FIRST LANGUAGE AND SOCIOLINGUISTIC INFLUENCES ON THE SOUND PATTERNS OF INDIAN ENGLISH

by

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DISSERTATION ABSTRACT

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The current dissertation is a systematic study of variation in the English spoken in multilingual and multicultural India. Three experiments were conducted to investigate the influence of two native languages (Hindi and Telugu) on English, which is spoken by almost all Indians as a second language. The first experiment indicated that Indian English (IE) is accented by the first language of its speakers, but high English proficiency and the degree of divergence between the sound patterns of the speaker's native language and his or her IE suggested that other factors might influence the preservation of a native language accent in IE. The second experiment controlled for language investigated the effect of region on IE, finding that listeners were able to distinguish speakers based on region even when they spoke the same native language. The regional variation in IE was more noticeable for native Telugu speakers than for native Hindi speakers. This difference was attributed to differences in the social and political power associated with these native languages: Hindi being the national language and the language of the capital city of India; Telugu, a regional language of Andhra Pradesh and spoken by many fewer people than Hindi. The third experiment was motivated by the idea that persistent effects of the speaker's native language might also be used to reflect a speaker's personal

identity. Accordingly, the experiment investigated the effect of speaking about personal versus neutral topics on IE pronunciation. The results were that speakers' IE pronunciation was more like their native language when speakers' discussed personal topics then when they discussed neutral topics. Overall, the results suggest that the pronunciation of IE is conditioned by social factors, meaning that it has entered the differentiation phase of Schneider's dynamic model of English evolution.

This dissertation includes previously published co-authored material.

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CHAPTER I

INTRODUCTION

India is the second-most populated country in the world with over 1.2 billion people, it is the seventh largest country by area (3,287,590 square kilometers), and a political democracy composed of 30 states and 7 union territories. India is a religiously diverse country with adherents to Hinduism, Buddhism, Jainism, Sikhism, Islam, Christianity, Judaism and Zoroastrianism. It is also home to people who speak 416 languages (SIL Ethnologue), 1,635 mother tongues as counted in India, which are in turn grouped into 122 language categories (Census, 2001). Languages in India belong to four basic language families: Indo-Aryan, Dravidian, Austro-Asiatic, and Tibeto-Burman. Indo-Aryan languages are spoken by about 75% of the population; Dravidian languages by about 23% of the population; together Austro-Asiatic and Tibeto-Burman languages are spoken by a little over 1% of the population, that is, by 7 million and 9 million people each. Apart from the languages belonging to the four major language families, there are some spoken by smaller speech communities that are not strictly categorizable into one of the 4 main language families. Andamanese and Nahali are two such languages. Andamanese is spoken by a very small group of people living on the Andaman Islands in the Bay of Bengal. Nahali is a language with fewer than 1,000 speakers, and is spoken in a small area in southwest Madhya Pradesh.

India is thus one of the most linguistically diverse countries in the world. However, the Indian government has given official status to only 22 regional languages in the 8th schedule. Hindi is the official language of the Union, but it shares this status

with the language of the British colonizers, English, rather than with another indigenous language. By the time India became independent in 1947, English had already consolidated its position in primary school and higher education (Agnihotri & Khanna, 1997). Today, next to its legal status as associate official national language, English is the official language of four states (Manipur, Meghalaya, Nagaland and Tripura) and of seven Union territories that are under direct control from New Delhi (the Andaman and Nicobar Islands, Chandigarh, Dadra and Nagar Haveli, Delhi, Lakshadweep, Mizoram and Pondicherry). Today in India, English is the primary medium of education, law, media, and business. It is also used for social interactions and in a pan-Indian literature. Even though Hindi is an indigenous language, it has not been able to unite India due to constant opposition from non-Hindi speaking community. This is why English has continued to play a role as an official language: it is needed to keep India united. Along these lines, Indian author Salman Rushdie (2003) observed that:

> In many parts of South India, people will prefer to converse with visiting North Indians in English rather than Hindi, which feels, ironically, more like a colonial language to speakers of Tamil, Kannada or Malayalam than does English, which has acquired, in the South, an aura of lingua franca cultural neutrality.

According to the 2001 census of India, 226,449 speakers have English as a native language, but most Indians speak English as a second language. Due to the large number of speakers (225 million), English of India has become a recognized variety: Indian English (IE). This variety was standardized in a monograph issued by the Central Institute of English and Foreign Languages (CIEFL). CIEFL was established in 1958 to conduct research on Indian English and to train English teachers. In the early 1970s,

research conducted by CIEFL led to the compilation of a list of linguistic features of English in India. These features were consolidated in the above-mentioned monograph to become the standardized variety of English in India. This official variety of English in used throughout India, and is meant to be devoid of regional influences. Although it owes its origin to the British Received Pronunciation, GIE deviates in its phonology and quality of phones. It takes into account the common segmental features across Indian languages such that GIE is distinctly Indian, but without prominent regional influences. English teachers go through training to make sure that students are introduced to this standardized variety.

New varieties of English are often stigmatized, and IE is no exception. According to Prator (1968) IE is the most unintelligible of the educated varieties of World Englishes. It is not only the British and other native speakers of English that have a negative attitude towards IE. In speaking of Indian attitudes towards IE, Kachru (1986) noted that during the phase of development of IE "to have one's English labeled *Indian* was an ego-cracking linguistic insult (p. 40)." Although this attitude has generally subsided among Indians themselves, the negative stereotype persists among those who live in countries where English is a native language. A simple search on the internet gives ample evidence of people's negative attitude towards IE. On one discussion board (http://www.antimoon.com/forum/t11954.htm), on Oct 21, 2008 a participant writes "why is it that there is not an Indian on earth who does not have an heinously strong accent, even when they are born and bred in English speaking countries?" People even equate the accent to that of IQ. Another discussion board posted on (https://answers.yahoo.com/question/index?qid=20120212190404AAyVCjl) asks "(d)o

most Indians have low IQs and bad English?" Many others comments wonder at why Indians have bad grammar and speak English so badly.

At one time, scholars also viewed non-native varieties of English, like IE, as non-standard varieties and unacceptable in a formal context. However, there is growing consensus that there is no longer a single English language (Crystal, 1997). Instead many Englishes have developed in different parts of the world. Today, scholars suggest that new varieties of English are innovations that are contributing to the growth and evolution of the English language (Bhatt, 1997; Sridhar, 1989).

In this dissertation, I will argue that the new variety of English in India has emerged as a language of prestige and power, and is increasingly being used across most domains of life in India by many highly proficient speakers. The term proficiency is applied here to persons educated only in English medium schools, that is, since age 6 years through college, and so exposed to GIE as the target variety. These proficient speakers use English fluently and on daily basis. With this use, IE has diversified within India itself to function as language of national, regional, and personal identity.

Because of the diversity of languages in India and the cultural and socio-political factors involved, IE has evolved from a contact language to an official variety. To understand this evolution, I will focus on the question of how Indian native languages effect the acquisition and use of IE. Specifically, this dissertation investigates how a second language can become not only a national language, but also a language of regional and personal identity. The answer to this question will be in the preservation of an L1 influence. It is argued here, based on the results from 3 experiments that investigate IE pronunciation while manipulating L1, region, and context, that an L1

accent in IE should not be seen as an index of second language proficiency so much as a marker of identity. Note that some of the evidence for this argument, presented in Chapter III, was previously published as a co-authored journal article.

CHAPTER II

BACKGROUND

2.1. English in India

English was introduced in India in the early 1600s by Christian missionaries. English was established firmly as the medium of instruction and administration with the Minute of 1835 by T. B. Macaulay. According to the Minute, a class of people were to be formed; “a class who may be interpreters between us (the British) and the millions whom we govern, a class of persons, Indians in blood and colour, but English in taste, in opinion, in morals and in intellect (quoted in Kachru, 1983:22).” The colonial strategy was to use English education as a means to strengthen British political authority in the country. People who knew English were given jobs, thereby compelling Indians to pursue English education. English became the lingua franca of the educated people in India. English gradually became the language of government, education, and advancement; in sum, "a symbol of imperial rule and of self-improvement (McCrum et al., 1988:325).”

After independence from the British in 1947, it was considered important to have an indigenous Indian language as the official language of India for maintaining the linguistic unity of the nation: “Hindi seemed most qualified (to serve as a national language), since it had more native speakers than any other Indian language and was already widely used in interethnic communications (Fasold, 1984:24).” Thus Hindi was designated as the language of communication between and within the states. However, due to opposition from non-Hindi states—especially, from Tamil Nadu—English was also introduced as an associate language (Article 343 of the Indian constitution). The plan

was that Hindi would eventually be promoted so that it might express all parts of the "composite culture of India" (Spolsky, 1978:56). But the south and other Indian communities continued to feel they would be professionally, politically and socially disadvantaged were Hindi to become the national language, and so opposition grew stronger to the planned phasing out of English in preference to Hindi. Thus the government was forced to adapt a policy that would help to maintain a status quo.

In 1967, Parliament passed the Official Language (Amendment) Act, which specified that:

> Notwithstanding the expiration of the period of fifteen years from the commencement of the Constitution, the English language shall continue to be used for all the official purposes of the Union for which it was being used immediately before such commencement (Constitution of India, 2007:212).

The act sanctioned the use of both Hindi and English for all official purposes, and this continues to be the case. But at the same time that the Indian Parliament re-designated Hindi as the national language and made English an official language for an indefinite period of time, 14 other languages (22 by 8th schedule, 2008) also continued to be designated as official languages. This meant that each state could choose its own regional language for use in local government affairs and in education according to Article 346 and 347. India's constitution thus guarantees the right of all citizens to communicate in their own language with any governmental agency.

Spolsky (1978) described the situation on the Indian subcontinent as one highlighting the "multitude of problems facing a political unit that contains a great number of languages (p. 42)." He further pointed out that it comes as no surprise that

India has had some difficulty in setting up a language policy. As a solution, in the early 1950s, the Indian government established eighteen states along linguistic lines, so that the majority in each spoke a common regional language and learned Hindi and English as official languages. However, the position of Hindi as an official language of India that must be learned by all has had constant opposition from non-Hindi speaking communities. By contrast, English is free from any undesirable (e.g. ethnic or religious) connotations that the native languages may have (Kachru, 1986). Thus, the pros of using English as a lingua franca in India might wipe away the fact that it originally was the colonizer's language. In principle, English could serve as a sole official language given its use across all regions for official purposes. According to Kachru, English provides a linguistic tool for the administrative cohesiveness of a country, and it serves as a language of wider communication.

Before independence, English was the language of the elite, of the administration, and of the pan-Indian press. The first universities were established in India in 1857 in Bombay, Calcutta and Madras. English provided a medium for understanding technological and scientific development. Ultimately, the legal system, the national media and important professions were conducted in English. By the 1920s, English had become the language of political discourse, intra-national administration, and law. It is the language associated with liberal thinking. Since independence in 1947, English has penetrated even deeper into Indian society (Kachru, 1986).

Even though English has a high index of communicativity in India, Fasold (1984:139) suggested that English lacks *symbolic power* because it has not been declared as a national language; it is just an associate official language. Fasold acknowledged that

other multilingual countries like Malaysia and Indonesia adopted, standardized, and developed a non-indigenous language as their lingua franca, and then promoted the lingua franca to serve as a national language. According to Fasold, these languages were standardized and developed as national languages because there was no obvious indigenous language that could be used. Fasold did not find this to be the case of English in India since Hindi is spoken by more people than any other language in India and has cultural attributes that English does not have. However, Kachru (1986) stressed the importance of speakers' attitudes when determining the (symbolic) power of a language: what one thinks the language will do for the person and what others think of a person when one uses the language. Similarly, Bourdieu (1991) argued that symbolic power rests on social recognition. Unification and codification of a language is an important way of achieving recognition because these lead to the use of a language as a common language. Insofar as this affects access to economic and social power, use of a language provides its speakers with linguistic capital. But linguistic capital is not restricted to economic and social prestige, it also provides cultural power. The more a language is used, the more linguistic capital will be available for its holders to get access to cultural power, and thus to symbolic power. Thus, for Kachru and Bourdieu, it is the usefulness and the prestige of a language that provides it with symbolic power.

We would note that the situation in India has changed considerably since Fasold (1984) first made his observations about English in India. In the last three decades, Indian English has been established as a language of national affairs; similar in status and function as, for example, Bahasa Indonesia, which is the language of education, communication, transaction, and trade in Indonesia. Like the lingua franca of Indonesia,

Indian English is now also used in the development of national culture, science, technology, and mass media.

2.2. Indian English (IE)

Laporte (2012) argued that communities of World Englishes (e.g. Indian English) often take pride in the distinctive features of their varieties, which are tokens of their identity. According to this view, World Englishes are varieties in their own right. Schneider (2003) has explained that the evolution of World Englishes takes place in 5 phases. The first phase is the *foundation phase*. This is when English is introduced to a population through trade or colonization, and its use is very limited. Next comes *exonormative stabilization*, which describes increased contact between native English speakers and the locals and, with this, an expanded use of English. It is during this second phase that English begins to be marked by local features. The third phase is *nativization*. During this phase, the range of English use increases with nativization at all linguistic levels. English also equates with the expression of a new national identity. Fourth comes *endonormative stabilization*. This phase follows political independence of the territory and corresponds to almost unanimous acceptance of the nativized language norms. The variety becomes codified and is used to express local identity. Finally, there is *differentiation*. During this phase, the nativized English variety becomes internally diversified and there is the emergence of dialects and local variants. Symbolic power might be acquired during phase 4 (endonormative stabilization) since this phase is characterized by "the gradual adoption and acceptance of an indigenous linguistic norm, supported by a new, locally rooted linguistic self-confidence (Schneider, 2003:249)."

Communities in the endonormative stablization phase of English nativization see themselves as part of a new nation; ethnic boundaries become redefined with the codification of the new variety.

Schneider (2003) argued that IE is very advanced in the nativization process and displays signs of endonormative stabilization. Balasubramanian (2009) claimed that IE has already entered endonormative stabilization phase, and possibly even the last phase, differentiation. Consistent with both views, a number of social theorists argue that IE is a variety on its own (e.g., Kachru, 1986; Bailey, 1991; Jenkins, 2003). Their argument is summed up by Kachru (1986) and Bailey (1991) as follows: Kachru noted that the functions of English "extend far beyond those normally associated with an outside language, including the instrumental, the regulative, the interpersonal and the innovative, self-expressive function (p. 37)." Bailey argued that "IE has emerged as a self-perpetuating national variety, though one mainly used by Indians whose native language is not English. IE is a minority tongue, and yet the language of national affairs (p. 145)."

In this dissertation, I test the view that IE is a distinct variety of English and, further, that IE has moved beyond the endonormative stabilization phase and is now in the process of differentiation. That is, like other established varieties of English, I hypothesize that IE is not homogeneous, but instead incorporates a range of varieties. Bhatt (1997:275) formulates this hypothesis in the following way:

> As a result of over 200 years of contact with native Indian languages, English has become an Indian language, both in its structure and use. And like other natural language, IE displays a hierarchy of varieties – from standard (monitored) to vernacular (unmonitored).

Stronger statements yet come from other applied linguists, Jenkins (2003:7), who argued that English in India has undergone "a process of Indianization in which it has developed a distinctive national character comparable to that of American or Australian English." Balasubramanian (2009:228) observed that the IE of younger speakers has more Indian features than the IE of older speakers, regardless of proficiency level. This latter observation suggests innovation around accent, a point that we will explore in this dissertation. Collectively, the observations about IE from these authors are consistent with my thesis that IE has advanced through most, if not all, of the World Englishes phases enumerated by Schneider (2003).

In the remainder of this chapter we will first consider the social political factors that argue for IE as a distinct variety of English, similar in status as British and American English. After that, we will present a canonical description of the sound structure of IE, which is the focus of my investigation in this dissertation. Finally, we will look at the different factors that likely continue to play an important role in transforming this non-indigenous language into a language of power and Indian identity.

2.3. Socio-Political and Cultural

In a multilingual and multicultural country like India, the position of English is determined by various social, political, and cultural considerations. During British colonization, English was used as a tool of power to cultivate a group of people who identified with the cultural and other norms of the political elite. English was considered a tool of civilization. Europeans thought they would contribute to the well-being of the

native people in the colonies, and elevated their language to the almost divine (Bonvillain, 1993).

Since independence, the perception of English as representative of an alien power base has changed. Today IE is very frequently learned as a second or third language after a native language. According to Spolsky (1978:42), English is more useful as a "lingua franca" in India than Hindi, the use of which is regionally limited. Spolsky also noted that the language policy of the school system in India, where English is first encountered, is both a result of the social and economic pressures that make English a good lingua franca in India, and a source of pressure on English itself. He argued that education is the best way to enforce language policy, listing the following pressures that effect language planning in a society: family (attitudes at home), religion (the language represents a "holy tongue"), ethnicity, political pressures (national unity), cultural pressures, economic pressures (commerce, science and technology), the mass media (e.g., if there is no media in a particular language, there will be strong pressure to learn another language which is better provided), legal pressures (language can often become the basis for discrimination), and military pressure (cohesion is better maintained if one language is used).

Regarding language policy, non-Hindi speaking communities found it unfair that they would have to learn Hindi as a national language and English as the official language where native speakers of Hindi would only have to learn English. As a result, the Three Language Formula was developed. The goals were to promote national integration and to make the educational load be fair to all communities (Srivastava, 1990:43). According to the formula, people from non-Hindi areas are supposed to learn

their regional language, English, and Hindi in school. In Hindi speaking areas, people study Hindi, English and any other modern Indian language. Sridhar (1989:22) observed that the Three Language Formula "seeks to accommodate the interests of group identity (mother tongues and regional languages), national pride and unity (Hindi), and administrative efficiency and technological progress (English)".

The introduction of the Three Language Formula also resulted in two different kinds of schools: the vernacular schools and the English-medium schools. In vernacular schools, students are taught all the subjects in their regional language. In English-medium schools, students are taught all the subjects in English except for the language courses. In both schools, students learn 3 languages. The difference is when English is first introduced to students. Students in vernacular schools encounter English later than those in English-medium schools. Thus, the different types of schools have divided IE speakers into early learners of English (beginning pre-school) and late learners (beginning high school; 5^{th} or 8^{th} grade). Since Indians generally feel that English equips them for socially-valued roles, and that regional languages are not economically valuable, English-medium schools have become symbol of prestige and power.

According to the 2001 census in India, 226,449 Indians are native speakers of IE, whereas 225 million speakers are second or third language speakers of IE. Due to the importance of English being the medium of interaction in the public domain, English speaking individuals lead India's economic, industrial, professional, political, and social life. With India's massive population, the 225 million IE speakers in India make India one of the top four countries in the world with the highest number of English speakers. As noted already, the large number of speakers and high prestige of English has resulted in

its nativization according to many scholars (e.g. Kachru, 1986; Sridhar, 1989; Wells, 1982). Nativization is due presumably both to transfer from the local native languages as well as to the new cultural environment and communicative needs that English serves (Sahgal, 1991:300). Because of the deep social penetration of English in India and its extended range of functions, the nativized variety is likely differentiating. At least this is the thesis that I intend to test in the present experiment by examining first language, regional, and social influences on the sound structure of IE.

2.4. Sound Structure of IE

English in India has evolved characteristic features at the phonological, lexical, syntactic and discourse levels. Some of the prominent phonological characteristics of IE are as follows: the replacement of alveolar consonants with retroflex consonants; an absence of dental fricatives /θ/ and /ð/; the substitution of aspirated voiceless dental plosive [t̪ʰ] for /θ/ and the unaspirated voiced dental plosive [d̪] for /ð/; the use of unaspirated voiceless plosives /p/, /t/, /k/; the use of /v/ for /w/; r-pronunciation, and epenthesis into consonant clusters (Bansal, 1978; Trudgill & Hannah, 1994; Sahgal & Agnihotri, 1988; Chaudhary, 1989; Coelho, 1997; Gargesh, 2004). A number of these features were incorporated into the standardization of IE, which is discussed next.

In the early 1970s, after the Three Languages Formula was introduced, IE was standardized in a monograph issued by the Central Institute of English and Foreign Languages so that there would be a consistent variety for use in primary and secondary education (CIEFL, 1972). The standardized variety was called General Indian English (GIE) and it was meant to serve as "a socially acceptable pronunciation (of IE) devoid of

regional peculiarities that may impair communication with speakers from within and from outside the country (Pandey, 1981:11)."

GIE has several salient phonological features such as a reduced vowel inventory compared to the Received Pronunciation (RP) of British English, the substitution of retroflex stops for RP British English alveolar stops, and the omission of some fricative sounds (Bansal, 1976; Wells, 1982). Although suprasegmental features were not standardized in the CIEFL monograph, the rhythms of (G)IE are notably different from those of most other Englishes. For example, whereas British English is a canonical stress-timed language, IE has most often been characterized as syllable-timed (Gargesh, 2004) or nearly syllable-timed (Babu, 1971).

General Indian English (GIE) has a 17-vowel system (11 monophthongs and 6 diphthongs): /iː, i, eː, ɛ, æ, ɑː, ɒ, oː, ʊ, uː, and ə/ and /ai, ɔi, aʊ, ɪə, eə, and ʊə/. Table 2.1 shows the consonant inventory of GIE described by CIEFL (1972). Frequent phonetic variants are shown in parentheses; the slash between [u] and [w] means that they are in allophonic variation.

Since the early 1970s, GIE has been used throughout the education system in India. It is important to note, though, that English is taught to Indians by first language speakers of Indian languages. Thus, depending on the focus and subjects in studies on IE, different viewpoints have emerged in the literature regarding its standardization. On one hand, certain scholars suggest that certain features have become so well-established in IE that they should be considered stable features of the language; that is, features found virtually everywhere English is used in the country (Verma, 1980; Nihalani et al., 2004).

Table 2.1. Consonant inventory of GIE (CIEFL, 1972)

	Labial	labio-dental	Dental	Alveolar	post-alveolar	Retroflex	Palatal	Velar	glottal
Stop	p (p) b		(t̪) d̪ t̪ʰ			ʈ (ʈʰ) ɖ		k (kʰ) g	
Affricate					tʃ dʒ (tʃʰ)				
Nasal	m			n				ŋ	
Fricative		f		s z	ʃ				h
Approximant	ʋ/w			r			j		
Lateral approximant				l		(l)			

On the other hand, other researchers have suggested that the English spoken in India differs with respect to a number of variables including first language (L1), proficiency in English, region and register (Bansal, 1976; Kachru, 1986; Wells, 1982; Gargesh, 2004).These competing descriptions of IE indicate that the question of variation is not settled. Kachru (1994) noted that:

> there is as yet no large-scale study of spoken or written South Asian English. Nor has any serious attempt been made to distinguish the features in terms of proficiency scale, the register-specificity of the features, and the distribution of grammatical features with reference to the regions (p. 518).

This dissertation may not represent the kind of large-scale study that Kachru's critique would seem to advocate for, but it is a step in the right direction in that a number of influences on the details of IE pronunciation are considered.

2.5. First Language Influences on IE

It has been widely recognized that languages vary depending on a number of linguistic and non-linguistic factors. Non-linguistic factors include, but are not limited to, geography, ethnicity, and social class. In the case of IE, the literature reviewed earlier strongly suggests that there are already established varieties of IE. But unlike the social theorists who see variety as a mark of acceptance by Indians of English, others have attributed it to poor proficiency. For example, Quirk (1972) described a spectrum of IE varieties that extend from pidgin-like to standard English with "imperceptible gradations the whole way along (p. 49)."

Linguists have been more circumspect in their explanation for IE varieties, but the suggestion still seems to be that proficiency is the principal reason for variation. For example, Wells (1982) suggested that IE phonetic characteristics are to be accounted for almost entirely in terms of interference from the native language. According to the 2001 census, there are 122 languages in India, even though only 22 have official status. Dialectal variation within these 122 languages puts the number at 253 mother tongues. If we take Wells suggestion seriously then there should be at least 122 varieties of IE, which is at odds with our previous discussion of a set of homogenous IE features. Wiltshire (2005) suggested instead that IE varieties may reflect different language families. There are four language families in India: Indo-Aryan, Dravidian, Tibeto-Burman and Austro-Asiatic. If variation is conditioned by the native language, and languages within a family share many features, then it is possible that we might see distinct varieties of IE emerge depending on the substratum influences associated with a particular language family. Again, though, the implicit suggestion is that the proximal

cause for variation is poor English proficiency. This conclusion is consistent with Gargesh's (2004) observation that only a small number of people in India have a near-native command over English. There are a significant number of additional people who have a high-level of English proficiency, but Gargesh do not consider them to be in native-like command of the language. That said, the high proficiency group includes administrators, teachers, scientists, journalists, and businessmen; all individuals whose variety is considered to be the educated variety and a benchmark for English language teaching (ELT). Finally, Gargesh noted that there are many people in India with only a low level of English proficiency, and whose competence in English is severely limited and used only in restricted domains. Shopkeepers, waiters and like are included in this group who are also mostly illiterate in English.

Odlin (1989:112) noted that "there is no little doubt that native language phonetics and phonology are powerful influences on second language pronunciation." Avery and Ehrlich (1992) pointed out that the sound system of the native language (L1) can influence the learners' pronunciation of a second language (L2) in at least three ways. First, when there is a sound in the L2, which is absent from the learners' native sound inventory, or vice versa, learners may not be able to produce or even perceive the sound(s). Second, when the phonotactics are different in the learners' L1 from those of the L2, they cause problems for learners because these rules are language specific. Third, rhythm and melody of a language determine its patterns of stress and intonation; learners may transfer these patterns into their L2.

Most researchers contend that adult learners cannot achieve native-like phonology in their second language (L2), and attribute the failure to language transfer and age-

dependent factors. However, it has been suggested that the second language learner has a very good chance of attaining native-like pronunciation in a language if s/he starts learning before the age of 6 (Oyama, 1976; Tahta et al., 1981; Thompson, 1991; Flege, 1988; Flege & Fletcher, 1992). Thus, in order to better investigate the kind of influence that the native languages of India have on IE, the current experiment investigated pronunciation of IE in speakers who were first exposed to English at 6 years of age or before and who continue to use English on a daily basis. The rationale was that if L1 influences were identified in this highly proficient (educated in English medium schools through university) group of IE speakers, then factors other than proficiency might account for variation in IE.

2.6. Region as a Source of Variation

Chapter III will show that there are L1 influences on IE even in the speech of highly proficient IE speakers. Chapter IV reports an experiment of the effect of region on IE to determine whether the L1 influences on IE are better understood as regional varieties of IE.

