delhi from January 25 to March 25, 2011.

I will not be paid.
I understand that the sessions will be recorded, and that I may request that the recorder be turned off at any time, for any reason.
I understand that the recordings may be duplicated for Raphaël Domange's supervisor to listen to, but that they will not be further distributed without my permission.
I do / do not wish to remain anonymous in all materials produced as the result of this fieldwork.
I understand that if I choose to be anonymous, all efforts will be made to respect this wish but complete anonymity cannot be guaranteed.
I do / do not give permission for primary materials (fieldnotes, audio recordings) to be made available to others.
I do / do not give permission for secondary materials (such as academic papers giving analyses of the language) to be made available to others, or published on the internet or in print.
Any other restrictions or specifications are listed below:

Signed by consultant:
Date:

Signed by fieldworker:
Date:
## Appendix B: Wordlist 1

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<td>20.</td>
<td>rung</td>
<td>40.</td>
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61. kidney
62. grace
63. graze
64. behave
65. anyhow
48. singer
47. ridden
46. written
50. fat
51. fad
52. lap
53. lab
54. sack
55. sag
56. belly
57. berry
58. bell
59. bet
60. chutney
Appendix D: Text

Christmas interview of a television evangelist © PAC

If television evangelists are anything like the rest of us, all they really want to do in Christmas week is snap at their families, criticize their friends and make their neighbours' children cry by glaring at them over the garden fence. Yet society expects them to be as jovial and beaming as they are for the other fifty-one weeks of the year. If anything, more so.

Take the Reverend Peter 'Pete' Smith, the 'TV vicar' who sends out press releases in which he describes himself as 'the man who has captured the spirit of the age'. Before our 9 a.m. meeting at his 'media office' on Crawshaw Avenue, South London, he faced, he says, a real dilemma. Should he make an effort 'to behave like a Christian' – throw his door open, offer me a cup of tea – or should he just play it cool, study his fingernails in a manner that showed bored indifference and get rid of me as quickly as possible? In the end, he did neither.

'As a matter of fact, John,' he says in a loud Estuary English twang, 'St Francis said, “At all times preach the gospel and speak whenever you have to.” But hey, he didn't mean “Be on your best behaviour and be happy all the time.” I could have been extra-polite to you, but the real me would have come out as I was talking. You cannot disguise what you are.'

'And what are you then, Pete?'

'Well, I'm a Christian, John. I've been one since I was 14. And I know for sure that Christianity will be judged more on who you are rather than what you have to say about it. Many church leaders don't appear to understand this. They think we can only be really Christian when we are ramming the doctrine of the Creation down people's throats. But if you try to force-feed people they get sick of it and think you're a pain. It's seen as the job of a Christian leader to wear a dog-collar and dress in purple and always be talking about the real meaning of the New Testament. In reality, that turns people right off!'

In many ways, 'Pete' Smith looks exactly how you'd expect a high-profile, born-again Christian to look: tall, handsome, clean-cut and evenly sun-tanned. He has those scarily white teeth that TV evangelists tend to have, and he doesn't wear a dog-collar. In fact, when doing his various religious programmes on Sunday mornings, he has been known to wear a black leather jacket instead, in casual mode. Today, the look is more business-like: metal-rimmed glasses, a grey suit, a blue open-neck shirt, and fashionable black shoes with large buckles. Smith is 44 but he looks a mere 24.

During the whole interview, there wasn't any talk of the poor or the needy but only of his forthcoming trip to China in February and the masses waiting for his message there. I ventured a few questions relating to the charity trust he founded some ten years ago and which, it is generally agreed, employs eight hundred staff and runs schools, hospitals and hostels around the world. And what about the gambling organization he has been willing to advise? Is that a temporary activity or might it be true that he has accepted to be paid to sit on its Board of Directors? Which side is religion on these days? Does money matter? It was as if I had launched a few missiles in his direction. He just sighed in answer: 'I'm only human, John. God knows I do my best and often fail, But it's no skin off my nose if our enemies sneer at some of the good work we do. Truth will out.'
Appendix E: Information sheet

Date of recording: ..........................................................................................................................
First name: .................................................................................................................................
Surname: .................................................................................................................................
PAC identifier: ...........................................................................................................................
Age at date of recording: ............................................................................................................
Place of birth: .............................................................................................................................
Current place of residence: ........................................................................................................

