Language Variation and Change, **12** (2000), 1–24. Printed in the U.S.A.

Geolinguistic diffusion and the U.S.–Canada border

CHARLES BOBERG
McGill University

ABSTRACT

The way in which language changes diffuse over space—geolinguistic diffusion—is a central problem of both historical linguistics and dialectology. Trudgill (1974) proposed that distance, population, and linguistic similarity are crucial factors in determining diffusion patterns. His hierarchical gravity model has made correct predictions about diffusion from London to East Anglia, but has never been tested across a national boundary. The aim of this article is to do so using data from both sides of the U.S.–Canada border. Two cases are examined: the non-diffusion of phonetic features from Detroit to Windsor and the gradual infiltration into Canadian English of American foreign (a) pronunciations. In both cases, the model makes incorrect predictions. In the first case, it is suggested that the model needs a term representing a border effect, and that the diffusion of phonetic features is constrained by structural, phonological factors; in the second, a traditional wave theory of diffusion appears to fit the data more closely than a hierarchical model.

CURRENT MODELS OF GEOLINGUISTIC DIFFUSION

Geolinguistic diffusion is the process by which linguistic changes spread geographically from one dialect or language to another. It is generally understood in historical linguistics that geolinguistic diffusion plays a central role in the diachronic evolution of languages: innovations arise in one place and gradually spread out from their point of origin until they have become general in the language as a whole or perhaps in a group of neighboring languages. On the other hand, some changes never complete their territorial diffusion or perhaps never go beyond their point of origin, thereby serving to diversify languages into dialects. Historical linguists have long sought to understand the process of diffusion, which has given rise to several distinct yet related questions. Why do certain innovative features spread and not others? Why are certain areas or dialects more receptive than others to change from outside? How and why do certain centers become leaders and others followers in the adoption of change? Proponents of the wave

This article was first presented at NWAVE-28, Toronto, October 1999. It could not have been written without the collaboration of Bill Labov and Sherry Ash, my co-authors on the *Atlas of North American English* at the University of Pennsylvania, or without the data collection efforts of students in my introductory sociolinguistics class at McGill University. I am also indebted to Peter Trudgill for his interest, encouragement, and comments and to the helpful suggestions of anonymous reviewers.

theory of linguistic evolution—in a reaction against the traditional Neogrammarian view of language change as a linear, genetic development—held that innovations diffuse spatially among adjacent speech communities like waves in a body of water, apparently sweeping over terrain until they are blocked by some physical or social barrier or until their force is exhausted by distance and time. This wave model gave a central role to the phenomenon of language contact and to the spatial diffusion of innovations from one language or variety to another.

Although the apparent results of wavelike diffusion were evident in the maps and atlases of dialect geographers and although the wave model came to be accepted as a useful alternative to, if not a replacement for, the Neogrammarian model, it is only relatively recently that the workings of geolinguistic diffusion and their consequences for language change have come under systematic investigation. Since the 1970s, several studies have presented evidence that changes do not diffuse evenly over space as in the wave model but rather tend to affect some communities before others in a way that is not directly related to the distance of each community from the source of the innovation. The general finding was that the adoption of innovations followed an urban hierarchy, with changes most often beginning in major centers of population (particularly in economic, cultural, and administrative centers), then spreading to affect successively smaller centers in the surrounding region, and eventually diffusing outward from small towns and villages into the countryside. In a hierarchical model of diffusion, then, a large market town at some distance from a metropolis might be affected before the intervening rural areas by an innovation originating in the metropolis. A simple hierarchy based on population size was held by Callary (1975) to predict the diffusion of the tensing and raising of /æ/ from Chicago into northern Illinois; a more complex hierarchy based on size and distance and pre-existing linguistic similarity was advanced by Trudgill (1974:235) to explain the diffusion of features of London English into towns and villages in East Anglia. Trudgill's model, known as the gravity model, is shown here.

$$Iij = S \cdot ((Pi\,Pj) \div (dij)^2) \cdot (Pi \div (Pi + Pj))$$

where:

Iij = influence of center i on center j
P = population
d = distance
S = index of linguistic similarity

The gravity model gets its name from its similarity to the mathematical model used to calculate the degree of mutual attraction, or gravitational pull, between two bodies. The main variables are the size of the centers of influence, measured in population (P), and the distance (d) between them (the index of linguistic similarity (S) is discussed later). The general prediction of the model is that the larger the centers and the smaller the distance between them, the greater their influence on one another. Two further predictions follow from this: first, large centers will influence other large centers before they influence equidistant smaller

ones; second, when two centers are not equal in size, the larger will have a greater influence on the smaller than vice versa. These predictions accord well not only with a good deal of evidence from historical linguistics, which shows that many changes appear earlier in major centers like London than in their surrounding hinterlands, but also with our intuitive notions of the structure of society and human interaction. An inspection of an airline route map, for instance, suggests that the greatest amount of intercity interaction is among major regional centers, from which less-traveled routes fan out to smaller local centers. Taking this as a reflection of patterns of personal communication and interaction, people in small towns only gain access to people in metropolises through people in large regional centers. This is also the way government and business administration work in setting up administrative hierarchies involving head, regional, and branch offices. Thus, people in New York City or Toronto are more likely to find themselves talking to people in Los Angeles or Vancouver than to people in Nebraska or Saskatchewan, even though the latter are closer to New York and Toronto. Intercity communication follows a hierarchical model.

Sociolinguistic studies of language change have shown that personal interaction is the catalyst for the diffusion of at least some kinds of linguistic innovation. Labov (1980:261) found that Philadelphia vowel shifts were most advanced among people with a maximal number of contacts outside their neighborhoods. Milroy and Milroy (1992) showed that a similar group of people in Belfast (i.e., people with the greatest number of weak external ties) was most likely to lead in the loss of local dialect features or in the convergence with regional or standard varieties. If intercity personal interaction follows a hierarchical model, as suggested here, then we would expect linguistic changes to diffuse along the urban hierarchy.

The diffusion studies of the 1970s have important limitations, however. To begin with, they considered only a few instances of the diffusion of individual features; thus, the lack of a wide range of comparable studies prevents us from being as sure of their conclusions as we might be. A recent study of language change in progress in Oklahoma, for instance, shed new light on the possibilities of hierarchical diffusion by showing that a top-to-bottom hierarchical model explained the spread of only some features; others appeared to be diffusing contrahierarchically, from the countryside into the towns and finally to the cities (Bailey, Wikle, Tillery, & Sand, 1993).

Another limitation, which is the direct concern of this article, is that Callary and Trudgill examined the diffusion of innovations only within regional dialect areas. This is a limitation because the English-speaking community, like the populations who speak French, Spanish, and many other languages, is now spread not just over many different dialect areas, but among many different nations. Some of these nations are geographically contiguous and have a long history of face-to-face interaction; all of them have for at least a generation enjoyed substantial contact by means of migration, travel, and electronic communication. Chambers and Trudgill (1998:170–175) showed how, long before the age of technologically facilitated travel and communication, a Parisian innovation in the

pronunciation of /r/—the substitution of a uvular trill for an apical trill—spread not just to other French dialects, but across languages from French to German and Danish, apparently jumping hierarchically from Paris to the major cities of Cologne, Berlin, and Copenhagen without affecting intervening territory until much later. If innovative features can spread from one language to another, we might well ask whether and how innovations diffuse within one language across national boundaries.

GEOLINGUISTIC DIFFUSION IN NORTH AMERICAN ENGLISH: THE U.S.–CANADA BORDER

The national boundary between the United States and Canada presents an ideal opportunity to study transnational geolinguistic diffusion. Like the boundary between France and Belgium or that between Germany and Austria, the boundary between the United States and Canada separates two populations that speak mutually intelligible yet distinctive varieties of the same language, one of which is supported by a vastly more numerous and culturally influential population than the other. In the North American case, where the United States is approximately ten times as populous as Canada and the flow of popular culture is overwhelmingly unidirectional from the United States into Canada, we would expect American English (or rather American Englishes) to have an influence on how English is spoken in Canada. Assessing or deploring this influence, particularly in light of the supposedly more British heritage of Canadian English, has been a favorite activity of both linguists and cultural nationalists in Canada for a long time. (For examples of linguistic assessments, see Bloomfield, 1948; Chambers, 1998; Nylvek, 1992; Scargill, 1957; Zeller, 1993.)