Regional distribution of different accents and dialects has been widely discussed by the dialectologists. As early as 1284, dialect division between the north and the south of France was noted by the poet Bernart d'Auriac, who coined the terms *langue d'oil* and *langue d'oc* from the words for 'yes' which were used in the north (*oil*, now *oui*) and in the south (*oc*), respectively (Chambers & Trudgill, 1998). The systematic study of dialects goes back well over a century. For example, George Wenker's work in Germany, based on the translation of High German sentences into dialectal ones by schoolmasters,

resulted in the first dialect map of Germany in 1876. Wenker's methodology was improved by Jules Gillieron in France, who sent trained field workers out to obtain consistent data from informants. According to Trudgill (1974) numerous European and American atlases have been produced using the methodology pioneered by Wenker and Gillieron. The methodology of using surveys and questionnaires to produce atlases of geographic dialects continues today in America and the United Kingdom.

McArthur (1998) also pointed out that in countries where the native language is English (England and the United States) there is "not a single variety of English, (instead English) differs markedly from one territory to another, and even from one region within a given territory to another (McArthur, 1998:43)." Given the vastness of the United States, several dialect atlases have been produced, and several are still under production. These include the *Linguistic Atlas of New England* (1939-43); *A Word Geography of the Eastern United States* (1949); *The Linguistic Atlas of the Upper Midwest* (1973-79)*; The Linguistic Atlas of the Gulf States* (1968-92) and *the Linguistic Atlas of the Middle and South Atlantic States* (1980), to name just a few. Two more recent and on-going projects are DARE, the *Dictionary of American Regional English* and *The Atlas of North American English* (Labov, Ash & Boberg, 2006). Similarly, The Survey of English Dialects (SED) was inaugurated in 1948, the survey was organized by dividing the country into four regions: the north, the east and west midlands and the south. The resulted maps are the *Phonological Atlas of the Northern Region* (1964); *A Word Geography of England* (1974); *The Linguistic Atlas of England* (1978); *Word Maps* (1987); the *Dictionary and Grammar* (1994) and *An Atlas of English Dialects* (1996).

Studies on the defining features of different varieties of English provide evidence that they are well distinguished based on phonology. Consider, for example, Labov et al.'s (2006) *Atlas of North American English*, which is based primarily on vowel production. Consonants tend to be less studied, though a number of researcher have looked carefully at particular contrasts. For example, Byrd and Mintz (2010) showed that Southern Californians typically have an interdental [θ] and [ð] where standard American English has dental consonants. Jacewicz et al. (2009) even found evidence of dialectal variations in the duration of closure voicing for /b/. This was longer in speech produced by people from Wisconsin than in that produced by North Carolina speakers. Other studies have investigated regional differences in suprasegmental features like rhythm, and speech rate. For example, White & Mattys (2007) examined the rhythmic contrasts between different accents of British English, with results showing evidence of rhythmic gradience between the most stress-timed Standard Southern British English (SSBE) to the least stress-timed Shetland English, with Bristolian English, Welsh Valleys English, and Orkney English falling somewhere in between. Dialect variation has been shown for speech rate too. For example, O'Neill (2008) found that Wisconsin speakers had faster articulation rates than North Carolina speakers for both read and spontaneous speech. Kendall (2009) found that speakers from Texas, Southern North Carolina (NC), Ohio, and Eastern NC have faster speech rates (≥ 5 syll/sec) than speakers from Central NC, Western NC, and Washington, DC (< 5 syll/sec). Jacewicz et al. (2009) found similar regional variation between north and south speakers of American English. Northern speakers (from Wisconsin) spoke faster than Southern speakers (from North Carolina). Finally, Byrd (1994) found that out of eight dialect regions in TIMIT database, the

speakers from the South had the slowest speaking rate, and the "Army Brat" category had the fastest.

Perceptual studies confirm that the phonological and phonetic patterns such as the ones described above are indeed perceptible. Listeners can judge the regional or ethnic background of unfamiliar talkers based on very short speech samples (5 to 8 words) with above-chance accuracy (Clopper, Conrey, & Pisoni, 2005; Clopper & Pisoni, 2006).

Regional variation is less discussed in second language situations since the focus of variation is typically on L1 rather than on geography. Even so, Pingali (2009) described IE accents as regional in nature, and classifies them on the basis of the geographical regions and further regions within them. Corpus studies on particular features (light verb construction, complementation) support the idea of regional varieties. Although these studies find overall similarities between different varieties of English on the Indian sub-continent (i.e., between IE, Pakistani English, Bangladeshi English and Sri Lankan English; Hoffman et al., 2011; Nam et al., 2013), subtle differences also exist. For instance, the light verb construction with an indefinite article (e.g. *take a walk, to have a chat*) is very frequent in IE compared to other Englishes (Hoffman et al., 2011; Nam et al., 2013). Thus, even though the regional varieties in South Asia all originated at more or less the same time and from British colonization, they seem to have taken on subtly different characteristics in different countries.

Of course, the indigenous languages in different regions across South Asia also differ. It is therefore difficult to know whether the regional differences in South Asian Englishes and in IE are attributable to the same social-cultural factors that drive regional variation in the monolingual situation. The most prominent such factor is the urge to

maintain a regional identity (Crawford, 2007) which may correlate with an ethnic (e.g., Scottish versus British) or social-political (e.g., Northeastern versus Southerner) identity. Evidence that language conveys identity can be found in the phenomenon of "Convergence/divergence" whereby speakers deliberately align or diverge in pronunciation and style from an interlocutor based on context (Wamalwa & Oluoch, 2013). When the context is threatening to the self-identity, the speaker may diverge from a standard dialect to a more vernacular one or vice versa, depending on whether he or she wants to distance or more closely resemble the person they are talking to.

Following independence in 1947, much of the initial divisions of India into states was traced along linguistic lines. For example, where most of the population spoke Tamil, the state of Tamil Nadu was formed; where most of the people spoke Telugu, the state of Andhra Pradesh was formed; where they spoke Gujarati, the state of Gujarat was formed; and so on. Division along linguistic lines occurred because India's independence encouraged many of the region-based linguistic groups to become self-conscious and demand self-determination (Bhattacharyya, 1989). Bhattacharyya (2001) argued that Indian patriotism is "aggressively attached to its provincial frontiers," and people continue to have very strong regional sentiments. Not all of these sentiments are tied to language, though. For example, the recent division of Andhra Pradesh into the states of Telangana and Seemandhra was driven by a rather complex situation of deprivation and ecology rather than by language. The dominant indigenous language in both regions is Telugu, but the people in Telangana are poorer and more rural than the people in Seemandhra. In spite of this, development was happening in Seemandhra and not in

Telangana. Political representation was also biased. Of the parliamentary constituencies, 25 were from Seemandhra, whereas 17 were from Telangana.

Altogether, history suggests that Indians have a strong sense of regional identity. Insofar as this factor contributes to linguistic diversity in a monolingual setting, it could also drive variation in IE.

2.7. L1 and Social Identity

Our previous discussion of regional identification in India indicated that these regions are often strongly associated with different languages. In the main, the languages of south India are Dravidian, but the languages of north India are Indo-Aryan. Regional differences could therefore reflect linguistic differences, not necessarily because of proficiency, but because indigenous languages stand in for a social identity.

According to Pattanayak (1990) a "(m)other tongue anchors the child to culture." He goes on to describe mother tongue as the "expression of primary identity and of group solidarity." The strong suggestion is that people are identified with certain ethnic, religious or cultural groups through ones mother tongue. Similarly Tully (1997:160) suggested that one can obtain a deeper knowledge of a culture only through knowledge of that culture's language. Tang (1999) stated simply that "culture is language and language is culture." In the case of English in India, it might be that variation in IE is influenced by the speakers' identity, and this identity may be best expressed by their mother tongue. This would mean that L1 influenced IE could be a metric of the speaker's sense of self rather than a metric of proficiency.

Pingali (2009:6) suggested that "English is not used in domains that are more emotional and non-intellectual. English is the language of the intellect and formality." Similarly, according to Dasgupta (1993), the topic being discussed is often a crucial determining factor for the language used in India. Politics, education, medicine are likely to be discussed in English; relationships and emotions are likely to be discussed is one's mother tongue, especially by those who are less proficient in English. The claim that IE and native languages are used in non-overlapping domains receives support in questionnaire studies (Pandit, 1978; Kachru, 1976; Sridhar, 1989). These studies have shown that the mother tongue is the preferred language in intimate or affective domains (family, friends, neighbors, and friends and relatives during weddings etc.), and English in more formal or utilitarian ones (teachers, strangers on the bus, office and bank employees, political and technical discussions).

But it is important to understand the dynamic change of attitude towards English in India in recent years. For example, a recent questionnaire study conducted by Hohenthal (2003) found that use of English has spread into personal domains. The same study also found that 90% of her informants considered English an important language for the development of the country; only 33% of informant perceived Hindi in this way. If it is true that IE is also being used more now in personal domains, then it may help account for why IE varies in systematic ways with speakers' first languages. A mother tongue codes identity. If IE is being used in place of the mother tongue, then the IE must code that identity instead. Evidence for a social-identity interpretation of L1-accented English is provided by Sharma and Sankaran (2009), who found that heritage Punjabi speakers, born and raised in London, England, frequently used retroflexion, which they

recognized as a strong marker of their ethnic identity. Evidence like this is consistent with the hypothesis that accented IE need not index proficiency; it can also index social-cultural identity.

It is also well documented in the sociolinguistic literature that participants produce more vernacular speech in less formal settings, such as interview speech, than in more formal settings, such as reading passages or word lists (e.g., Labov, 1972). The effect of formality on variation may reflect a listener-oriented attempt on the part of the speaker to better approximate a set of standard variants. Labov also suggested that the most natural style of speech for a speaker comes out in the most casual situations. In addition, Kiesling (2009) suggested that the position of a speaker varies with respect to a particular conversation, thus it may vary according to the setting, including the topic of discourse or the relationship of speaker to listener. Finally, according to Schieffelin and Ochs (1986) children who learn language in a particular context/environment will tend to adopt a similar style in the same context even when they are grown. Conversational setting thus effects a speakers' use of the vernacular, with more informal and personal settings encouraging more "accented" speech. This could mean that if English is used to discuss topics in the personal realm, the Indian speaker may produce more L1-accented English by way of expressing his or her primary social identity or because it is more comfortable, homey variety of the language. Identification with language would be less important when English is used to discuss topics that are associated with the public domain, such as education and employment. Also, in order to sound more educated and professional, speakers may aspire to a more standard variety. It is possible that when IE is

used in these domains it is produced with less obvious L1-influence than if used in domains where identity matters more.

2.8. Current Dissertation

In this dissertation, we will examine empirically the question of Indian English (IE) variation in a multilingual context. The study aim is to understand the nature of IE in India. Is it merely a highly useful language that is learned by millions of Indians for pragmatic reasons? Or does IE show some of the hallmark traits of national languages, including the ability to express regional and social identity? Put another way, we suspect that IE varies substantially across India. Is this due solely to its status as an L2? Is second language transfer due to non-native like proficiency or poor teaching, and is this the entire explanation for IE variation? For that matter, does IE really vary much between speakers of different L1s when proficiency is controlled? The current dissertation addresses all these questions by investigating the effect of native language, regional and social factors on IE pronunciation.

Three experiments were conducted. Experiment 1 investigated the influence of L1 on the segmental and suprasegmental features of IE produced by native Hindi speakers living in Delhi and native Telugu speakers residing in Hyderabad. All speakers had attended English-medium schools from primary school onwards, and thus learned GIE as the target variety of English. The speakers all reported extremely high proficiency in English and used the language on a daily basis. The findings from this experiment showed that there is an influence of L1 on IE even when language proficiency is controlled. Experiment 2 was conducted to disambiguate the effect of region and

language on IE pronunciation. English produced by native Hindi and Telugu speakers residing in Delhi was compared to that produced by native Hindi and Telugu speakers residing in Hyderabad. The results suggested distinct regional accents, but they also indicated that Telugu speakers were more likely to adopt the regional variety than Hindi speakers, suggesting other social factors might also be relevant. Experiment 3 was conducted to investigate one of these factors; namely, setting. Native Hindi and Telugu speakers were engaged in an English language conversation that covered topics in both the personal and neutral domains. The findings were that the L1 influence in IE was stronger when the topic was personal compared to when it was neutral. Overall, the findings were taken to suggest that variation in IE does not only reflect variation in proficiency. Instead, variation has also emerged from sociolinguistic and cultural factors that cannot be easily parsed out from those associated with proficiency-based transfer. The implications of the results are discussed in each of the chapters and revisited with respect to the issue of the symbolic power of IE in the final chapter.

CHAPTER III

EXPERIMENT 1: NATIVE LANGUAGE INFLUENCES

The work presented in this chapter was previously reported in a co-authored article published in the *Journal of Phonetics*: Sirsa, H., & Redford, M. A. (2013). The effects of native language on Indian English sounds and timing patterns. *Journal of Phonetics*, 41, 393-406.

3.1. Introduction

Native language interference in second language acquisition is well documented (Lado, 1957; Selinker, 1971; Flege, 1980; Dulay et al., 1982; Lott, 1983; Ellis, 1997; Carroll, 1964; Beardsmore, 1982). Interference takes the form of automatic transfer of structures from the L1 to the L2 resulting in variable errors in the learners L2, especially when L1 and L2 are distinctly different (Ellis, 1997; Dechert, 1983). Many researchers have suggested that IE phonetics and phonology can be attributed to L1 transfer (Bansal, 1970; Balasubramanian, 1972; Chaswal, 1973; Thundy, 1976; Wells, 1982). Early investigations of native language influences on IE phonology used the contrastive analysis framework to compare IE with British English or American English, assumed to be the purer varieties. The differences found between IE and these varieties were attributed to L1. More recent studies have compared IE produced by speakers with different L1s and compared this with the standardized variant, GIE (Maxwell & Fletcher, 2009, 2010; Pickering & Wiltshire, 2000; Wiltshire & Moon, 2003; Wiltshire &

Harnsberger, 2006). The results from these studies suggest that L1 influences IE, but that there are many similarities between IE varieties.

Maxwell and Fletcher (2009, 2010) investigated the acoustic–phonetic characteristics of IE vowels in L1 speakers of Punjabi and Hindi from northern India. Although Maxwell and Fletcher noted that both Punjabi and Hindi are Indo-Aryan languages, they were careful to document differences in the vowel inventories and suprasegmental features of the two languages based on phonological descriptions of these languages. Very few differences were observed in the IE vowels produced by the two groups, but Punjabi speakers produced IE diphthongs with more phonetic variation than Hindi speakers. Maxwell and Fletcher concluded that Punjabi and Hindi speakers shared vowel categories for IE monophthongs, but that native language phonology may influence the representation of IE diphthongs.

In spite of Maxwell and Fletcher's (2010) conclusion of persistent L1 influences on IE, their methods leave room for an alternative explanation. In particular, 2 of the 4 Punjabi speakers began English medium education in secondary school. All other speakers were educated in English from primary school onwards. Thus, variability in age-of-acquisition may have accounted for the larger degree of phonetic variation observed in Punjabi speakers' productions of IE diphthongs compared to Hindi speakers' productions of IE diphthongs (for age of acquisition effects on pronunciation see, e.g., Flege & Fletcher, 1992; Long, 1990). This possibility is further supported by Maxwell and Fletcher's acknowledgment that the differences between the groups did not conform to predictions based on differences in the phonologies of Punjabi and Hindi.

Two studies on the realization of prominence in IE have documented only similarities across speakers with different language background, and so provide no further evidence for persistent effects of L1 on IE (Pickering & Wiltshire, 2000; Wiltshire & Moon, 2003). The larger of the two studies (Wiltshire & Moon, 2003) investigated the effect in speakers of Indo-Aryan (Hindi and Gujarati) and Dravidian (Tamil and Telugu) languages. These speakers were asked to produce English noun/verb pairs that differed only in canonical stress placement. There were 10 speakers in each group, and all speakers had been educated in English from primary school onwards. Multiple acoustic correlates of prominence (duration, amplitude, and F0 changes) were measured and no significant differences between Indo-Aryan and Dravidian speakers' productions were found. IE productions did however differ significantly from American English productions of the same words. In particular, duration differences between stressed and unstressed syllables were much smaller in IE productions than in American English productions, consistent with the reports that IE is syllable-timed rather than stress-timed (Gargesh, 2004). IE productions also differed from American English in the direction of pitch change from prominent to non-prominent syllables.

In contrast to the Wiltshire and Moon (2003) study, Wiltshire and Harnsberger (2006) reported some L1-dependent differences in the production of IE rhotics, voiceless stops, and pitch accents. Five Gujarati (Indo-Aryan) and 5 Tamil (Dravidian) speakers of IE produced English word lists, isolated sentences, and a read passage for later acoustic–phonetic analysis and a transcription-based analysis of intonation. These analyses indicated many similarities across the categories examined, but also a few differences across groups. For example, Gujarati and Tamil speakers of English produced the high

and mid back vowels differently from one another and from the canonical descriptions of GIE back vowels. One of the differences between Gujarati English and descriptions of GIE, namely the near merger of /u/ and /ʊ/ in Gujarati English, was attributed to the absence of a short, high back vowel in Gujarati. The other differences observed could not be explained with reference to the L1 of the speaker.

Consonantal and intonational differences were also noted in the English produced by Gujarati and Tamil speakers. Specifically, there was substantial variation in the production of rhotics across speakers, but unlike Gujarati speakers, Tamil speakers also produced a Tamil-style fricativized approximant in this category. Tamil speakers of English also produced longer VOTs than Gujarati speakers of English. And while both Tamil and Gujarati speakers of English produced many more pitch accents per utterance than would be typical in American or British English, there were also L1 related differences in proportion of rising versus falling pitch accents. The sum of these segmental and suprasegmental differences led Wiltshire and Harnsberger to conclude that the effects of L1 on IE may "supersede GIE norms (p. 103)." This conclusion is consistent with the view that IE representations are persistently influenced by the L1 of its speakers, and so may lack a stable phonology that is characteristic of a dialect.

Although the Wiltshire and Harnsberger (2006) study is comprehensive, their conclusion that IE is strongly influenced by L1 might be called into question for two reasons. First, like Maxwell and Fletcher (2010) who found some subtle L1 effects on IE, Wiltshire and Harnsberger's study included speakers who were first exposed to English at different ages. Three of the five Tamil speakers were educated in English from the beginning of primary school. The other two were first exposed to English later: one

began English medium education in the 3rd grade (age 9), and one in higher secondary school (age 15). The Gujarati speakers were more homogeneous in that all had been educated in English from primary school onwards. The variability in age of acquisition could account for the differences observed between groups, and especially for why Tamil speakers were found to occasionally use a Tamil-style fricativized approximant for the English rhotic.

The second reason that we might call into question Wiltshire and Harnsberger's (2006) conclusion that L1 influences supersede GIE norms is that no comparable L1 data are presented. Here, a number of similarities between the groups are at issue. Although some of these were interpreted as more consistent with similarities between Tamil and Gujarati when different than GIE, no empirical data is offered to support this interpretation. In fact, with the exception of the Pickering and Wiltshire (2000) study, none of the acoustic–phonetic investigations of L1 influences on IE compare the segmental and suprasegmental characteristics of L1 and IE in the same speakers. The Pickering and Wiltshire (2000) study does however support Wiltshire and Harnsberger's idea that similarities across indigenous Indian languages may account for similarities in the IE produced by speakers with different language backgrounds. In particular, Pickering and Wiltshire found that the variable of interest in that study, prominence realization, was the same in the IE and across the different L1s of their 3 speakers.

If both the similarities and differences in IE sound patterns across groups can be attributed to the native languages of the speakers, then the acquisition of IE sound patterns may simply involve the selective transference of L1 categories to L2. An alternative hypothesis is that Indians acquire a common IE phonology that is distinct

from their native language phonology. This latter hypothesis does not contradict the idea that IE phonology reflects indigenous Indian languages influences; it merely suggests that these influences are historical in nature. To test between these competing hypotheses, we investigated the perceptual and acoustic similarities and differences of IE produced by native Hindi and native Telugu speakers, all of whom had been educated in English from primary school onwards. We also investigated acoustic similarities and differences between the native languages of the speakers.

We focused on native Hindi and Telugu speakers' production of IE because Hindi has the most speakers among the Indo-Aryan language family, and Telugu among the Dravidian language family. Hindi is the official language of 11 states, and its speakers account for 41.03% of total population of India. Telugu is an official language of Andhra Pradesh, and its speakers account for 7.19% of the total population of India. Hindi and Telugu are also known to be phonologically distinct: Hindi has a larger phonemic inventory than Telugu (Maddieson, 1984). The Hindi vowel inventory includes a tense-lax distinction and a quantity difference as well as a central vowel: /i, iː, eː, ɛ, æ, ə, a, ɔ, oː, u, uː/ (Ohala, 1999). In contrast, the Telugu vowel inventory includes just 5 vowels and a phonemic length contrast, /iː, i, eː, e, aː, a, oː, o, uː, u/, as well as a low-front vowel /æː/ in borrowed English words (Krishnamurti, 1972). Although Hindi and Telugu consonantal inventories are roughly similar in size, as shown in Appendix I, the Telugu set is functionally smaller than the Hindi set because the contrasts due to voicing and aspiration are strictly features of written or literary Telugu in the retroflex, palatal, and velar series (Krishnamurti, 1972:5). Also, there is some indication that Hindi and Telugu may vary in the degree of retroflexion for particular speech sounds (Ladefoged &

Bhaskararao, 1983). Finally, Hindi and Telugu are both described as quantity sensitive languages, but default stress is on the last syllable in Hindi and on the first in Telugu (Ohala, 1999; Srinivas, 1992). Hindi has been described as a syllable-timed language (Crystal, 1995; Dauer, 1983), and Telugu as mora-timed (Murty, Otake, & Cutler, 2007).

We investigated the similarities and differences in IE as a function of native language using global perceptual analyses, and specific acoustic measurements. Naïve and experienced listeners provided perceptual judgments on IE sentences produced by different speakers. The listeners had to determine whether the speakers had the same or different native languages. The naïve listeners were native speakers of American English with little exposure to IE; the experienced listeners were native Hindi or Telugu speakers and fluent IE speakers. We expected that naïve listeners would only be able to distinguish between IE produced by native Hindi and Telugu speakers if speaker's native language strongly influences IE production. We expected that experienced listeners might be able to distinguish between IE produced by Hindi and Telugu speakers if native language effects on IE are subtle and salient to regional or social identity.

The acoustic measurements focused on vowel and obstruent production as well as on temporal patterns that contribute to the perception of language rhythm, which reportedly differs in Hindi and Telugu. We reasoned that if IE involves the transference of native language categories, then IE sound patterns produced by Hindi and Telugu speakers should parallel the native language sound patterns produced by the same speakers. If IE phonology is acquired separately from native language phonology, then there should be little to no measurable differences in the IE sound patterns produced by

Hindi and Telugu speakers, and measurable differences in the native language sound patterns produced by the same speakers.

3.2. Methods

3.2.1. Participants

Fourteen IE speakers provided speech samples for the present experiment. Seven speakers had Hindi as their native language and 7 had Telugu as their native language. Three of the Hindi speakers were female and 4 were male. Five of the Telugu speakers were female and 2 were male. All speakers were between the ages of 20 and 35 years old. All speakers were exposed to English education from the 1st grade onwards (age 6), and all continued to be educated in English through college. Five of the native Hindi speakers and 5 of the native Telugu speakers were residing in India at the time of the experiment. The remaining 4 IE speakers were residing in Oregon (Eugene or Portland), but had been in the United States for less than 6 months at the time of recording. All Hindi speakers were from Delhi and all Telugu speakers were from Hyderabad. All the Indian English speakers and listeners are exposed to English taught by the teachers who are native speakers of one of the indigenous languages of India rather than native speakers of English (British or American English). Thus the input variety of English is the codified and standard variety of Indian English – GIE.

Ten naïve listeners and 10 experienced listeners participated in the perceptual judgment task that compared IE produced by native Hindi and Telugu speakers. Ten additional naïve listeners participated in a perceptual judgment task that compared Hindi and Telugu. The naïve listeners were American-English speaking undergraduates from

University of Oregon, who received course credit for their participation. The experienced listeners were 4 native speakers of Hindi and 6 native speakers of Telugu, who were residing in Eugene, Oregon, and had been in the United States for at least one year. None of the experienced listeners were acquainted with any of the Indian speakers who provided the spoken material for the experiment.

3.2.2. Material

The language samples were sentences from different language versions of a story familiar to all Indians; that of Lord Ganesha and his adventurous ride on his mouse at night on Ganesha Puja. The English version was obtained on-line from http://pz26.com (accessed summer 2009). The story was then translated, sentence-by-sentence, into Hindi and Telugu by native speakers of these languages. The translations were then checked against the intuitions, a multilingual speaker with native-like fluency in Hindi, Telugu, and English.

Each story consisted of 13 sentences that varied in length from 11 to 49 syllables in English, from 12 to 43 syllables in Hindi, and from 15 to 53 syllables in Telugu. Appendix II provides the text for each language. The English, Hindi, and Telugu sentences were printed on separate cards in native orthographies (Roman, Devanagari, and Brahmi scripts, respectively). The cards were then shuffled to randomize sentence order before being presented to speakers. The randomization process was used to avoid storytelling prosody.

3.2.3. Production Task

The participants were given a stack of cards that were either in their native language (Hindi or Telugu) or in English. If participants were given cards with sentences in their native language, they were then instructed either in Hindi or Telugu to look through the cards to familiarize themselves with the text. If they were given cards with sentences in English, they were instructed to do so in English. Participants were then asked to read the sentences on each card at a comfortable speed. Participants read through the entire stack in one language, and then the process was repeated for the other language with instructions given in the language that corresponded to the language of the cards. Participants then took a break before returning to the first stack to repeat the process. Participants alternated between stacks (languages) in this way until 3 repetitions of all the sentences had been obtained for each of the languages. The cards were shuffled between each re-reading so that the sentences were read in a new random order every time they were read. Participants were recorded in a quiet room using a Shure professional unidirectional microphone and a Marantz Professional PMD660 portable solid-state recorder. All measures reported in this paper were taken from either the second or third repetition of the sentences. The third repetition was used if the second repetition was not fluently spoken.