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Occupation: ..........................................................................................................................
Previous occupations: ...........................................................................................................

Education (until what age, what type of education): .............................................................
..................................................................................................................................................
..................................................................................................................................................

Medium of education*: ..........................................................................................................
Languages spoken*: ..................................................................................................................

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<tr>
<td>c) Wife/ Husband*:</td>
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<td>d) Children*:</td>
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<tr>
<td>e) Siblings*:</td>
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<td>f) Best friends*:</td>
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<tr>
<td>g) Friends in the neighbourhood*:</td>
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<td></td>
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<tr>
<td>j) Juniors/Subordinates*:</td>
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<td>k) Boss or teacher*:</td>
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<td>l) Administration*:</td>
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Informant's father:
Year and place of birth: ............................................................................................................
Occupation: .............................................................................................................................
Education: ...............................................................................................................................
Languages/Dialects spoken: ....................................................................................................

Informant's mother:
Year and place of birth: .............................................................................................................
Occupation: .............................................................................................................................
Education: ............................................................................................................................... 
Language/ Dialects spoken: ....................................................................................................

Informant's wife/husband:
Year and place of birth: .............................................................................................................
Occupation: .............................................................................................................................
Education: ............................................................................................................................... 
Language/ Dialects spoken: ....................................................................................................

Number of children, age and education:......................................................................................
....................................................................................................................................................
....................................................................................................................................................
....................................................................................................................................................

People who played an important role during the informant's acquisition of the English language:
......................................................................................................................................................
......................................................................................................................................................
......................................................................................................................................................

Type of accommodation of the informant (house, flat, residential area etc...):..............................
......................................................................................................................................................
Integration into the area, relationships within the neighbourhood: ............................................
......................................................................................................................................................
Ethnic group: ............................................................................................................................
Cultural and leisure activities, travels: ............................................................................................
......................................................................................................................................................
Additional information: ..................................................................................................................
......................................................................................................................................................

NB: The questions marked with a star (*) do not come from the original PAC protocol but were added by me.
## Appendix F: Y_Lex wordlist

- endorsement
- jilt
- ponder
- bland
- hestate
- choke
- cornered
- required
- amalgam
- underwater
- aviation
- accession
- roast
- garge
- paddle
- therapeutic
- melancholy
- mutter
- undergraduate
- kitsh
- aide
- havoc
- enigma
- neminary
- overtime
- irresistible
- murray
- abound
- syllabus
- mauve
- orbally
- drowsy
- fumble
- dub
- jumble
- disguise
- fallow
- cardination
- dwarf
- ale
- pledge
- objectivity
- manse
- foundry
- mollic
- elector
- crust
- midfield
- yawn
- smelt
- gorge
- dragoon
- symmetry
- acquince
- biblical
- bulbous
- pulsh
- subside
- duchy
- screw
## Appendix G: Goldvarb X coding sheet

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Appendix H: NORTH & FORCE matrix tables

The following tables comport two types of information, that is, means and intervals. The intervals are the maximum and minimum D1 of all the vowels of the words in the corpus belonging to GOAT and THOUGHT. They are labelled [o] and [ɔ] respectively. The D1 of all the vowels from the FORCE and NORTH sets are calibrated against these intervals and attributed to one group or the other. It can be noted that, in citation form, there were strictly no overlap between GOAT and THOUGHT for any speaker. Thus, if a vowel's D1 falls in between the two intervals, it is attributed to one set or the other so that the difference between [ɔ] Min and [o] Max remains maximal.

The means are the averaged D1 of all the vowels in each of the four sets. The vowels from NORTH realised as [o] and the vowels from FORCE realised as [ɔ] are factored out. The means were computed in order to determine if GOAT/FORCE and THOUGHT/NORTH do no differ too strikingly; they are plotted in Figure 1.a next page.

Table 1.a: Citation form

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Figure 1.a: NORTH-THOUGHT and FORCE-GOAT correspondence in citation form (above) and in conversation style (below).