Part D

Transmission and Diffusion

15

The Diffusion of Language from Place to Place

Most of this volume and the two preceding have dealt with linguistic change from below in the sense defined in Labov (1966): the gradual development of the linguistic system in the speech community, driven by factors internal to that community. Yet relations between speech communities are present in the background throughout and sometimes emerge to take center stage. Chapter 9 examined the social and linguistic conditions that lead to the divergence of neighboring dialects and the overall dispersion of linguistic systems in North America. The discussion of triggering events in Chapter 5 included a case of massive population movement and mixture in the genesis of the Northern Cities Shift in Western New York State. This chapter will confront some of the principles governing changes that are the result of dialect contact, introducing a distinction between transmission within the speech community and diffusion across communities.

15.1 Family-Tree and Wave Models of Change

Throughout the history of linguistics, two models of linguistic change have coexisted in an uneasy relationship. The family-tree model has been the principal guide and major output of the comparative method. Yet all linguists agree that there are some situations where the effects of a wave model must be recognized, registering the influence of distinct terminal nodes of the tree on one another. Such wave effects are seen most clearly in communities with extended periods of bilingualism; in the formation of pidgins and creoles; and in the major *Sprachbund* areas in which features spread across languages in ways unrelated to place on the family tree. Contact effects may appear as inextricably embedded in the reconstruction of normal linguistic development. Ringe, Warnow and Taylor (2002; hereafter RWT) present their current best tree for Indo-European as Figure 15.1, with the Germanic languages branching from the major node which includes Balto-Slavic (Old Church Slavonic, Lithuanian, etc.) and Indo-Iranian (Vedic, Avestan, etc.). Yet, as suggested by the

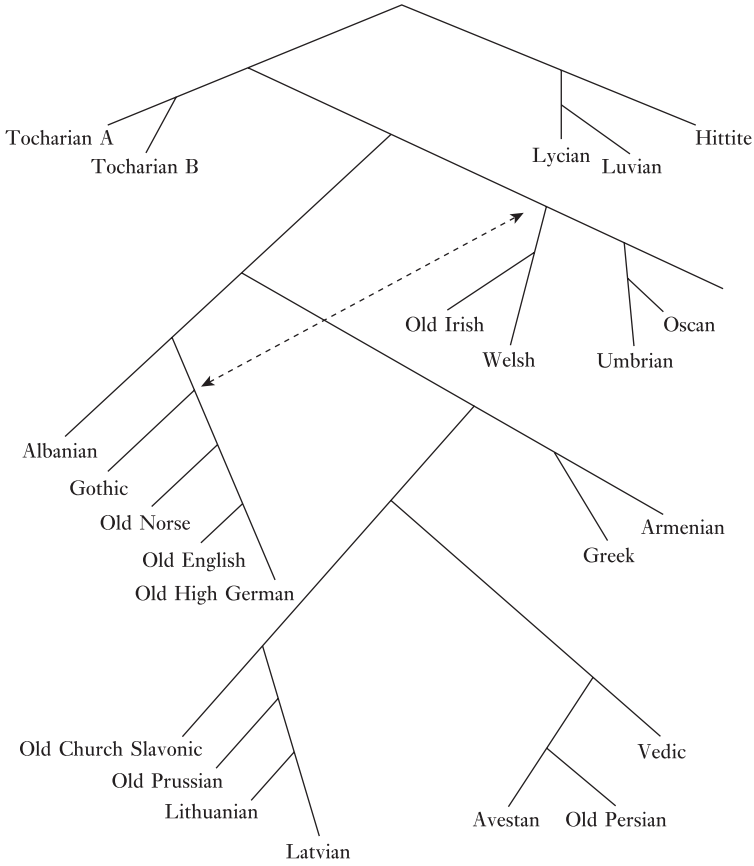

Figure 15.1 Best Indo-European family tree (Ringe, Warnow, and Taylor 2002), with indication of shared characteristics of Germanic with Italo-Celtic branch

dashed arrow (my addition to the diagram), Germanic shares many characters with the Italo-Celtic branch, which split much earlier from the main Indo-European community. The authors find that this situation reveals the modification of the family-tree descent characters by later contact:

> This split distribution of character states leads naturally to the hypothesis that Germanic was originally a near sister of Balto-Slavic and Indo-Iranian [. . .] that at a very early date it lost contact with its more easterly sisters and came into close contact with the languages to the west; and that that contact episode led to extensive vocabulary borrowing at a period before the occurrence in any of the languages of any distinctive sound changes that would have rendered the borrowings detectable. (RWT, p. 111)

This is of course only one of innumerable findings on the effect of language contact, from Schmidt (1871) through Weinreich (1968) and beyond. Bloomfield's discussion of the limitations of the family-tree model includes a diagram with this very example of Italic influence on Germanic, adapted from Schrader's original (Bloomfield 1933: 316). I cite RWT here because the contact problem is foregrounded in one of the most recent and sophisticated developments of the family-tree model for the most studied of all language families: Indo-European. It would seem, then, that any general view of language descent must be prepared to integrate the two models of language change. This chapter will argue that the two models involve linguistic processes that are quite different in their mechanism and effects, the results of different types of language learning.

15.2 Defining Transmission and Diffusion

We begin with the concept of *linguistic descent*, the basic concept that underlies the family-tree model. Bloomfield's chapter on the comparative method states the conditions under which we can recognize one language as a later stage of another (1933: 316ff.). Hoenigswald (1960) also devotes a chapter to the formal definition of mother, daughter, and sister relations. The formulation of linguistic descent given by RWT (p. 63) goes beyond the relationship of the linguistic forms, and introduces the social process of linguistic acquisition that will be a main focus of this chapter:

> A language (or dialect) Y at a given time is said to be descended from language (or dialect) X of an earlier time if and only if X developed into Y by an unbroken sequence of instances of native-language acquisition by children.[1]

This unbroken sequence of native-language acquisition by children is here termed linguistic *transmission.* The continuity of dialects and languages across time is the result of the ability of children to replicate faithfully the form of the older generation's language, in all of its structural detail and complexity, with consequent preservation of the distances between the nodes of the family tree. But linguistic descent can be preserved even when this replication is imperfect, that is, when language changes. This is the normal type of internal language change; it is termed "change from below" or change from within the system, as opposed to "change from above" or the importation of elements from other systems (Labov 1966).[2] Change from below may involve the systematic interaction of social, cognitive or physiological factors, which is responsible for the increasing distances between the nodes over time. Such internal changes are generated by the process of *incrementation*, in which successive cohorts and generations of children advance the change beyond the level of their caretakers and role models, and in the same direction,

over many generations (see Vol. 1, Ch. 14). Incrementation begins with the faithful transmission of the adult system, including variable elements with their linguistic and social constraints (Labov 1989a, Roberts 1993). These variable elements are then advanced further in the direction indicated by the inherited age vectors.[3] Children's incrementation of the change may take the form of increases in frequency, extent, scope or specificity of a variable.[4]

When entire communities move, they carry with them the agents of transmission and incrementation. Describing the development of new colonial dialects, Trudgill argues that

> most of the complicated work leading to the eventual establishment of a new, single norm will be carried out by children under the age of eight [. . .] hence the deterministic nature of the process, and the similarity of outcomes from similar mixtures. (2004: 28)

As noted above, analyses within the family-tree model regularly report the effect of changes that diminish the distances between nodes of the family tree. This may happen spontaneously, when parallel branches converge through independently motivated changes; but more often it is the result of contact between the speech communities involved and the transfer of features from one to the other. This transfer across branches of the family tree is here designated linguistic *diffusion*.