3.2.4. Perceptual Judgment Task

On each trial, naïve and experienced listeners were presented with the most fluent IE renditions of two different sentences produced by different IE speakers (sentences 5 and 8, see Appendix II). A second group of naïve listeners were also presented with the

most fluent native language renditions of these same two sentences on every trial. The same pair of different speakers was never repeated for a particular sentence order (5, 8 or 8, 5) in either language task. In half of the stimuli, the different speakers had the same native language background. In the other half, the different speakers had different native language backgrounds. The same and different stimuli were amplitude normalized (70 dB) and presented in random order over headphones to listeners, who were seated in front of a computer in a quiet experimental room. Listeners were instructed that they would hear speech samples from native Hindi speakers and native Telugu speakers. They were then told that their job was to listen to each pair of sentences and judge whether the different speakers had the same language background or different language backgrounds. Judgments were to be made on a 5-point scale, where "1" equaled a confident "same" judgment and "5" equaled a confident "different" judgment. The scale was presented on a computer monitor, and the listeners indicated their response by clicking on the box with the number that corresponded to their judgment. We expected that only experienced listeners might be able to tell the difference in IE produced by speakers with different language backgrounds if the differences were subtle. We expected that naïve listeners would be able to distinguish between Hindi and Telugu, since these languages are reported to differ phonologically.

Perceptual judgments on the paired sentences took approximately 25 minutes to complete. Preliminary analyses indicated that 1 of the 10 naïve listeners who made judgments on IE defaulted to a single judgment and then did not complete the task as required. The judgments from this listener were therefore excluded from further analysis.

For each of the response options the total number of responses was calculated within speaker language background and listeners' experience.

3.2.5. Acoustic Measurements

Acoustic measurements were also used to investigate group differences in the production of IE as well as the similarities and differences between Hindi and Telugu. A number of segmental and suprasegmental characteristics were chosen for analysis including vowel quality, degree of retroflexion for /ʈ/ and /ɖ/, extent of aspiration for voiceless stops, the spectral characteristics of /s/, and temporal patterns associated with lexical stress, phrase final lengthening, language rhythm, as well as a measure of speech rate. The measurement procedures are described in more detail next.

Vowels: Using the Praat speech processing software (Boersma & Weenink, 2011), utterances were displayed and segmented into consonantal and vocalic intervals. F1 and F2 values were extracted automatically at the midpoint of every vowel using formant tracking and a script. Every measure was also visually inspected and when a mismatch between the tracks and the formant band in the spectrogram was detected, script parameters were changed until a proper match was obtained. Formant values were then normalized using the Lobanov method (Thomas & Kendall, 2007) to control for variability due to speaker vocal tract characteristics. Normalized F1 and F2 and the ratio of F1 to F2 were used as dependent variables in the analyses of vowel quality.

Consonants: Six words with post-vocalic retroflex consonants were chosen from the IE, Hindi, and Telugu sample (see Table 3.1) to investigate the degree of retroflexion across languages. Retroflexion was quantified as the difference between F3 and F2 at

vowel offset, which was meant to characterize the degree of F3 depression due to retroflexion (Wiltshire & Harnsberger, 2006). As with the vowel measures, values at F2 and F3 offset were extracted automatically, but the formant tracks for every measure were visually inspected and parameters were adjusted if there was a mismatch between the tracks and the visible formant bands on the spectrogram.

Table 3.1. List of words with retroflex stops /ʈ, ɖ/, voiceless stops /p, k/ and fricative /s/ in English, Hindi and Telugu.

Obstruent	English	Hindi (= gloss)	Telugu (=gloss)
/ʈ/	/hɪʈ/ "hit"	/peʈ/ (stomach)	/ʧuʈʈu/ (around)
	/kɔʈ/ "caught"	/fəʈ/ (rip off)	/kəʈʈu/ (tie)
	/gɔʈ/ "got"	/ghəʈnɑ/ (event)	/pɔʈʈɑ/ (stomach)
/ɖ/	/lɔrɖ/ "lord"	/pɑkəɖ/ (hold)	/ʧeɖɖɑ/ (bad)
	/lɑɖɖu/ "laddoo"	/lɑddu/ (Indian sweet)	/lɑddu/ (Indian sweet)
	/roɖ/ "road"	/bɑɖɑ/ (big)	/roɖɖu/ (road)
/p/	/pəsnalɪti/ "personality"	/pəsand/ (like)	/pəɖɪndi/ (fell)
	/pʊld/ "pulled"	/puja/ (worship)	/puji/ (worship)
	/əpon/ "upon"	/pure/ (whole)	/apuɽu/ (that time)
/k/	/kəpɛsɪti/ "capacity"	/kaha:ni/ (story)	/kada/ (story)
	/kɔʈ/ "caught"	/ka:ran/ (reason)	/kaʈʈu/ (tie)
	/kəsd/ "cursed"	/kar/ (do)	/kalʊgʊ/ (happen)
/s/	/səmθɪŋ/ "something"	/sa:np/ (snake)	/sarɪkɪ/ (as a result)
	/tasks/ "tusks"	/uska/ (his)	/ʧuste/ (if sees)
	/si/ "see"	/vese/ (as a result)	/tisi/ (pull out)

Six words with syllable-initial voiceless stops were chosen from the IE, Hindi, and Telugu sample (Table 3.1) to investigate aspiration across languages. Aspiration was quantified using VOT. With regards to these measures, 3 of the Hindi speakers and 6 of the Telugu speakers produced at least one stop with multiple bursts. When this occurred, VOT was measured from the last burst to voicing onset.

Finally, three additional words were chosen from the IE, Hindi, and Telugu sample (Table 3.1) to compare non-final syllable /s/ production across the 3 languages. Some studies have shown that spectro-temporal properties of /s/ vary with language contact (Erker, 2012). An effect of first language on the production of /s/ in IE might be anticipated based on the differences in the phonemic inventories of Hindi and Telugu: Hindi has /s/ in contrast to /ʃ/ and /z/, whereas Telugu has /s/ in opposition to /ʃ/ and to /ʂ/. The spectral characteristic of /s/ across the 3 languages was captured by a center of gravity (COG) measurement.

Suprasegmentals: Twelve disyllabic words were selected to investigate temporal patterns associated with lexical prominence, which help to define language rhythm (Dauer, 1983). The English words were further categorized according to their dictionary-defined prominence pattern (trochaic or iambic). We attempted to match the prominence patterns of the English words with prominence patterns in Hindi and Telugu words following the quantity-sensitive stress rules for the different languages and the intuition on prominence placement. Table 3.2 provides the list of words selected for this analysis.

Lexical prominence was captured as the ratio of first vowel duration to second vowel duration in the disyllabic word (V1:V2) since duration represents the best correlate

of lexical prominence in English (Huss, 1978) and since the temporal pattern corresponded best with our interest in rhythm.

Table 3.2. Disyllabic words selected from English, Hindi, and Telugu texts for analyzing lexical stress.

Language	Trochaic pattern	Iambic pattern
English	after, nothing, something, stomach, story, temper, very, witnessed	event, himself, respect, result
Hindi	dekha, galti, gusse, jese, mani, niche, puja, pure	ise, laddu, lekin, pakad
Telugu	meda, mani, oka, pedda, peru, poṭṭa, puji, velli	kopam, laddu, tatar

Phrase final lengthening also contributes to the perception of language rhythm (Nooteboom, 1997). Final lengthening in IE, Hindi, and Telugu was assessed by dividing the final vowel duration by penultimate vowel duration in the sentence for each of the 13 sentences.

Finally, we calculated several global rhythm metrics based on interval duration and speech rate. These measures have all been used to distinguish between languages from different rhythm classes (Dellwo, 2010; Grabe & Low, 2002; Ramus, Nespor, & Mehler, 1999). Although we acknowledge the controversy surrounding the hypothesis that interval duration measures adequately convey language rhythm (see, e.g., Arvaniti, 2009), we also note that the measures provide an objective description of vocalic and consonantal durations, and these are at least in part correlated with long-established notions of rhythm.

The interval duration measures used in the current experiment were as follows: the proportion of vowel duration to total speech duration in a sentence (%V, Ramus et al., 1999); the standard deviation of consonant duration for each sentence (ΔC, Ramus et al.,

1999); and the normalized weighted summed difference of sequential vowel durations across a sentence minus the final syllable (nPVI, Deterding, 2001; Grabe & Low, 2002). Speech rate was calculated as the number of vowel intervals (=syllabic nuclei) per second of speech for each sentence, following one of the measures used by Dellwo (2010).

3.2.6. Analyses

The perception data were analyzed using an ordinal logistic regression model in SPSS. We used the listener's response (1-5) as the dependent variable. Speakers' native language and listeners' experience were entered into the analysis as predictors. The ratings were also z-transformed within each listener so that the results could be visualized using a normally distributed dependent measure, comparable across listeners.

For the acoustic data linear mixed effects modeling was used to investigate the effect of native language on IE as well as on the similarities and differences of the sound patterns of the native languages involved. The analysis investigated the fixed effects of speakers' native language (Hindi or Telugu speakers) and language task (IE or L1) on the various acoustic measures. Segment identity was an additional fixed factor in the analysis on retroflexion and aspiration. The English lexical prominence pattern was an additional fixed factor in the analysis on V1:V2 duration. Again, item (word or sentence) and speaker were treated as random factors. All results are given with the denominator degrees of freedom rounded to the nearest whole number.

3.3. Results

American-English speaking listeners were less able to distinguish between English sentences produced by native Hindi and Telugu speakers than native Hindi and Telugu speaking listeners, but the naïve listeners easily distinguished between Hindi and Telugu sentences. Moreover, naïve listeners were better able to differentiate between Hindi and Telugu than experienced listeners were able to differentiate between English produced by Hindi and Telugu speakers. The acoustic measures were consistent with the perceptual results. Although Hindi and Telugu differed on almost every measure, the English produced by native Hindi and Telugu speakers differed on only 3 measures. These results are presented in detail below.

3.3.1. Perceptual Judgments

The analysis of similarity ratings on IE sentences as a function of speakers' native language (Hindi or Telugu) and listener experience (naïve or experienced listener) revealed a simple effect of speakers' native language, $\chi^2(1) = 8.40$, $p = .004$, and a significant interaction between speakers' native language and listener experience, $\chi^2(1) = 41.37$, $p < .001$. The significant interaction is shown in Figure 3.1.

Analyses on ratings split by listener experience indicated that the effect of speakers' native language was significant for both naïve American-English speaking listeners $\chi^2(1) = 6.25$, $p = .012$, and for experienced Hindi and Telugu speaking listener [$\chi^2(1) = 44.08$, $p < .001$]; however, it was only experienced listeners who could accurately differentiate English sentences produced by native Hindi speakers from those

produced by native Telugu speakers. Naïve listeners appear to have judged English produced by speakers with the same native language as more different than English produced by speakers with different native languages. The result is entirely unexpected. Further investigations revealed no immediate explanation: the effect was not driven by a particular listener nor by significant differences in the "same" or "different" stimuli. (We considered whether there were important differences in the proportion of stimuli with same gender pairings of speakers within each type; there were not.) Naïve listeners clearly attended to something in the productions, but that something was not related to the native language of the speakers.

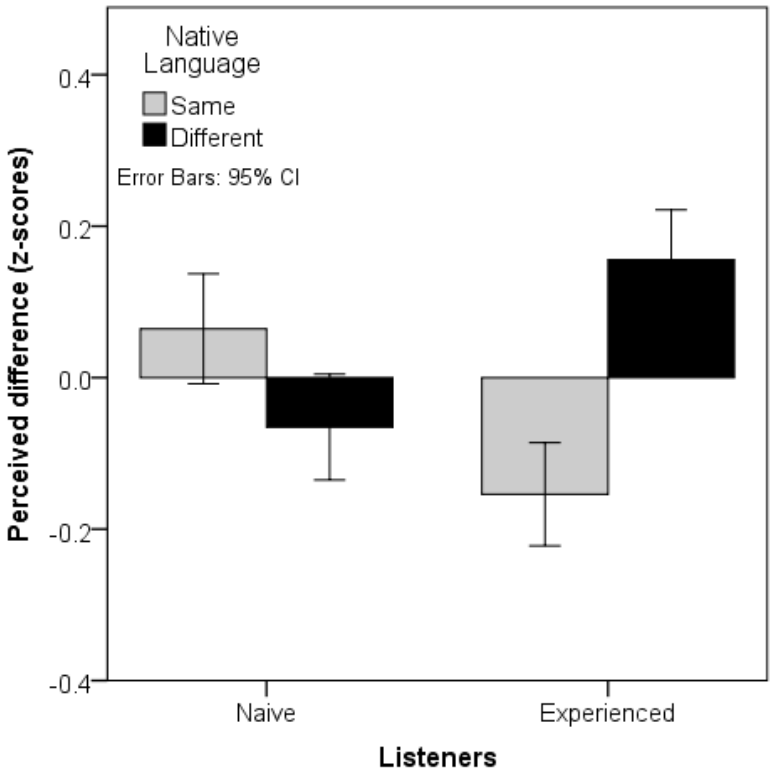


Figure 3.1. Listener difference ratings of IE sentence pairs are shown as a function of the speakers' native language (same vs. different) and listeners' experience (naïve=native American-English speaking, experienced=native Hindi or Telugu speaking). Note that analyses were conducted on the untransformed dependent variable (see Analyses).

The analysis of naïve listeners' similarity ratings on IE and L1 sentences also revealed a significant effect of language task, $\chi^2(1) = 11.38$, $p = .001$, significant effect of speakers' native language, $\chi^2(1) = 26.25$, $p < .001$ and significant interaction effect of language task and speakers' native language, $\chi^2(1) = 77.60$, $p < .001$. It is clear from Figure 3.2 that the interaction was due to the fact that naïve American-English speaking listeners were very clearly able to appropriately differentiate Hindi from Telugu sentences. Listener difference ratings of IE sentence pairs are shown as a function of the speakers' native language (same vs. different) and listeners' experience (naïve = native American-English speaking, experienced = native Hindi or Telugu speaking).

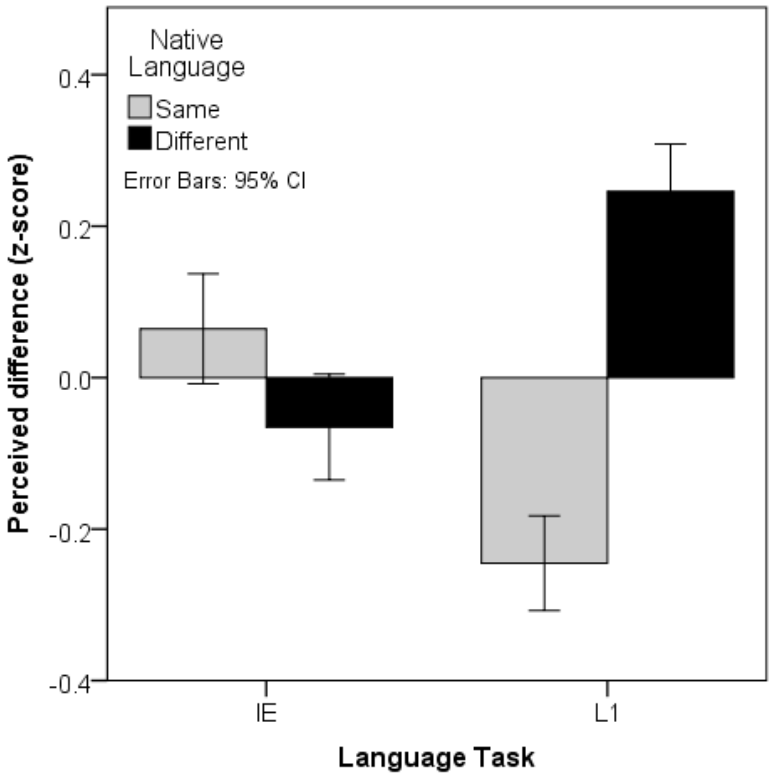


Figure 3.2. Naïve listener difference ratings on IE and L1 sentence pairs are shown as a function of the speakers' native language (same vs. different). Note that analyses were conducted on the untransformed dependent variable (see Analyses).

Visual inspection of the results shown in Figures 3.1 and 3.2 suggests that one other comparison between the groups may be interesting: a comparison of naïve listeners' difference ratings of Hindi and Telugu compared to experienced listeners' different ratings of English produced by native Hindi and Telugu speakers. An analysis of the effect of language task and speakers' native language on the ratings from the different groups of listeners confirms the impression derived from inspection of the figures; namely, that naïve listeners were better at differentiating Hindi and Telugu than experienced listeners were at differentiating English produced by speakers with different native language, $\chi^2(1) = 12.50$, $p < .001$. Table 3.3 shows a break-down of the actual responses based on speakers' native language (same or different), language task (L1 or IE) and listeners background (Naïve or Experienced).

Table 3.3. Distribution of listeners' response as a function of speakers' native language, language task and listeners' background.

Listener background	Language Task	Confidence Score	Target/Native language	
			Same	Different
Naïve	L1	1 = same	302	137
		2	200	119
		3	74	70
		4	110	167
		5 = different	226	347
	IE	1 = same	219	238
		2	102	128
		3	71	80
		4	125	104
		5 = different	235	194
Experienced	IE	1 = same	301	197
		2	147	126
		3	59	59
		4	111	138
		5 = different	190	283

Taken together, the similarity ratings on IE sentences by naïve and experienced listeners indicate perceptible effects of L1 on IE, albeit fairly subtle ones that are only identified by experienced listeners. Note that the results on ratings of Hindi vs. Telugu show that naïve listeners' are very good at picking up on phonological differences when these are sufficiently robust.

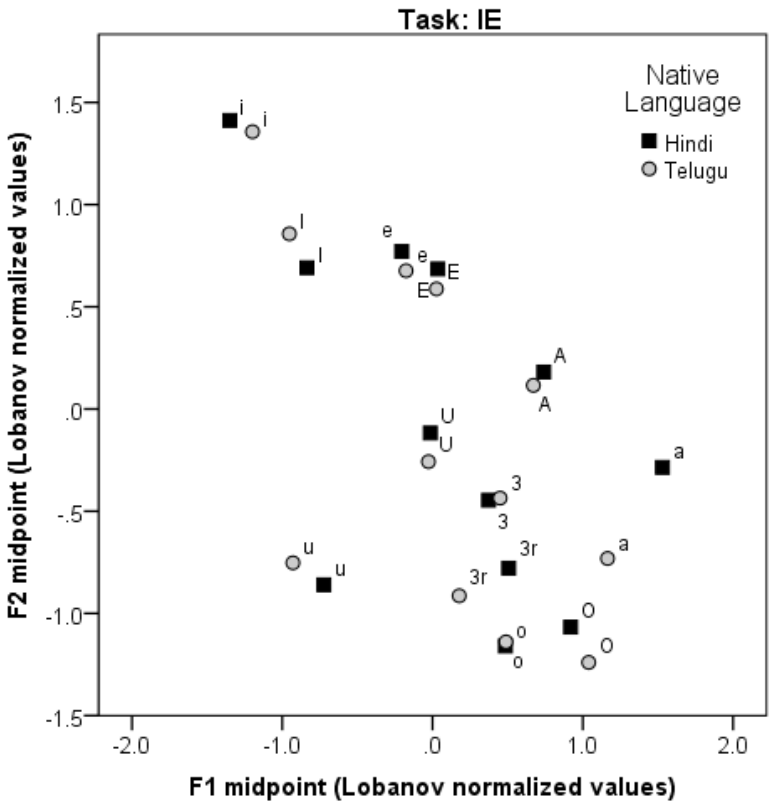
3.3.2. Acoustic Measurements

The next set of analyses addressed the effect of language task and speakers' native language on the production of specific segmental and suprasegmental attributes. The results on vowel production are presented first, followed by those on retroflexion, aspiration, /s/ production, lexical stress, final lengthening, and rhythm, in that order.

The IE and L1 vowels are plotted in Figure 3.3 according to their normalized F1 and F2 values and shown as a function of speakers' native language. A qualitative comparison of the different vowel spaces depicted in the figure suggests that IE does vary somewhat with speakers' native language, but the differences between IE and the L1s are more striking. Quantitative analyses were conducted to determine which, if any, of the differences evident in Figure 3.3 were systematic enough across speakers to be statistically significant. In particular, the analyses investigated the effects of native language and language task on F1 and F2 separately; the focus was just on F1 and F2 because these contribute the most to vowel perception (Fry, 1979; Aylett, 1996).

Analyses of F2 revealed significant effect of task on /e/, $F(1, 24) = 10.27$, $p = .004$. This vowel was more centralized in IE compared to the L1. Analyses on F1 revealed a suite of high and mid vowels that were lower in IE compared to L1: /i/, $F(1,$

24) = 8.02, p = .009; /e/, $F(1, 24) = 24.78$, $p < .001$; /ɔ/, $F(1, 24) = 68.89$, $p < .001$; /o/, $F(1, 18) = 35.04$, $p < .001$; /ʊ/, $F(1, 24) = 18.44$, $p = .001$. Figure 3.3 shows that IE vowels are more centralized compared to the L1 vowels, suggesting different vowel spaces for IE and the L1s. There were also significant effects of native language on F1 for /i/, $F(1, 24) = 4.47$, $p = .045$, and /e/, $F(1, 24) = 6.87$, $p = .015$, and a significant interaction between task and native language for /ɪ/, $F(1, 17) = 4.88$, $p = .041$. If we interpret these results with reference to the group mean values shown in Figure 3.3, we find that the main effects were due to Hindi speakers producing more raised front vowels /i/ and /e/ than Telugu speakers across the language tasks. The interaction was due to a relatively raised /ɪ/ in Hindi compared to Telugu, but similar productions of /ɪ/ in IE regardless of speakers' native language.



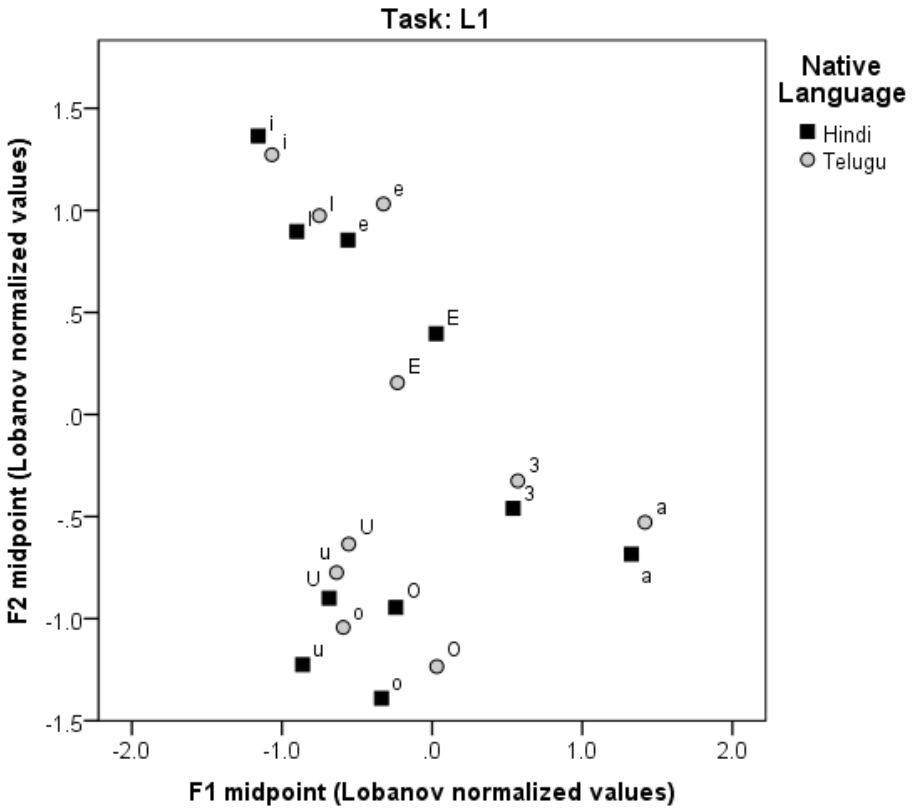


Figure 3.3. The monophthongal vowel space is shown for IE (top) and L1 (bottom) as a function of speakers' native language. Vowel measures were taken at the F1 and F2 midpoint and normalized using the Lobanov method (note: i=/i/ or /i:/, I=/ɪ/ or /i/, e=/e/ or /e:/, E=/ɛ/ or /e/, A=/æ/, a=/ɑ/ or /ɑ:/, 3=/ə/, 3r=/ɚ/, o=/o/ or /o:/, O=/ɔ/ or /o/, u=/ʊ/ or /u/, u=/u/ or /u:/).

With respect to degree of stop retroflexion, an analysis of the difference between F3 and F2 at vowel offset indicated no significant main effects of speakers' native language, language task or consonant type, but there was a significant 2-way interaction between native language and consonant type, $F(1, 134) = 4.35$, $p = .039$, and 3-way interaction between these factors, $F(1, 134) = 7.48$, $p = .007$. This result, shown in Figure 3.4 appears to have been due to similar degrees of retroflexion across consonant types in IE compared to the L1, and a native language difference in the consonant that was produced with more retroflexion (i.e., a smaller difference in F2 and F3 offset). Hindi

speakers, in particular, appeared to have produced /ʈ/ with more retroflexion than /ɖ/, but the reverse may have been true for Telugu speakers. Thus, once again, L1 differences were evident, but IE targets were constant across speakers with different native languages.

