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1 Introduction

As a vast amount of historical and sociolinguistic research has shown, sound changes are not instantaneously implemented in all areas where the changing language is spoken. Changes gradually diffuse through and between speech communities, such that some areas may be relatively advanced with respect to a given change, while others will be just starting to exhibit signs of it. This fact presents an interesting question concerning individual speaker variation and change: what is the effect of moving between communities that differ in the extent to which a particular sound change has taken hold?

The work presented here contrasts with previous research on migration and language change which has primarily dealt with contact between speakers of two markedly different dialects or language varieties (Feagin 1990; Bowie 2000; Chambers 1992; Bortoni-Ricardo 1985). Feagin's work, for instance, shows that those who grew up in the r-less community acquired post-vocalic /r/ when they moved to a community where /r/ is pronounced. These studies conflate migration with structural distinction so that in cases where a speaker has moved into a new community, they are also exposed to a linguistic system that is qualitatively different from their own.

The current study addresses the question of dialect zone-internal migration by using real-time data to study changes in the speech of 4 young adults in Ontario who moved from their small hometown to larger urban communities within the same dialect region. These locations differ in how advanced they are with respect to /æ/-retraction, a change in progress affecting some varieties of Canadian English. This paper will examine the linguistic conditioning of this change as well as the effect of individual social practices on its adoption.

1.1 /æ/-retraction, Conditioning Environments and Geographic Distribution in Ontario

Several studies have shown that /æ/, the vowel found in the TRAP and BATH lexical sets, is involved in a change in progress (Labov et al. 2006; Boberg 2005; Clarke et al. 1995; Esling and Warkentyne 1993). Labov et al.

(2006) and Boberg (2005) both identified a significant positive correlation between F2 and speaker age which cannot be attributed to age-grading processes: younger speakers of English in Ontario and Quebec exhibit variants of /æ/ that are more retracted than those of older speakers.

Clarke et al. (1995) described the phonological conditioning of /æ/-retraction. Their data showed that variants of /æ/ followed by a liquid or a fricative are more retracted than variants in other environments, while the lowest rates of retraction were found before nasal consonants, stops and affricates.

Lawrence's (2002) study of /æ/-retraction in Ontario found geolinguistic patterns associated with acoustic properties of /æ/. Speakers from Toronto showed lower mean second formant frequencies than did subjects from smaller towns in Ontario. This suggests that pronunciations of /æ/ are more retracted in the Greater Toronto Area than in smaller towns further away from the city.

De Decker (2001) focused on the distribution of /æ/-retraction among high school peer groups in Tillsonburg, a small town in southwestern Ontario. The GOLDVARB results reported there were partly consistent with Clarke et al.'s findings: retraction was favored by following stops, fricatives and affricates and disfavored by following nasals and /g/. De Decker found that the social practices and orientation of one's peer group also significantly affected the degree to which speakers used retracted variants of /æ/. We will return to discuss this analysis in more detail below.

Six months after De Decker's (2001) data were collected, several of the original subjects moved away from Tillsonburg to attend college or university in larger urban centers. This situation enables us to address the question introduced above: have the speakers who moved to a larger city (closer to Toronto) altered their pronunciation of /æ/ as a result of this move?

2 Methodology

Two different analyses were completed for this study: first a large scale study of 23 speakers at one time, divided into 5 peer groups, and a real-time study of 4 speakers with data taken from two points in time.

2.1 The peer group study (2001)

Before we consider any real-time data, it is important to determine how the 4 subjects realized /æ/ in 2001, relative to other peer groups in their community and so we begin with our synchronic findings on the distribution of /æ/-

retraction among 5 adolescent peer groups in Tillsonburg. Data from all 23 subjects interviewed as part of the initial study in 2001 were re-analyzed acoustically and tested for synchronic differences based on each speaker's peer group affiliation.

To facilitate this analysis, we quantified retraction as the relative difference between the mean F2 of /æ/ and the mean F2 of /a/ for each subject and averaged these values for each of the five peer groups. The results are presented in section 3 and illustrate the social distribution of /æ/-retraction across a sample of adolescent peer groups.

2.2 The real-time study of 4 speakers (2001 & 2004)

Data from the four female subjects forming the Smart Kids (SK) group was collected in 2001 and 2004. The first data set was collected when the four subjects were in their final year of high school. Each subject was re-examined in 2004 before the onset of her final semester at university. The city of residence of each individual in 2004 is shown in Table 2.2 below.