Viewed from a non-English perspective, the differences between the kinds of English spoken along the American and Canadian sides of the international boundary are neither many nor large. Given the common elements in the historical origins of these varieties, the location of the majority of the Canadian population within a few hours' drive of the border, and the lack of any substantial restrictions on cross-border movement of people or cultural products, this is perhaps what we would expect. Yet enough differences persist that the role of the political and institutional border as a linguistic boundary is not a trivial question. Canadian English is distinct enough to be subject to measurable American influence at every level of grammar, so that examining the progress of this influence may serve to illuminate the linguistic status of political boundaries and to test the adequacy of current models of geolinguistic diffusion in a transnational context.

This article examines the predictions made by Trudgill's gravity model about the linguistic influence of six major American cities on six major Canadian cities. The American cities include four major cities on or near the Canadian border (Seattle, Detroit, Buffalo, and Boston) as well as the metropolises and world cultural capitals on the east and west coasts (New York City and Los Angeles). To get a sense of perspective, the influence of London (England) was also calcu-

lated. The Canadian cities represent a selection of major population centers across the country (Vancouver, Calgary, Toronto, Montréal, and Halifax) as well as Windsor, a large border town in southwestern Ontario located directly across the river from Detroit. A second series of calculations measured the influence of Canadian cities on each other, since it may be presumed that American influence that enters Canada in one place may spread to other cities by means of secondary influence; this is equivalent to Trudgill's calculations of the influence of one town on another in East Anglia (1974:235–237).

The gravity model has no provision for a national border, but it does include an index of pre-existing linguistic similarity, the term that Trudgill labels S in his equation. This is a simple multiplier of the result of the size and distance calculation and is intended to produce larger influence values for places that share many linguistic features than for places that share relatively few. Trudgill's quantification of linguistic similarity is somewhat vague and makes no reference to specific features, but follows a general taxonomy of English regional varieties from the specific to the general (1974:234). In his scheme, the speech of Norwich is most similar to other Norfolk varieties (S = 4), then to other East Anglian varieties (S = 3), then to other southeastern varieties (S = 2), and then to any other English variety (S = 1).

The same approach to linguistic similarity is adopted here, but more explicit use has been made of similarities in phonological structure as the main criterion for ranking. The most basic reference points for structural comparison are the two "pivot points" demonstrated by Labov (1991:12) to be the most consequential phonological variables in North American English: the status of /æ/ (one phoneme or split into tense and lax lexical classes) and the status of /ɑ/ and /ɔ:/ (distinct or merged). Since all Canadian cities share a common phonology in these terms (/æ/ is one phoneme, and /ɑ/ and /ɔ:/ are merged) in addition to other linguistic features that can be identified as "Canadian," any pair of Canadian cities was assigned a maximal similarity index of 5. Any pair involving Los Angeles or Seattle, which are not Canadian but share an identical phonological system and many phonetic similarities, was assigned an index of 4. Buffalo and Detroit, on the other hand, differ from Canadian English in maintaining the phonemic distinction between /ɑ/ and /ɔ:/ and also exhibit striking phonetic differences; pairs involving these cities were assigned an index of 3. New York City and Boston are even more different from Canadian English than are Buffalo and Detroit, retaining a wider range of vowel contrasts before /r/, which is often vocalized, and diverging from Canadian English in terms of both pivot points in the case of New York City and one pivot point (i.e., the status of /æ/) in the case of Boston. Any pair involving New York City or Boston was therefore assigned an index of 2. Finally, any pair involving the non–North American variety of English spoken in London was assigned the minimal index of 1. The absolute values of the similarity index are obviously somewhat arbitrary, but the relative values that are required are clear. In any case, it will become obvious that the value of S does not have a large effect on the main pattern of the results.

The population figures used in the calculations are metropolitan area statistics from the 1990 census for the United States and the 1991 census for Canada, rounded to the nearest hundred thousand. The tables show population in thousands, and it was these numbers (actual populations divided by 1,000) that were used in the calculations in order to reduce the size of the resulting indices. The entire population of Montréal was included, though this is obviously a methodological problem since anglophones are a minority there. In fact, the effective population of any city with a large group of citizens who speak some other language or variety than the one under study is difficult to assess for purposes of measuring influence. For example, a large proportion of the population of Detroit (76% of the city and 21% of the metropolitan area in 1990) speaks African American English, which could not be expected to have the same kind or amount of influence on Canadian speech as European American varieties. This is one of many procedural problems in applying Trudgill's model. Others include the relevance of land distance in an age of jet travel and electronic communication and the problem of what to take as the source of influence: cities, regions, or the United States as a whole. Cities have the advantage of being specific points from which distances can be measured, but calculating the influence of every single American city near the Canadian border would be problematically laborious. In addition to the challenge of a national border, then, the North American situation presents other practical complexities for the application of the gravity model. Trudgill (and Callary) examined the influence of a single metropolis on its hinterland, a much easier situation to model.

Putting aside these methodological problems, the results of the gravity model calculations are shown in Table 1. The model predicts, as we would expect, an overwhelming influence of Detroit on Windsor, since Detroit is vastly larger and less than a mile away. The skyscrapers of downtown Detroit in fact can be seen from many places in Windsor, almost as though Windsor were a neighborhood of Detroit rather than a city in a different country. This influence is disproportionately larger than any other: the actual value produced is about 4 million. By comparison, the influence of Detroit on Toronto is just over 200, or 20,000 times smaller than its influence on Windsor. In the same range as Detroit's influence on Toronto are New York City's influence on Montréal (255) and Toronto (169) and Seattle's influence on Vancouver (195). The influences of Buffalo on Toronto (117) and of Boston on Montréal (61) are smaller still, while other pairs of cities produce numbers that fade into comparative insignificance: for instance, the value for the influence of Los Angeles on Vancouver is only 20, and Boston's influence on Halifax is a mere 2. Remarkably, the influence of London on Canadian cities never rises above 0.4; perhaps this helps to explain the overwhelmingly North American sound of Canadian English. In one case, across the Niagara River, the influence is reversed: the model predicts that Toronto will have a heavier influence on Buffalo than Buffalo on Toronto, since Toronto is the larger of the two cities. If we sum the influences of all six American cities on each Canadian city, as shown in Table 1, the model predicts that the most heavily influenced city will be Windsor, followed by Toronto, Montréal, Vancouver, Calgary, and Halifax.

TABLE 1. *Gravity model calculation of influence (I) of major American cities and London (England) on Canadian cities*

		Vancouver P = 1,600	Calgary P = 800	Windsor P = 300	Toronto P = 3,900	Montréal P = 3,100	Halifax P = 300
Los Angeles	d	2,045	2,523	3,661	4,037	4,568	5,509
P = 14,500	I	20.0	6.9	1.3	10.9	7.1	0.6
Seattle	d	230	1,168	3,723	4,102	4,342	5,927
P = 2,600	I	194.7	4.7	0.2	1.0	0.8	0.1
Detroit	d	3,869	3,042	1	384	915	1,856
P = 4,700	I	1.1	1.0	3,976,200	203.8	31.5	1.2
Buffalo	d	4,325	3,437	549	168	638	1,579
P = 1,200	I	0.1	0.1	2.9	117.0	7.7	0.3
New York City	d	4,709	3,883	1,207	826	611	1,528
P = 18,000	I	2.4	1.8	7.3	169.1	255.0	4.5
Boston	d	5,048	4,218	1,293	974	496	1,101
P = 4,200	I	0.4	0.3	1.4	17.9	60.9	1.9
London (England)	d	13,350	12,600	9,000	8,700	8,250	7,050
P = 11,100	I	0.1	0.1	0.0	0.4	0.4	0.1
Sum of American influences		218.7	14.8	3,976,213.1	519.7	363.0	8.6

Top seven sources of influence, ranked by index score

1. Detroit on Windsor	3,976,200.0
2. New York City on Montréal	255.0
3. Detroit on Toronto	203.8
4. Seattle on Vancouver	194.7
5. New York City on Toronto	169.1
6. Buffalo on Toronto	117.0
7. Boston on Montréal	60.9

Note: P = population in thousands (United States: 1990 census; Canada: 1991 census); d = distances in kilometers.