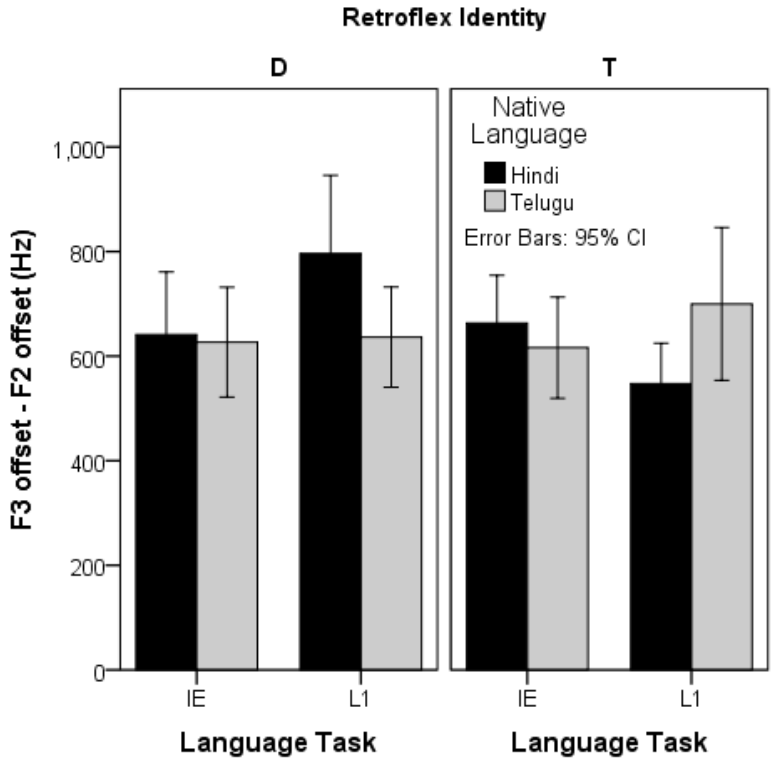


Figure 3.4. Degree of retroflexion of post-vocalic stops is shown for IE and L1 as a function of the speakers' native language. Retroflexion was measured as the difference between the F2 and F3 offset values in the preceding vowel (note: T=/ʈ/, D=/ɖ/).

As for the degree to which voiceless stops were aspirated, the analysis on VOT indicated a main effects of speakers' native language, $F(1, 158) = 6.40$, $p = .012$, and stop identity, $F(1, 158) = 46.34$, $p < .001$, but no effect of language task and no interactions between the factors. Figure 3.5 shows these results.

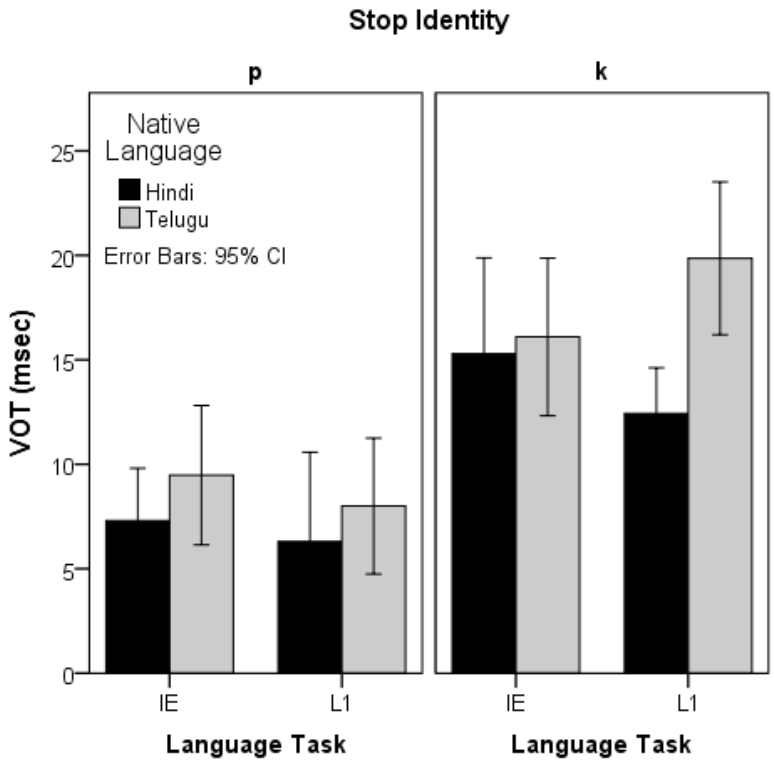


Figure 3.5. Syllable-initial, voiceless bilabial and velar stop voice onset times (VOT) are shown for IE and L1 as a function of the speakers' native language.

In spite of the main effect of speakers' native language, VOT in Hindi English was not different from VOT in Telugu English. Rather, the native language effect seems to have been driven by a significant difference in the production of Hindi and Telugu voiceless velar stops: post-hoc comparisons showed that these were produced with significantly less aspiration in Hindi compared to Telugu ($p = .001$).

In contrast to the measures of retroflexion and aspiration, the frequency measures on /s/ showed a clear effect of speakers' native language on IE. Like the results on stop aspiration, the overall analysis of mean frequency indicated a significant effect of speakers' native language, $F(1, 80) = 13.38$, $p < .001$, but no effect of language task or interaction with language task. Unlike the results on stop aspiration, post-hoc

comparisons indicated that the difference between speakers' native language was significant for IE ($p = .021$) as well as for the L1 ($p < .001$). Figure 3.6 shows that Hindi speakers produced /s/ with a lower average frequency in English and in their L1 compared to Telugu speakers.

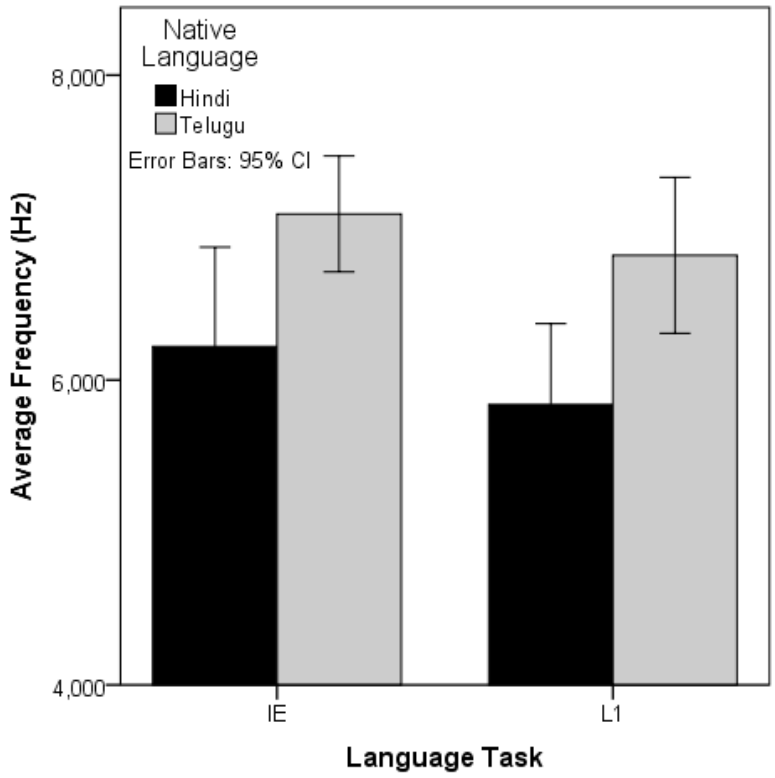


Figure 3.6. The average frequency of syllable-initial /s/ is shown for IE and L1 as a function of the speakers' native languages (L1).

The analyses on suprasegmental temporal patterns indicated a minimal effect of native language on IE, but substantial differences in the sound patterns of Hindi and Telugu. For example, the results on temporal patterns associated with lexical stress in English indicated a significant effect of speakers' native language, $F(1, 297) = 29.84$, $p < .001$, and stress pattern, $F(1, 297) = 5.18$, $p = .024$, on the vowel-to-vowel duration ratio. There was also a significant interaction between speakers' native language and task, $F(1,$

297) = 9.12, p = .003. When the data were split by language task, the effect of speakers' native language was significant for L1 disyllabic words, $F(1, 140) = 39.09$, $p < .001$, but not for IE. Of course, the effect of lexical stress pattern was significant in IE, $F(1, 157) = 8.50$, p = .004, but not in the L1s. The results are shown in Figure 3.7.

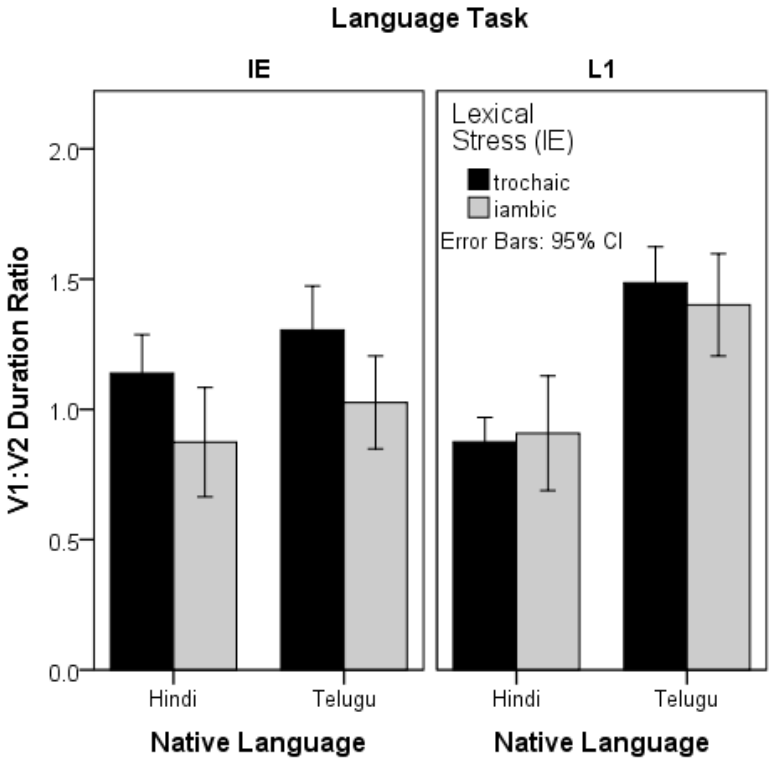


Figure 3.7. IE and native language (L1) lexical stress in disyllabic words, measured as the ratio of the duration of the first vowel to the duration of the second, is shown as a function of speakers' native language (Hindi and Telugu).

We can see in Figure 3.7 that trochaically- and iambically-stressed English words were differentiated regardless of the speakers' native language, and that the striking differences between Hindi and Telugu speakers occurred in the L1s where disyllabic words were produced either with a long V2 relative to V1 (Hindi) or a long V1 relative to V2 (Telugu). Thus, the results once again indicated a strong contrast between Hindi and

Telugu, but none in the IE produced by Hindi and Telugu speakers. The difference in this stress pattern in Hindi and Telugu speakers must be due to the fact that Hindi is more stress-timed than Telugu. The literature strongly points to the view that Hindi speakers have intuitions with respect to the location of stress in Hindi words. Arun (1961:21) claimed that "stress is not so prominent in Hindi as in English. However, it is sometimes phonemic". Similarly, Mehrotra (1965) suggested that stress plays a vital part in Hindi, although not as vital as in English, or Russian, or Greek. In addition, the current experiment suggests an effect of L1 on rhythm with Hindi speakers having higher variability in vowel duration than Telugu speakers.

In contrast to the results on lexical prominence patterns, the results on phrase-final lengthening suggested an effect of native language on IE. The overall analysis indicated a main effect of speakers' native language on the measure of final lengthening, $F(1, 347) = 4.33$, $p = .038$, but no effect of language task or any interaction between the factors. Post-hoc analyses indicated that the effect of speakers' native language on final lengthening was not significant within each language, so the effect was small (see Figure 3.8). Overall, Hindi speakers engaged in more phrase-final lengthening than Telugu speakers regardless of the language they were speaking.

Finally, the analyses on global rhythm metrics and speech rate suggested that IE has a rhythm pattern that is distinct from either Hindi or Telugu, and that the native language has little influence on speakers' production of IE rhythm. Specifically, the analyses indicated an effect of speakers' native language on ΔC $F(1, 166) = 3.96$, $p = .048$ and on speech rate, $F(1, 163) = 69.28$, $p < .001$, an effect of language task on %V, $F(1, 171) = 122.11$, $p < .001$, ΔC, $F(1, 164) = 11.63$, $p = .001$ and speech rate $F(1, 151) =$

257.23, $p < .001$, and an interaction between speakers' native language and language task on speech rate, $F(1, 151) = 148.44$, $p < .001$.

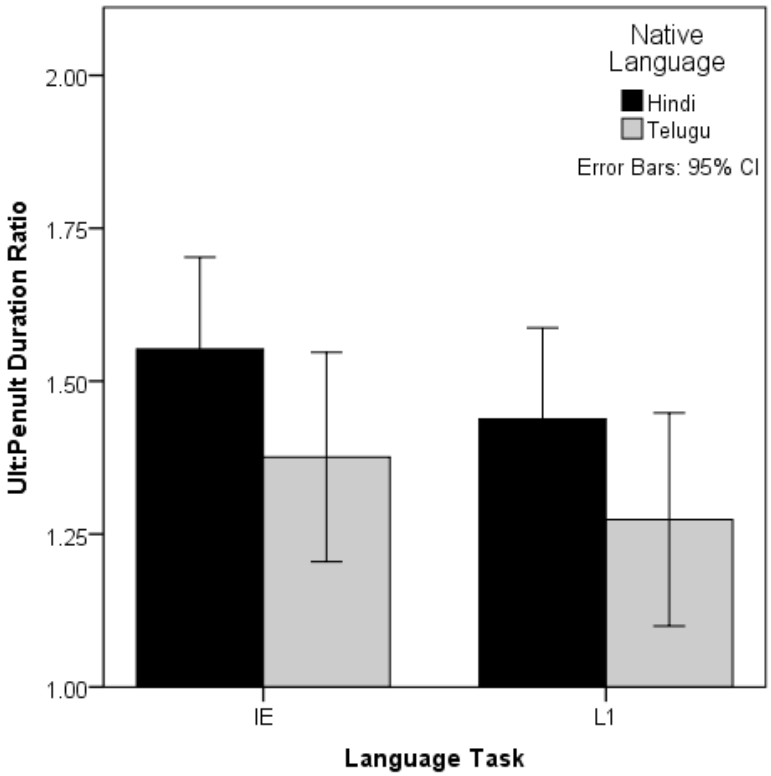


Figure 3.8. Phrase-final lengthening, measured as the ratio of the ultimate vowel duration to the penultimate vowel duration, is shown for IE and the speakers' native languages (L1) as a function of the speakers' native language.

Post-hoc comparisons indicated no significant effect of speakers' native language on any of the measures in IE, but a significant effect of speakers' native language on L1 ΔC (p = 011), and speech rate ($p < .001$). Note that there were no significant main effects or interactions on nPVI. The significant results are shown in Figure 3.9.

Although the %V value (46.8%) in IE was lower than the values for Hindi (52.3%) and Telugu (51.2%), it was still much higher than that reported for the canonically stress-timed language, British English (41.1%; Grabe & Low, 2002).

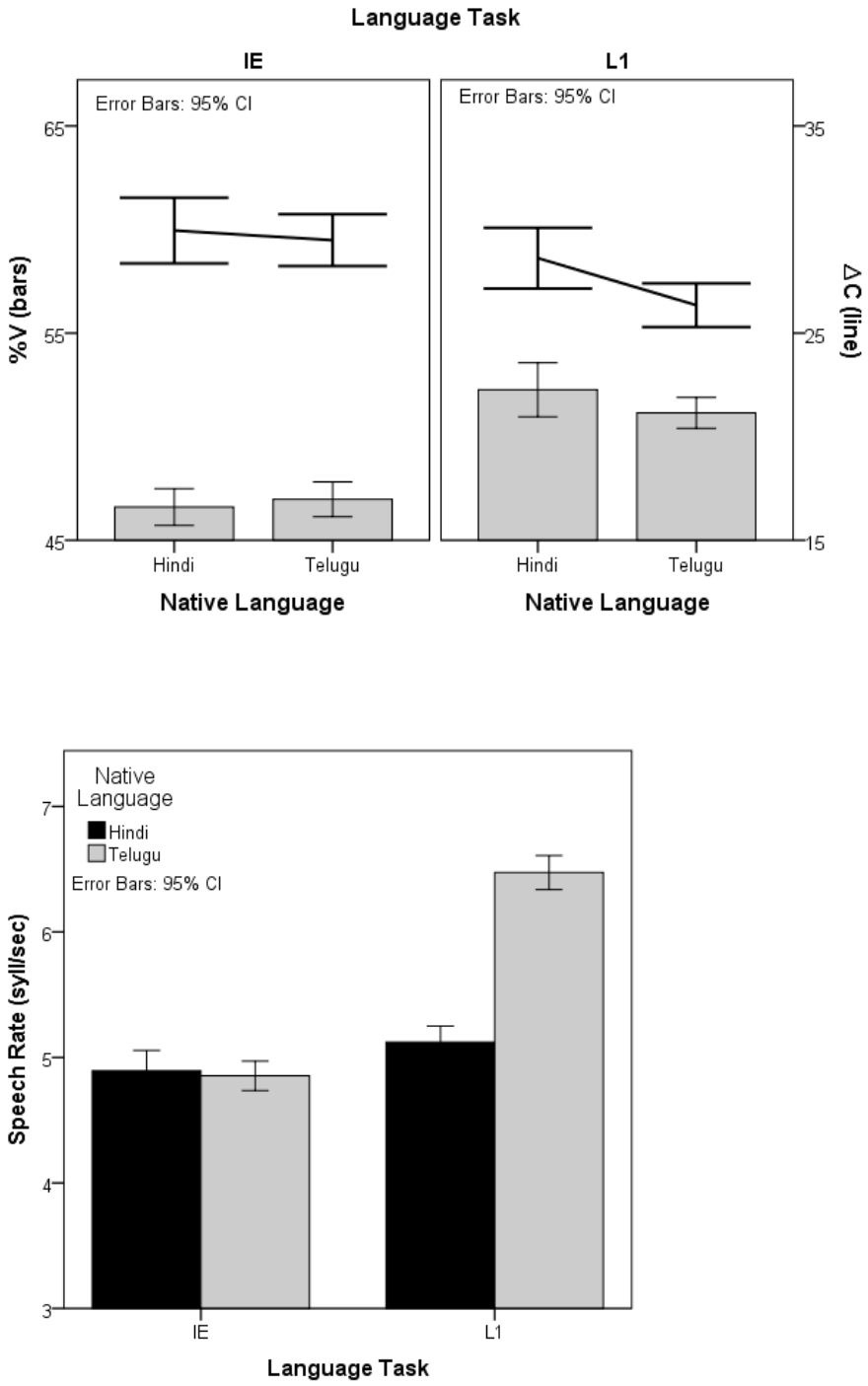


Figure 3.9. Several global measures of language rhythm are shown for IE and L1 as a function of the speakers' native language. The top panel shows the results for the average percent of vowel duration (bars) and the standard deviation in consonant duration (line) across each phrase. The bottom panel shows the results for speaking rate, also calculated separately for each phrase.

Similarly, the ΔC value for IE (29.7) was marginally higher than the value for Hindi (28.6) and for Telugu (26.4), but much lower than that reported for British English (54; Ramus et al., 1999). Of course, the interval-based measures, including speech rate, are sensitive to a variety of factors that are not strictly rhythmic, and so a cross-study comparison of mean values should be interpreted with caution. The comparison does, nonetheless, support the intuition that timing in IE is significantly different than timing in British English. We have further shown here that the timing of IE is also substantially different from that of two indigenous Indian languages.

In sum, the acoustic measures indicated some effects of native language on IE. In particular, there were L1 effects on IE /i/, /e/, /ɑ/, and /u/, on the articulation of /s/, and on final lengthening. The L1 effect on vowels and final lengthening can be interpreted with respect to the values obtained for each native language. The L1 effect on /s/ might be due to the fact the Hindi has a different sibilant / shusher set than Telugu: /s, ʃ, z/ versus /s, ʃ, ʂ/. Although there were some language-specific differences in IE, many more differences were found in the sound patterns of Hindi and Telugu themselves. The degree of stop retroflexion varied by language with Hindi speakers producing /ʈ/ with more retroflexion than /ɖ/ and vice versa for Telugu speakers consistent with Ladefoged and Bhaskararao (1983) who also found that the degree of retroflexion varies between Hindi and Telugu language. Hindi speakers also produced stops with less aspiration and /s/ with a lower mean frequency than Telugu speakers. In addition, Hindi speakers lengthened V2 relative to V1 in disyllabic words, whereas Telugu speakers did the reverse. This finding is likely due to differences in stress placement: the last syllable is typically stressed in Hindi, but the first syllable in Telugu. Finally, Hindi speakers engaged in somewhat more final

lengthening than Telugu speakers, and produced phrases with higher %V and ΔC, but at slower speech rates than Telugu speakers. Altogether, the results are consistent with the suggestion that Indians with similar educational backgrounds have similar IE representations that are minimally influenced by their L1.

3.4. General Discussion

The current experiment investigated native language influences on IE as spoken by Indians with different language backgrounds and educated in English medium schools. This experiment was undertaken to assess the competing hypotheses that IE represents L1 influenced English or a perfectly acquired pan-Indic variety of English. Although most contemporary linguists likely accept that IE is a distinct variety of English, IE diverges from other major dialects of English in that its speakers are nearly always exposed to the language after they have acquired one or more indigenous Indian languages. It is therefore reasonable to assume that IE phonology may not be stable across speakers in India. The strongest version of this assumption predicts that native language phonologies will account for both the similarities and differences in IE produced by speakers with different language backgrounds. The current findings are consistent with previous findings in contradicting this strong prediction. Specifically, the present results indicate that the sound patterns of IE show minimal variation with native language background even while the sound patterns of the native languages are substantially different from one another.

The present results are not fully consistent with the alternative strong hypothesis, namely, that IE represents a perfectly acquired pan-Indic variety of English with a

distinct and stable phonology. Like Maxwell and Fletcher (2010) and Wiltshire and Harnsberger (2006), we found some effects of L1 on IE. Because we controlled for age of acquisition, the L1 effects found in the present experiment cannot be easily attributed to divergent proficiency levels. This ambiguity raises the following questions: do the L1 effects on IE indicate its incomplete acquisition, which is defined here as partial overlap between speaker's L1 and IE phonology? Or are the subtle L1 effects due to sociolinguistic factors, including identity and/or regional variation? Although the results from the current and previous studies on IE do not provide definitive answers to these questions, we suspect that the noticeable effects of indigenous languages on IE are due to sociolinguistic factors rather than to psycholinguistic ones.

As noted in Chapter II, many Indians are first exposed to English at age 6 in primary schools. There is evidence to suggest that this is early enough for individuals to acquire an "accentless" variety of a target language (Flege & Fletcher, 1992; Long, 1990). Let us consider what this might mean in the Indian context. English medium school teachers do not speak English natively, nor do they have the same L1 as each other or as their students, and there is also some indication that not all teachers have equal proficiency in English (Annamalai, 2005; Mohanty, 2006). Putting aside the question of how one assesses proficiency in a variety that is not well described and has emerged through use by multilingual speakers, let us assume for the moment that children received highly variable English input. If this is not currently the case (and it may not be), then we can at least assume that it was the case for young English-learning Indians at some point since the adoption of the Three Language Policy in 1968. Under these circumstances, the notion of accentless IE may be the same as that of language

emergence. That is, adults who learned IE from a young age may have come to produce the same IE patterns regardless of their first language if they regularized the variable input that they received.

We know from the example of Nicaraguan Sign Language that young children can regularize highly variable input to create a grammatically structured language within a single generation (Senghas, Sotaro, & Ozyurek, 2004). What appears to be critical to the speed at which this process occurs is the size of the community of young people involved, and their motivation for learning the language and using it among themselves (Senghas, Senghas, & Pyers, 2005). As noted in Chapter II, the community of young people learning English in India is extremely large. Moreover, the language has become a lingua franca for young people of different language backgrounds, who interact regularly in the multilingual urban cities of India. Under these circumstances, it is hard to imagine that IE is anything other than another variety of English, albeit one that may have already evolved into multiple varieties (see, e.g., Wiltshire, 2005).

Strong social and regional pressures may account for multiple IE varieties. The prevailing political unrest in Northeastern India and the secessionist impulses of many citizens in the region provide an extreme example of these pressures. Wiltshire (2005) noted that such pressures could account for the Tibeto-Burman influenced variety of IE spoken in the region. She also advocated for descriptive work to determine the number of varieties in existence and the extent to which they are based on L1 phonologies. A complementary research program would be to investigate regionally based differences on IE that are independent of L1. For example, we are interested in the possibility that the IE spoken by native Hindi speakers from cities other than Delhi may differ from that spoken

by native Hindi speakers in Delhi. Similarly, for the IE of native Telugu speakers living in different cities. An experiment of this sort would disambiguate psycholinguistic and sociolinguistic factors to some degree. And, if the regional varieties of IE varied in the way that IE varied by language group in this experiment, then we would have better evidence for sociolinguistic explanations of what otherwise looks (merely) like L1 influenced IE.

CHAPTER IV

EXPERIMENT 2: REGIONAL INFLUENCES

4.1. Introduction

The previous experiment indicated that the sound patterns of IE show minimal variation with native language even while the sound patterns of the native languages are substantially different from one another. However, the experiment design did not control for region: Hindi speakers were from Delhi, and Telugu speakers from Hyderabad. This confound of L1 and region does not allow us to conclude that the differences found in IE are necessarily explained by L1 differences. As discussed in Chapter II, regional influences are very evident in language, even in monolingual countries like the United States and the United Kingdom where English "… differs markedly from one territory to another and even from one region within a given territory to another McArthur (1998:43)." Balasubramanian (2006:4) also suggested that English used as a second language in other countries, "cannot and should not be regarded as a (single) variety, as there is no single geographical region to talk about, no single language background … (particularly in a highly multilingual situation like India), and no one situation of use."

Also noted in Chapter II, IE has been described as having regional varieties. In particular, Pingali (2009:18) stated that "the speech of Indians can be classified on the basis of the geographical regions and further regions within them." Unfortunately, she does not list these geographical varieties. However, Bhaskararao (2002) suggested that IE has very distinct pronunciation patterns in the following regions: North-Eastern India, Bengal, and Orissa (East), Andhra, Karnataka, Tamil Nadu, & Kerala (South),

Maharashtra, Gujarat (West), Punjab and Bihar (North). In addition, Chaudhary (2004) and Gargesh (2004) have described some segmental differences and differences in the phonological patterns of IEs spoken in different regions. For example, Chaudhary (2004:4-5) observed that

> (s)ome speakers of English in south India pronounce both *far* and *for* as *for*. While the Hindi speakers pronounce both these words as *far*… Among South Indian speakers, there is a tendency to precede some initial vowels by a *y* sound. Thus, we can come across words like *yell, yem* and *yen* for the letters *l, m* and *n*... whereas Hindi speakers pronounce them as *el*, *em* and *en*.