Name	Moved to	Population*
Anita	Waterloo, Ontario	86,543
Erika	Hamilton, Ontario	490,268
Sylvia	Toronto, Ontario	2,481,494
Katherine	Toronto, Ontario	2,481,494

Table 2.2: Destination of each subject after moving from Tillsonburg.

*based on 2001 StatsCan Census report

All four subjects were recorded while reading the same word list in 2001 and 2004, yielding approximately 30 /æ/ tokens per session. In both cases, recordings were made in the same quiet room at the home of one of the subjects using a SONY Mini-disc recorder and were later digitized using a Marantz PMD670 flash recorder at a sampling frequency of 22kHz.

For both the peer group and real-time analyses, tokens of /æ/ were divided into two groups based on the phonological conditioning environments that were found to be relevant to retraction by De Decker (2001). The environment known to inhibit retraction is referred to henceforth as INHIB (or /æ/0) while the favoring or promoting environment is referred to as PROMO (or /æ/1). Each token of /æ/ was measured acoustically using Praat with a spectrogram window size of 0.005 seconds and LPC window size of 0.01 seconds. First and second formant frequencies were measured at three temporal points throughout the duration of the vowel (i.e. onset, temporal mid-

point and offset). For each individual, F1 and F2 values taken at the midpoint of [æ], in both INHIB and PROMO environments, were compared across the two time periods using individual paired samples t-tests.

In addition to word list recordings, all four subjects were interviewed twice: first as a group and then each individually. Both interviews lasted approximately 1 hour each. Sociolinguistic interview modules focussed on topics such as their attitudes towards moving away from Tillsonburg and living in larger cities and the resulting change in their social ties and practices (if any). These data were compared with ethnographic data collected in the 2001 study.

3 Results: The Peer Group Study (2001)

The initial investigation gathered data from 18 high school students, all female, who self-identified as belonging to one of the following social networks: the Smart Kids (SK), The Christians in Action (CIA), the Downtown Kids (DK), the Clown Posse (CP) and the Ontario Academics (OAC). Their average F2 distance values (as described above) are presented for both of the classes of conditioning environments described above.

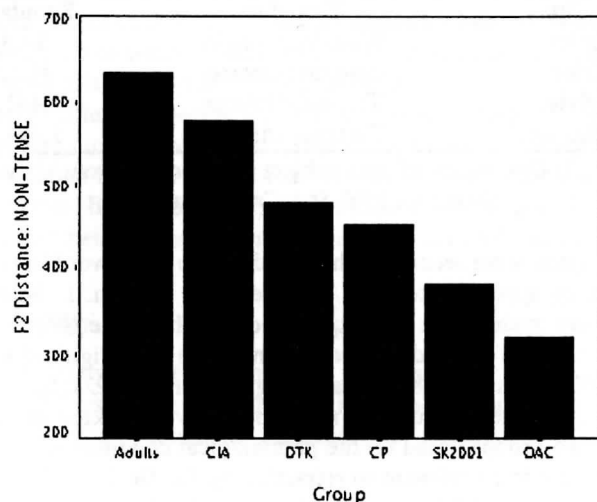


Figure 3.1: F2 distance between /æ/ and /a/ in Hertz in PROMO environments

Figure 3.1 presents the F2 distance measures (i.e. mean F2 of /æ/ - mean F2 of /a/) for /æ/1 for 5 peer groups in Tillsonburg, and a sample of 5 ran-

domly selected adult females from the same town. A one-way ANOVA, with F2 distance as the dependent variable and peer group as the independent variable, revealed significant differences at the .05 level [$F(6,20) = 5.209$, $p=0.002$].

Tukey Post-hoc tests reveal significant differences between the OAC and the CIA and between the Adults and the OAC and the SK. No significant differences were found between the Adults, CIA, DTK and CP or the SK and the CIA, DTK and CP. Thus, the group with the most retracted forms of /æ/ is the OAC, the least retracted is the Adult sample. Crucially, the SK patterned with the OAC showing slightly less retracted forms than the OAC.