TABLE 2. *Geographic diffusion of American linguistic influence (I) within Canada, as predicted by the gravity model*

		Vancouver P = 1,600	Calgary P = 800	Windsor P = 300	Toronto P = 3,900	Montréal P = 3,100	Halifax P = 300
Toronto	d	4,382	3,420	381	—	542	1,463
P = 3,900	I	1.2	1.1	37.4	—	114.6	2.5
Montréal	d	4,566	3,603	906	542	—	941
P = 3,100	I	0.8	0.8	5.2	91.1	—	4.8
Vancouver	d	—	962	4,720	4,382	4,566	5,493
P = 1,600	I	—	4.6	0.1	0.5	0.4	0.1

Top three sources of influence, ranked by index score

1. Toronto on Montréal	114.6
2. Montréal on Toronto	91.1
3. Toronto on Windsor	37.4

Note: P = population in thousands (United States: 1990 census; Canada: 1991 census); d = distance in kilometers.

Within Canada, the most influential places are naturally the two largest cities, Toronto and Montréal, and the strongest influences they have are on each other (see Table 2). Toronto also influences Windsor to a smaller degree, though Detroit's influence is 100,000 times as great. All of the other numbers are negligible by comparison, but we can imagine that, had this exercise been expanded in scope, Vancouver would influence Victoria and Kelowna; Calgary, Lethbridge and Red Deer; Toronto, Kitchener and Peterborough; and so on. Since, apart from Windsor, Toronto and Montréal are the greatest receivers of American influence, a picture emerges of this influence, whatever it may be, entering Canada via Toronto and Montréal and spreading from these large cities to smaller ones. The flow of influence predicted by the model can be displayed on a schematized map, as shown in Figure 1. In Trudgill's study of East Anglia, it was important to calculate competing influences on a place, which would tend to accelerate innovations once they began, since smaller places would initially be under the influence of both innovative and conservative larger centers, whereas at a later stage of the change all of the larger places would exert an innovative influence. In the case of Windsor, however, the Canadian influence of Toronto seems irrelevant beside the American influence of Detroit.

Just what these values mean in terms of actual linguistic influence is unclear, but in one case, that of Detroit's influence on Windsor, the prediction is unmistakable: Windsor should be completely assimilated to Detroit within one generation. Some Ontarians do in fact think that people in Windsor speak like Americans. One Windsor-based columnist suggested that,

> because of a lifetime of watching Detroit TV, some Windsorites seem to have absorbed far too much of the Michigan eeacksent—at least, to sensitive ears in the rest

https://doi.org/10.1017/S0954394500121015 Published online by Cambridge University Press

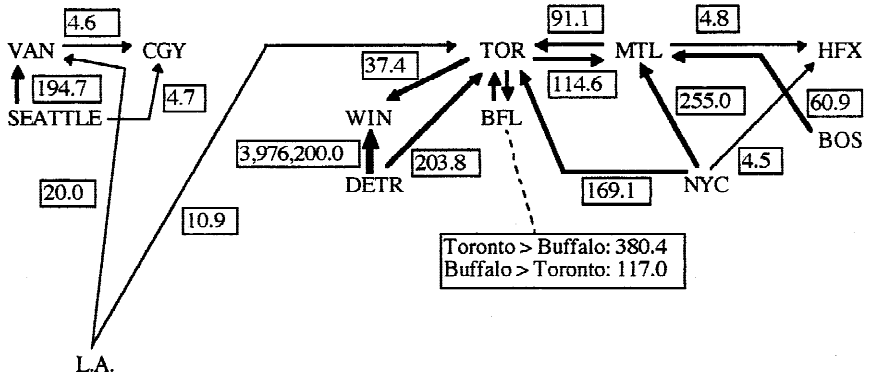

FIGURE 1. Geographic diffusion of American linguistic influence on Canada, as predicted by the gravity model.

> of Canada. Now, Windsor natives aren't quite as grating with the nasal twang, but they can still be identified during rush hour from the far end of a subway platform in Toronto. . . . Throw in the pronunciation "daller" and the average Torontonian immediately wants to push them in front of the next train. (Vander Doelen, 1998)

But this impression turns out to be erroneous or at least based on something other than the phonology and phonetics of Windsor English, which are by far the most important determinant of the overall impression an outsider would have of the way people in Windsor speak. When we inspect acoustic analyses of the vowel systems of people on either side of the Detroit River, we see a difference as big as what we might expect to find—and do find—between places much farther apart, such as Toronto and Chicago.

PHONETIC FEATURES: THE NATIONAL BOUNDARY AS A LINGUISTIC BARRIER

Acoustic data on the speech of Americans and Canadians on either side of the international border are now available as a result of the Telephone Survey of Change in Progress in North American English, carried out at the Linguistics Laboratory of the University of Pennsylvania, a project that is now publishing an *Atlas of North American English* (Labov, Ash, & Boberg, to appear). These data come from acoustic analysis of several hundred vowels for each speaker, elicited by means of a sociolinguistic interview conducted and tape-recorded over the telephone. The vowel systems presented in this article show normalized mean measurements for the vowels under discussion (rather than individual tokens of each vowel) as well as those means that are useful for establishing the outlines of the vowel space, such as those for /i:/ and /u:/. Vowels not relevant to the discussion are omitted from the charts in the interest of clarity. The means are all based on at least 5 tokens and, in most cases, on 15 or 20 tokens. Each vowel chart

https://doi.org/10.1017/S0954394500121015 Published online by Cambridge University Press

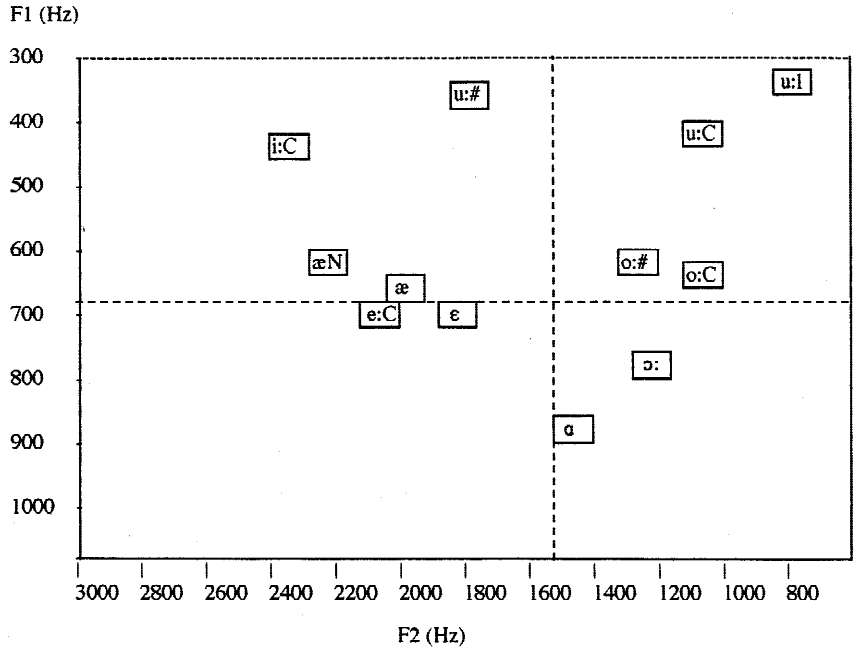

FIGURE 2. Selected mean vowel measurements for 47-year-old man from Detroit, MI (TS 127).

also displays a grand mean of F1 and F2 (dotted lines), which divides the system into high-front, low-front, high-back, and low-back quadrants. The vowel symbols in the charts are based on IPA usage, with some important allophonic environments indicated (_C = following consonant; _# = word-final; _N = following nasal; _l = following /l/).