Wiltshire (2005) showed that the IE spoken by speakers from north-eastern India is easily distinguished from other "Indian" Englishes and from General Indian English (GIE). Wiltshire suggested that the strong social and regional pressures prevailing in north-eastern states of India could perhaps explain the difference. In the same way, we might imagine that the political and regional pressures in Andhra Pradesh (the Telugu speaking state), which has led to the division of the state into Telangana and Seemandhra, may have similar linguistic consequences for IE spoken by people in Hyderabad, the capital city of Andhra Pradesh. Corpus studies (Hoffman et al., 2011; Nam et al., 2013) have looked at regional differences between IE and the Englishes spoken in the neighboring countries of Pakistan, Bangladesh and Sri Lanka with respect to specific syntactic features. These studies suggest subtle differences across the regional varieties even though all emerged from the imposition of British English during the colonial period.

Together, studies of English spoken on the Indian subcontinent indicate that there are likely regional IE varieties. This observation is consistent with the hypothesis put

forward in Chapter III whereby subtle differences between Hindi IE and Telugu IE could be attributed as much to regional factors as to the L1 itself. The hypothesis of regional varieties (dialects of IE) seems even more likely when we consider that the divide between north and south is especially salient in India. This divide has been explained in terms of the Aryan Invasion theory (see Frawley, 2005). According to this theory, India was invaded and conquered by nomadic light-skinned Indo-European tribes from Central Asia around 1500-100 BC, who overthrew an earlier and more advanced dark-skinned Dravidian civilization from which they took most of what later became Hindu culture. Frawley observed that this theory

> (F)irstly, served to divide Indians into a northern Aryan and southern Dravidian culture which were made hostile to each other. This kept the Hindus divided and is still a source of social tension. Second, it gave the British an excuse in their conquest of India. They could claim to be doing only what the Aryan ancestors of the Hindus had previously done millennia ago.

Even after independence from the British, a North/South divide has persisted in India. People are identified as belonging to a particular region based on stereotyped looks and IE accents. Although, to the best of my knowledge, there is no academic work that has looked at the sociolinguistic aspects of the situation, ample evidence for the persistence of the divide can be found in books and films, and in the way people talk about one another on the internet. For example Kushwant Singh in his book *India Without Humbugs* distinguishes his characters by taking a mocking tone to their Tamilian English (South Indian): “India govvermentta no gudda Madras govvermentta very gudda India govvermentta morning appointmentta evening ruttrunchmentta Madras

govvermentta morning appointmentta evening permanentta." Similarly, Bollywood movies (such as *Padosan*, *Chennai Express*, and *Khiladi*) play on North versus South stereotypes to add humor. But this practice results in a situation that creates further division as many perceive it as North Indians making fun of South Indians. For example, Shiv Visvanathan in an article in firstpost.com on August 12, 2013 said about the movie *Chennai Express*, "Stereotypes block awareness of the other, and other alternatives and become undemocratic. North and South, despite the loyalty of fans, get divided further by *Chennai Express*." In addition, there are plenty of blogs and many articles in Indian newspapers that discuss this divide and the attitudes people have towards one another. For example, in an article "The great North-South debate rages" published in Times of India (April 14, 2008) by Santosh Desai summed this divide as follows:

> The North and South of India have traditionally seen themselves as polar opposites. Given the stranglehold the North has had on national politics as well as national modes of popular representation (cinema and hence music), the mutual stereotyping crystallized into the categorization of the South as the lesser other – a strange being from another world, to be looked at with patronizing curiosity and to be referred to in broad brushstrokes of crude humour. The Hindi film, beginning with *Mehmoods Masterji* in Padosan, perpetuated the ai-ai-yo view of the South Indian for a long, long time…. This has given rise to a new stereotype. The ignorant North Indian category relies on the North Indians lumping together of four rich and varied Southern cultures under one umbrella to justify itself. Of course, this is just as true for the North where 11 different states are banded together under one label… It is only because of the skewed nature of the power

equation that North Indian ignorance has a punitive consequence while South Indian ignorance is ignored.

Another article, "Indian English Blemishes" by Sajeesh in the online newspaper Non Resident Indian (NRI) (May 03, 2012), argued that "Indian English can at best, be categorized into two – northern and southern." These examples provide evidence of a strong native sentiment that there is a North/South divide in India.

Regionalism in the north and south has led to division of states (e.g., Andhra Pradesh into Telangana and Seemandhra). In India, regions are socio-culturally very distinct from one other, and often home to majorities with different L1s. Since Independence, states or sub-states of India have been created with autonomous powers in order to politically accommodate linguistic identity. However, regional identity goes beyond language as noted previously in Chapter II. For instance, of the states that have been created in 2000—Uttaranchal, Chhattisgarh, and Jharkhand—language did not play the predominant role. Similarly, statehood or sub-statehood in the north-east is based on tribal ethnicity, not language (Bhattacharyya, 2003).

Regional accents may have evolved due to geographical separation and social differences, but they are maintained because they mark identity. For example, Underwood (1988) showed that a strong Texas accent is indexed by use of low monophthong /a/ where the standard variety of American English uses diphthong /ai/ and "the regional Texas /a/ has retained its popularity because many Texans, regardless of their social transformations, have not abandoned their identity as Texans (p. 418)." Thus it seems reasonable to assume that even though IE is not a native language, its status as a lingua franca in India may mean that its regional differences have evolved and are being

maintained so that when people from the north and south talk, for instance, they are communicating social information as much as linguistic information.

Social and economic circumstances in present day India allow us to test the hypothesis of IE dialects by disambiguating L1 influences on IE from regional influences on IE because people with different L1s now routinely live together in major cities. Delhi and Hyderabad are among the top 10 big cities in India that have shaped the regional pattern of urbanization and inter-regional flow of migration since 1990 (NSSO, 2010). According to the 2001 Indian census, 309 million people, 30% of the total population of India, were migrant workers. Migration into large metropolises became especially significant between 1991-2001 Delhi grew by about 45 percent (2.17 million) due to in migration, and Hyderabad by about 26 percent (500,000). This migration into cities has rendered them multilingual. So, for example, Delhi in the north has 28,067 Telugu speakers according to the 2001 census figures. It is reasonable to assume that South Indians moving to Delhi may adjust to a Delhi IE accent and lifestyle so that they may more easily integrate into the social-economic life of the city. There is also a very well-known proverb in Hindi, "Jaisa des waisa bhes," which is parallel to "when in Rome do as the Romans do," suggesting that there is also social pressure to integrate.

In the current experiment, we focused on Delhi (North) and Hyderabad (South) speakers' production of IE, selecting individuals from each city who had Hindi as a native language and others who had Telugu as a native language. Speakers with these L1s were chosen so that we could make a direct comparison with the results from the experiment reported in Chapter III. For this reason, we also used the same elicitation task as in the previous experiment. Once again, similarities and differences in IE were investigated

using global perceptual analyses and specific acoustic measurements. We expected that listeners would be able to differentiate Delhi speakers from Hyderabad speakers and that acoustic measurement would show differences for Hindi and Telugu speakers similar to previous experiment. In particular, we expected vowel space differences, differences in the production of the retroflex consonants and of /s/, and differences in suprasegmental temporal patterns. In general, we expected that speakers would adapt features from the prominent language of the region. Thus, we expected Delhi speakers to produce IE with features from Hindi and Hyderabad speakers features from Telugu. Of particular interest was the question of whether native Hindi- and Telugu-speaking listeners could determine whether speakers were from the same or different geographical regions based on limited exposure to their speech. We reasoned that if IE differs by geographical region, then IE sound patterns produced by Delhi and Hyderabad speakers should be different regardless of the speaker's L1, assuming that the speakers had assimilated the regional IE accent.

4.2. Methods

4.2.1. Participants

Twenty two IE speakers provided speech samples for the present experiment. Twelve speakers had Hindi as their native language and 10 had Telugu as their native language. Three of the Hindi speakers were males, as were two of the Telugu speakers. All speakers were between the ages of 18 and 35 years old. Six of the native Hindi speakers were from Delhi and still residing there at the time of the experiment. The other 6, also originally from Delhi, had resided in Hyderabad for between 4 and 7 years (M = 5.8 years) at the time of the experiment. Six of the native Telugu speakers were from

Hyderabad and still residing there at the time of the experiment. The other 4, also from Hyderabad, had resided in Delhi for between 6 and 10 years (M = 7.2 years) at the time of the experiment. All speakers had been exposed to English from the 1st grade onwards (age 6), all continued to be educated in English through college, and all used English on a daily basis for education and work-related conversation (see Table 4.1).

Table 4.1. Speakers' usage of language in different domains.

L1	City	Family	Friends	Strangers	Work/School	Media
Hindi	Delhi	Mother tongue; occasional use of IE with father by 2 speakers	Hindi	Hindi and IE	IE	Hindi and IE
Hindi	Hyderabad	Mother tongue; occasional use of IE with father by 1 speaker	Hindi and IE	IE	IE	Hindi and IE
Telugu	Delhi	Mother tongue; occasional use of IE with father by 1 speaker	Hindi	Hindi and IE	IE	IE
Telugu	Hyderabad	Mother tongue; occasional use of IE with father by 2 speakers	Telugu and IE	IE	IE	Telugu and IE

Two of the Hindi speakers residing in Delhi were working; one as a teacher at high school level and one as lab assistant (computer science department). The other four were in their final year of higher-education (one as a Master's level student and the others

as college seniors). Similarly, two of the Hindi speakers in Hyderabad were working; one as college lecturer and the other as a software engineer. The other 4 were pursuing their education (two were Master's level students, one was doctoral level, and one was a college senior). One of the Telugu speakers in Delhi was working in marketing, the others were studying (Law, one was at Master's level, one at the BA level). Similarly, two Telugu speakers residing in Hyderabad were working: one as an animator and the other as a software engineer. The other 4 were studying (three at the Master's level, one at the BA level).

Ten IE-speaking listeners participated in the perceptual task that compared IE produced by native Hindi and Telugu speakers. Five listeners were native speakers of Hindi and the other five were native speakers of Telugu. All were residing in Portland, Oregon at the time of the experiment and had been in the United States for at least one year. None of the listeners were acquainted with any of the Indian speakers who provided the spoken material for the experiment.

4.2.2. Material

The materials used in the present experiment were the stories of Lord Ganesha, same as in Experiment 1, except that here only the IE data were collected.

4.2.3. Production Task

The production task was administered in exactly the same way as in Experiment 1.

4.2.4. Perceptual Judgment Task

As in Experiment 1, on each trial, listeners were presented with the most fluent IE renditions of two different sentences produced by different IE speakers (sentences 5 and 8, see Appendix II). The same pair of different speakers was never repeated for a particular sentence order (5, 8 or 8, 5). The same and different stimuli were amplitude normalized (70 dB) and presented in random order over headphones to listeners.

Unlike in Experiment 1, stimuli were blocked by language so that listeners only heard sentences produced by speakers with the same L1. The pair of speakers was either female or male but never a combination of male and female. In half of the stimuli, the different speakers were from the same city. In the other half, the different speakers were from different cities. The listeners' task was to judge whether the sentences they heard were spoken by two speakers living in the same city or in different cities. Listeners were seated in front of a computer in a quiet room and instructed in their task. They were asked to make their same/different judgments on a 5-point scale, where "1" equaled a confident "same" judgment and "5" equaled a confident "different" judgment. The scale was presented on a computer monitor, and the listeners indicated their response by clicking on the box with the number that corresponded to their judgment. The order of presentation of the L1 blocks (Hindi or Telugu) were counterbalanced, and listeners were given a 10 minute break between the blocks. Perceptual judgments on the paired sentences took approximately 30 minutes to complete.

4.2.5. Acoustic Measurements

The segmental and suprasegmental characteristics that differentiated IE spoken by Hindi and Telugu speakers were chosen for analysis, including vowel quality, degree of retroflexion for /ʈ/ and /ɖ/, the spectral characteristics of /s/, and temporal patterns associated with lexical stress, phrase-final lengthening, language rhythm, and speech rate.

4.2.6. Analyses

The perception data were analyzed using ordinal logistic regression in SPSS. We used the listeners' responses (1-5) as the dependent variable. Cities, speakers' native language, and listeners' language background were entered into the analysis as predictors. The ratings were also z-transformed within each listener so that a normally distributed dependent measure, comparable across listeners, could be used for visualization of the results. Preliminary analyses indicated no effect of listeners' language background so their judgments were averaged in subsequent analyses.

Linear mixed effects modeling was used to investigate the fixed effects of speakers' cities (Delhi or Hyderabad) and speakers' native language (Hindi or Telugu) on the various acoustic measures. Segment identity was an additional fixed factor in the analyses of retroflexion and aspiration. Target lexical prominence patterns were added as a fixed factor in the analysis on V1:V2 duration. As in Experiment 1, item (word or sentence) and speaker were treated as random factors. All results are given with the denominator degrees of freedom rounded to the nearest whole number.

4.3. Results

IE-speaking listeners were able to distinguish English sentences produced by speakers residing in Delhi from those produced by speakers residing in Hyderabad. Region-based discrimination was higher for sentences produced by native Telugu speakers than for those produced by native Hindi speakers. The acoustic measures were consistent with the perceptual results. The English produced by speakers residing in Delhi and Hyderabad differed, but regional IE accents were more evident in native Telugu speaker's English than native Hindi speaker's English. These results are presented in detail below.

4.3.1. Perceptual Judgments

The analysis of similarity ratings on IE sentences revealed a simple effect of cities (same versus different), $\chi^2(1) = 18.56$, $p < .001$, an effect of native language (Hindi versus Telugu), $\chi^2(1) = 14.15$, $p < .001$, and a significant interaction between these factors, $\chi^2(1) = 4.01$, $p = .045$. The significant interaction is shown in Figure 4.1.

Analyses on ratings split by speaker's native language indicated that the effect of region was significant only for Telugu speakers, $\chi^2(1) = 17.04$, $p < .001$. Listeners seem to be better at identifying phonological differences for the Telugu speakers from different cities than for Hindi speakers from different cities. Even in the block with native Telugu speakers, listeners preferentially selected "2" and "4," indicating less than perfect certainty in their judgments; for example, listeners made a total of 115 "2" responses

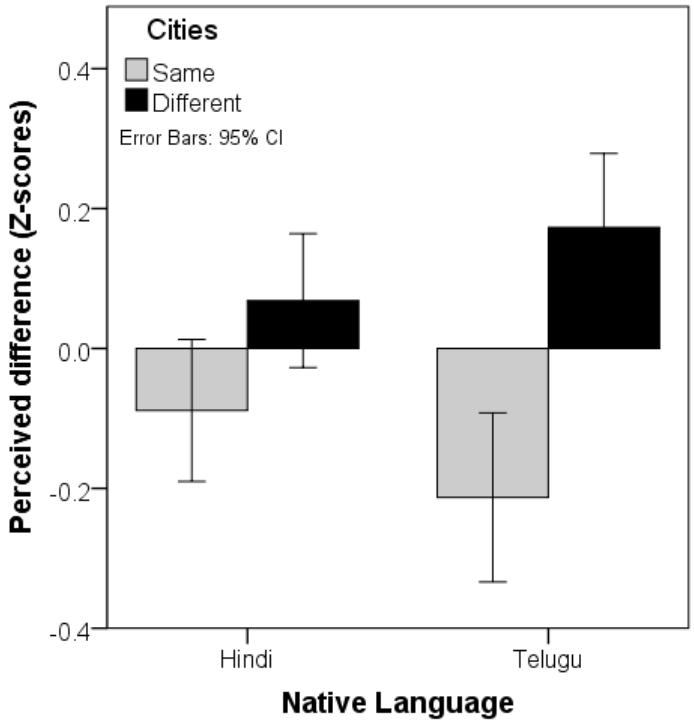


Figure 4.1. Listeners' difference ratings of IE sentence pairs are shown as a function of cities (same vs. different) and speakers' native language (Hindi or Telugu). Note that analyses were conducted on the untransformed dependent variable (see Analyses).

compared to just 45 "1" responses on IE sentences produced by two native Telugu speakers residing in the same city. Table 4.2 shows a break-down of the actual responses based on city (same or different) and speakers' native language (Hindi or Telugu).

In sum, the similarity ratings on IE sentences indicate that listeners can differentiate IE spoken in different regions even when it is produced by native speakers of the same L1. However, this effect seems to have been due primarily to the ease with which listeners distinguished between Telugu speakers living in different cities. We might conclude from this that IE produced by Hindi speakers was fairly consistent in the two cities examined.

Table 4.2. Distribution of listeners' response as a function of geographical region (target) and speakers' native language.

Speakers' native language	Confidence Score	Target/Region	
		Same	Different
Hindi	1 = same	28	54
	2	133	119
	3	21	16
	4	87	152
	5 = different	72	99
Telugu	1 = same	45	35
	2	115	98
	3	4	8
	4	62	128
	5 = different	34	51

4.3.2. Acoustic Measurements

The next set of analyses addressed the effect of cities and speaker's native language on the production of specific segmental and suprasegmental attributes. The results on vowel production are presented first, followed by those on retroflexion, aspiration, /s/ production, lexical stress, final lengthening, and rhythm, in that order.

With regards to vowel production, the vowels were first plotted according to their normalized F1 and F2 values and as a function of cities and native language (Figure 4.2). A qualitative comparison of the different vowel spaces depicted in Figure 4.2 suggests that vowel production varies somewhat with both factors. Quantitative analyses were conducted to determine which, if any, of the differences evident in the figure were systematic enough across speakers to be statistically significant. In particular, the analyses investigated the effects of cities and native language on F1 and F2 separately.

Analyses of F1 revealed a significant effect of cities only on vowel /ə/, $F(1, 18) = 6.94$, $p = .017$, and a significant effect of native language on /u/, $F(1, 18) = 7.34$, $p =$

.014. The main effect of region was due to Hyderabad speakers producing a more centralized /ə/ than the speakers residing in Delhi. The main effect of native language was due to Telugu speakers' production of a more open /u/ vowel in comparison to Hindi speakers.

Analyses of F2 revealed a significant effect of cities again on /ə/, $F(1, 18) = 5.78$, $p = .027$ and on /u/, $F(1, 18) = 5.49$, $p = .031$. In addition, a significant interaction between cities and native language was observed for /ɔ/, $F(1, 18) = 6.10$, $p = .024$. When the data were split by native language, an effect of cities was observed only for Telugu /ɔ/, $F(1, 18) = 22.53$, $p = .001$. If we interpret these results with reference to the mean values shown in Figure 4.2, we find that the main effect of cities was due to the production of more centralized /ə/ and fronted /u/ vowels by Hyderabad speakers in comparison to speakers residing in Delhi. The interaction effect was due to a more fronted production of /ɔ/ by Telugu speakers residing in Delhi than Hindi speakers residing in Delhi. The fronted vowel is nonetheless consistent with that which Hindi speakers produced in Experiment 1. It is possible that this result therefore indicates a kind of overshoot or hyper-adaptation to Delhi norms.

With respect to the consonants, an analysis on the degree of retroflexion associated with stop production indicated an effect of cities on the difference between F3 and F2 at vowel offset, $F(1, 101) = 9.46$, $p = .003$, as well as an effect of native language, $F(1, 101) = 5.95$, $p = .016$. There was no interaction between these factors. When the data were split by stop identity, the effect of city was significant for both /ɖ/, $F(1, 55) = 4.57$, $p = .037$ and /ʈ/, $F(1, 46) = 4.80$, $p = .037$, whereas the effect of native language

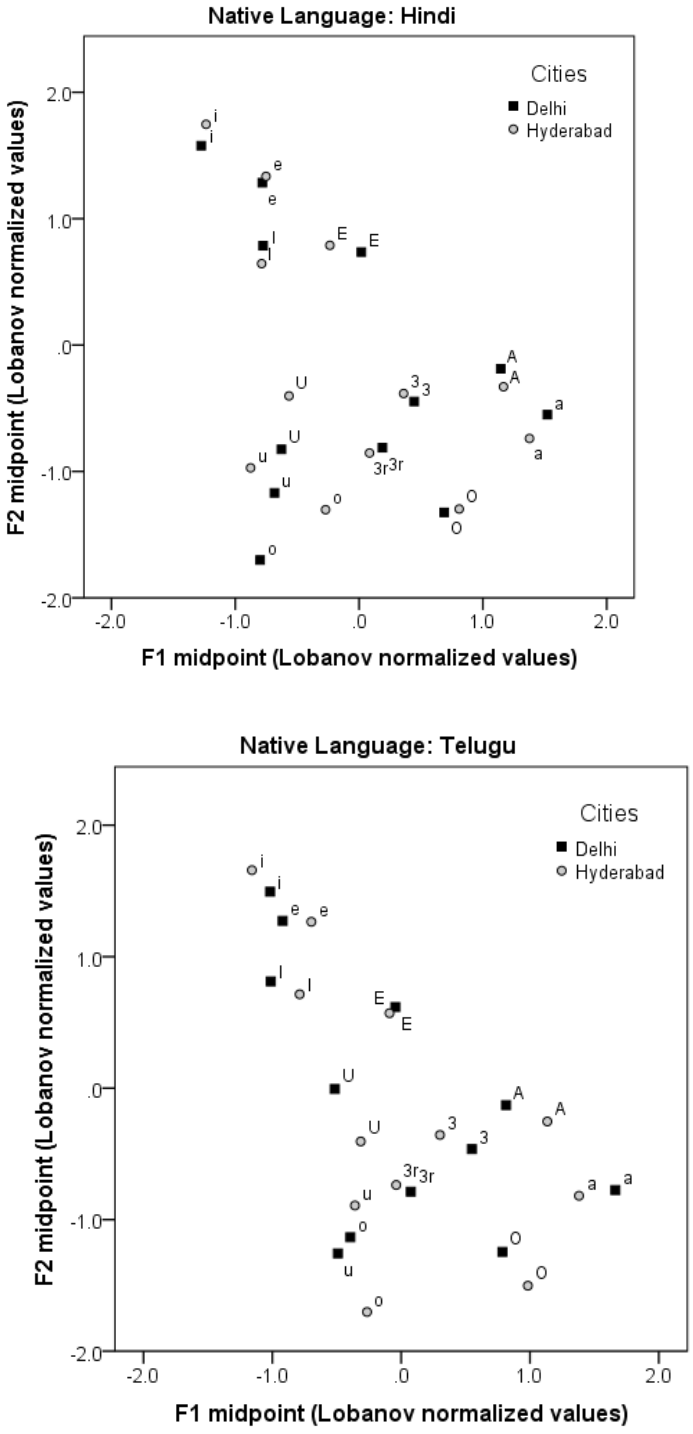


Figure 4.2. The monophthongal vowel space is shown for speakers' native language Hindi (top) and Telugu (bottom) as a function of city (Delhi or Hyderabad). Vowel measures were taken at the F1 and F2 midpoint and normalized using the Lobanov method (note: i=/i/ or /iː/, I=/ɪ/ or /i/, e=/e/ or /eː/, E=/ɛ/ or /e/, A=/æ/, a=/ɑ/ or /ɑː/, 3=/ə/, 3r=/ɚ/, o=/o/ or /oː/, O=/ɔ/ or /o/, u=/ʊ/ or /u/, u=/u/ or /uː/).

was only significant for /ɖ/, $F(1, 55) = 11.12$, $p = .002$. These results, shown in Figure 4.3., indicate that speakers residing in Delhi exhibited higher degree of retroflexion than speakers residing in Hyderabad. The main effect of native language on /ɖ/ was driven by speakers residing in Delhi: Hindi speakers from Delhi produced retroflexes with higher F3 values than Telugu speakers from Delhi. This result suggests a persistent effect of L1 in that Hindi speakers in Experiment 1 also produced more retroflexion than Telugu speakers.

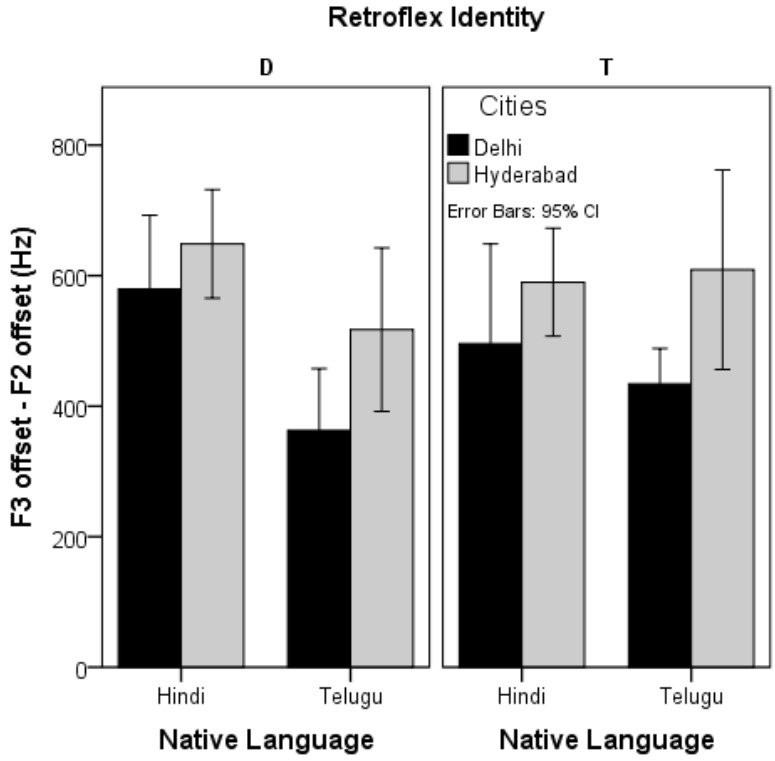


Figure 4.3. Degree of retroflexion of post-vocalic stops is shown as a function of the city (Delhi or Hyderabad) and the speakers' native language (Hindi or Telugu). Retroflexion was measured as the difference between the F3 and F2 offset values in the preceding vowel (note: T=/ʈ/, D=/ɖ/).

The effect of region and native language on the production of fricative /s/ was also investigated. As expected from Experiment 1, the results indicated a main effect of

native language, $F(1, 57) = 13.12$, $p = .001$, and an interaction effect of city and native language, $F(1, 57) = 4.19$, $p = .045$. The interaction effect, shown in Figure 4.4 shows that Hindi speakers from Hyderabad produced /s/ with much lower frequency than Telugu speakers residing in Hyderabad. Post hoc comparisons indicated a significant effect of native language only on /s/ produced by speakers residing in Hyderabad ($p = .01$). This result was just as in Experiment 1 where Hindi speakers also produced /s/ with lower average mean frequency than Telugu speakers.