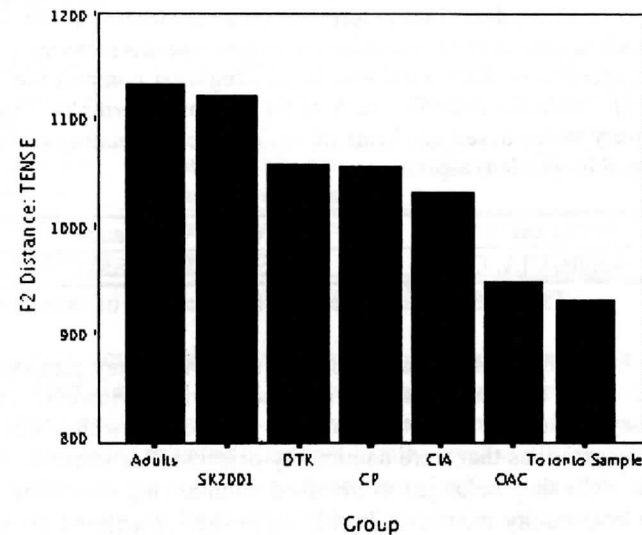


Figure 3.2: F2 distance between /æ/ and /a/ in Hertz in INHIB environments for 5 peer groups. A sample of 5 adults and 5 Toronto females are also shown.

Figure 3.2 shows the F2 distance measures for /æ/0 across the 5 peer groups and the group of randomly selected adult females from the community. No significant differences were found between these groups [$F(6,20) = 1.149$, $p = 0.371$]. F2 distance measures for the 5 randomly selected female university students from Toronto are included to illustrate the difference in retraction values between Toronto and Tillsonburg. What is interesting about

these findings, however, is the relationship between the Adults, the SK, the CIA and the OACs.

The SK show values for retraction in /æ/1 that are most like the OACs and least like the Adults. In this case, they are similar to their peers. However, for /æ/0, they exhibit values *least like* the OACs and *most like* the adults. Conversely, the CIA show *little difference* between themselves and the adults for /æ/1 but retract /æ/0 *like* the OACs do. Thus, this analysis reveals that, for these two groups, there is no direct correlation between retraction in PROMO and retraction in INHIB environments. The CIA and the SK are simultaneously similar to their peers and unlike their peers, depending on the conditioning environment. However, it is interesting that only these two groups show this cross-over pattern.

How might this situation be explained? De Decker (2001) argued that the groups could be described in terms of cultural identity, which is defined as "a sociolinguistic factor which involves how speakers conceive of themselves in relation to their local and larger, regional communities" (Hazen 2000: 127). Table 3.3 classifies each of the groups in terms of a binary cultural identity status based on forms of social practice relating to local-loyal and regional (expanded) aspirations.

Local	Expanded
Adults, CIA, CP	DTK, SK, CIA

Table 3.3: Cultural identity classifications of each group

The SK shared many of the same goals as the OAC. They planned to leave town and attend university elsewhere in the province. However, unlike the OACs, they also spoke about their positive connections with adults and participated in activities that were community-oriented. For instance, the extra-curricular clubs they belonged to involved volunteering their time to assist other community members. In this sense they resembled the CIA who exhibited strong local loyalty through their Evangelical Christian outreach programs. While rooted in local traditions governed by their church leaders, such activities required them to interact and present themselves as authentic members of the teenage social order. Thus, the social behavior of the CIA and the SK indicate that cultural identity is multi-faceted and requires a deeper understanding of the numerous options available to community members.

This multi-faceted social behavior though appears to have linguistic correlates. The phonetic split observed above appears to mark the complex cultural identities of the CIA and SK. Specifically, the SK's high F2 distance values in the INHIB environment might be interpreted as a result of their

mutual engagement with older adults in the community. To put it another way, the SK's social network ties with adults might be one of the driving forces behind their weak degrees of retraction in the INHIB environments. Likewise, their positive orientation towards peers with similar expanded identity values (like attending university in a larger city) might contribute to their higher degrees of retraction in PROMO environments. If this is true, then we would expect that if a change in the social ties and practices accompanied the SK's move to the city, changes in the pronunciation of /æ/ are likely to follow.

Table 3.4 below outlines a diachronic view of the social network ties and social practices of that the members of the SK exhibited in 2001 and 2004. These features emerged from both the group and individual sociolinguistic interviews.

Social Factor	2001	2004
primary network ties	ingroup	infrequent ingroup (SK) contact; roommates
secondary network ties	adults in the community; teachers	friends of friends (peers)
social practices/endeavors	community service; study groups	dance clubs, nightlife; study groups

Table 3.4: Social factors in 2001 and 2004

Table 3.4 indicates that some salient social changes occurred between 2001 and 2004. Many of these newly developed patterns resemble the social practices of OACs in 2001. In 2004 we see that the members of the SK primarily hung out with urban oriented peers, not locally loyal small-town adults. One caveat must be noted: at the time of the second set of interviews, Katherine indicated that although her experiences at university were entirely positive, she did not hang out with friends at local dance clubs or bars on the weekends. In other words, her personal practices were inconsistent with the practices presented in Table 3.4.