The process of comparative reconstruction normally employs the family-tree model and treats contact or "wave model" effects as disturbing elements that limit the precision of the reconstruction. What RWT makes explicit is here assumed: that transmission is the fundamental mechanism by which linguistic diversity is created and maintained, and that diffusion is of secondary importance. However, the wave model first proposed by Schmidt (1871) does provide an alternative version, in which diffusion is the main mechanism of linguistic change. This process of diffusion first creates a continuous web of linguistic similarities and differences. In Bloomfield's summary:

> Schmidt showed that special resemblances can be found for any two branches of I[ndo]-E[uropean], and that these special resemblances are most numerous in the case of branches which lie geographically nearest each other. Different linguistic changes may spread, like waves, over a speech-area, and each change may be carried out over a part of the area that does not coincide with the part covered by an earlier change. The result of successive waves will be a network of isoglosses. Adjacent districts will resemble each other most; in whatever direction one travels, differences will increase with distance, as one crosses more and more isogloss-lines. (Bloomfield 1933: 316)

How, then, are the discontinuities between languages created in this model? They are the result of a secondary process in which speakers of one particular dialect gain a form of ascendancy – political, economic or cultural – and the ensuing expansion of this dialect wipes out the intermediate forms of the original continuum. Thus the divergence of branches in the present sense is the result of the elimination

of diversity through dialect leveling. This notion of a basic dialect continuum accords well with the principle of density that Bloomfield introduces in his chapter on dialect geography. Bloomfield does not adopt Schmidt's alternative explanation of diversity, but rather withdraws to a view of the family-tree model as an ideal pattern that is never realized in reality without rejecting the idea itself: "The comparative method [. . .] would work accurately for absolutely uniform speech-communities and sudden, sharp cleavages" (ibid., p. 318).

The following sections will argue that the primary source of diversity is the transmission (and incrementation) of change within the speech community, and that diffusion is a secondary process of a very different character. Such a clear dichotomy between transmission and diffusion is dependent upon the concept of a speech community with well-defined limits, a common structural base and a unified set of sociolinguistic norms. Although for many scholars, including dialectologists, speech communities form continua without clear boundaries between them (Carver 1987, Heeringa and Nerbonne 2001), we find that the best studied communities in the Eastern United States are discretely separated from their hinterland. New York City turned out to be a geographic unity defined by a common structural base (Labov 1966), as is shown on the one hand by the match between the department store study and the study of the Lower East Side, and, on the other, by the sharp contrast between out-of-towners and native New Yorkers. So, too, was Philadelphia, where the geographically random telephone survey matched the long-term study of ten neighborhoods, and the oldest upper-class Philadelphian matched the oldest working-class Philadelphian in the specifics of the complex short-*a* split that defines the community (Labov 1989b; PLC, Vol. 2). As Chapter 9 showed, an even more startling uniformity and deeper divisions between speech communities are found by ANAE. The extraordinarily homogeneous vowel system of the Inland North is sharply separated from the Canadian system to the north and the Midland system to the south, with a tight bundling of a dozen structural isoglosses.

This discussion of transmission and diffusion will draw from such well-defined communities and from the highly structured patterns that define them. The nature of the inquiry may depend in part on the difference between dialectology in North America and studies in Western Europe (Auer and Hinskens 1996, Trudgill 1996, Kerswill 2004). In European studies the contrast between transmission and diffusion is less prominent, since the main phenomena involve the transfer of well-known features of older and well-established dialects. We do not find there many reports of changes from below that depend upon transmission through incrementation, as in the new sound changes of North America. A second difference has to do with the degree of involvement with linguistic structure. Most discussions of dialect continua deal with lexical isoglosses, lexical incidence, or unconnected phonetic variables, where the distinction between transmission and diffusion may not be so clear. The argument to be advanced below is dependent upon more abstract phenomena: linguistic changes that involve grammatical conditioning, word boundaries, and the systemic relations that drive chain shifting.

15.3 Structural Diffusion

In discussions of the linguistic consequences of language contact, the question of structural borrowing regularly comes to the fore. There is no question about structural transmission within the community: if structures were not transmitted across generations, there would be no continuity in language. The issue is entirely about what can happen in diffusion across communities.

RWT argue for a strong linguistic constraint against structural diffusion. They state that the essential condition for the family-tree model is that morphosyntactic structures are faithfully transmitted across generations and are *not* transferred from language to language in normal linguistic development. Thomason and Kaufman (1988) contend that social factors can override linguistic constraints, discounting the impact of any structural factors. Moravcsik (1978) proposes five general principles that delimit the extent of borrowing; but Campbell (1993) offers a critical overview of the validity of such constraints. Hock and Joseph note that "structural elements usually do not diffuse through borrowing" (1996: 14), but are the cumulative results of changes in pronunciation and lexical borrowing. Winford concludes that "[t]he case for direct borrowing of structure in any of these [bilingual] situations has yet to be proved" (2003: 64).

In a meticulous review of the literature on structural borrowing, Sankoff (2002: 658) concludes that the notion of a "cline of borrowability" must be upheld:

> Though most language contact situations lead to unidirectional, rather than bidirectional linguistic results, conditioned by the social circumstances, it is also the case that linguistic structure overwhelmingly conditions the linguistic outcomes. Morphology and syntax are clearly the domains of linguistic structure least susceptible to the influence of contact, and this statistical generalization is not vitiated by a few exceptional cases.

Close investigations of some cases of structural borrowing have shown that they are actually consequences of lexical borrowing: "On the other hand, lexicon is clearly the most readily borrowable element, and borrowing lexicon can lead to structural changes at every level of linguistic structure" (ibid.).

The borrowing of preposition-final constructions into Prince Edward Island French, carefully studied by King (2000), is cited by RWT in support of their position that structural borrowing has proved to be an illusion in the few cases which have been studied in sufficient sociolinguistic detail. If this is the case, the contrast between transmission and diffusion is absolute. One copies everything; the other is limited to the most superficial aspects of language, words and sounds.[5] However, it seems unlikely that the actual situation is so abruptly polarized. Joseph (2000) presents convincing cases of the diffusion of syntactic structures across the languages of the Balkans. The spread of the construction Verb-"not"-Verb may be

based on a common lexicalized model with the verb "want," but there is no such evidence in the replacement of infinitival complementation by finite forms.[6] In any case, contributors to this debate agree – with the exception of Thomason and Kaufman – that there are structural limitations on what types of linguistic patterns can be transmitted across languages.

15.4 Accounting for the Difference between Transmission and Diffusion

It is proposed here that the contrast between the transmission of change within speech communities and the diffusion of change across communities is the result of two different kinds of language learning. On the one hand, transmission is the product of the acquisition of language by young children. On the other hand, the limitations on diffusion are the result of the fact that most language contact takes place among adults. It follows that structural patterns are not as likely to be diffused, because adults do not learn and reproduce linguistic forms, rules and constraints with the accuracy and speed that children display.

This hypothesis is informed by recent studies that have greatly refined our understanding of the extent of those changes in language learning ability that take place at the end of the critical period (see the recent reviews of Newport 1990 and Scovel 2000). The period of decline in language learning ability extends from roughly 9 to 17 years of age. The experiments of Johnson and Newport (1989) showed that subjects who had acquired a second language after 17 years of age could not reproduce the syntactic judgments of native speakers. Oyama (1973) and Payne (1976) showed that children who arrived in a speech community after the age of 9 did not acquire the local phonological pattern with any degree of precision. However, many recent studies show that adults do have the capacity to change their linguistic systems to a significant degree after this critical period (Sankoff 2004). Real-time replications consistently show some adult movement in the direction of the change (Vol. 1, Ch. 4). A real-time re-study of Montreal French (Sankoff et al. 2001, Sankoff and Blondeau 2007) found a quantitative shift of apical to uvular /r/ for about a third of the adult speakers. At the same time, it was observed that no adults showed the total conversion to uvular /r/ that was characteristic of many pre-adolescents.

15.5 Diffusion in Dialect Geography

Evidence for the differentiation of family-tree and wave models may be drawn from dialect geography, which provides simultaneous records of both diffusion and

transmission. The differentiation of regional dialects yields a fine-grained model of family-tree evolution. Dialect geography also focuses our attention upon diffusion, since the distribution of features across contiguous dialects leads to the inference that some have spread in a wave-like process of diffusion from one dialect to another (Trudgill 1974a, Bailey et al. 1993, Wolfram and Schilling-Estes 2003). With the advent of quantitative studies in the 1960s, this process of diffusion could be examined in some detail.