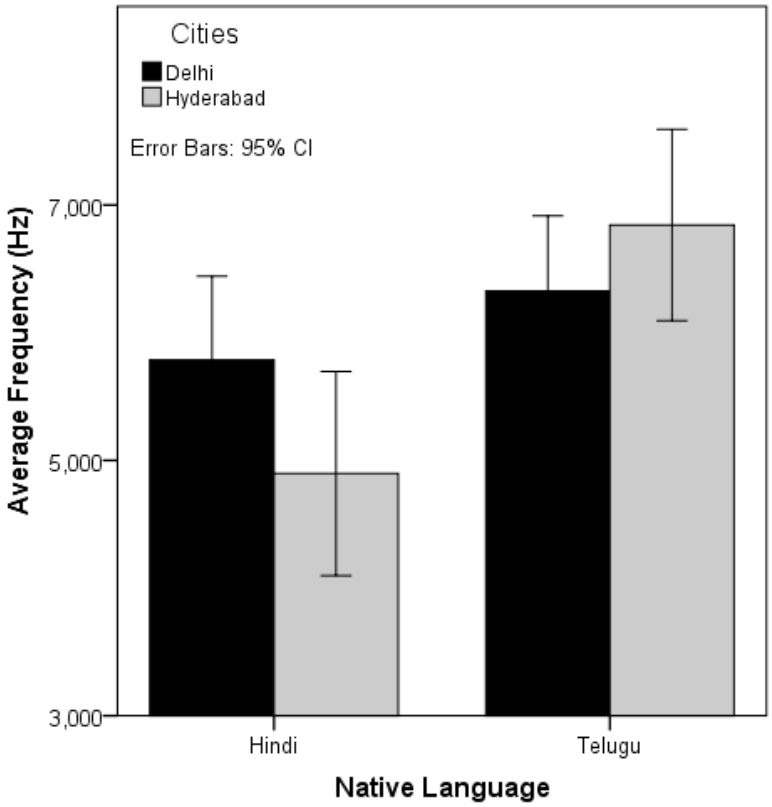


Figure 4.4. The average frequency of syllable-initial /s/ is shown as a function of the city (Delhi or Hyderabad) and the speakers' native languages (Hindi or Telugu).

Turning now to the suprasegmental measures, we expected based on the results from the previous experiment that Hindi and Telugu speakers would produce lexical

stress differently such that Hindi speakers would lengthen V2 relative to V1 more than Telugu speakers; Hindi speakers were also expected to produce more final lengthening than Telugu speakers, and to produce speech with a higher rhythm value but lower speech rate than Telugu speakers. Assuming that the regional influences reflect the dominant languages spoken in the two cities of interest, we expected that IE produced by speakers residing in Delhi would reflect features associated with L1 Hindi and that IE produced by speakers residing in Hyderabad would reflect those associated with L1 Telugu.

The analysis of the temporal patterns associated with lexical stress production indicated a significant effect of native language, $F(1, 222) = 4.82$, $p = .029$, and of stress pattern, $F(1, 222) = 11.97$, $p = .001$, but no main effect of city or any interaction of these factors. These results are shown in Figure 4.5. From the figure we see that Hindi speakers produced iambically-stressed disyllabic words with longer V2 relative to V1, whereas Telugu speakers produced the pattern in a manner more similar to their trochaic pattern; that is, with nearly equal V1 and V2 durations. This result parallels the one reported in Chapter III (see Figure 3.7).

The results on phrase-final lengthening also indicated an effect of native language, $F(1, 241) = 10.90$, $p = .001$, with an effect of cities that approached significance, $F(1, 242) = 3.71$, $p = .051$. The almost significant effect of city was due to a pattern whereby speakers from Delhi showed more phrase-final lengthening than speakers from Hyderabad (see Figure 4.6). This result is consistent with the assumption that speakers residing in Delhi would produce a variety of IE consistent with L1 Hindi IE regardless of the speaker's actual native language.

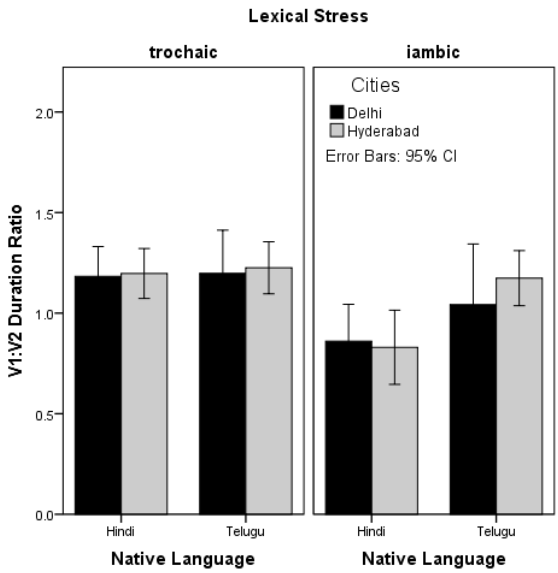


Figure 4.5. IE lexical stress in disyllabic words, measured as the ratio of the duration of the first vowel to the duration of the second, is shown as a function of the city (Delhi and Hyderabad) and the speakers' native language (Hindi and Telugu).

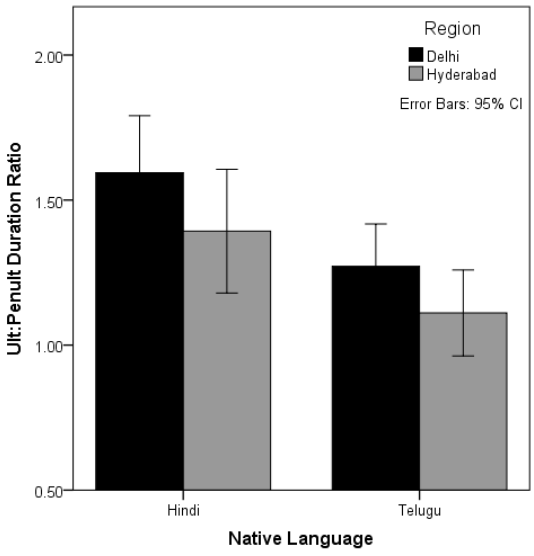


Figure 4.6. Phrase-final lengthening, measured as the ratio of the ultimate vowel duration to the penultimate vowel duration, is shown as function of city and the speakers' native languages.

The final analyses of suprasegmental patterns showed an effect of cities on several global rhythm metrics: %V, $F(1, 241) = 42.16$, $p < .001$; ΔV, $F(1, 242) = 5.33$, $p = .022$; nPVI, $F(1, 240) = 8.38$, $p = .004$. The effect of cities on speech rate was also significant, $F(1, 241) = 6.10$, $p = .014$. Also, there were effects of native language on several of the global rhythm metrics: ΔC, $F(1, 241) = 4.97$, $p = .027$; ΔV, $F(1, 242) = 6.97$, $p = .009$, and nPVI, $F(1, 240) = 7.66$, $p = .006$. These results, shown in Figure 4.7 appear to be due to more variable and longer vowel durations and faster speech rates by speakers residing in Hyderabad compared to those residing in Delhi regardless of their native language. It is likely that the rate differences account for the final result, which is that speakers residing in Hyderabad produced higher variability of successive syllabic durations (nPVI value) than speakers residing in Delhi. Delhi speakers exhibited IE that was more syllable-timed; it had higher %V and lower nPVI (Low & Grabe, 2002; Low, 2006). Again, the effect of region here is what one would expect if regional accents are influenced by the dominant L1.

In sum, the acoustic measures indicated effects of geographical region and native language on IE. In particular, there was an effect of city on IE /ə/, /u/, on the degree of retroflexion, and on rhythm and speech rate. With regard to the degree of retroflexion speakers' residing in Delhi produced /ɖ/ and /ʈ/ with more retroflexion than speakers residing in Hyderabad. Thus, as expected, no matter the L1, Delhi speakers seem to follow the features of Hindi speakers who engage in higher degree of retroflexion. For the suprasegmental features too speakers residing in Delhi displayed features of Hindi

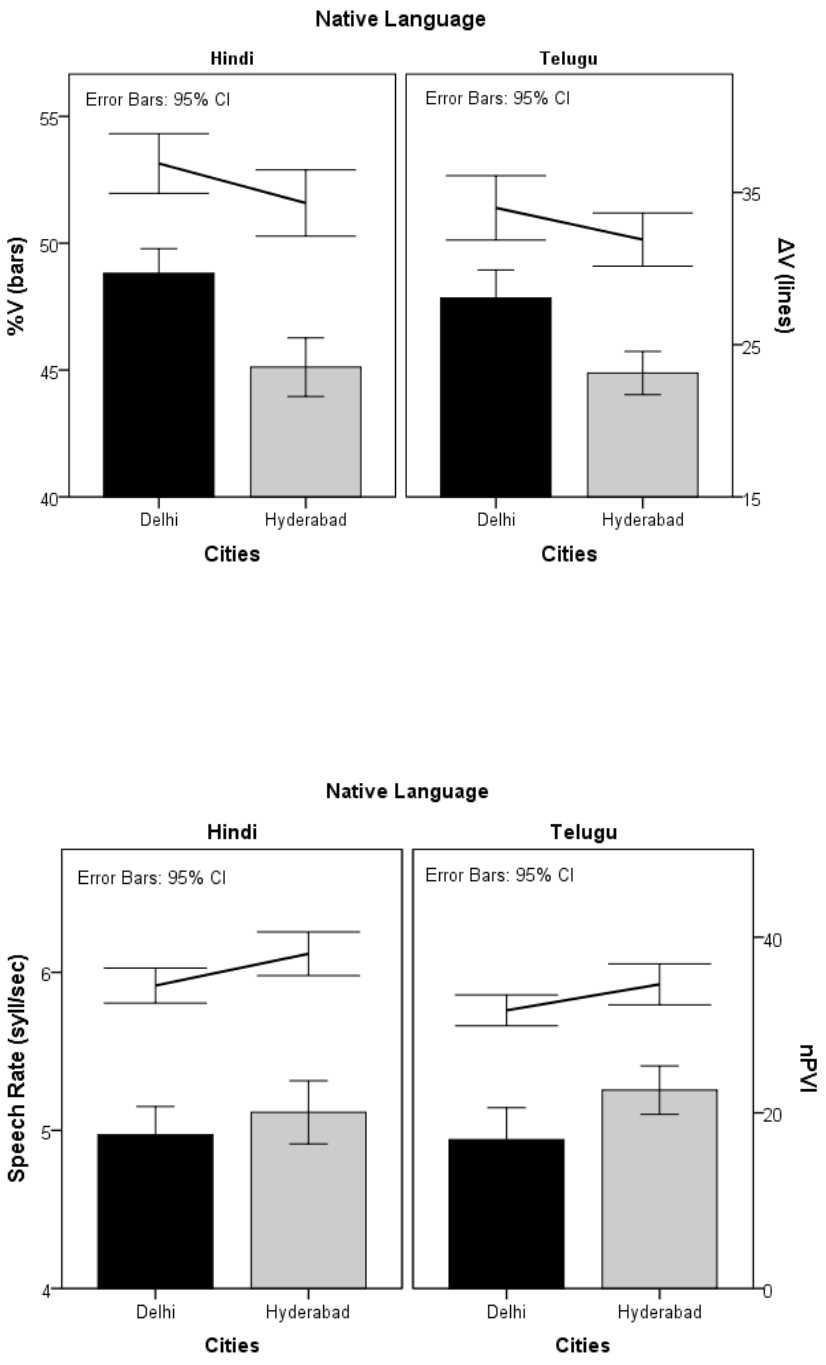


Figure 4.7. Several global measures of language rhythm are shown as a function of the city and the speakers' native language background. The top panel shows the results for the average percent of vowel duration (bars) and the standard deviation in vowel duration (line) across each phrase. The bottom panel shows the results for speaking rate (bars) and the nPVI (lines) across each phrase.

speakers such that speakers residing in Delhi engaged in somewhat more final lengthening and produced phrases with higher %V, ΔV and at slower speech rates and lower nPVI than speakers residing in Hyderabad. Nonetheless, effects of speakers' native language on IE were also observed regardless of their city of residence. Similar to the results reported in Chapter III, L1 influenced vowel quality, degree of retroflexion for /ɖ/, the articulation of /s/, temporal patterns in iambically stressed words, final lengthening and the rhythm measures. Overall results suggest regional influences on IE along with L1 effects.

4.4. General Discussion

The current experiment investigated regional influences on IE as spoken by Indians with different native languages. Previous studies indicate strong influences of L1 on IE (Bansal, 1970; Chaswal, 1972; Thundy, 1973; Wells, 1982; Maxwell and Fletcher, 2010), but qualitative descriptions of IE variation and social-historical factors also point to the possibility that IE is influenced by region (e.g., Gargesh, 2004; Balasubramania, 2006; Pingali, 2009). The results from the present experiment in which native languages were controlled indicate that the effects of region on IE go beyond the effects of L1 on IE. That is, the results suggest that there are likely distinct IE "accents" in the north and south of India. However, the results also suggest that Telugu speakers are more likely to adopt a regional accent than Hindi speakers.

The current results align well with other published studies on regional variation. In particular, we find differences in the vowel space across regions and native languages. This result is consistent with many of the studies on dialectal variation, which frequently

report differences in vowel systems as a hallmark of regional accent (Wise, 1933, on Southern English; Kurath & McDavid, 1961, on the east coast; Allen, 1976, on the Upper Midwest; Labov, Ash, & Boberg, 2006; inter alia). For example, Jacewicz, Fox, & Salmons (2007) have shown that the regional varieties spoken in the South of the United States, in the Midland and in the North of the United States differ not only in vowel position within an F1/F2 vowel space, but also in vowel duration and in the amount of spectral change over the course of the vowels. Similarly, Leinonen (2010) suggests that Swedish dialects differ more in vowel quality than in consonantal articulation.

Our results also revealed consonantal variation across regions, where the degree of retroflexion differed from one region to the other such that speakers residing in Delhi had higher degree of retroflexion than speakers residing in Hyderabad. This result is also consistent with the broader literature on regional accents where consonants are known to vary by dialects. “The degree of retroflexion seems to vary regionally, socially and stylistically to some extent…” (Wells, 1982: 432). Similarly, Kolarik (2013) suggested regional variation in the use of retroflex [ɻ] which is predominant in Dublin but not in other parts of Ireland. Regional variation in consonantal articulation has also been reported. For example, Recasens (2011) found dialectal variation for several consonants—dental /t/, the alveolars /n, l, s, r/ and the alveolopalatals /ʧ, ʃ, ʎ, ɲ/—across three Catalan dialects (Valencian, Easter, Majorcan). Similarly, a number of American-English dialects, such as the New York, Cajun English, and African-American Vernacular English frequently substitute /d/ for /ð/ (Wolfram, 1969; Dubois and Horvath, 1998; Gordon, 2004; Thomas, 2007).

The current experiment also revealed regional variation in temporal patterns, where speakers residing in Delhi engaged in more phrase-final lengthening, spoke a more syllable-timed variety of IE and at a faster rate than speakers residing in Hyderabad. These results are also in line with the sociolinguistic literature. For example, Hirst and Di Cristo (1998) found that dialects within languages and even related languages exhibit different degrees of final lengthening. And White & Mattys (2007) showed that different regional accents in the United Kingdom (Standard Southern British English (SSBE), Bristol, the Welsh Valleys, Orkney and Shetland) are associated with different speech rhythms. Other studies of regional variation have also demonstrated differences in speech rate (e.g., O'Neill, 2008; Byrd, 1994; Verhoeven, De Pauw, & Kloots, 2004). Thus, the current experiment shows that many of the same markers of regional variation found in previous studies also differentiate IE that is spoken in the north and south of India.

Overall, the effect of region on sound patterns of IE strongly suggests regional varieties of IE akin to those described for languages that are the L1 for large and geographically dispersed speech communities. The perceptual results also indicated that regional differences are identifiable, especially for Telugu speakers. Evidence for perceivable regional differences in Hindi speakers' IE might have been possible if listeners were exposed to more speech. On the other hand, the absence of strong perceptual differences in the IE spoken by L1 Hindi speakers residing in Delhi and Hyderabad could suggest that regional IE accents are not adopted by all Indians or that the Hindi speakers in Hyderabad had not resided in the city long enough to acquire the regional accent. In particular, it is possible that age of arrival in the new city and other individual difference variables might explain the absence of an effect of region on IE

produced by Hindi speakers in Hyderabad. On the other hand, the mean difference in length of residence for Telugu speakers in Delhi and Hindi speakers in Hyderabad was only 1.4 years. Length of residence is therefore unlikely to be the sole explanation for why regional variation was particularly noticeable in the IE produced by native Telugu speakers. Here we consider an explanation for the difference based on language prestige below.,

At the time of Indian Independence, Khariboli, a vernacular Hindi was standardized, becoming the official language of 11 states (Hindi-belt area). Speakers from these areas speak different regional dialects of Hindi at home, but they still identify with the larger Hindi-speaking community. Although a few of the Hindi speakers in this experiment reported usage of one of the regional dialects of Hindi with their grandparents, they strongly identified themselves as part of the larger Hindi-speaking community in India. Thus an absence of an effect of city on IE might be due to a greater allegiance to Hindi (and therefore to Hindi-inflected IE) than to region. This possibility is made even more likely when considering that Hindi is the only national language in India. The language can therefore act as a link between Hindi speakers across regions, discouraging them from adapting to regional variations in IE. A strong allegiance to Hindi and other Hindi speakers is also consistent with self-reported usage in this experiment. Hindi speakers reported using Hindi (and IE) with friends in Hyderabad. This contrasts with Telugu speakers who lived in Delhi and used only Hindi with friends.

Telugu speakers might feel more compelled to adapt to the regional IE variety than their Hindi-speaking peers given that Telugu does not have the same symbolic power as Hindi. It was pretty clear from the Telugu speakers' responses to the language usage

questionnaire that Telugu speakers residing in Delhi used their L1 only in the family domain. Delhi-ites also exhibit the kind of superiority that denizens of capital cities often exhibit. It is possible that the social environment in Delhi signals a disdain for non-Hindi speakers. This possibility is consistent with the north-south stereotyping discussed in Chapter II, where stereotyping of South Indians is perceived as derogatory. These factors could encourage Telugu speakers residing in Delhi to adopt the regional accent so as not to be excluded from the social-economic life of the city.

Of course, it could also be that the elicitation method and speech materials used in the present experiment did not allow for regional accents to emerge in the IE produced by Hindi speakers. It has long been known that speakers' select a speech style based on their assessment of the formality that the situation requires, and that regional effects on language are best detected in the least conscientious (most casual) speech (Labov, 1972). Could it be that the sentence reading task we used was too formal or perhaps overly structured? To better understand possible interactions between native language and region on IE and in the promotion of self-identity. We turn now to an experiment in which the speech data were elicited in a conversational context to assess the effect of setting on L1-accentedness in IE.

CHAPTER V

EXPERIMENT 3: EFFECTS OF LINGUISTIC-IDENTITY

5.1. Introduction

In the previous studies, speech was elicited by asking speakers to read the sentences based on the story of Lord Ganesha. This story is learnt in childhood, usually told to the child by their parents and grandparents in their mother tongue. According to learning stance theory (Schieffelin & Ochs, 1986), when the context is reminiscent of the past, speakers are likely to reproduce the kind of speech used in that past situation. In this case, speakers may have recreated something of their parents/grandparents speech when producing the Lord Ganesha story for us. Thus, it is possible that the effects of L1 on IE found in our previous experiments were due to the nature of the speech materials used. This possibility is consistent with sociolinguistic and corpus research on setting. For example, Labov (1972) have shown that a speakers' style of speech depends on the formality of the situation, and that casual situations where participants discuss personal topics elicit the most vernacular speech. Similarly, Liu (2010) found that spontaneous speech acoustics carried more dialect cues than read speech acoustics. Golcher and Reznicek (2011) found that German texts produced by non-native speakers of German are more readily classified by topic than by native language.

With respect to the effect of setting on IE, Leitner (1994) has shown that the choice between British, American and Indian English and the varieties within these dialects are influenced by the type of text that speakers are asked to read. Non-fictional texts elicit more standard British and American pronunciations; fictional texts, more IE

and “accented” language. Similarly, Balasubramanian (2009) found that IE has more Indian features in spontaneous speech than in read speech, and that when Indians adopt a more formal register their pronunciation becomes closer to the British English dialect. Balasubramanian also found that the proportion of Indian features in written text was higher in personal correspondence than in business correspondence.

The way a speaker speaks reflects the identity (or dimension of identity) that is active during the interaction; reflecting how the speaker defines the interaction situation (Krauss & Pardo, 2006). According to Krauss and Pardo, identity concerns people’s sense of who they are; the attributes and features that distinguish them from others (personal identity), and also the attributes that make them members of coherent classes or categories to which they belong, or with which they are identified (social identity). Many of these aspects of identity are embodied in speech. This is in line with Tajfel (1978) who argued that the individual has multiple identities, but that a distinction can be made between personal identities and group-related identities. Meyerhoff (2006) noted that even style can be thought as an act of identity. The speaker design approaches to style similarly suggest that styles are used to create and then foreground certain speaker identities (Schilling-Estes, 2002; Rickford & Eckert, 2001).

L1 accent in L2 speech can also be thought of as an act of identity. Guiora (1972) suggested that the more rigid language ego boundaries in adults compared to children results in their assertion of cultural and ethnic identity through maintenance of a stereotypical accent. That is, he argued that socio-emotional factors are as powerful in determining the pronunciation of L2 language as learning itself. Insofar as Indian people are identified with familial, ethnic, religious or cultural groups through their mother

tongue, we might wonder whether L1-accented IE is a reflection of this personal and social identity.

In Chapter II it was noted that some studies have found that people regularly use their mother tongue in the intimate or affective domains (i.e., with family, friends, neighbors, religion, emotions) and use English in formal or utilitarian domains (i.e., with teachers, strangers, in technical and political discussions; Kachru, 1976; Shridhar, 1982; Pandit, 1978; Dasgupta, 1993). In Chapter II, it was also noted that for many speakers, IE has penetrated into the intimate and affective domains (Hohenthal, 2003). The extension of IE into more domains suggests that speakers must also command different styles of IE appropriate to the different domains within which it is used. If the affective and intimate domains encourage a more vernacular style, in-line with what the sociolinguistics literature tells us, then we might expect that IE is most "accented" in these domains, assuming that accent is a way to convey personal and social identity in India. In the present experiment, we used conversational topics as a stand-in for domain. The goal was to determine whether L1 accentedness varied with the topic of conversation. Assuming that L1 accentedness is a socio-indexical marker of personal identity, we expected that accentedness might be more evident in discussions of more personal topics or of topics that recall childhood than in discussion of more neutral topics. This prediction was tested by measuring the perceptual and acoustic similarities and differences of IE elicited in a conversational setting. Native Hindi and Telugu speakers engaged in an English conversation with another IE speaker to discuss schooling, employment/career plans, childhood memories, and marriage. If the prediction is upheld, then it may be that the

effects of L1 on IE observed in Experiment 1 and Experiment 2 were due to the association of the Lord Ganesha stories with childhood rather than to IE proficiency.

5.2. Methods

5.2.1. Participants

Sixteen of the 22 IE speakers from Experiment 2 participated in the present experiment. Eight of the speakers had Hindi as their native language and 8 had Telugu as their native language. Four of the native Hindi speakers were residing in Delhi and the other 4 were residing in Hyderabad. Similarly, 4 of the native Telugu speakers were residing in Delhi and the other 4 were residing in Hyderabad.

Thirty new listeners participated in a perceptual task that compared IE produced by native Hindi and Telugu speakers. Fifteen listeners were native speakers of Hindi and other 15 were native speakers of Telugu. All listeners were residing in Portland, Oregon and had been in the United States for at least one year. As in the previous experiments, none of the listeners were acquainted with any of the speakers who provided the spoken material for the experiment.

5.2.2. Elicitation Task

Conversational speech was elicited from each speaker. The experimenter manipulated the conversation so that the following topics were discussed: 1) schooling, 2) employment, 3) marriage and 4) childhood memories. At the beginning of the conversation, each speaker was asked about their mother tongue and the languages they used on a daily basis. The conversation flowed from there, with the next topic chosen on

the basis of what had been previously discussed. For example, when a speaker said that they spoke Hindi/Telugu at home but English at work, then the experimenter shifted the conversation so that the speaker would talk about their job and career plan; however, if a speaker said that they had been using English since their school days, then the experimenter shifted the conversation so that the speaker would talk about schooling and/or childhood memories and so forth. Thus the order in which the topics were discussed was quasi-randomized by the flow of the conversation. The length of the conversation with each speaker varied from 7–12 minutes, with each topic discussed for 1-3 minutes. The length of discussion and amount of speech produced varied from one speaker to other, with some participants initially providing little speech due to shyness. The experimenter managed shyness by following the interests of the speaker rather than keeping the discussion strictly focused on the specific topic. For example, one speaker who talked about her childhood memories said that she used to play kho-kho (a field game), and nothing much after that. The experimenter therefore turned the conversation over to asking questions about kho-kho. The discussion of kho-kho then provided the basis for the sample of speech on the topic "childhood memories."

Participants were recorded in a quiet room using a Shure professional unidirectional microphone and a Marantz Professional PMD660 portable solid-state recorder. To be consistent with previous experiments, utterances that were approximately 2 to 6 seconds in length were chosen for analysis. In spite of some shyness, every speaker produced at least 2 utterances on each topic that met the minimum requirement of being 2 seconds long and prosodically coherent. These sentences varied in length from 8 to 27

syllables. Orthographic transcriptions of the 128 sentences selected for analysis are given in Appendix III.

5.2.3. Perceptual Judgment Task

The 128 sentences selected for analysis were amplitude normalized to 70 dB and divided into two sets. Each set consisted of just one sentence per topic from each speaker. Thirty listeners participated in the task. Twenty listeners completed the judgment task that used the first set of sentences, and 10 listeners completed the task that used the second set of the sentences. Half of the listeners in each group (N = 15) heard only sentences elicited from conversations of personal topics, and the other half (N = 15) heard only sentences elicited from conversations on neutral topics. Half of the listeners in each topic-based condition were Hindi speakers and other half were Telugu speakers.