To summarize the findings so far, the data from 2001 show very little variation in the pronunciation of /æ/0 though F2 values indicate the SK are among those who are most tensed in the community, just behind the sample of adults. However, significant differences in mean F2 values were found for /æ/1. Looking across the two years of data, we note changes in the social network ties and practices of SK members, with the exception of one subject, Katherine, who did not express positive evaluation of nightlife activities.

These findings allow us to make predictions for 2004. First, since the subjects' ties with adults had changed, and they appear to have lost ties and

practices that served to construct elements of a locally-loyal identity, we suspect changes in the linguistic forms reflecting these social changes. Therefore, we predict significant changes in the pronunciation of /æ/0 because the ties and practices that were argued to engender weaker forms of /æ/-retraction in the INHIB environments have, for the most part, been lost.

4 Results: Real-Time Study (2001 and 2004)

Tables 4.1 to 4.4 below show mean F1 and F2 values in both 2001 and 2004. In each table, formant values reflect the mean value taken at the vowel midpoint. Standard deviations are included below each mean value and changes between 2001 and 2004 are shown in the fourth column as a decrease (-) or increase (+). All statistically significant differences ($p < .05$) between 2001 and 2004 are represented in bold.

	2001	2004	Change	Significance
Anita	935	885	-51	t(19)= 3.655, p=.002
	55	43	-12	
Sylvia	900	828	-72	t(20)= 3.926, p=.001
	54	92	38	
Katherine	954	974	20	t(16) = -1.383, p=.186
	65	54	-11	
Erika	931	913	-18	t(17) = 1.251, p=.228
	68	37	-31	

Table 4.1: Mean F1 in for /æ/1 (PROMO environments).

	2001	2004	Change	Significance
Anita	649	681	32	t(8)=-1.080, p=.312
	55	56	1	
Erika	555	583	28	t(8)=-1.622, p=.143
	30	32	2	
Sylvia	628	651	23	t(8)=-.567, p=.586
	62	102	40	
Katherine	688	703	15	t(7)=-.624, p=.553
	63	99	36	

Table 4.2: Mean F1 in Hertz for /æ/0 (INHIB environments)

	2001	2004	Change	Significance
Anita	1619	1555	-64	t(18)=3.236, p=.005
	79	56	-23	
Erika	1668	1566	-102	t(17)=3.896, p=.001
	88	79	-9	
Katherine	1632	1674	42	t(16)=-.792, p=.440
	194	121	-73	
Sylvia	1630	1647	17	t(20)=-.398, p=.695
	166	126	-40	

Table 4.3: Mean F2 in Hertz for /æ/1 (PROMO) environments.

	2001	2004	Change	Significance
Anita	2411	2277	-134	t(8)=1.906, p=.093
	163	227	64	
Erika	2355	2186	-169	t(8)=3.961, p=.004
	133	122	-11	
Katherine	2376	2334	-42	t(7)=-.354, p=.734
	109	330	221	
Sylvia	2308	2164	-144	t(7)=3.085, p=.018
	92	109	17	

Table 4.4: Mean F2 in Hertz for /æ/0 (INHIB environments).

Table 4.1 reveals significant differences between 2001 and 2004 for two subjects. Both Anita and Sylvia exhibit lower mean first formant frequencies which correlates with a higher /æ/ in the PROMO environment. This finding was unexpected since /æ/-retraction involves, by default, an element of lowering. Table 4.2 shows no significant findings for /æ/ in the INHIB environment. This means that no individual changed the height of /æ/0. Table 4.3 illustrates a significant difference between 2001 and 2004 for Anita and Erika. Both subjects exhibit lower mean F2 values in 2004 suggesting a significant effect involving retraction. Finally, table 4.4 reveals a significant difference in the mean F2 values for Erika and Sylvia. In both cases, the direction of effect is lower which correlates with a more retracted position. These findings are summarized in Table 4.5.