15.5.1 The diffusion of (æ) in Norway

Striking examples of diffusion are found in Trudgill's study of the Norwegian dialects of the Brunlanes Peninsula (1974a). Figures 15.2a and b show the progress of the lowering of /æ/ over two generations. The numbers on the map represent a scale of lowering from 0 to 500. They indicate both incrementation of the variable in the cities that are the points of origin and the geographic diffusion from them to the next largest cities – and ultimately to the small villages of the countryside.

The data from Figure 15.2 were originally used to support the gravity model of diffusion, in which the influence of one city on another is proportional to their population sizes and is inversely related to the square of the distance between them.[7] But they also illustrate the striking difference between the two types of language change: incrementation in urban speech communities and diffusion across the countryside. In Figure 15.2a, the towns of Larvik and Stavern have values above 240 for the oldest generation of speakers, over 60 years old; in Figure 15.2b, the middle generation of speakers in those cities shows values of over 280. This increase in the magnitude of the lowering process points to incrementation as the generating process in the city of origin.[8]

Figure 15.2 also illustrates the opposite process: the steady decline of the variable as one moves away from the city centers to the inland rural area, where values under 200 are found. Viewed as a process of diffusion from the city centers, this decline can be seen as a wave of continuous weakening as each new level of the variable (æ) diffuses outward. It is also possible to see Figure 15.2 as an array of incrementing regions, where each surrounding area exhibits incrementation at its own level, and the only difference between the big city and the small town is the time at which the process was initiated.

This issue cannot be resolved solely on the basis of the data from Brunlanes, which are presented as an output phonetic process with no structural conditions or consequences. More complex data, to follow from North American English, will make it possible to distinguish parallel development from diffusion. But, given the urban influence indicated in Figure 15.2, we can expect a certain degree of weakening of ongoing change in outlying areas, since the expanding forms are copied from adults who are at a relatively conservative level to begin with, and acquired by

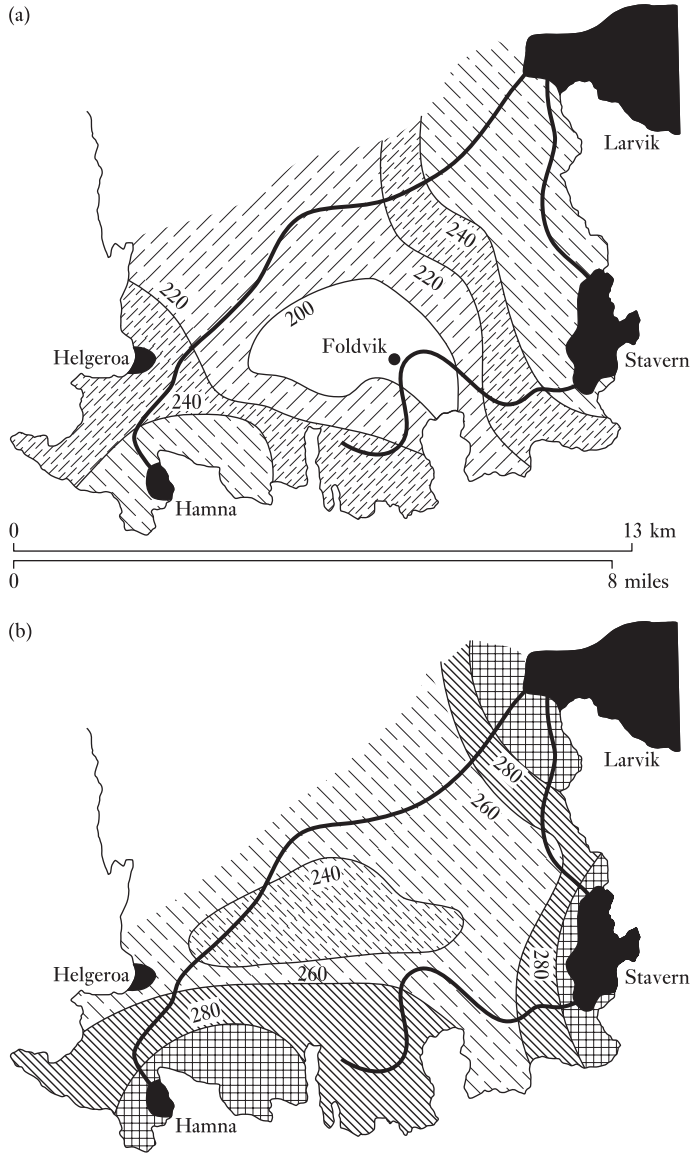

Figure 15.2 Lowering of /æ/ on the Brunlanes Peninsula (Trudgill 1974a, Maps 7, 8); Figure 15.2a Speakers 70 years of age and older; Figure 15.2b Speakers 25–69 years of age. Reprinted by permission of Cambridge University Press

adults who change their own speech in a sporadic and inaccurate manner. The next case shows how a sociolinguistic variable diffusing from an urban center can be dramatically reinterpreted in an outlying community.

15.5.2 The diffusion of (an) from Tehran to Ghazvin

The nature of this adult contact is illustrated in the study of the urban Persian dialect of Tehran by Modaressi (1978). One of the sociolinguistic variables he studied was (an), the raising of /a/ to [o:] and [u:] before nasals, as in the shift of name of the capital city from [tehra:n] to [tehru:n]. This variable shows regular social stratification in Tehran, where the higher the social status of a speaker, the lower the frequency of (an) raising. Modaressi also studied the small city of Ghazvin, ancient capital of the province of that name, located about 150 km from Tehran.

Figure 15.3 shows percent raising of (an) by age and style for Tehran and Ghazvin. Both cities exhibit sharp stylistic stratification and a regular advance of the variable. The solid lines show the values for Tehran, and, at a lower level, dashed lines show the values for Ghazvin.

Figure 15.4 plots this variable by social class, which is registered by years of education completed. Ghazvin is only slightly behind Tehran for speakers with some college education, but the difference increases with lower educational levels. Furthermore, the two communities show opposite directions of sociolinguistic stratification: the more education the citizens of Tehran have, the less they raise /an/ to [u:n]. In contrast, the more education citizens of Ghazvin have, the more

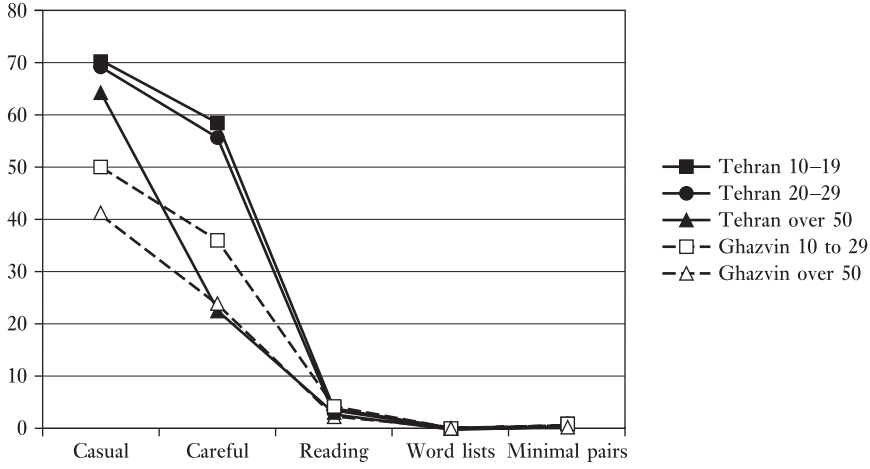

Figure 15.3 Percent raising of (an) by age and style in the Persian of Tehran and Ghazvin