On each trial, listeners were presented with two different sentences produced by different IE speakers. Listeners either participated in a condition where all sentences were drawn from conversations on a personal topic or from those on a neutral topic. The sentences were produced by speakers who had either the same native language or different native languages, but their city of residence was controlled by dividing the judgment tasks into two blocks. In one they heard just speakers residing in Delhi and in the other just speakers residing in Hyderabad. The same pair of different speakers was never repeated for a particular sentence order. The pairs of speakers were either female or male, but never a combination of male and female. The sentence pairs were presented in random order over headphones to listeners. Listeners were told that their job was to listen to each pair of sentences and judge whether the different speakers had the same native

language background or different native language backgrounds. Judgments were to be made on a 5-point scale, where "1" equaled a confident "same" judgment and "5" equaled a confident "different" judgment. The scale was presented on a computer monitor, and the listeners indicated their response by clicking on the box with the number that corresponded to their judgment. The order of the block of speakers (from Delhi or Hyderabad) was counter-balanced across listeners. Listeners were given a 10 minute break after completion of the first block. Perceptual judgments on the paired sentences took approximately 30-40 minutes to complete.

5.2.4. Acoustic Measurements

As in the previous two experiments, acoustic measurements were used to investigate differences in IE pronunciation. In the present case, the factors of interest were the conversational topic, and native language of the speaker. The same segmental and suprasegmental characteristics were chosen for measurement: F1 and F2 for all vowels, degree of retroflexion for /ʈ/ and /ɖ/, the spectral characteristics of /s/, and temporal patterns associated with lexical stress, phrase-final lengthening, language rhythm, as well as a measure of speech rate. To be consistent with previous experiments the selection criteria for each category was same: only syllable-initial stops, non-final /s/, and disyllabic words were chosen for measurement. All possible occurrences of each were extracted from the 128 sentences obtained. Table 5.1 provides the list of words selected to investigate the degree of retroflexion and /s/ production. The list of disyllabic words selected for stress pattern analysis is provided in Table 5.2. The number of vowels

measured was 353. Vowel identity was determined based on what would be the canonical GIE pronunciation of the word.

Table 5.1. List of words with retroflex stops /ʈ, ɖ/ and fricative /s/ in English.

Obstruent	**Words**
/ʈ/	auto, but, forget, got, it, lot, not, out, right, sort, that, what, write
/ɖ/	abroad, bad, bit, dad, did, field, good, had, mad, period, side, today, would, weird
/s/	school, scale, saint, said, research, civils, certain, science, second, sector, see, select, self, sense, seriously, seventh, side, sisters, sixth, slap, small, so, software, some, something, sort, south, speak, spend, stand, standard, starting, strict, student, studied, studying, success, such, sudden, syllabus, system, CBSE, CS, ICICI,

Table 5.2. Disyllabic words selected for analyzing lexical stress.

Trochaic pattern	**Iambic pattern**
after, always, commerce, conflicts, convent, easy, either, English, enter, even, every, family, father, fifty, finish, future, gamble, hundred, interest, into, legal, level, many, market, marriage, marry, masters, mobile, moment, never, only, parents, pattern, people, person, public, rather, rickshaw, sector, software, something, student, teacher, theater, trouble, very, writer	about, abroad, accept, arrange, because, become, before, believe, belong, between, commit, depend, forget, oppose, select, success

5.2.5. Analyses

Preliminary analyses indicated no effect of sentence set or listener background on the results for both sets of analyses. Thus, the data were combined in all analyses reported

below. The perception data were analyzed using ordinal logistic regression in SPSS. We used the listeners' responses (1-5) as the dependent variable. Topic and native language were entered into the analysis as predictors. The acoustic data were analyzed using linear mixed effects modeling. These analyses investigated the fixed effect of conversational topic (Neutral or Personal) and speakers' native language (Hindi or Telugu) on the various acoustic measures. Segment identity was an additional fixed factor in the analysis of retroflexion. The English lexical prominence pattern was an additional fixed factor in the analysis on V1:V2 duration. Item (word or sentence) and speaker were treated as random factors. All results reported below are given with the denominator degrees of freedom rounded to the nearest whole number.

5.3. Results

Indian-English speaking listeners were able to distinguish between English sentences produced by native Hindi speakers and native Telugu speakers. More importantly, listeners were better able to differentiate between native speakers of Hindi and Telugu when the speech sample was extracted from discussion of a personal topic. The acoustic measures were consistent with the perceptual results. The English produced during discussion of a personal topic differed on 5 measures from that which was produced during discussion of a neutral topic. These results are presented in detail below.

5.3.1. Perceptual Judgments

The analysis of similarity ratings on IE sentences revealed a simple effect of native language, $\chi^2(1) = 5.23$, $p = .019$, and an effect of topic, $\chi^2(1) = 65.72$, $p < .001$.

These effects are shown in Figure 5.1. Listeners could accurately differentiate English sentences produced by native Hindi speakers from those produced by native Telugu speakers especially when sentences had been extracted from the conversations on personal topics. The result is consistent with the prediction that L1 influence on IE would be stronger for topics that are more personal to the speaker.

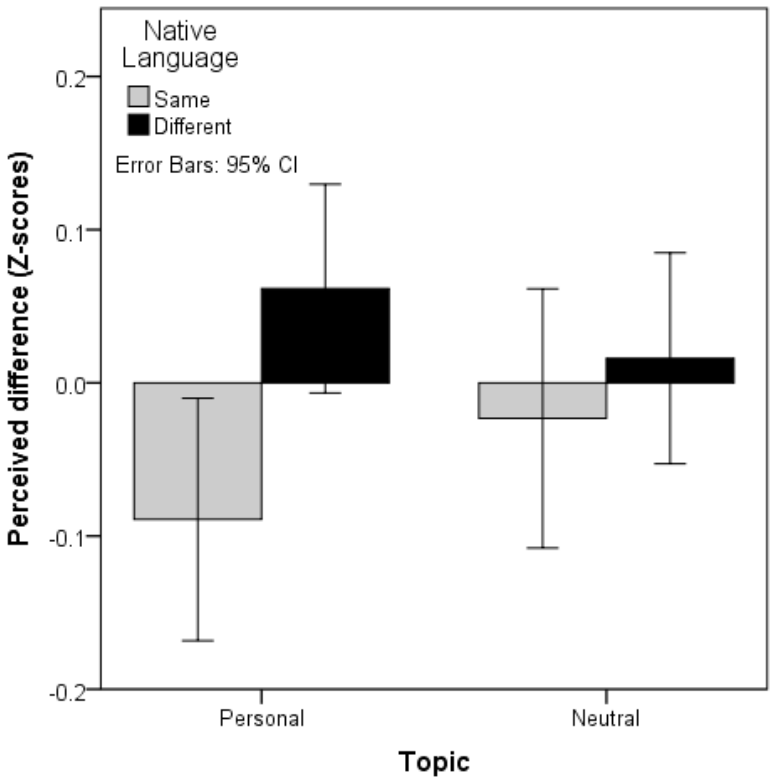


Figure 5.1. Listener difference ratings of IE sentence pairs are shown as a function of the topic (Personal vs. Neutral) and native language (same or different). Note that analyses were conducted on the untransformed dependent variable (see Analyses).

Table 5.3 shows the distribution of the actual responses based on topic (Personal or Neutral) and speakers' native language (same or different). The numbers confirm that listeners were able to easily differentiate speakers with different L1s when the speech samples were extracted from discussion of a personal topic: when the sentences came

from speakers with the same L1, the majority of responses were "1" and "2"; when the sentences came from speakers with different L1s the majority of responses were "4" and "5". Listeners correctly differentiated speakers based on L1 52% of the time, were wrong 43% of the time, and uncertain 5% of the time. When the speech samples were extracted from conversations on a neutral topic from different L1s they were correct 49% of the time, wrong 38% of the time, and not sure 3% of the time. The effect of topic shown in the Figure 5.1 seems to be due to the certainty of the correct responses in the personal topic condition.

Table 5.3. Distribution of listeners' response as a function of native language (target) and topic.

Topic	Response	Native Language/Target	
		Same	Different
Personal	1=same	110	160
	2	206	233
	3	30	31
	4	124	210
	5=different	141	251
Neutral	1=same	86	120
	2	124	177
	3	22	23
	4	139	201
	5=different	169	259

In sum, the similarity ratings on IE sentences indicate that effect of topic on IE is strong enough for listeners to be able to differentiate speakers' native language, especially when the speech sample was been extracted from discussion of a personal topic. Listeners had more difficulty distinguishing the speakers' L1 when sentences were extracted from discussion on a neutral topic. These results are consistent with the idea that socio-

indexical markers of personal identity become more pronounced when speakers' speech is about a personal topic.

5.3.2. Acoustic Measurements

The next set of analyses addressed the effect of topic (Personal vs. Neutral), and native language (Hindi or Telugu) on the production of specific segmental and suprasegmental attributes. The results on vowel production are presented first, followed by those on retroflexion, /s/ production, lexical stress, final lengthening, and rhythm, in that order. We expected that, similar to the previous two experiments, vowel systems would be different for IE produced by Hindi and Telugu speakers, and that Hindi speakers of IE would produce a higher degree of retroflexion and lower mean frequency for /s/ production than Telugu speakers as well as greater final lengthening, a more variable rhythm pattern, and a slower speech rate from Telugu speakers. In terms of topic, we expected greater effects of L1 during discussion of personal topics compared to during discussion of neutral topics.

The IE vowels are plotted in Figure 5.2 according to their normalized F1 and F2 values and shown as a function of topic and speakers' native language. A qualitative comparison of the different vowel spaces depicted in the figure suggests that IE does vary somewhat with topic and with native language. Quantitative analyses were conducted to determine which, if any, of the differences evident in Figure 5.2 were systematic enough across speakers to be statistically significant. In particular, the analyses on F1 and F2 values separately tested for effects of topic, and native language on the production of particular vowels.

Analyses of F1 revealed a significant effect of topic on /ə/, $F(1,23) = 5.82$, $p = .024$; on /e/, $F(1,28) = 5.45$, $p = .027$; and on /u/, $F(1,20) = 5.54$, $p = .029$, a significant effect of native language on /ɑ/, $F(1,28) = 12.45$, $p = .001$; and on /u/, $F(1,20) = 6.82$, $p = .017$. Visual inspection of the Figure 5.2 shows that the main effect of topic was due to speakers' production of more raised vowels for the personal topic than the neutral topic. The main effect of native language was due to Hindi speakers producing more raised back vowels than Telugu speakers. This result is similar to the results for back vowels from Experiment 2.

Analyses of F2 revealed a significant effect of topic on /ɔ/, $F(1, 29) = 6.33$, $p = .018$, a significant interaction between topic and native language was observed for /u/, $F(1,20) = 4.47$, $p = .047$. The main effect of topic was due to a more centralized vowel in the personal topic condition compared to the neutral topic condition. The interaction effect of topic and native language was due to Hindi speakers' production of a more backed /u/ in speech extracted from conversations on a personal topic whereas Telugu speakers produced a more centralized /u/ in this context. Thus, as expected, Hindi and Telugu speakers showed more L1 accented vowels for the conversations on personal topic than neutral topic.

With respect to degree of retroflexion, an analysis of the difference between F3 and F2 at vowel offset indicated a significant effect of topic, $F(1, 90) = 10.69$, $p = .002$, a significant effect of native language, $F(1, 90) = 7.76$, $p = .007$, and an interaction between native language and retroflex identity, $F(1, 90) = 15.67$, $p < .001$. When data

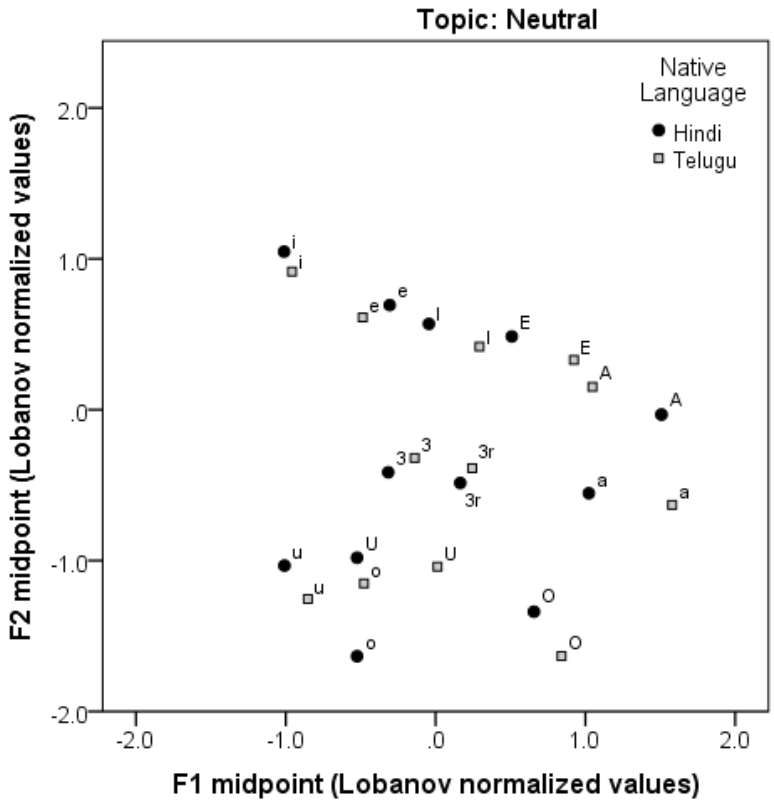


Figure 5.2. The monophthongal vowel space is shown by native language (Hindi or Telugu) and by topic (Personal: top panel; Neutral: bottom panel). Vowel measures were taken at the F1 and F2 midpoint and normalized using the Lobanov method (note: i=/i/ or /i:/, I=/ɪ/ or /i/, e=/e/ or /e:/, E=/ɛ/ or /e/, A=/æ/, a=/ɑ/ or /ɑ:/, 3=/ə/, 3r=/ɚ/, o=/o/ or /o:/, O=/ɔ/ or /o/, u=/ʊ/ or /u/, u=/u/ or /u:/).

were split by retroflex identity, the effect of topic was significant only for the /ɖ/, $F(1, 39) = 12.49$, $p = .001$, whereas effect of native language was significant for /ʈ/, $F(1,51) = 20.96$, $p < .001$. This result, shown in Figure 5.3, indicates that speakers produced the consonant with more retroflexion when speaking on a personal topic than when speaking on a neutral topic, consistent with the expectation of more L1-accented speech when the topic is more personal. As before, Hindi speakers were found to produce consonants with a higher degree of retroflexion than Telugu speakers, albeit only for /ʈ/.

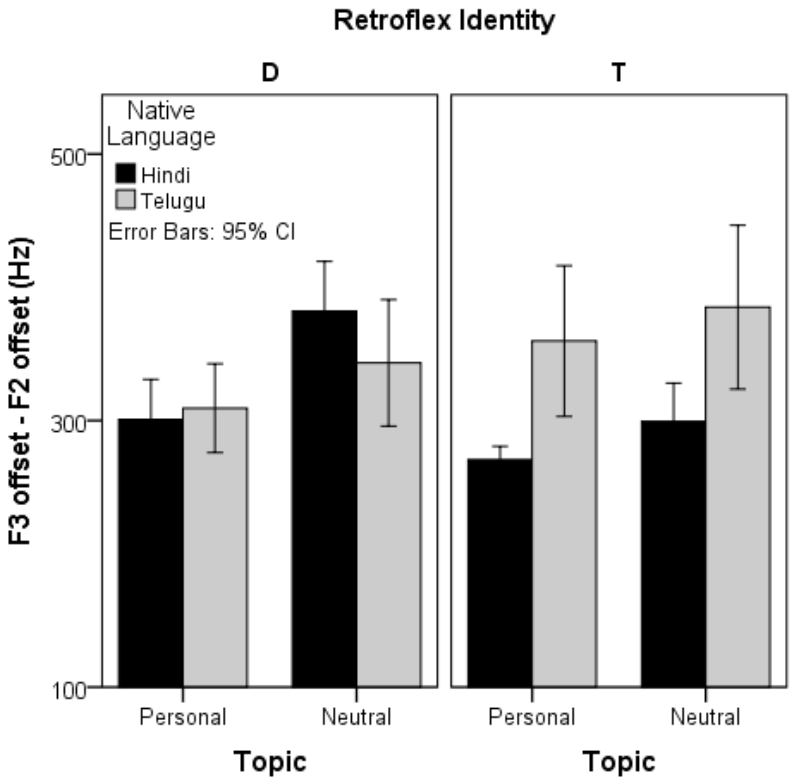


Figure 5.3. Degree of retroflexion of post-vocalic stops is shown as a function of topic (Personal vs. Neutral) and native language (Hindi vs. Telugu). Retroflexion was measured as the difference between the F2 and F3 offset values in the preceding vowel (note: T=/ʈ/, D=/ɖ/).

The overall analysis of mean /s/ frequency indicated a main effect of native language, $F(1, 82) = 9.50$, $p = .003$, but no effect of topic or any interaction between factors. The result in Figure 5.4 shows that Hindi speakers' once again produced /s/ with a lower average frequency compared to Telugu speakers.

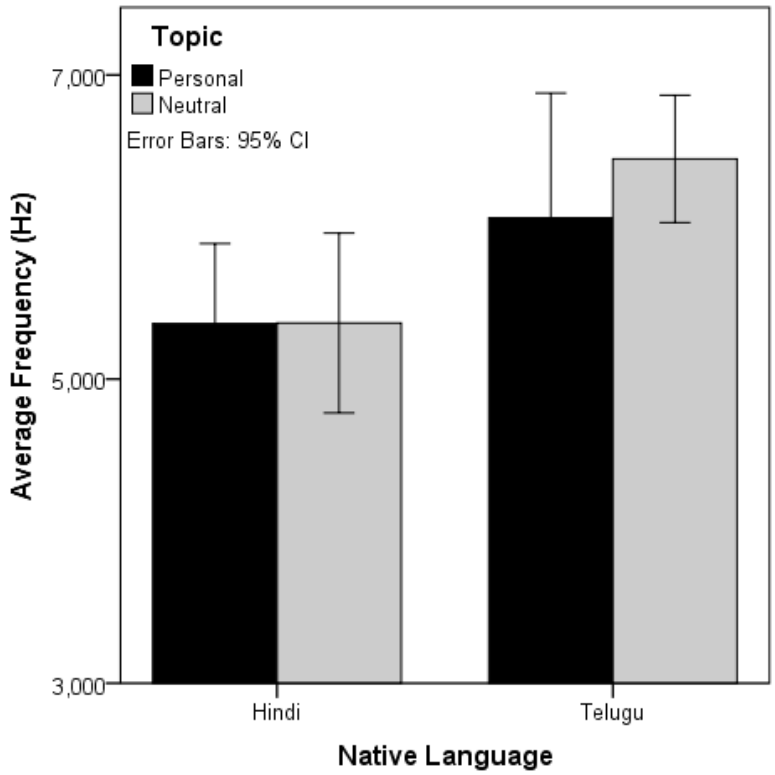


Figure 5.4. The average frequency of syllable-initial /s/ is shown as a function of topic (Personal vs. Neutral), and the native language (Hindi vs. Telugu).

The results on temporal patterns associated with lexical stress in English indicated a significant effect of stress pattern, $F(1, 116) = 91.24$, $p < .001$, but no main effect of topic, native language or any interaction between these factors. When the data were split by stress pattern, a nearly significant interaction between topic and native language was observed for the trochaic stress pattern, $F(1, 82) = 4.86$ $p = .054$. This result, shown in Figure 5.5, was due to Hindi speakers, who tended to produce trochaically-stressed disyllabic words with long V1 relative to V2 when speaking on a personal topic compared to neutral topic. This result is consistent with the expectation that IE would be more "accented" when speaking on a personal topic compared to a neutral topic.

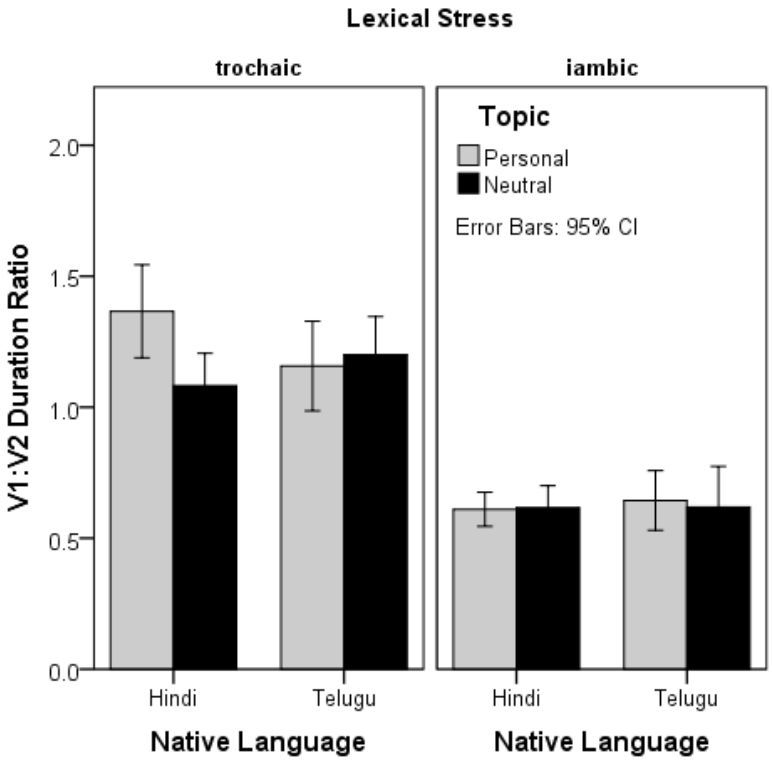


Figure 5.5.IE lexical stress in disyllabic words, measured as the ratio of the duration of the first vowel to the duration of the second is shown as a function of topic (Personal vs. Neutral), and native language (Hindi vs. Telugu).

The results on phrase-final lengthening also indicated an effect of topic, $F(1,124) = 4.19$, $p = .043$, but no effect of native language. There was also no interaction between these factors. Speakers simply produced more phrase-final lengthening when speaking on a personal topic compared to a neutral topic (aee Figure 5.6). The analyses on global rhythm and speech rate also indicated no effect of topic or native language or interaction between factors.

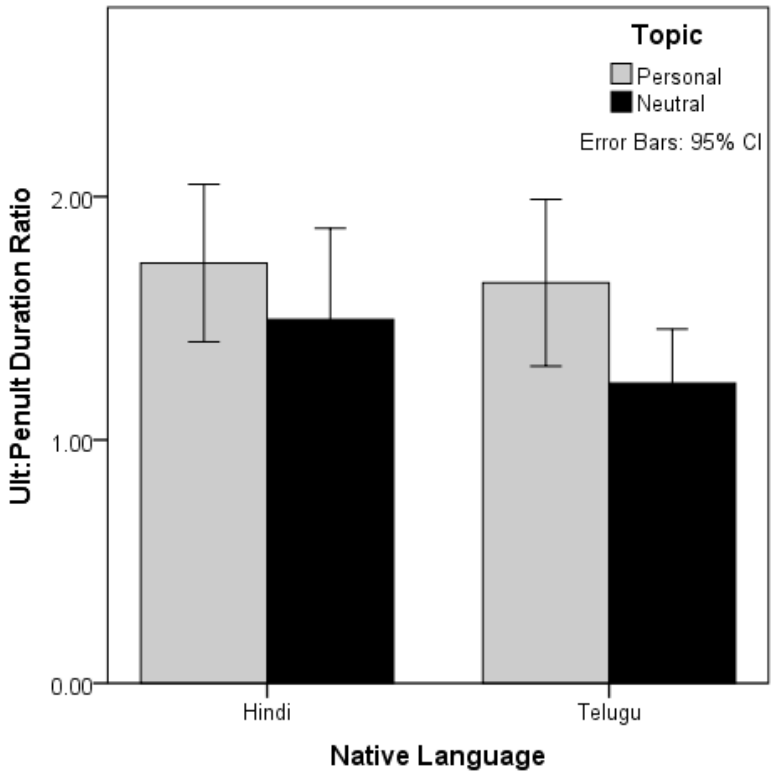


Figure 5.6. Phrase-final lengthening, measured as the ratio of the ultimate vowel duration to the penultimate vowel duration, is shown as function of topic (Personal vs. Neutral), and the speakers' native language (Hindi vs. Telugu).

Finally, the analysis on global rhythm metrics and speech rate indicated no effect of topic or native language or interaction between factors. Figure 5.7 shows no difference in the speech rate for Hindi and Telugu speakers and for the personal and neutral topics.

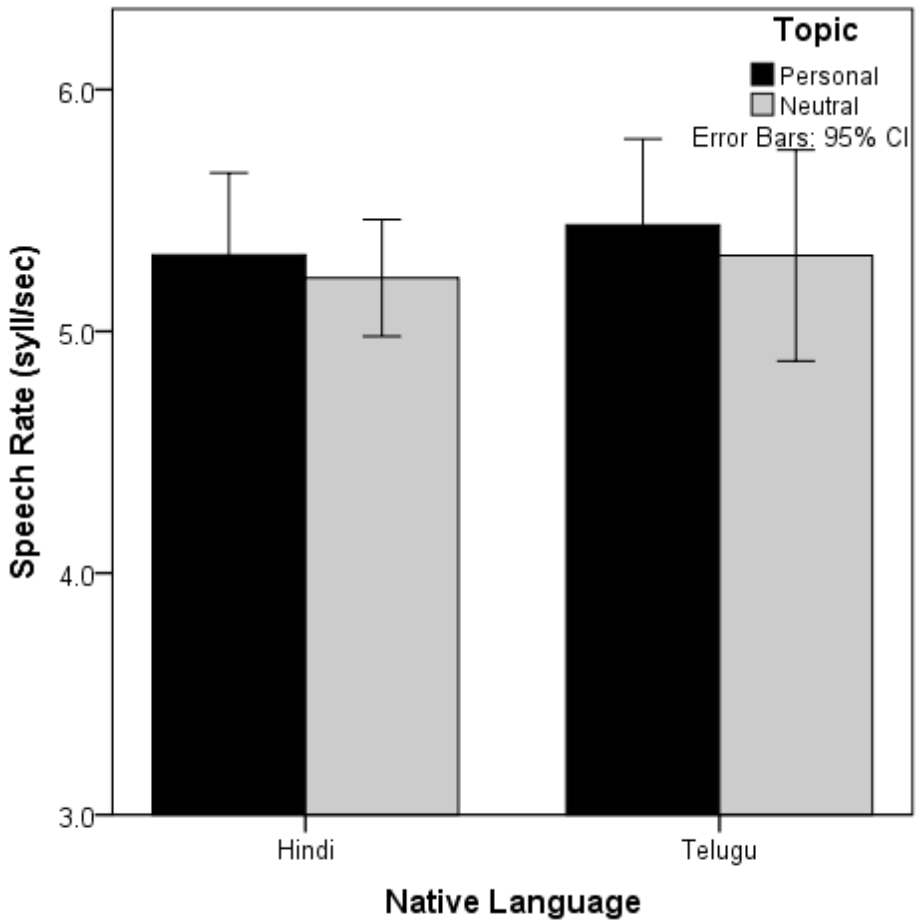


Figure 5.7. Speech rate shown as a function of topic (Personal vs. Neutral), and speakers' native language (Hindi vs. Telugu).