Let us first examine the vowel system we find on the American side of the border. Detroit speech provides an excellent example of the Northern Cities Shift, a chain shift of several vowels that affects the Inland North region of the United States along the Great Lakes. The 47-year-old man represented in Figure 2 has a solid distinction between /ɑ/ words like *stock* and /ɔ:/ words like *stalk*: the former are pronounced with a very open, low-central to low-front vowel [a]. This is close to a typical Canadian pronunciation of the /æ/ of *stack*, but in the Northern Cities Shift the /æ/ has been raised to the mid-front region and is tense and ingliding, [steək]. In this position, it is not much lower or laxer than the prenasal vowel of *stand*, which is raised in most North American dialects, including the English of southern Ontario. The Northern Cities Shift is even more extreme in the 37-year-old woman represented in Figure 3; she exhibits a centralization of the /ɛ/ of *deck*, another component of the shift. Her distinction between the low-back vowels /ɑ/ and /ɔ:/ is just as solid as the man's, and her /æ/ is even higher.

https://doi.org/10.1017/S0954394500121015 Published online by Cambridge University Press

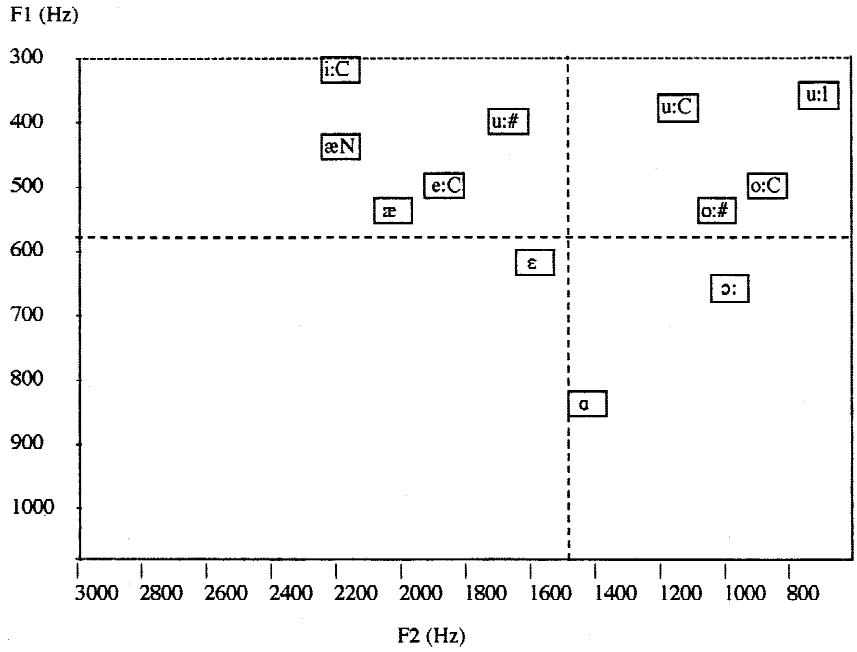

FIGURE 3. Selected mean vowel measurements for 37-year-old woman from Detroit, MI (TS 176).

In Buffalo, the other border city considered in this article, we see a similar configuration. In fact, the 56-year-old woman whose system is shown in Figure 4 is even more advanced in the Northern Cities Shift than is the woman from Detroit, with her /æ/ approaching high-front position and her /ɑ/ having crossed over into the low-front quadrant of the vowel space. In fact, for this woman, /ɛ/ has shifted so far back and /ɑ/ so far forward that /ɛ/, which most of us think of as a front vowel, is actually pronounced slightly further back than /ɑ/, which most of us think of as a back vowel.

To get an idea of Canadian English by comparison, we now turn to the vowel system of a 34-year-old woman from Toronto, shown in Figure 5. She shows a remarkably different system from that of Detroit and Buffalo: the /ɑ/ and /ɔ:/ of *stock* and *stalk* are merged in the low-back corner, so that they both sound like [stɒk], and the /æ/ of *stack* remains in low-front position. Raising of /æ/ occurs only before nasals (where it is quite pronounced). Labov (1991:33) pointed out that these conditions are systematically related: the retention of most of the /æ/ class in low-front position prevents the fronting of /ɑ/, which keeps /ɑ/ and /ɔ:/ distinct in the Northern Cities Shift. When /ɔ:/ descends and unrounds, /ɑ/ cannot get out of the way, and the two vowels merge in Canadian English (as well as in structurally identical American dialects, such as those of the western United

https://doi.org/10.1017/S0954394500121015 Published online by Cambridge University Press

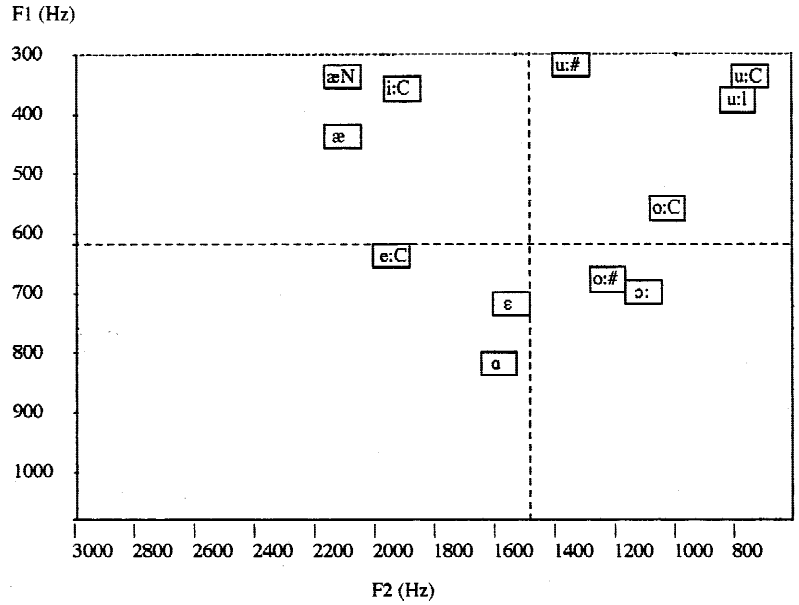

FIGURE 4. Selected mean vowel measurements for 56-year-old woman from Buffalo, NY (TS 347).

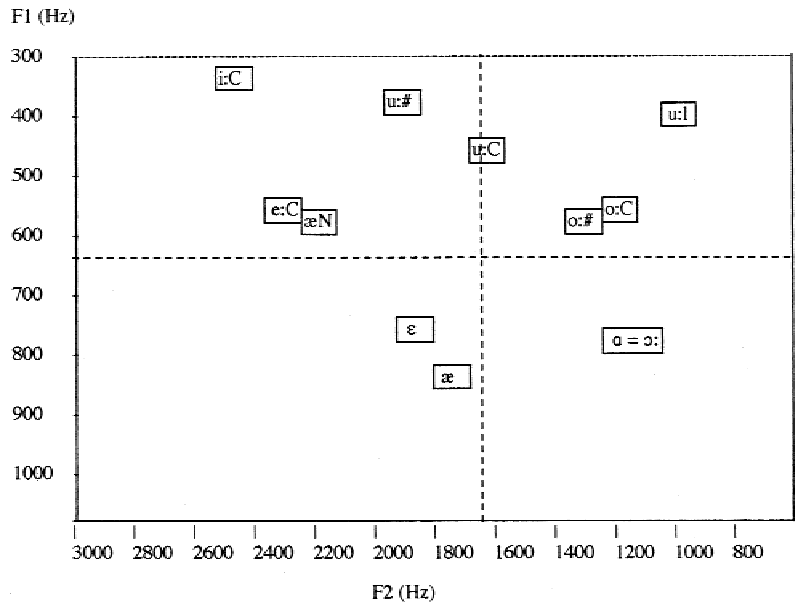

FIGURE 5. Selected mean vowel measurements for 34-year-old woman from Toronto, ON (TS 645).

https://doi.org/10.1017/S0954394500121015 Published online by Cambridge University Press