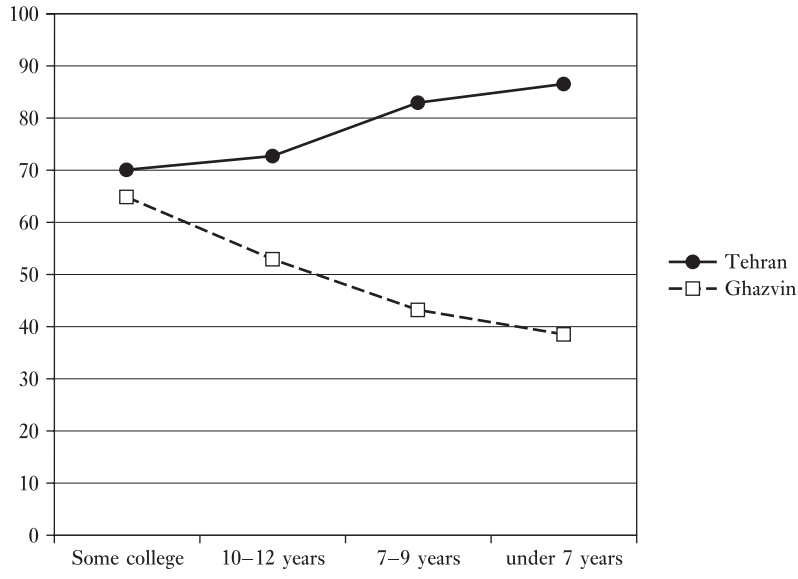

Figure 15.4 Percent raising of (an) by education in the Persian of Tehran and Ghazvin

they raise /an/. This result makes sense only if we infer that the contact between Tehran and Ghazvin occurs primarily among more educated adults and that the variable spreads downward in Ghazvin, at a progressively lower rate through a network of adult contacts. While the original adoption of the Tehran raising of (an) was a matter of speaker-internal accommodation (Trudgill 1986, Ch. 1; Joseph 2000), the speaker-external spread through the Ghazvin community follows a reverse pattern of social prestige among adults.

This is not to say that incrementation will not also take place among children in Ghazvin. But they will have inherited the new variable through the filter of adult diffusion, along with the social evaluation particular to Ghazvin. These examples from dialect geography support the notion that the diffusion of linguistic variables from place to place is carried forward by adults, from whom we expect less advanced rather than more advanced forms of the variables. One odd result of this diffusion is that, in Ghazvin, casual speech favors the forms that are most common among the highest-prestige speakers – a sociolinguistic anomaly.

The lowering of (æ) in Norway and the raising of (an) in Iran are typical of the many phonetic output rules that we find in studies of sound change in progress. In order to pursue the question of whether structural features can be diffused, we need to consider more complex patterns than the unconditioned lowering of /æ/ or raising of /a/ before nasals. The diffusion of the grammatically conditioned short-*a* split of New York City provides such a case.

15.6 The Diffusion of the NYC Short-*a* System

Almost all dialects of North American English show a raising and fronting of some members of the historical short-*a* class (ANAE, Ch. 13).[9] Phonetic conditioning is always present, in some cases as a continuum, in others as a discrete division into *tense* and *lax* distributions.[10] In some cases the tense and lax classes are phonetically predictable by simple rules; in others they are not. There are five basic types of distribution:

a *The nasal system* All short *a* before the front nasal consonants /n/ and /m/ are tense (*ham*, *hammock*, *man*, *manage*, *span*, *Spanish*), while all others are lax.
b *Raised short* a All words with historical short *a* are tense. Found only in the Inland North.
c *Continuous short-*a *raising* Short-*a* words are variably tensed, with vowels before nasal codas leading and vowels before voiceless stops and after obstruent liquid onsets (*glass*, *brag*) remaining in low front position.
d *Southern breaking* Short *a* is broken into a low front nucleus, palatal glide and following inglide in the Southern dialect area.
e *Split short-*a *systems* In New York City and the Mid-Atlantic region, the distribution of tense and lax vowels is governed by a complex of phonological, grammatical, stylistic and lexical conditions.

One form of the type (e) distribution is specific to New York City and its immediate environs, and was first described by Babbitt in 1896.[11] Babbitt reported that older speakers used the tense variant for the New England broad-*a* class, while younger speakers appear to have had the modern system as first described by Trager (1930, 1934, 1942) on the basis of his Newark, New Jersey speech pattern.[12] The older and the newer systems agree in tensing (in closed syllables) before some front nasal clusters and all front voiceless fricatives; but the newer system expands to include all front nasals, all voiceless fricatives and all voiced stops in coda position, as indicated in Figure 15.5. While both systems have tense *can't*, *dance*, *half*, *bath*, *pass*, *past*, the new system adds *man*, *stand*, *cash*, *cab*, *mad*, *badge*, *flag*. The degree of raising and fronting is a strong sociolinguistic marker, and New Yorkers frequently lower their tense vowels in careful speech. But the distribution into tense and lax classes is not socially evaluated and is uniformly distributed in the spontaneous speech of community members, to the extent that it is not disturbed by the effects of formal observation (Labov 1966).

To this phonetic conditioning a number of specific conditions are added:

1 *Function word constraint* Function words with simple codas (*an*, *I can*, *had*) are lax, while corresponding content words are tense (*tin can*, *hand*, *add*). *Can't*, with a complex coda, also remains tense. This preserves the contrast

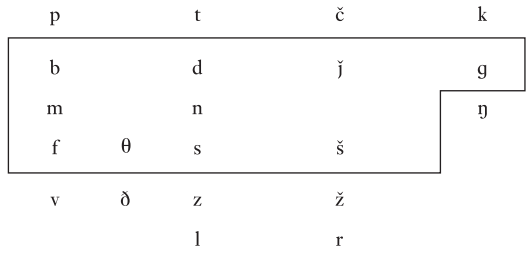

Figure 15.5 Codas that condition tensing of short *a* in New York City

of tense *can't* versus lax *can* in environments where the /t/ is elided or neutralized.

2 *Open syllable constraint* Short *a* is lax in open syllables, yielding tense *ham*, *plan*, *cash* but lax *hammer*, *planet*, *cashew*.
3 *Inflectional boundary closing* Syllables are closed by inflectional boundaries, so that tense forms include *planning* as well as *plan*, *staffer* as well as *staff*.
4 *Variable items* Considerable variation is found before voiced affricates and fricatives, in closed syllables (*jazz*) and in open ones (*imagine*, *magic*).
5 *Initial condition* Initial short *a* before codas that normally produce tensing are lax (*aspirin*, *asterisk*), except for the most common words (*ask*, *after*).
6 *Abbreviations* Abbreviated personal names are often lax (*Cass*, *Babs*).
7 *Lexical exceptions* There are a number of lexical exceptions: for example *avenue* is normally tense, in contrast to lax *average*, *savage*, *gavel*.
8 *Learned words* Many learned or late learned words with short *a* in tense environments are lax: *alas*, *carafe*.

Given the lexically specific conditions (4–7), it would seem necessary to analyze this pattern as a phonemic split. However, Kiparsky (1988) argued from the standpoint of lexical phonology that the patterns of change in progress within the community indicated the presence of a lexically and grammatically conditioned rule. To decide the issue, more information is needed than we now have available on how the pattern is learned. Chapter 18 of Volume 1 discussed the relation between the Philadelphia and the NYC split of short *a*. The similarity between the two systems was underlined by the fact that New Yorkers had greater success in learning the lexically determined aspects of the Philadelphia pattern than in learning the more rule-governed aspects.