In sum, the acoustic measures indicated effects of topic and native language on IE. The effect of topic and native language was observed for vowels and retroflexion. Topic also affected final lengthening. The effect of native language on vowels and retroflexion were similar to the ones seen in Experiment 1 and 2: Hindi speakers produced /ʈ/ with more retroflexion than /ɖ/ and vice versa for Telugu speakers. Hindi speakers also produced /s/ with a lower mean frequency than Telugu speakers, similar to previous studies. Altogether, the results are consistent with the suggestion that speech

varies not only by speakers' native language but also by the conversational setting such that more accented speech is elicited when the topic is personal.

5.4. General Discussion

The current experiment investigated the effect of conversational topic on IE accentedness. The results indicate that this effect of topic go beyond the effect of native language on IE, which is also still observed. The results provide some minimal support the view that accentedness is a socio-indexical marker of personal identity (Tajfel, 1978; Krauss & Pardo, 2006; Meyerhoff, 2006). As expected based on sociolinguistic studies with monolingual speakers (Labov, 1972; Kiesling, 2009; Schieffelin and Ochs, 1986; Guiora, et. al., 1972; Dasgupta, 1993), the domain of speech indexed by the topic influenced the variety of speech that speakers used in conversation: more personal topics elicited more L1-accented IE than neutral topics. For example, we found an effect of topic on vowel space such that vowels produced in conversation about a personal topic were raised and centralized relative to those produced in conversation about a neutral topic. It is to be noted that vowel system of Hindi and Telugu are smaller than that of the GIE vowel system. The Indian languages also exhibit a length contrast for almost all the vowels. It is also been suggested that short vowels in Hindi and other Indian languages tend to be more centralized compared to long vowels, resulting in a smaller vowel space (Mishra et al., 2010). Thus, the greater degree of vowel centralization when speaking on a personal topic could reflect greater L1 accentedness. Of course, centralization is also a feature of vowel reduction, which is frequently observed in casual speech (Picheny et al. 1986; Bradlow, 2002; Harst et al., 2011). Casual speech is produced in settings where the

listeners are familiar and the conversation is easy, for example, the familial domain. Thus, it could also be that Hindi and Telugu speakers produced more centralized vowels in discussion of personal topics than neutral topics because their speaking style varied with the topic. Still, the finding that speakers also produced consonants with more retroflexion when speaking on a personal topic is clearly consistent with the prediction of greater L1 accentedness when speaking on a personal topic. Retroflexion is characteristic of many South Asian languages, and thus may serve as a strong marker of personal or social identity, just as it seems to do for Punjabi speakers in London (Sharma & Sankaran, 2009).

With respect to the effect of topic on final-lengthening, Odlin (1989: 56) has claimed that "many paralinguistic elements can also serve to mark a conversational style: intonation and related characteristics such as loudness and speech rate, gestures, facial expression, physical posture, and the like." This result too might indicate the emergence of a more vernacular, casual IE when speaking on a personal topic. This casual IE is also more influenced by the L1.

Together the results from the present experiment continue to undermine the idea that proficiency is the best explanation for L1 influence in IE. A partial explanation for the effect of native language in Experiments 1 and 2 may be due to the speech materials used in those experiments. The telling of Lord Ganesha's story may have put speakers in mind of the context in which they would have first encountered the story: a very personal, very familial context. Such a reinterpretation of the earlier results accords with learning stance theory discussed earlier (Schieffelin & Ochs, 1986).

The present results might also be interpreted in terms of psychological factors rather than in terms of social factors. A number of scholars suggest that a vernacular-to-standard continuum results from the amount of attention paid to the linguistic form while speaking (e.g., Tarone, 1983; VanPatten, 1990). When speakers are engaged in casual conversation or are excited about the topic they are discussing they may pay more attention to the content of what they are saying and, as a consequence, less attention to the form of the language. Less attention to form could result in more accented/vernacular speech and in more errors in the non-native language. When speakers are neutral about the topic and emotionally less excited, they may pay more attention to the linguistic form, resulting in a more standard L2. This psycholinguistic interpretation of the results may be fully compatible with the social interpretation given above, particularly if we imagine that a speech community grammaticalizes individual tendencies towards more accented speech under more personal and casual speaking conditions. Still, the different explanations for the findings do highlight once again the complexities of understanding IE variation in the multi-lingual context in which it is used.

CHAPTER VI

CONCLUSION

This dissertation investigated linguistic and social factors that were hypothesized to contribute to variation in IE. The goal was to understand the status of IE as one of the World Englishes. The findings reported in Chapter III indicate that different L1s influence the pronunciation of IE, but that this influence is relatively subtle in nature. The results reported in Chapter IV suggested that L1 influences on IE might be partly regional in nature. Although persistent effects of L1 on IE were observed, listeners were able to differentiate IE speakers by region when L1 was controlled. However, it was largely the Telugu speakers who showed strong regional variation in IE; Hindi speakers much less so. This difference was interpreted to reflect the relative social and political power of the two indigenous languages. Hindi has higher prestige than Telugu by virtue of being a national language and the language of the capital city. Thus IE spoken by Hindi speakers and by speakers residing in Delhi might be considered more prestigious than English spoken by Telugu speakers and speakers living in Hyderabad. In other words, the IE variety spoken in Delhi might be the emerging standard variety of IE.

As for the persistent effects of L1 on IE, we wondered whether the elicitation task encouraged people to use a variety of the language that indexed a personal identity since they were asked to tell a story that they would have learned as children. The experiment presented in Chapter V tested for variation along personal to professional and familiar to formal axes by investigating the pronunciation of IE when speaking on topics designed to orient the speaker to his or her personal identity and to recall the family domain or to IE

as a language of education and economic power. The results indicated that, as expected based on the sociolinguistic literature, speaking on personal topics brought out more accentedness than speaking on neutral topics. This result was interpreted to suggest that speakers have found a way to modify IE to foreground their personal and social/ethnic identity; a task that may also be accomplished by using the mother tongue. Alternatively, result could be interpreted to suggest style switching and that while discussion personal topics speakers pay less attention to linguistic form resulting in a more accented speech.

Overall, the findings suggest that, among highly proficient speakers of IE, variation in pronunciation is socially conditioned, suggesting that IE has entered the differentiation phase of Schneider's (2003) dynamic model of English evolution. At least among the speakers in this experiment, IE tracks personal expression even while allowing for communication across regional, ethnic and other social boundaries. Thus IE is truly an Indian language; one that people can relate to and call their own even while it is also used as a lingua franca without any loaded aspect of ethnic group. Due to globalization and the importance of English in the global market, IE is becoming more important to Indians than any of the other indigenous languages of India. Thus it might not be far-fetched to say that IE will soon acquire the status of (national) language that unifies the country.

6.1. IE Use Across Domains

There are contradictory views on the use of IE in different domains. Some scholars claim that IE is used exclusively as a utilitarian language (Das, 2002; Pingali, 2009). Others suggest that IE is used across domains, from the personal to the economic

domain (Pandit, 1978; Kachru, 1976; Sridhar, 1989; Hohenthal, 2003). From the self-reported language use reported by participants in experiment 2 (Chapter IV), IE seems to have penetrated the friendship domain for many speakers and the family domain to a lesser extent. Exclusive use of IE in the professional domain suggests that this is still its principle domain. But there are signs that this situation is continuing to change. With increased mobility of people from one region to other in India, there has also been rise in intermarriages between partners of different backgrounds. Although this does not necessarily imply a change in the language used in the personal domains, the trend is towards marriages between people who share an educational background rather than merely a social or ethnic background. When this happens, individuals who do not speak the same L1 may marry, and the couple falls back on IE to communicate in the personal domain. This situation is observed especially in marriages where one partner is from a Tamil- or Hindi-speaking state as these individuals are least likely to speak another indigenous language besides Tamil or Hindi. The rate of intermarriages is only likely to increase with in-migration to large cities and with the importance and emphasis on education and English. As intermarriages increase, so too will the penetration of IE into the personal domain.

6.2. IE as a Possible National Language

Due to the enormous linguistic and ethnic diversity of India, India has had problems choosing a national language. The biggest problem has been that there is no single indigenous language that a large majority of the citizens accept as a symbol of national identity due to jealousies between groups. It is for this reason that Hindi, an

indigenous language, is questioned in its status as national language. As an ethnic and regional language, the use of Hindi as a national language is perceived by a significant portion of the population an imposition of one group over the others. Any attempts to enforce the use of one indigenous national language throughout India might lead to greater state autonomy or division of a country that readily divides along ethnic/regional and social/economic lines. Recall that Indian independence cost it the division of Indian subcontinent into present day India and Pakistan, based on religion. This division is fierce and symptomatic of the strong differences in social identities that occur throughout India.

Because of the constant threat of division, India needs a language that is neutral with respect to ethnic and regional identities and so could act as uniting power. Many think English can be that one language, for example, Kachru (1986), stresses the neutrality of English: "English is free from any undesirable (e.g. ethnic or religious) connotations native languages may have. The pros of using English have wiped away the fact that it originally was the colonizer's language (p. 9)." Famed author Salman Rushdie (2003) wrote that

> IE is not "English" English, to be sure, any more than Irish or American or Caribbean English is. And it is a part of the achievement of English-language Indian writers to have found literary voices as distinctively India, and also as suitable for any and all of the purposes of art, as those other Englishes forged in Ireland, Africa, the West Indies, and the United States.

In modern day India, it is clear that IE is the language of economic power without which one cannot become a doctor, an engineer, a scientist, or obtain any other high-prestige job. This power has conferred prestige upon English, and along with this,

prestige on the increasing number of English-medium schools in Indian. As this dissertation shows, IE is now also a malleable and flexible language that mixes with the vocabulary of the home and hearth. It is Indian now. IE does not hold to any Oxford norms, and is continually being adjusted according to the Indian speakers' wish. And the differentiation of IE into multiple varieties continues apace. That said, a standardized variety is also important. GIE is supposed to be this variety, and is meant to be consistently taught in primary and secondary education. But English teachers are also native speakers of an Indian language, and thus likely also exhibit an L1-accented IE that is then imparted to students. In this scenario, it may be that students who have teachers with Hindi as their L1 receive a variety of IE that has higher prestige given that Hindi itself is more associated with political and other social power than other Indian languages.

6.3. Remaining Issues

As suggested by Kachru (1986) a large-scale study of variation of IE is needed. The current dissertation provides initial insights into the linguistic and socio-linguistic factors that continue to play an important role in the evolution of IE into different varieties. However, the present study was restricted to the most educated Indians; those who are highly proficient in English. Future work will need to investigate English in the context of different proficiency levels. Along these lines, the present study focused just on the social aspects of the IE acquisition; psychological factors were not explicitly taken into consideration even though the personal topics and elicitation methods used in Experiment 3 are also sometimes used to investigate accentedness in the second language

acquisition literature. Still, a truer study of attention to form might need to use more controlled speech materials than the ones used here. Finally, the present study did not provide information on attitudes towards differently accented IE, even though there was some indication from Experiment 2 that Hindi-accented IE might be more prestigious than Telugu-accented IE. According to Acculturation Model by Schumann (1978) the degree to which the second-language learners acculturate themselves towards the culture of target-language group generally depends on social and psychological factors. These factors will determine respectively the level of social distance and psychological distance an L2 learner is having in course of his learning the target language. Thus it is important for the future work to explore these factors in detail.

Although the number of people getting educated in English has been on the rise in India, it is nonetheless true that a large portion of the Indian population are uneducated or have limited education and so little to no access to English. A discussion of IE as a national language leaves underprivileged people out. On the other hand, it is important to note that any discussion of national language leaves these people out. With little to no education, their use of language is largely restricted to their mother tongue. This situation calls for serious reform of education in India and the proper implementation of language policy. In spite of the Right of Children to Free and Compulsory Education Act or Right to Education (RTE) Act which came into force on 1st April 2010, there are many loopholes in Indian law and also deliberate ignorance of the act in most private schools. The act requires all private schools to reserve 25% of seats to underprivileged children; however, children continue to be admitted to private schools based only on caste. In addition, most of the public schools in India do not have proper infrastructure, and have a

shortage of teachers. As a consequence, the quality of education not held to a high standard and English education is frequently ignored. In all, the policy needs to be revised to take input from educators, and the government needs to monitor the schools to enforce the rule or face dire consequences. Additional funding must also be allocated to public schools so that they may be improved and brought to par with the private schools in the quality of education that they offer in English and other subjects.

APPENDIX A

CONSONANT INVENTORIES OF GIE, HINDI AND TELUGU

A. CONSONANT INVENTORY OF GIE (CIEFL, 1972)

	labial	labio-dental	dental	alveolar	post-alveolar	retroflex	palatal	Velar	glottal
Stop	p (pʰ) b		(t̪) t̪ʰ d̪			ʈ (ʈʰ) ɖ		k (kʰ) g	
Affricate					tʃ dʒ (tʃʰ)				
Nasal	m			n				ɲ	
Fricative		f		s z	ʃ				h
Approximant	ʋ/w			r			j		
Lateral approximant				l		(ɭ)			

B. CONSONANT INVENTORY OF HINDI (Ohala, 1999)

	labial	labio-dental	dental	Alveolar	post-alveolar/palatal	retroflex	velar	uvular	glottal
Stop	p pʰ b bʰ		t̪ t̪ʰ d̪ d̪ʰ			ʈ ʈʰ ɖ ɖʰ	k kʰ g gʰ	(q)	
Affricate					tʃ tʃʰ dʒ dʒʰ				
Nasal	m			n	ɲ	ɳ	ŋ		
Fricative		f		s z	ʃ		(x) (ɣ)		h
Tap or Flap				ɾ		(ɽ) (ɽʱ)			
Approximant		ʋ		l	ɹ				

C. CONSONANT INVENTORY OF TELUGU (Krishnamurti, 1972)

	Bilabial	Labio-dental	Dental/ Alveolar	Retroflex	Post-alveolar/Palatal	Velar	Uvular	Glottal
Nasal	m		n	ɳ				
Plosive	p pʰ b bʱ		t̪ d̪ʱ d̪	ʈ ʈʰ ɖ ɖʱ		k kʰ g gʱ		
Affricate					tʃ dʒ tʃʰ dʒʱ			
Fricative		f	s	ʂ	ʃ			h
Tap or Flap			ɾ					
Approximant	w		l	ɭ	j			

APPENDIX B

LORD GANESHA STORY IN IE, HINDI AND TELUGU

A. STORY IN INDIAN ENGLISH

1. Lord Ganesha is very fond of laddoo (modaka, a sweet delicacy).
2. Once upon a day of Ganesh Puja, Ganesha went from house to house and accepted the offering of laddoo.
3. He stuffed himself to the capacity and decided to take a ride on his mouse at night.
4. Along the moonlit road, they got to see a large snake, and the troubled rat stumbled, with the consequence Ganpati fell down.
5. He hit the ground hard and as a result his stomach burst open.
6. All the laddoo came out, but Ganesha again stuffed them into his stomach.
7. He caught the snake and tied it around his belly.
8. Moon witnessed the whole event and laughed heartily.
9. Lord Ganesha lost his temper and furiously looked about for something to throw at his tormentor.
10. Getting nothing, he pulled out one of his tusks and hurled it at the moon.
11. He cursed the moon that no one should look at the moon on the day of Ganesh Puja.
12. If anyone would look at it, he will get a bad name, criticism, or ill reputation.

13. If anyone gets to see the moon by chance he would be free from that bad name or blame after hearing the story of Lord Krishna's clearing his personality in respect of syamantaka jewel.

B. STORY IN HINDI (Standard transliteration, sentences were presented in Devanagari script.)

1. Bhagwan Ganesh ko laddoo bahut pasand hai.
2. Ek baar Ganesh Puja ke din Ganesh ghar ghar gaye, tatha jo laddoo diye gaye veh swikar kiye.
3. Vah baDi mushkil se raat me apne vahan chuhhe par sawar hokar nikle.
4. Chandni raat me unhe ek baDa saanp dikha jise dekh kar vah bhaybhit ho gaye aur Dagmagane ke karan Ganapati niche gir paDe.
5. Vah jese hi sakht zamin par gira, vese hi uska peT faT gaya.
6. Girte sabhi laddoo bahar gir gaye lekin Ganesh ne unhe dubara apne peT me Daal diya.
7. Usne saanp ko pakaD kar apne kamar me bandh liya.
8. Chaand is pure ghaTna kram ko dekhte hue ji bhar kar hasa.
9. Bhagwan Ganesh gusse me aa kar aag babula hote hue kuch fekne ke liye idhar udhar dekha.
10. Jab kuch nahi mila to usne apna ek daant bahar nikaal kar chaand par vaar kiya.
11. Usne chaand ko shrap diya ki Ganesh Puja ke din koi bhi chaand ko nahi dekhega.
12. Agar koi ise dekhega to vah badnaam hoga aur use burai aur badnaami milegi.

13. Agar koi galti se chaand ko dekh le to vah chaand ko dekhne ke bure prabhav se tabhi mukt hoga jab Sri Krishn ka syamantaka maNi ki kahani paDe

C. STORY IN TELUGU (Standard transliteration, sentences were presented in Brahmi script.)

1. Ganesha na ku kuDumulu ante chaala ishtam.
2. OkapuDu Ganesha Puji rojuna GaneshaDu intinti ki velli laddoolu tiskone vaaDu.
3. Atanu poTa ninda tini aa raatri eluka pai shikaruki vellaDu.
4. Aa chandrakaanti lo waLLu roddu pai oka pedda pamunu choosaru, daanto yeluka tatar paDindi, daanto Ganapati paDi poyaDu.
5. Aa nelanu gaTTiga taake sariki atana poTTa paglindi.
6. Laddool anni poTTa nunDi baita paDDayi, kani GaneshaDu anni malli poTTa lo peTTesa kunnaDu.
7. Atanu paamunu paTTukoni tana poTTa chuTTu kaTTu kunnaDu.
8. chandruDu antaa choosi manaspoortiga navveDu.
9. Ganeshani ku yento kopam vachchindi, aa kopam to atani pai wisaraDaniki yedaina doruku tundemo ani choosaDu.
10. Emi dorakaka GaneshDu oka dantanni tisi chandruni meeda ki visiri veesaaDu.
11. Ganesha Puja rojuna yevaru chandruni chuDaraadani atanu shapinchaaDu.
12. Atanni yavaaina chooste gani ataniki cheDDa peru, apaninda, leka apavaadu kalugu tayi.

13. Porpaatuna yevraina chandruni chooste vallu apanindala paalayete KrishnuDu syamantaka maNi pondeTappuDu paaleina apanindalu kada chadivite aa apanindalanunDi vimukti pondutaaru.

APPENDIX C

SENTENCES ON MARRIAGE, CHILDHOOD MEMORIES, SCHOOLING AND EMPLOYMENT

A. SENTENCES ON MARRIAGE

1. We have to spend whole our life with that guy, so we should know him like properly.
2. Arrange marriage it's a gamble, can work if you want to.
3. At a personal level, I won't go for arrange marriage.
4. Love cum arrange marriage is the best, it gives you a lot of commitment.
5. Love marriage is something, I find it quite tricky.
6. Prefer arrange marriage, I don't believe in love.
7. After marriage, it doesn't depend that I like love marriage or arrange marriage.
8. Love marriage, in 100%, 5% is success.
9. Marriage is like far far away, and probably not there at all. I don't really want to get married.
10. Love marriage, it depends sometimes it's good sometimes it's not.
11. If I fall in love, then I will go for that.
12. Until and unless the guy is qualified, they don't have any problem.
13. I will go for an arranged marriage not for love marriage.
14. I prefer arranged marriage, because I am very bad at choosing things to myself.
15. In my place it is mostly arranged marriages, in my family.
16. Love marriage is only girl's choice.

17. We don’t know the guy, then how can we marry him without knowing, so we must know him first.
18. Love marriage, at least you don’t have anyone else to put the blame.
19. I do trust my parents they will take a right decision for me.
20. You know kids can look upto their parents they can learn lot of things.
21. And marriage is not only between two people it’s about two families.
22. Because my father and family will not prefer for love marriage.
23. I have done it for my marriage only, I didn’t take any dowry.
24. Mom dad is also arranged marriage.
25. With marriage comes so many other things like having kids and this and that.
26. Conflicts and fights are always there is love marriage or arrange marriage.
27. If even after your marriage if he throws you, at least you can do whatever you want.
28. Because I think it is quite weird to, you know to spend the whole life with the person whom you don’t know at all.
29. No man in our family did a love marriage or nothing, maybe because of that also.
30. I think arrange marriage, my parents will choose for me.
31. So I think even if I prefer any guy I think they will accept.
32. She only will be selecting and everyone will oppose her in Indian culture.

B. SENTENCES ON CHILDHOOD MEMORIES

1. Actually, I got many punishment from my teacher.
2. My first English flick, Titanic, and I was underage.

3. Do remember one slap of my teacher, because I forgot to take my scale to the school.
4. I was in class 4 at that time, so it was really a moment for me at the award ceremony.
5. When I was in 8th standard, so I decided there I have to do law.
6. I fell down from 1st floor to ground floor.
7. New feeling that I am going to new place for my education.
8. In my 8th class I played kho-kho.
9. And when the teacher asked me where I wanted to sit, I pointed near the dustbin.
10. When I was in 5th class there was a annual sports day.
11. I once scolded my brother, I used some very bad words.
12. To be honest I didn't have any male friends.
13. There is an instant that my dad and mom told me.
14. More than my parents I used to go and approach her, wheneve I used to write poems.
15. Initially it was a horrible place for me.
16. When the rickshaw man comes, we just tell him to go away, we don't want to go to school today.
17. I used to stand outside everyday in my library period.
18. At that time I was 12 or 13 and I went to this theater.
19. The school that I was studying earlier was quite small.
20. I was taking the award at such a small age.

21. In the serial, he had the principles that I have to fight with the true people and true things.
22. And I was going to see the banana and I fell down.
23. Because don't know to follow up their studies, lot of trouble I faced.
24. I think kho-kho is very good game to play.
25. Plus I was always a bit of a loner in school, like I didn't make a lot of friends.
26. My class teacher, she forced me to take part and I was not willing to do it.
27. And he said that you are studying in English medium school and learning these all things.
28. So they only asked me that you can go and come back at 12.
29. They are thinking that there is too much in my brain and I will become mad and all.
30. There used to be my principal, who used to encourage me in writing poem. I don't know why.
31. But, then later on I got used to that school, I got used to those people.
32. The rickshaw man doesn't come, my father used to drop us.

C. SENTENCES ON SCHOOLING

1. My 1st class till 12th I was very good at English rather than in science.
2. I did my schooling from Hillgrove public school.
3. Before that I was into Saint. Mary, south ex.
4. Upto 10th I did my schooling from Bal Bharati.

5. Since from the beginning I was in Lady Irvine school only, it's an English medium school.
6. LKG to 7th studied from Holy Angle school.
7. But, in my school, I didn't get science side.
8. I miss my those days, 11th and 12th.
9. They tried to make it compulsory many times.
10. Force us to go outside the class and we can't finish our syllabus.
11. I was in Hillgrove public school, right from the beginning.
12. I am from a convent, so we were also encouraged to speak in English only.
13. But, only shifted different schools, that's it.
14. There was a strict rule that we should speak in English, but we never used to do that.
15. From my nursery till 10th standard I was in ICIC board school.
16. Sister's convent from nursery to 10th standard same school.
17. When I studied commerce than I got interest.
18. In fact not only me, but the whole class, you have to speak in English.
19. From starting commerce is one thing which interest me a lot.
20. Well shifting school was ok, I mean there was not much to think about.
21. Actually, when I was in 12th I was in science.
22. New school crowd was not very good, but adjusted myself in that atmosphere.
23. Upto 10th class I studied in the same school.
24. I miss my those days 11th and 12th.
25. Teachers of course they imparted the education etc in English.

26. Force us to go outside the class and we can't finish our syllabus.
27. I was like 50-50 in science, whereas in English I was average student.
28. And the courses are also really good and the teachers are like of a great reputation.
29. Studied through my 6^{th} class in CBSE pattern and then suddenly shifted to SSC pattern.
30. I am a monitor, so I had to speak English.
31. 11^{th} and 12^{th} I just changed to other college.
32. I did not change any school, had same teachers and friends, till 10^{th} class.

D. SENTENCES ON EMPLOYMENT OR CAREER PLAN

1. I have to do MBA after my graduation
2. It will be good for my career if I end up or enter piping sector.
3. I want to do my post graduation from abroad.
4. I have two plans in mind, either do M.Com and then get into lectureship.
5. Basically, after this passing out I want to practice for certain years.
6. Doing B.Tech in CS so hoping for software engineer.
7. Actually, my profession is marketing.
8. After graduation, I want to do MBA.
9. Plan to work after finishing my M.A, probably as a technical writer.
10. 99% translation, 1% for professor.
11. I wanted to teach, I don't want to go for research.
12. I think I will do M.A in literature only.

13. Ya, I am interested in civils, I wanted to become IAS or IPS officer.
14. I want to become professor in English.
15. I think I like teaching but I am not seriously considering it.
16. Plan is to take masters in English, after M.A., Ph.D.
17. I want to do outside India, so it depends on my marks.
18. Just being a mechanical engineer, you are not gonna enter into an automobile firm.
19. Right now I am thinking of masters.
20. I am not a sort of girl who can think such a long term thing.
21. And then I want to go into a firm, as a legal advisor.
22. IT is low but can develop in 4 years.
23. If I get any opportunity I will enter the market.
24. After graduation MBA.
25. There are not a lot of technical writer around.
26. Right now the market value for French is little bit low.
27. Those who are really very interested in learning a second language as English.
28. Maybe I will try for MNCs or something.
29. Some point of view I have that, that I have to teach.
30. I don't know what will be my future right, I don't know where I belong.
31. I will try to be a translator.
32. Teacher, I think it's a best and easy job, easy in the sense, cool, many holidays.

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