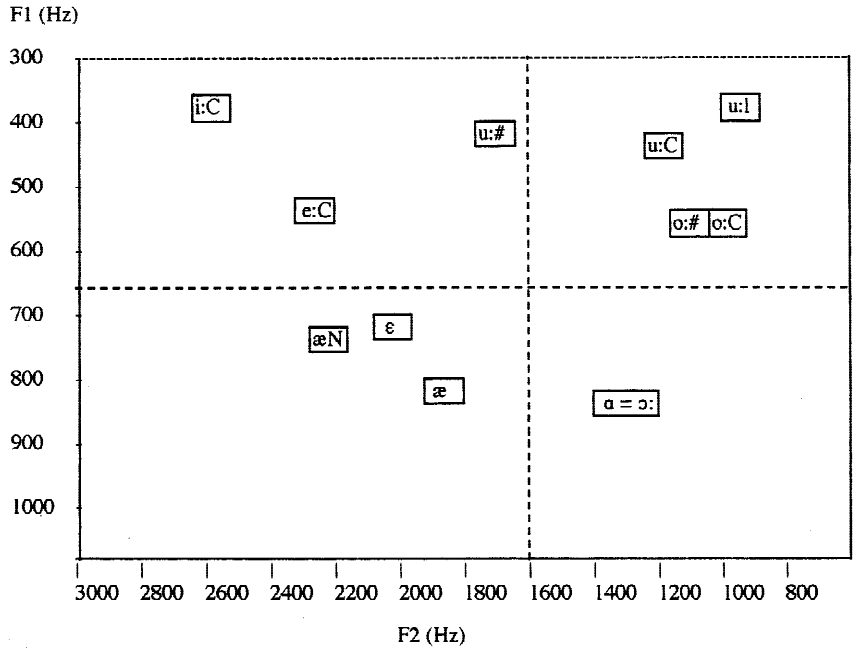

FIGURE 6. Selected mean vowel measurements for 53-year-old man from Windsor, ON (TS 643).

States). Clarke hypothesized that this merger creates a pull-chain effect, which she called the Canadian Shift, whereby /æ/ begins to move back into central position to fill up the space created by the merger of the low-back vowels (Clarke, Elms, & Youssef, 1995).

Which system do we find in Windsor—the American system of Detroit or the Canadian system of Toronto? The vowel systems of the two Windsor speakers interviewed for the Telsur project clearly show that Windsor is just as Canadian as Toronto; in fact we find the same system whether we look at a 53-year-old man (Figure 6) or a 27-year-old woman (Figure 7). The vowels /ɑ/ and /ɔ:/ are completely merged in the low-back corner, and /æ/ remains in low position; the only raising of /æ/ occurs before nasals. The result of this is that *stack* is pronounced in Windsor with almost exactly the same vowel quality as *stock* in Detroit. If these speakers are representative of the Windsor population in general (a larger sample could confirm this, but there is no obvious reason to doubt it), it must be concluded that, at least at the level of the phonetics and phonology of the vowel system, the massive influence of Detroit predicted by the model is simply nonexistent.

In trying to explain this erroneous prediction, we immediately come back to the observation made earlier that Trudgill employed his model within rather than

https://doi.org/10.1017/S0954394500121015 Published online by Cambridge University Press

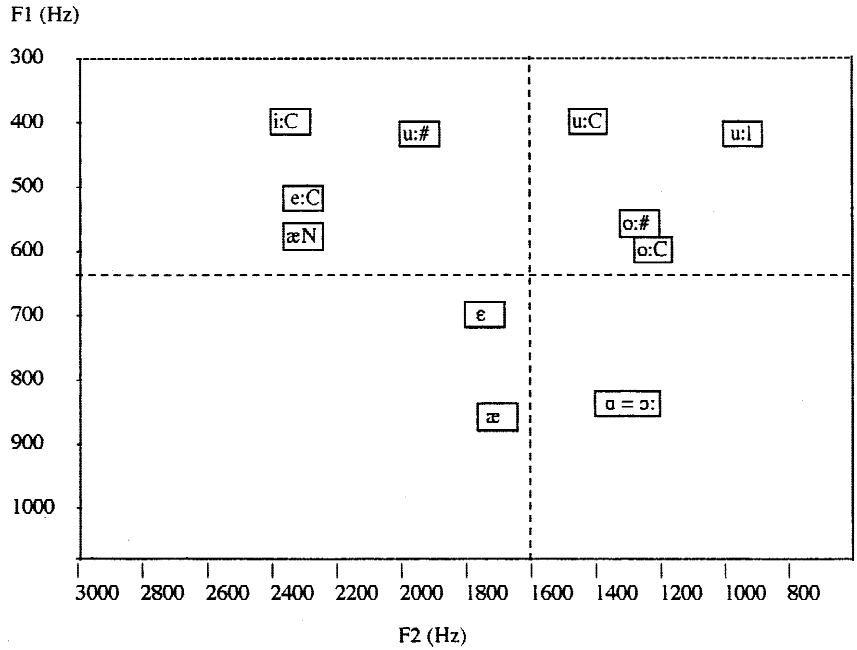

FIGURE 7. Selected mean vowel measurements for 27-year-old woman from Windsor, ON (TS 661).

across a national border, and that the model does not include a term representing the potential effect of such a border. This is the most obvious explanation for its failure in the case of Detroit and Windsor. Yet a closer consideration of the situation of these communities makes the explanation less obvious. Given the totally different vowel systems in the two cities, we would expect them to be divided by an almost impermeable communication barrier, yet such a barrier does not exist. On the contrary, people in Windsor have frequent and often intensive contact with speakers of Detroit English. Not only do they engage in the cross-border shopping and entertainment activities typical of Canadians in many communities (perhaps more frequently as a result of being so close), but because of the North American Auto Pact, a trade agreement that distributes automobile manufacturing among communities on both sides of the border, many people from Windsor frequently go to Detroit for work, and Detroiters come to Windsor. All three major American auto manufacturers have plants in southwestern Ontario, and American and Canadian employees cross the border regularly in the course of normal business activities; this binational automotive industry is the largest employer in both cities. The intensive interaction has even led to intermarriage between Americans and Canadians, bringing some

https://doi.org/10.1017/S0954394500121015 Published online by Cambridge University Press

members of each speech community into the kind of personal network relations that sociolinguists generally hold to be the main conduits of linguistic influence (Milroy & Milroy, 1992).

It is therefore difficult to imagine a communication barrier along the Detroit River that would be of the necessary magnitude to block a linguistic influence as intensive as that predicted by our model. Turning to other possible explanations, we might suggest that setting the linguistic similarity index so high was an error, given the phonological differences between Detroit, with a low-back (/ɑ/ vs. /ɔ:/) distinction, and Windsor, with a low-back merger. Labov (1991) demonstrated that such phonological differences have wide-ranging phonetic consequences and are the root of the major dialect divisions in modern North American English. Perhaps a difference like this should cause us to set the linguistic similarity index at zero, which would produce zero influence, essentially what we see at the phonetic level. Evidently, the internal structure of the vowel system is a strong enough factor to prevent the diffusion of phonetic features from one dialect to another, at least when those phonetic features are structurally embedded. Trudgill anticipated this result, warning that "we have to take the *linguistic system* into account as a resistance factor"; he pointed to matters of phonemic contrast as an important example of this factor (1974:241).

This principle, however, seems to operate independently of the political status of the dialect boundary involved: it holds equally, for instance, within American English to the south of the Northern Cities area. A vowel system from Columbus, Ohio, about as far south of Detroit and Buffalo as Toronto is north of them, shows a similar lack of influence from the Northern Cities Shift, perhaps for a similar reason. As in Canada, much of the North Midland area of the Midwest has /æ/ in low-front position and shows a tendency toward a low-back merger. The 57-year-old speaker from Columbus represented in Figure 8 is not completely merged but shows a greatly reduced distance between the means of /ɑ/ and /ɔ:/; teenagers in Columbus would likely show a completed merger. Her /æ/, raised only before nasals, is identical to those of the Ontario speakers. The failure of the Northern Cities Shift to diffuse outward from the Northern Cities, then, may be rooted in structural phonology rather than in geolinguistic or sociolinguistic factors like political boundaries or communication patterns. It is the extraordinary geographic approximation of the two dialects on either side of the river that makes this lack of diffusion so striking in the case of Detroit and Windsor. Indeed, it is along this stretch of the border, where large numbers of Americans and Canadians are geographically closer and more integrated than anywhere else in North America, that we find the greatest degree of linguistic difference. By contrast, where the border passes through the Great Plains and where major Canadian cities like Winnipeg, Calgary, and Edmonton are hundreds of miles from any comparably large American centers, the linguistic differences are minimal: the phonological systems of western Canada and the northwestern United States are identical, and the phonetics very similar. This situation is the exact opposite of what would be predicted by the gravity model.