At this point in the discussion, the tense class will be referred to as /æh/ and the lax class as /æ/, without deciding how these classes are generated or stored. Figure 15.6 shows the characteristic distribution of tense /æh/ and lax /æ/ for an ANAE speaker from New York City recorded in 1996. Nancy B. was then 65 years old, a homemaker and secretary of Italian–American background. Only two members

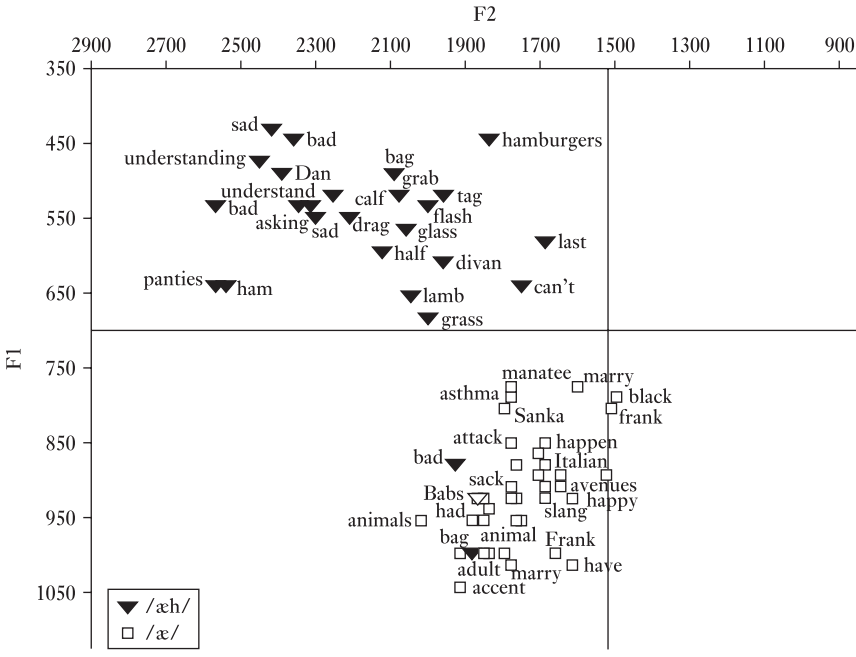

Figure 15.6 Short-*a* distribution of Nancy B., 65 [1996], New York City, TS 495

of the tense class (one each of *bad*, *bag*) were corrected to the lax class during the interview. Otherwise we observe a clear separation between the two classes. The tense /æh/ class includes short *a* in closed syllables before voiced stops (*sad*, *bad*, *bag*, *tag*, *drag*), front nasals (*ham*, *understanding*, *hamburgers*, *can't* and *divan*), and voiceless fricatives *(calf*, *flash*, *glass*, *last*, *grass*). In the lax category are corresponding words with short *a* in open syllables (*animal(s)*, *manatee*), function words (*have*, *am*, *had*), and environments that are always lax (*happen*, *attack*, *black*), including before velar nasals (*Frank*, *slang*, *Sanka*).

The dialect of New York City is confined to the city itself and to several neighboring cities in Northeastern New Jersey (Weehawken, Hoboken, Jersey City, Newark).[13] The NYC short-*a* distribution is uniform throughout this area and, as far as we know, has been stable through most of the twentieth century. It is clear that the New York City short-*a* system is very far from whatever beginnings it had as a simple, phonetically determined sound change. This system has developed the lexical and morphological irregularities characteristic of many late stages of change (Janda and Joseph 2001). It therefore gives us an opportunity to see what happens to this complex structure when it diffuses to other communities.

ANAE shows that the New York City pattern was diffused to four other communities, along the paths shown in Figure 15.7.

Figure 15.7 Diffusion of the New York City short-*a* pattern to four other speech communities

15.6.1 Diffusion to Northern New Jersey

I was born in Rutherford, New Jersey: a small residential *r*-pronouncing town studded with Dutch farmhouses, just outside of the New York City speech community. Though the local dialect that I acquired was *r*-pronouncing, the short-*a*

system generally conformed to the descriptions of the NYC short-*a* system given above.[14] But there was a striking difference in the absence of the function word constraint. A very common utterance among residents of this Northern New Jersey area was "Did you say C–A–N or C–A–N–T?," since the vowel is tense in both words and the /t/ is often neutralized before a following apical obstruent (as in "I can't tell you"). Tense vowels are found in *am*, *an*, *and* as well. I originally cited this as an example of how the advance of sound change can override functional constraints; but, from the perspective of the present study, it appears as an instance of the loss of structural detail in the diffusion of the NYC short-*a* system to dialects with which it is in contact.

Cohen (1970) is a detailed study of short-*a* systems in New York City and in the adjacent areas of Northern New Jersey. He finds that the area closest to New York, Bergen County (between the Hackensack and Hudson Rivers), replicated the NYC features outlined above, with no more variation than we find in the city itself. In the area between the Hackensack and Passaic Rivers, including Rutherford, there is a striking tendency to lose the functional constraint before nasals, so that *can*, *am*, *an*, *and* are tense. Variable tensing is found in open syllable word types like *planet*, *fashionable*. Beyond the Passaic River, the short-*a* systems are radically different from that of New York City. ANAE interviews carried out in the 1990s in Passaic and Paterson show a uniform nasal system, with tensing before and only before nasal consonants. This gives us some indication of what may have preceded the diffusion of New York City influence into Bergen County.

Although the original ANAE design was aimed at cities of 50,000 or more, it was extended to study a number of small towns in the area between New York City and Philadelphia. Two speakers from North Plainfield, NJ were interviewed. North Plainfield is a residential community of 20,000, located 28 miles southwest of New York City and 18 miles southwest of Newark, the nearest full representative of the NYC dialect. One ANAE subject was Alex O., an 81-year-old retired tool and die maker of Russian/Polish background, who was interviewed in 2001. Figure 15.8 shows that his short-*a* system clearly follows the basic New York City pattern. The symbols in Figure 15.8 are cued to the NYC pattern; grey triangles represent tense /æh/ and black squares represent lax /æ/. Vowels are tense in closed syllables before voiced stops (*cab*, *bad*, *glad*) and voiceless fricatives (*bath*, *math*, *glass*, *past*, *rash*, *Alaska*). A few words that are normally tensed in NYC, mostly polysyllables, are found in the lax class: *mash*, *candidate*, *mansions*.[15] An important item here is lax *bag;* words with final /g/ are uniformly lax outside of NYC. As in NYC, inflectional boundaries close the syllable (*banning*). The open syllable constraint is partially intact, with lax *Canada* but tense *classics*.[16] The lexical exception *avenue* is tense, as in NYC. The crucial difference from NYC is the absence of the functional constraint before nasals, as shown in the tense positions of *am* and the auxiliary *can* along with the noun *can*. (However, *had* is lax.)

The second North Plainfield speaker studied is a younger man, Michael O., a consultant in criminology of Irish background, 58 years old in 2001 and not related

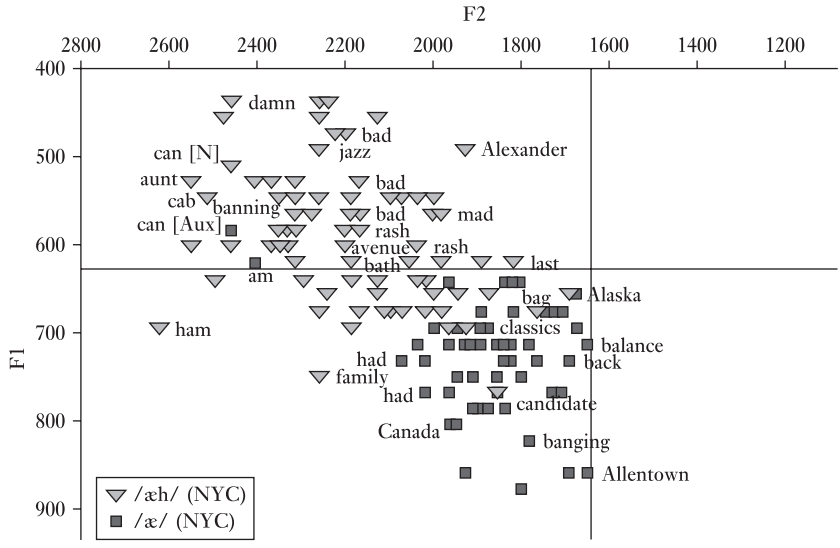

Figure 15.8 Short-*a* system of Alex O., 81 [2001], North Plainfield, NJ, TS 815

to Alex O. Michael O. preserves the NYC system in its basic outlines before front nasals, voiced stops and voiceless fricatives, but with further loss of structural detail. In his speech we observe the tensing of *am* and auxiliary *can* at the same phonetic position as in Alex O.'s speech; but his *had* is also tense. On the other hand, the lexical exception *avenue* is lax. The open syllable constraint is weaker: *camera*, *damage*, *Janet*, *planet*, *Spanish*, *Catholic* are tense, but *manage* and *castle* are lax.