	/æ/1 (PROMO)	/æ/0 (INHIB)
Anita	retracted/raised	no change
Erika	retracted	retracted
Sylvia	raised	retracted/raised
Katherine	no change	no change

Table 4.5: Summary of significant changes at vowel midpoint, by environment

5 Concluding Remarks

In section 4, data was examined across two points in time, occurring at stages that are significant milestones for adolescents and young adults. When the investigation began in 2001, the subjects were about to graduate from high school. In 2004 they were finishing their final year of undergraduate studies.

Our initial question concerning the propensity for individual change finds a positive answer: the data indicate that all but 1 of the subjects exhibited significant changes between 2001 and 2004. Where changes were found, they tended to be consistent with the direction in which /æ/ is considered to be shifting, that is, further back. It was suggested that these phonetic changes are a response to the social ties and practices that the subjects developed while at university.

The first analysis, which looked at the social distribution of /æ/-retraction in 2001 among a section of the adolescent population in Tillsonburg identified an interesting pattern. In most cases, groups who were most advanced in the PROMO environments were most advanced in the INHIB environments and those least advanced in the INHIB environments were least advanced in the PROMO environments. However, the four SK subjects exhibited a split in this pattern. With respect to the PROMO environments, they were consistent with other groups classified as having expanded cultural identities. With respect to the INHIB environments, the SK patterned like the adult members of the sample who had the least retracted variants in the INHIB environments. This suggests that the social practices or network ties of the SK subjects played a role in how they realized /æ/. They phonetically marked their status as upwardly mobile, university-bound students while at the same time, marking their ties with adult members of the community and their positive experiences with local practices.

Based on this finding we predicted that when the SK moved away from Tillsonburg and those ties and practices with locally-loyal adults are weak-

ened or lost entirely, we expected to find more retracted variants in the INHIB environments in 2004, consistent with the pronunciations exhibited by other urban-oriented peers. Findings from the real-time analysis showed that only two subjects were consistent with this prediction, Sylvia and Erika. Given Katherine's evaluation of urban nightlife, she might not share the same positive orientations towards her city that Sylvia, Erika and Anita do. This might account for why her pronunciations of /æ/ remained stable. Sylvia exhibited variants in the PROMO environments that were higher in 2004 than in 2001. This was unexpected since it does not follow the direction of the shift. Anita raised in this environment but her raising was accompanied by retraction. Erika exhibited retraction alone. One finding of this study, then, is that while the phonetic targets one exhibits in adolescence may shift under certain conditions, no two subjects examined here showed the same changes.

The analysis of real-time data offers an opportunity to examine how a sound change like vowel shifting is actualized across a dialect region among mobile young adults. It allows us to consider a phenomenon like migration within the borders of one dialect zone. While little attention has been given to how such movement patterns advance the phonetic realizations of a sound change in progress this study has provided at least a preliminary step towards examining this issue.

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Transplanted Dialects and Language Change: Question Formation in Québec

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1 Introduction

Variability in question formation is a well-documented feature of French syntax. In yes/no questions, five distinct variant forms have been competing for centuries: *inversion* of (clitic) subject and verb (INV), as in (1), *complex inversion* (C-INV) (2), rising *intonation* (INT) (3), phrase-initial interrogative particle *est-ce-que* (ECQ) (4), and its post-verbal counterpart *tu* (TU) (5).

- (1) *As-tu* (INV) déjà parlé avec un vrai Français de France là?
(XX.105.2768)¹
'Have you ever spoken to a real Frenchman from France?'
- (2) Et *le roi est-il* (C-INV) icitte? (XIX.036.3932)
'And the king, is he here?'
- (3) Ah, toi *tu restes pas* (INT) avec tes parents? (XX.112.1819)
'Oh, you don't live with your parents?'
- (4) Mes bombes *est-ce que* (ECQ) je les largue ici? (XX.078.1502)
'My bombs, do I throw them here?'
- (5) *Tu vas-tu* (TU) être plus marié oubedonc moins marié?
(XX.079.1471)
'Are you gonna be more married or less married?'

Empirical studies of European varieties report that the variability illustrated in (1–5) has resolved itself in favor of INT (3), with ECQ persisting as a minor contender. INV, once the quintessential interrogative marker, is now restricted to literary use. The spread of TU is said to have been blocked by

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¹Codes refer to corpus (XIX = *Récits du français québécois d'autrefois* [Poplack and St-Amand 2002]; XX = *Corpus du français parlé à Ottawa-Hull* [Poplack, 1989]; XVII = *Corpus of 17th-century popular French plays*), speaker, and line number. Examples are reproduced verbatim from audio recordings or plays.