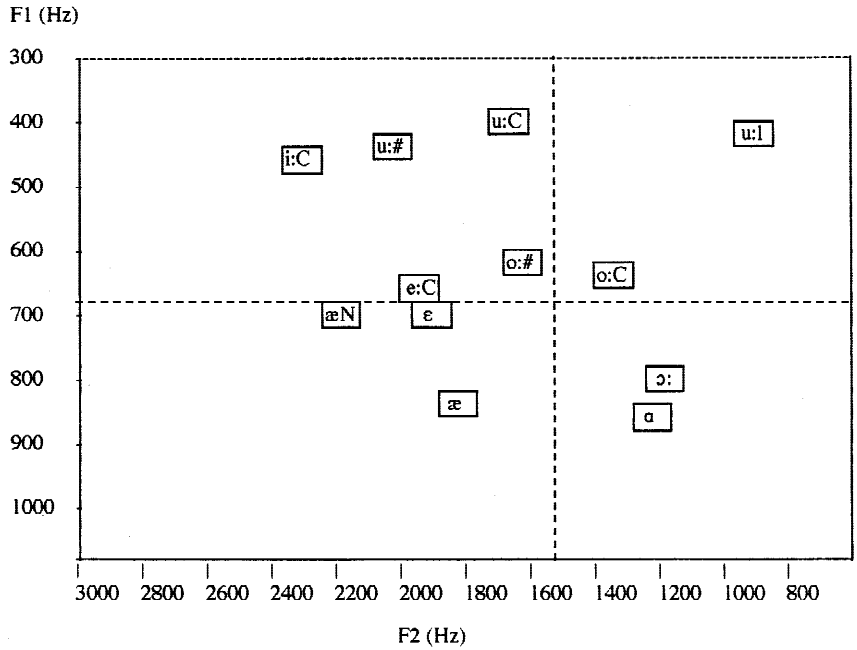

FIGURE 8. Selected mean vowel measurements for 57-year-old woman from Columbus, OH (TS 100).

LEXICAL FEATURES: EVIDENCE FOR TRANSNATIONAL DIFFUSION

Phonetics and phonology are of course not the only levels of grammar at which we might look for evidence of diffusion. Thomason and Kaufman (1988) made it clear that language contact phenomena can be observed at all levels of grammar and are most pervasive at the less abstract and systematic levels, particularly the lexicon. In the lexical domains of vocabulary and phonemic incidence, the incorporation of innovative features from other varieties is not constrained by systematic or structural forces like phonemic inventory and phonological space; it is well known that the most common form of linguistic transfer among languages is the transfer of vocabulary items.

Many differences at this level remain between American and Canadian English. They are in fact the best-known and best-studied differences between the dialects (see, e.g., Avis, 1954–1956; Gregg, 1957; Hamilton, 1958; Scargill & Warkentyne, 1972). Many of them have their roots in British–American differences, with Canada showing either retention of British forms or alternation between British and American usage. In a recent investigation of differences of this type, Chambers (1994) reported several clear isoglosses along the Niagara River

https://doi.org/10.1017/S0954394500121015 Published online by Cambridge University Press

TABLE 3. *Foreign (a) nativization in the United States and Canada*

Word	Percent /ɑ:/ for Americans (n = 147)	Percent /ɑ:/ for Canadians (n = 629)
panorama	18	6
Pakistani	21	9
Iraq	28	7
pajamas	58	15
plaza	75	16
Colorado	86	26
Vietnam	86	44
taco	88	48
Slavic	89	15
Mazda	93	18
macho	93	68
llama	94	29
pasta	95	19
lava	95	23
drama	95	25

between Canadians in southwestern Ontario and Americans in upstate New York. For example, Canadians pronounce the past tense of *shine* to rhyme with *gone*, in the British fashion, whereas for Americans it rhymes with *bone*. The international border separates two distinct varieties of English at this level.

Yet some features do diffuse across the border, making it difficult to imagine how the effect of a political boundary might be included in the model in any general way. Nylvek (1992) found that American pronunciations are on the rise in Saskatchewan English; Chambers (1998) showed both phonemic incidence and lexicon to be shifting toward American variants in the Golden Horseshoe area of southern Ontario (greater Toronto and environs). One feature that is clearly diffusing but that has not yet been reported on in Canada is the pronunciation of foreign loanwords spelled with the letter ⟨a⟩, which tend to be pronounced with the long /ɑ:/ sound of *father* in American English and the short /æ/ sound of *fat* in Canadian (Boberg, 1997). That, at least, is the traditional difference, which can be heard largely intact among older Canadians. Among younger Canadians, /ɑ:/ pronunciations appear to be increasing, at least in some high-profile words that feature in the media and popular culture. Data on this change were collected by students in a sociolinguistics class at McGill University between 1998 and 2000, using a word list containing 15 examples of the foreign (a) variable. Table 3 shows the frequency of /ɑ:/ in the pronunciation of each word by 147 American and 629 Canadian respondents.

The data in Table 3 show a consistent national difference across the entire set of words. American use of /ɑ:/ ranges from 18% in *panorama*, where /æ/ is preferred by a majority, to 58% in *pajamas*, reflecting a great deal of variation, to

https://doi.org/10.1017/S0954394500121015 Published online by Cambridge University Press

TABLE 4. *Foreign (a) nativization in the United States and Canada, by age: Average number of words nativized with /ɑ:/, out of 15*

	Age		
	60 and Older	40–59	Under 40
Americans ($n = 147$)	11.2 ($n = 44$) $SD = 2.6$	11.0 ($n = 43$) $SD = 2.5$	11.2 ($n = 60$) $SD = 1.3$
Canadians ($n = 629$)	2.7 ($n = 121$) $SD = 2.8$	3.2 ($n = 177$) $SD = 2.7$	4.3 ($n = 331$) $SD = 3.0$

95% in *pasta*, *lava*, and *drama*, a practically categorical preference for the back vowel. Canadian use of /ɑ:/ is well below American use in every case, surpassing 50% in only one word, *macho.* Yet the two patterns are not unrelated: where American use of /ɑ:/ is higher, Canadian use generally increases as well. Most importantly, while American use remains stable, Canadian use appears to be converging with American use, as shown in Table 4. The data show a gradual diffusion of the American foreign (a) pattern across the border into Canada, where there is a monotonic correlation with age. Out of the 15 words under study, the number pronounced with /ɑ:/ rises from an average of 2.7 for the oldest generation of Canadians (60 and older), to 3.2 for the middle generation (40–59), to 4.3 for the youngest generation (under 40)—an increase from oldest to youngest of about 60%. The results of *t* tests show that both differences are statistically significant: oldest versus middle at $p < .01$ ($t = -2.56$ at 296 *df*) and middle versus youngest at $p < .005$ ($t = 6.94$ at 506 *df*).

Now that we have some evidence of diffusion to test it against, the performance of the gravity model can be evaluated in relation to a regional breakdown of the Canadian foreign (a) data, which is provided in Table 5. Unfortunately, Windsor was not identified as a separate place in the regional coding of the foreign (a) data, but southwestern Ontario, which contains Windsor (as well as Hamilton, London, Kitchener–Waterloo, and St. Catherines–Niagara) and is closest to the major centers of American population around Detroit and Buffalo, has been divided from the rest of the province. In addition, the data on greater Toronto and Montréal have been separated from those of their respective provinces. Setting aside for a moment the extraordinary case of Windsor, the gravity model predicts that Toronto, with a combined American influence index of 520 (see Table 1), will be most advanced in the adoption of American features, followed by Montréal (363). By contrast, Canadians in the West and in the Atlantic regions should be less advanced in the change, being less populous and farther away from large American centers. Toronto and Montréal, moreover, should reinforce their leading positions by influencing each other (as shown in Table 2).