In these cases and in those to follow, we recognize the influence of the NYC system by its complex and unusual conditioning of tensing before front nasals, voiced stops and voiceless fricatives – a feature found only in NYC and in communities that have a history of contact with NYC. A number of lexical and phonetic details may or may not be copied with the basic phonetic pattern. Most subject to loss through diffusion are the open syllable constraint and the function word constraint.

15.6.2 Diffusion to Albany

Albany was actually settled before New York City. Established by Henry Hudson in 1609, it was the second permanent settlement in the colonies which would later become the United States. It had a long and separate history, during and after the Dutch period. But the construction of the Erie Canal from 1810 to 1827 led to a steady flow of population from New York City to Albany and westward. It is not

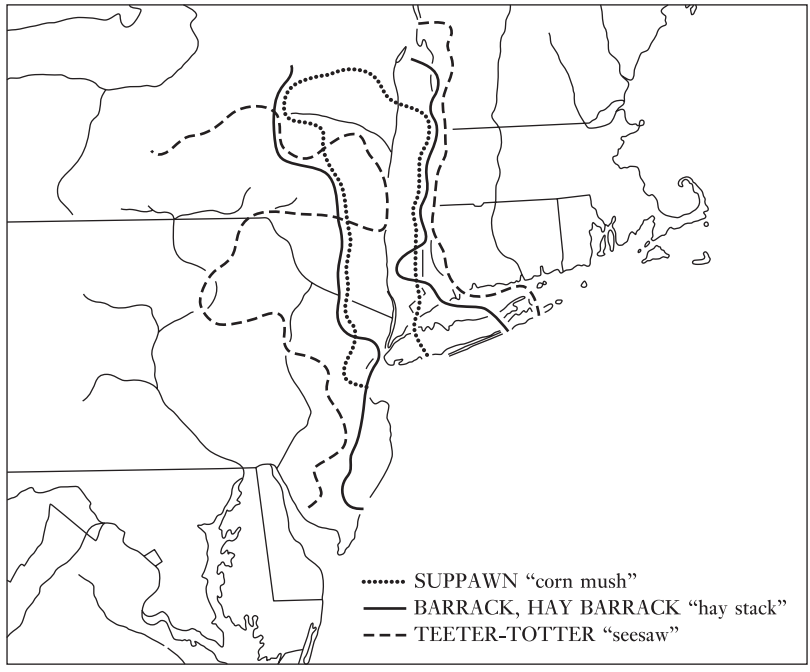

Figure 15.9 The Hudson Valley as a dialect area (Kurath 1949, Figure 13). Copyright © 1949, reprinted by permission of the University of Michigan Press

surprising, then, to find a number of lexical maps from the *Word Geography* of Kurath (1949) that display an affiliation between New York City and the Hudson River valley. Figure 15.9 traces the distribution of three vocabulary items that are common to the NYC region and the Hudson Valley: the words *suppawn* for "corn meal," *barrack* for "hay cock" and *teeter-totter* for "seesaw." Of these, *teeter-totter* is most likely to survive in New York City today; it was used regularly by Lower East Side subjects in 1963 (Labov 1966).

The short-*a* distributions in New York State outside of the Hudson Valley do not resemble the New York City system. Most of these cities have type (b), the wholesale raising of short *a* characteristic of the Inland North. New England is dominated by the type (a) nasal pattern. But, in Albany, the two ANAE speakers exhibit a striking resemblance to the NYC pattern – the situation illustrated in Figure 15.10: the short-*a* distribution of John E.[17]

Anyone familiar with New York City phonology will recognize Albany as a close relative. The back vowel /oh/ in *law* and *coffee* not only is raised to upper mid back position, but also shows the type of rounding ("pursing") specific to New York City. The tensed short *a* has a strongly fronted nucleus, which rises to upper mid and lower high position. As in New York, the tense set is a complex configuration

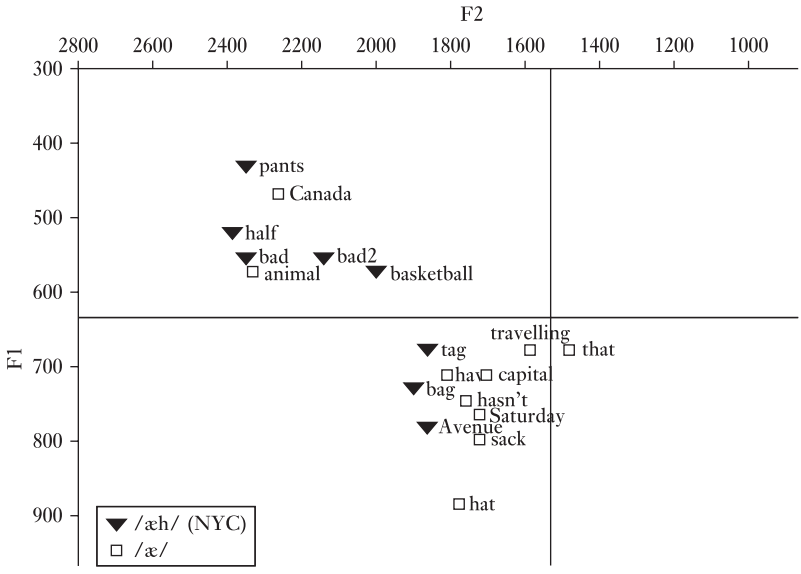

Figure 15.10 Short-*a* tokens of John E., 46 [1995], Albany, NY, TS 353

of voiced stops, voiceless fricatives and front nasals. However, a close examination of the specifics of the Albany system reveals some marked departures from NYC.

As in Figure 15.8, the symbols in Figure 15.10 are keyed to the tense/lax classes of NYC. Empty squares in the upper left region and solid triangles in the lower right denote deviations from the NYC system. As in NYC, short *a* before voiced stops and voiceless fricatives is tense (*bad*, *half*, *basketball*). But Albany shows the loss of the open syllable constraint: two tokens each of *Canada* and *animal* are clearly tensed. As in North Plainfield, short *a* before /g/ is lax: *tag* and *bag*. The word *avenue*, which normally has a tense vowel in NYC, is lax here.

The diffusion northward of the short-*a* system to Albany represents a transportation of the general phonetic basis for the NYC split, but not a faithful copy. The opposition of closed versus open syllables is lost and, with it, the grammatical opposition between tense *planning* and lax *planet*. What remains is the separation of the tokens into a bimodal distribution of allophones determined by the unusual phonetic constraints that are found in NYC: voiced stops (with the exception of /g/) and voiceless fricatives, along with front nasals.

Dinkin's exploration of dialect boundaries in upstate New York State (2009) yields a richer picture of the diffusion of NYC features into the Hudson Valley. Figure 15.11 shows the vowel system of a 53-year-old retired retail worker from Poughkeepsie, a city halfway up the Hudson Valley between New York City and Albany. Again, the phonetic pattern of the NYC system is reproduced, with its

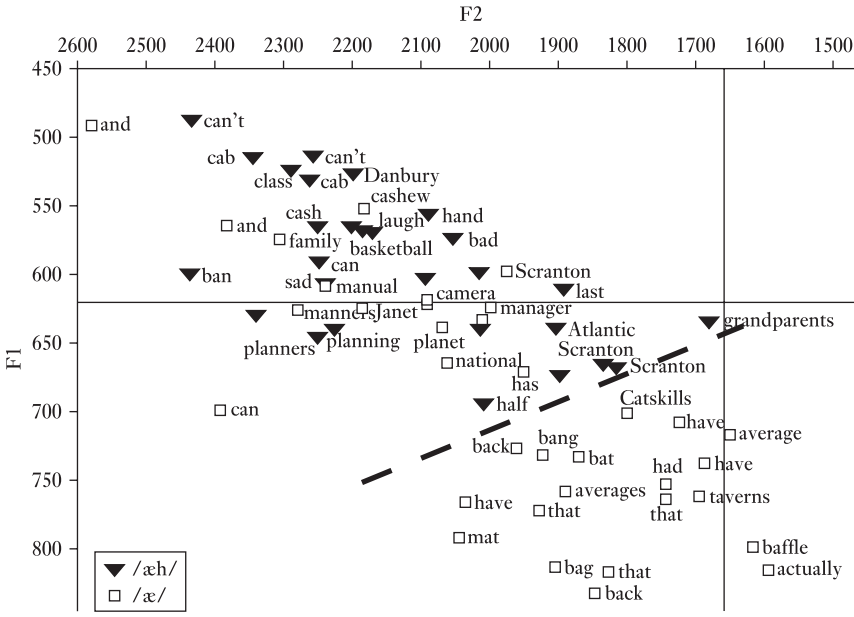

Figure 15.11 Short-*a* vowels of Louie R., 53 [2009], Poughkeepsie, NY (Dinkin 2009). Reprinted by permission of the University of Pennsylvania

tense short *a* before front nasals, voiceless fricatives (*laugh*, *cash*, *last*, *basketball*) and voiced stops (*cab*, *bad*). Again, among the voiced stops, /g/ is excepted from tensing (lax *bag*). The function word constraint is weakened: *can*, *and*, *has* are among the tense vowels, though *have* and *had* are lax. The open syllable constraint is also missing: *national*, *cashew*, *family*, *camera*, *planet*, *manner* are all tense.

15.6.3 Diffusion to Cincinnati

The city of Cincinnati is represented by four speakers in the ANAE database; three are analyzed acoustically. Figure 15.12 shows the characteristic short-*a* system as displayed in the productions of a 58-year-old woman, Lucia M., a former teacher of Irish/German background, who was then working as an accountant at a savings-and-loan firm. One can observe a division into tense and lax sets, which is characteristic of NYC. The tense set includes short *a* before front nasals (*ham*, *aunt*, *chance*, *divan*), voiced stops (*mad*, *sad*, *dad*) and voiceless fricatives (*cash*, *hashbrowns*). Boberg and Strassel (2000) noted the resemblance between the Cincinnati and NYC short-*a* patterns; they interviewed fifteen more subjects, paying considerable attention to short *a* (see also ANAE, Ch. 19).

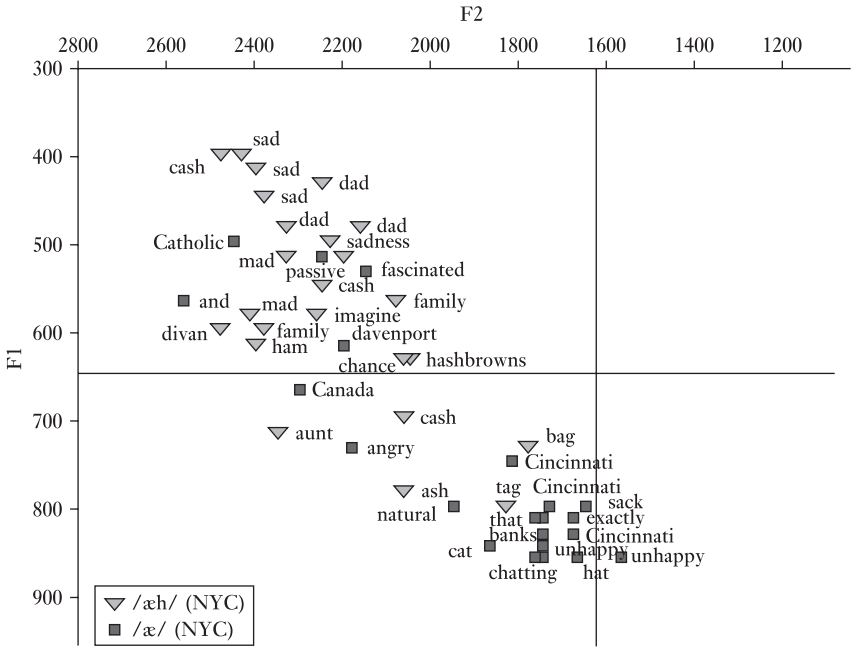

Figure 15.12 Short-*a* system of Lucia M., 58 [1994], Cincinnati, OH, TS 120

We find in Cincinnati the same type of deviations from the NYC pattern as in North Plainfield and Albany, shown in Figure 15.12 as dark squares among the grey triangles. The open syllable constraint is consistently violated, as shown in tense *Catholic*, *passive*, *fascinated*, *davenport* and *Canada*. In addition, the function word *and* is found in the tense group, reflecting the loss of the grammatical constraint. Among the lax tokens, the only clear exception to the NYC pattern is vowels before /g/.

Our first task is to account for the resemblance between NYC and Cincinnati in historical terms – in the original settlement pattern or by later contact. Cincinnati lies squarely in the Midland area, which was generally populated by a settlement stream that passed through Philadelphia, Western Pennsylvania and Kentucky. But, while the Mid-Atlantic region of Baltimore, Wilmington and Philadelphia limits tensing before voiced stops to only three words (*mad*, *bad*, *glad*), Cincinnati has general tensing before all voiced stops except /g/. While the Mid-Atlantic region limits tensing to codas with front voiceless fricatives, Cincinnati resembles NYC in tensing before palatal /š/ as well. It should also be noted that the five oldest Cincinnati subjects interviewed by Boberg and Strassel had uniform tensing before voiced fricatives – an environment that is variable in NYC.[18]

We are fortunate in having very detailed accounts of the settlement of Cincinnati. From 1943 to 1963, the Historical and Philosophical Society of Ohio published a *Bulletin* with contributions from many local scholars. We will consider this evidence on the settlement history of the Cincinnati speech community in some detail, since it gives us an intimate view of the process of diffusion and bears crucially on the relation between the New York City and the Cincinnati short-*a* patterns. The great majority of the settlers whose origins are identified were raised in New Jersey, not far from the North Plainfield area just considered.

The history of the city now known as Cincinnati began in 1787, when Congress opened to settlement the land between the Allegheny Mountains and the Mississippi River (Shepard 1949). Several prominent veterans of the Revolutionary War made the first purchase of land near the mouth of the Miami River. Major Benjamin Stites was a native of Scotch Plains in Union County, NJ, who first became acquainted with the Cincinnati region during the French and Indian wars, and he conveyed his enthusiasm for settlement to Judge John Cleves Symmes. Symmes was a native of New York who moved to New Jersey at the age of 28. He and his associates purchased 330,000 acres between the Great Miami and Little Miami Rivers. With Symmes's party was Ephraim Kibby, a hunter, road builder and Indian fighter who afterwards served in the territorial legislatures; his birthplace was listed as New Jersey in 1754 (although Sjodahl 1964 argues that he came to New Jersey to enlist in the 4th New Jersey Regiment from his family home in Somers, Connecticut). Shortly afterwards, a party of twenty-six settlers headed by Stites arrived.[19] His children Benjamin Jr, Elijah and Hezekiah were all prominent in the early history of the area; Benjamin Jr's wife is said to have been the first white woman in Cincinnati.

Among the early settlers, the Burnet family had great influence in the first half of the nineteenth century (Stevens 1952). Dr William Burnet (1730–91) was a native of New Jersey born of Scottish parents, a member of the Continental Congress and Surgeon General during the Revolutionary War. One of his sons, William, went to Cincinnati in 1789 but returned in 1791. In 1796 two other sons, Jacob and George, moved to Cincinnati; they both became lawyers and took part in the territorial government of Ohio. Burnet's youngest son Isaac went to Cincinnati in 1804, studied law with Jacob and married a woman from a Cumberland County, PA family. He became the county prosecuting attorney and was succeeded by another New Jersey man, Joseph Crane. Isaac Burnet and Joseph Crane then opened the Dayton Manufacturing Company together with two other businessmen, one from New Jersey, the other from Rhode Island. Isaac Burnet was elected mayor of Cincinnati in 1819, and served for twelve years.

At a meeting of the Cincinnati Pioneer Association in 1844, it was noted that the oldest pioneer present was William Dennison, born in New Jersey. A monument to another prominent early pioneer, Daniel Drake, shows that he was born in 1785 in Essex County, NJ (Blankenhorn 1950). A study of the Old Stone Episcopal Church centered around Reverend John Collins, who came to Cincinnati in 1802 from Gloucester County, NJ.