Table 5 shows that the regional results do not conform to the predictions made by the gravity model. The national average for all Canadian respondents is 3.9

https://doi.org/10.1017/S0954394500121015 Published online by Cambridge University Press

TABLE 5. *Foreign (a) nativization in Canada, by age and region: Average number of words nativized with /ɑ:/, out of 15*

Region[a]	Age			
	60 and Older	40–59	Under 40	All Ages
West	3.9 ($n = 16$)	4.2 ($n = 21$)	4.2 ($n = 38$)	4.1 ($n = 75$)
	$SD = 3.1$	$SD = 1.9$	$SD = 2.3$	$SD = 2.4$
Southwestern Ontario	3.5 ($n = 11$)	4.6 ($n = 17$)	6.6 ($n = 25$)	5.3 ($n = 53$)
	$SD = 1.8$	$SD = 2.9$	$SD = 2.9$	$SD = 2.9$
Toronto	2.2 ($n = 13$)	4.4 ($n = 17$)	5.0 ($n = 43$)	4.3 ($n = 73$)
	$SD = 2.0$	$SD = 2.8$	$SD = 2.6$	$SD = 2.7$
Other Ontario	2.6 ($n = 18$)	4.2 ($n = 12$)	5.5 ($n = 42$)	4.5 ($n = 72$)
	$SD = 2.8$	$SD = 3.4$	$SD = 3.0$	$SD = 3.2$
Montréal	2.7 ($n = 44$)	2.3 ($n = 85$)	3.3 ($n = 129$)	2.9 ($n = 258$)
	$SD = 3.2$	$SD = 2.5$	$SD = 2.7$	$SD = 2.8$
Other Québec	1.7 ($n = 3$)	2.6 ($n = 7$)	2.2 ($n = 18$)	2.3 ($n = 28$)
	$SD = 1.5$	$SD = 1.7$	$SD = 1.8$	$SD = 1.7$
Atlantic	0.7 ($n = 12$)	2.1 ($n = 8$)	5.8 ($n = 24$)	3.7 ($n = 44$)
	$SD = 0.9$	$SD = 1.8$	$SD = 3.8$	$SD = 3.7$

[a]Of the Canadians, 26 subjects moved from one region to another during the acquisition period, so they could not be assigned to a region. They are included in the total ($n = 629$), which is therefore greater than the sum of the regional totals. All other subjects were classified by the region they lived in between the ages of 5 and 17.

instances of /ɑ:/ out of the 15 words. Contrary to the predictions of the model, the West and Atlantic regions, with means of 4.1 and 3.7, respectively, are more or less at par with the national average, not significantly below it. Instead, the most conservative region with respect to this change is Québec, including greater Montréal, whose value of 2.9 is well below the average rather than above it, as predicted by the model. This may be because of the isolation of Québec anglophones within a francophone province, which may insulate them from continental trends affecting North American English. However, the model is no more successful in predicting the performance of Toronto, which at 4.3 is slightly above average but certainly not leading the change. While Montréal is ahead of its Québec hinterland (2.9 vs. 2.3 is significant at $p < .05$; $t = 1.84$ at 284 *df*), Toronto is not ahead of the rest of Ontario (4.3 vs. 4.5 is not significant; $t = 0.70$ at 143 *df*). Moreover, the model predicts that Toronto and Montréal, because of their extensive mutual influence, will behave in a similar way, yet this is not supported by the data: they are clearly different.

The most striking aspect of these data, however, is the fact that the region which shows the most advanced state of the change is neither Toronto nor Montréal but southwestern Ontario. At 5.3, this region is well above the national average and well ahead of Toronto (5.3 vs. 4.3 is significant at $p < .005$; $t = 3.32$ at 24 *df*). The cross-tabulation with age shows that, in the oldest generation,

https://doi.org/10.1017/S0954394500121015 Published online by Cambridge University Press

southwestern Ontario shares its leading position with the West (the difference between them not being significant), and that Toronto catches up with southwestern Ontario in the middle generation (again, an insignificant difference), but that among the youngest generation southwestern Ontario moves firmly into the lead (the difference between its mean of 6.6 and Toronto's of 5.0 being significant at $p < .005$; $t = 3.87$ at 66 df). At first glance, then, the regional analysis of the diffusion of the American foreign (a) pattern into Canada provides what looks like an example of wave-style diffusion rather than a hierarchical pattern: those people who live closest to large American populations are the most advanced in adopting features from American English, regardless of community size.

A closer analysis, however, turns up evidence for both models. Let us return at this point to the case of Windsor, which is in southwestern Ontario. If Windsor is typical of its region, then the gravity model is in fact making the right prediction, at least in a qualitative sense. Windsor, and by extension southwestern Ontario, should be more advanced than Toronto and the rest of Canada in the adoption of American features. In a quantitative sense, the prediction is inaccurate; the average of 5.3 instances of /ɑ:/ out of 15 is nowhere near the American level of 11, yet the influence index of 4 million suggests that Windsor should converge with American usage almost instantly. Nevertheless, the correct prediction that Windsor should be ahead of Toronto urges us to take a closer look at southwestern Ontario to see whether other large towns in the region might also have higher influence indices than Toronto, which would confirm the gravity model's accuracy. Gravity model calculations of the combined influence of Detroit and Buffalo on the four largest cities in southwestern Ontario are provided in Table 6. For comparison, the influence of Detroit and Buffalo on Toronto and the influence of Toronto on the southwestern Ontario cities are also shown.

Table 6 shows us several things. First, the limited scope of Table 2 disguised the fact that Toronto's greatest influence is not on Montréal (115); its influence on southwestern Ontario cities is considerably stronger. More importantly, since Toronto is not leading the change toward American foreign (a) pronunciation, we see that Windsor is not the only place in southwestern Ontario that has a higher influence index than Toronto. St. Catherines–Niagara, which is only a short distance from Buffalo, has an American influence index more than twice as high as Toronto's, though nowhere near that of Windsor. However, Windsor and St. Catherines, being so close to the border, turn out to be anomalies: Hamilton, London, and Kitchener–Waterloo, even though they are all closer to the border than Toronto, have much lower influence indices than Toronto because of their smaller size. It is not the case, then, that the gravity model predicts that the entire southwestern Ontario region would be ahead of Toronto in the change. Rather, the region contains a range of strongly and weakly influenced places, most of which are less strongly influenced than Toronto. Since the data from southwestern Ontario come from all over the region (the most common city being Hamilton) and not just from Windsor and St. Catherines, they do in fact appear to provide more support for a wave model of diffusion than for the gravity model.

TABLE 6. *Geographic diffusion of American linguistic influence (I) within southwestern Ontario, as predicted by the gravity model*

		Toronto P = 3,900	Hamilton P = 600	London P = 400	St. Catherines–Niagara P = 400	Kitchener–Waterloo P = 400
Detroit	d	384	347	211	411	307
P = 4,700	I	203.8	62.3	116.7	30.8	55.1
Buffalo	d	168	104	259	40	168
P = 1,200	I	117.0	133.1	16.1	675.0	38.3
Detroit + Buffalo	I	320.8	195.4	132.8	705.8	93.4
Toronto	d	—	75	200	139	96
P = 3,900	I	—	1,802.7	176.9	366.2	767.6

Note: P = population in thousands (United States: 1990 census; Canada: 1991 census); d = distances in kilometers.

Turning to other regions of Canada, the leading position of the West among the oldest speakers and the relatively high position of Atlantic Canada among the youngest speakers (second only to southwestern Ontario) are surprising results that offer counter-evidence to both the hierarchical and wave-based models of diffusion. While the relatively high American influence index of Vancouver (219 in Table 1), stemming from its proximity to Seattle, might seem to run in favor of the gravity model, the 11 Vancouver subjects among the western sample did not in fact exhibit a higher mean frequency of /ɑ:/ pronunciations than the subjects from parts of the West with much lower influence scores (the Vancouver frequency of 4.2 and the non-Vancouver frequency of 4.0 were not significantly different). The diachronic stability of the western data suggests an alternative explanation of the relatively high frequency of American pronunciations in the West: it may result from American settlement rather than diffusion. This is also a possible explanation for the relatively high level of /ɑ:/ pronunciations among the oldest generation of southwestern Ontarians (significantly higher than among the oldest Torontonians: $p < .025$; $t = 2.30$ at 22 *df*), since refugees from the American Revolution were the most important stream of early settlement in that region. The oldest Atlantic Canadians, by contrast, exhibit virtually categorical use of /æ/, so that the performance of the youngest generation represents an 800% increase in preference for /ɑ:/, a striking development that neither settlement history nor the gravity or wave models of diffusion can explain.

DISCUSSION AND CONCLUSIONS

How, then, can we account for the differential effects of the international boundary? It seems clear that some features diffuse more easily than others. The failure of phonetic features to diffuse in some cases appears to be governed more by structural phonological factors than by the coincidence of historical isoglosses with political boundaries. Where these constraints do not exist, many features—and even some phonetic features—appear to diffuse quite easily across the international boundary. For instance, a comparison of the American and Canadian vowel systems in Figures 2 through 8 shows that the fronting of /u:/ is well advanced on both sides of the border. There is nothing in the high-central region of the vowel space to constrain the forward movement of /u:/ from its original position in the high-back corner, and so this change affects the whole continent simultaneously. Whether this is really a case of diffusion as opposed to a series of independent developments is not yet clear.

This is not to say that a national boundary has no effect. Canada is clearly not a part of the American speech community in some respects, and its independence in this regard is presumably supported and perpetuated by the general post-acquisition stability of grammars at a more abstract level and by Canadian institutions, such as schools, textbooks, dictionaries, and national media, at the less stable level of lexicon and phonemic incidence. However, the fact that these

institutions have been only partially effective in maintaining distinctness (as shown by the data presented here on foreign (a) and by the studies of Nylvek, 1992, and Chambers, 1998) suggests that changes at this level of grammar may indeed diffuse by means of the mass media and popular culture—a kind of language contact that has generally been dismissed in sociolinguistic studies of language change, but should now, perhaps, become the subject of systematic study.

One factor that we have so far overlooked, anticipated again by Trudgill (1974:241), is the role of attitude and subjective evaluation in diffusion. Bailey's research group found this to be decisive in determining diffusion patterns in Oklahoma. Features that had local prestige tended to diffuse up the urban hierarchy from the countryside, home of their traditional users, whereas features that had global prestige tended to diffuse down the hierarchy from the cities, home to people with the most external contacts (Bailey et al., 1993). In the U.S.–Canada border context, it seems clear that some features, such as quotative *be like*, which has spread in Canada as rapidly as in the United States, are positively evaluated because of their association with a glamorous youth culture based in the United States. The American use of long /ɑ:/ in nativizing foreign words spelled with ⟨a⟩ is evidently also positively evaluated, at least in some words. In Labov's terms (1972), the shift toward using /ɑ:/ for foreign (a) appears to be a change from above, with an obvious external source (American English) and an overt prestige value stemming from its association with perceptions about the "correct" way to pronounce foreign languages. (See Boberg, 1999, for a discussion of the attitudinal dimensions of this variable in American English.)

Other features, however, such as the American variants of many traditional British–American pronunciation differences or indeed the Northern Cities Shift, hold no such positive prestige for most Canadians and so are not imitated. In general, it seems safe to say that Canadians do not want to sound like Americans, so that when a variant is marked [+American] rather than, say, [+young] or [+trendy] it will not be readily transferred. An adequate model of geolinguistic diffusion clearly requires a term that incorporates prestige and subjective evaluation in its calculations, though how this would work quantitatively is at present not clear. The methodological problem reminds us of trying to attach probabilities to variable rules in a transformational grammar: could the results of attitudinal surveys be attached to linguistic descriptions of language change, indicating the probability with which a change would be adopted in a given speech community or by a certain kind of speaker? As Labov (1972) found on Martha's Vineyard, a larger center can have an influence on a smaller one only if the inhabitants of the smaller one hold a positive subjective evaluation of the larger center and its cultural associations. It seems doubtful that the inhabitants of Windsor have a positive evaluation of Detroit in this sense, any more than do the Toronto subway riders who apparently want to push them off the platform. The general conclusion that emerges from the research presented here is that current models of geolinguistic diffusion, while they represent a great advance in the study of geolinguistics and language change, do not make accurate predictions

about certain cases of diffusion in North American English and face considerable practical difficulties when they are applied beyond the circumstances for which they were created. Adaptation and refinement of these models to fit a wider range of geolinguistic scenarios will require a great deal more research.

REFERENCES

Avis, W. S. (1954–1956). Speech differences along the Ontario–United States border: I–III. *Journal of the Canadian Linguistic Association* 1:13–18(I), 1:14–19(II), 2:41–59(III).

Bailey, Guy, Wikle, Tom, Tillery, Jan, & Sand, Lori. (1993). Some patterns of linguistic diffusion. *Language Variation and Change* 5:359–390.

Bloomfield, Morton W. (1948). Canadian English and its relation to eighteenth century American speech. *Journal of English and Germanic Philology* 47:59–67.

Boberg, Charles. (1997). *Variation and change in the nativization of foreign (a) in English.* Doctoral dissertation, University of Pennsylvania.

_____ (1999). The attitudinal component of variation in American English foreign (a) nativization. *Journal of Language and Social Psychology* 18:49–61.

Callary, R. E. (1975). Phonological change and the development of an urban dialect in Illinois. *Language in Society* 4:155–170.

Chambers, J. K. (1994). An introduction to dialect topography. *English World-Wide* 15:35–53.

_____ (1998). Social embedding of changes in progress. *Journal of English Linguistics* 26:5–36.

Chambers, J. K., & Trudgill, Peter. (1998). *Dialectology* (2nd ed.). Cambridge: Cambridge University Press.

Clarke, Sandra, Elms, Ford, & Youssef, Amani. (1995). The third dialect of English: Some Canadian evidence. *Language Variation and Change* 7:209–228.

Gregg, R. J. (1957). Notes on the pronunciation of Canadian English as spoken in Vancouver, B.C. *Journal of the Canadian Linguistic Association* 3:20–26.

Hamilton, Donald. (1958). Notes on Montreal English. *Journal of the Canadian Linguistic Association* 4:70–79.

Labov, William. (1972). *Sociolinguistic patterns.* Philadelphia: University of Pennsylvania Press.

_____ (1980). The social origins of sound change. In W. Labov (ed.), *Locating language in time and space.* New York: Academic. 251–265.

_____ (1991). The three dialects of English. In P. Eckert (ed.), *New ways of analyzing sound change.* New York: Academic. 1–44.

Labov, William, Ash, Sharon, & Boberg, Charles. (to appear). *Atlas of North American English: Phonetics, phonology and sound change.* Berlin: Mouton de Gruyter.

Milroy, Lesley, & Milroy, James. (1992). Social network and social class: Toward an integrated sociolinguistic model. *Language in Society* 21:1–26.

Nylvek, Judith. (1992). Is Canadian English in Saskatchewan becoming more American? *American Speech* 67:268–278.

Scargill, M. H. (1957). Sources of Canadian English. *Journal of English and Germanic Philology* 58:610–614.

Scargill, M. H., & Warkentyne, H. J. (1972). The survey of Canadian English: A report. *English Quarterly* 5:47–104.

Thomason, Sarah Grey, & Kaufman, Terrence. (1988). *Language contact, creolization and genetic linguistics.* Berkeley: University of California Press.

Trudgill, Peter. (1974). Linguistic change and diffusion: Description and explanation in sociolinguistic dialect geography. *Language in Society* 3:215–246.

Vander Doelen, Chris. (1998). Us talk funny? Yuze ain't got no ears! *The Montreal Gazette*, March 9, A6.

Zeller, Christine. (1993). Linguistic symmetries, asymmetries, and border effects within a Canadian/American sample. In Sandra Clarke (ed.), *Focus on Canada.* Amsterdam: Benjamins. 179–200.