In 1957, Shepard discovered a trunk full of letters in the attic of a house in North Bend, a suburb of Cincinnati. Written by a neighbor who had left the farming district of New Jersey, they were addressed to relatives back in New Jersey, describing in alluring terms the new tract of land purchased by Judge Symmes (Shepard 1957).

The view that emerges of the linguistic formation of the Cincinnati dialect is clear. From its founding in 1788 to at least the middle of the nineteenth century, Cincinnati society was dominated by people from central New Jersey. Settlers were drawn from many other areas as well, like Rhode Island, Connecticut and Pennsylvania, but a typical board of directors had three of four members from New Jersey. The great majority of the community leaders identified in these historical notes came from the area of New Jersey which now has the short-*a* system of Figure 15.8.

This was not a community migration of 10,000 to 20,000 people, typical of the New England migrations discussed in Chapter 10. People moved as individuals or in small groups, occasionally returning, and often married outside of their groups of common origin. At least for the earliest period, the NYC short-*a* system was transmitted from adults to other adults, contacting settlers from other dialect regions in their new home: a case we would have to classify as diffusion rather than transmission. The situation is made more complex by the local origins of the settlers. Some of the New Jersey migrants may have come from communities that maintained the NYC system intact. Others may have had the modified system we saw in North Plainfield, and hence they may have been the agents of a second diffusion. In any case, Cincinnati children of the first quarter of the nineteenth century absorbed from their parents the simplified form of the NYC system described here. The diffusion was effective: with its New Jersey origins and continued contact with the home communities, the Cincinnati dialect resisted leveling with other Midland dialects to the end of the twentieth century.

This second diffusion has created a further distance from the original NYC pattern. The open syllable constraint is practically gone in the Cincinnati version, as well as the grammatical constraint. Furthermore, two phonetic parameters have been generalized. Voiced fricative codas lead here to tensing much more consistently than in New Jersey or New York. As we have seen elsewhere, the constraint against tensing before velars is extended from nasal to oral consonants – that is, to /g/.

At this point we have to consider the possibility that the short-*a* systems of Plainfield, Albany and Cincinnati represent an original stage of the NYC pattern, which was faithfully transmitted to New Jersey and Albany and then perhaps less faithfully westward, while the features that now distinguish NYC – particularly the grammatical constraint – are later developments. This would correspond to the version of the wave model elaborated by Wolfram and Schilling-Estes (2003).

The earliest account we have of the NYC short-*a* system is Babbitt (1896). Our present argument assumes that, one century earlier, the NYC system was similar to what it is now. If our speculations on the earlier history of the NYC short-*a* system are correct, this system had its origins in the British broad-*a* system at a

time when the British vowel was fronted (Ferguson 1975; PLC, Vol. 1), and it has undergone considerable change from that point on. The grammatical constraint would be one such innovation. On the other hand, the open syllable constraint is shared by all versions of the British broad-*a* system and by the NYC system. The question then remains: is there any evidence that the grammatical constraint does date back to the time of the Revolutionary War? Though we have no direct evidence, indirect evidence characteristic of the comparative method stems from the fact that the dialects of Philadelphia, Reading, Wilmington and Baltimore – clearly cognate with NYC in having the phonemic split of short *a* – share this constraint. The function words *can*, *am*, *an* are also lax in the Mid-Atlantic short-*a* systems.[20] The likelihood that these are independent innovations is not very great, considering the fact that no other case has been reported in North America or in Britain across the wide variety of short-*a* developments. As we have seen, the changes that have taken place are rather in the other direction: that of the shift of short *a* in function words from lax to tense.[21] We therefore proceed with the most likely scenario, that the British broad-*a* class was transformed early on in the formation of the American English of the two major cities of the Mid-Atlantic region through the common innovation of a constraint on function words, an innovation that has been faithfully transmitted within these speech communities but not diffused to others.

The next case shows a resemblance to New York City in a broader range of phonetic phenomena; with evidence of commercial relationships that led to intimate social intercourse with New York City during the nineteenth century.

15.6.4 Diffusion to New Orleans

Though the city of New Orleans is located in the Southern United States, it has long been recognized that its dialect is quite different from that of other cities in the South. ANAE defines the South as a dialect region by the monophthongization of /ay/ before voiced obstruents – the initiating stage of the Southern Shift. Such monophthongization is found only marginally in New Orleans. There are no traces of the second and third stages of the Southern Shift, which involve the reversal of the relative positions of the short vowels and front upgliding vowels. Still, New Orleans does fall within the larger Southeastern superregion, characterized by the fronting of /ow/ and resistance to the low back merger (ANAE, Map 11.11).

Many observers have noted a resemblance between the speech of New Orleans and that of New York City. For example Liebling (1961) remarks:

> There is a New Orleans city accent [. . .] associated with downtown New Orleans, particularly with the German and Irish Third Ward, that is hard to distinguish from the accent of Hoboken, Jersey City, and Astoria, Long Island, where the Al Smith inflection, extinct in Manhattan, has taken refuge.

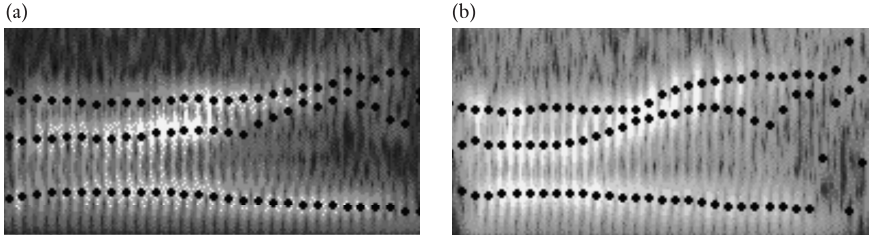

Figure 15.13 LPC analysis of pronunciation of vowel nuclei of (a) *first* and (b) *pers(on)* by Sybil P., 69 [1996], New Orleans, LA, TS611

Like most public observers of city dialects, Liebling interprets working-class metropolitan accents as geographic subdivisions. But the perception of similarity between New York City and New Orleans is based on reality. It is well known that New Orleans has the palatalized form of the *r*-less mid central vowel [ɚ] in *work*, *thirty*, etc., which forms the main stereotype of older New York City speech. Labov (1966) reports that this stigmatized *r*-less feature was rapidly disappearing among younger speakers. However, close attention to the *r*-colored form used by many New Yorkers today reveals a continuing trace of palatalization. Figure 15.13 displays this phonetic characteristic of New Orleans in two mid central vowel nuclei as pronounced by one of the oldest ANAE speakers from New Orleans: Sybil P., 69, of German/Italian background. In Figure 15.13a the vowel in *first* shows a steady state for 101 msec, with F2 at about 1373 Hz. F2 then rises abruptly, for 44 msec, to a peak of 1964 Hz. At the same time it comes into close proximity with F3, producing the auditory effect of a palatalized [r]. In Figure 15.13b a similar pattern is followed in the first syllable of *person*, though the conjunction of F2 and F3 is not maintained for as long.

A palatalized mid central vowel is also characteristic of areas of South Carolina and Eastern Georgia (Kurath and McDavid 1961), and can be found in the Gulf States (Pederson et al. 1986). In New Orleans, it appears in conjunction with many Northern phonetic features. One phonetic characteristic rarely found in the South is the use of stops for interdental fricatives, widely recognized as a feature of New York City working-class speech.[22] Sybil P. uses initial stops in *Thursday* and *thirties*. (It should be noted that Sybil P. had worked as a secretary in a bank and cannot be considered a lower-class speaker.)

When we turn to the short-*a* system, the parallels between New Orleans and New York City become even more striking. Figure 15.14 displays the short-*a* distribution of Sybil P. The solid triangles and empty squares superimpose the NYC system on the New Orleans system, so that similarities and differences are immediately visible. Three black triangles appear in the lax distribution: *Dan*, *grandparents*, *after*.[23] In the tense distribution, we find short *a* before front nasals; voiced stops /b/ and /d/ (*bad*, *sad*, *crab*, *Crabtree*); and voiceless fricatives (*asked*,

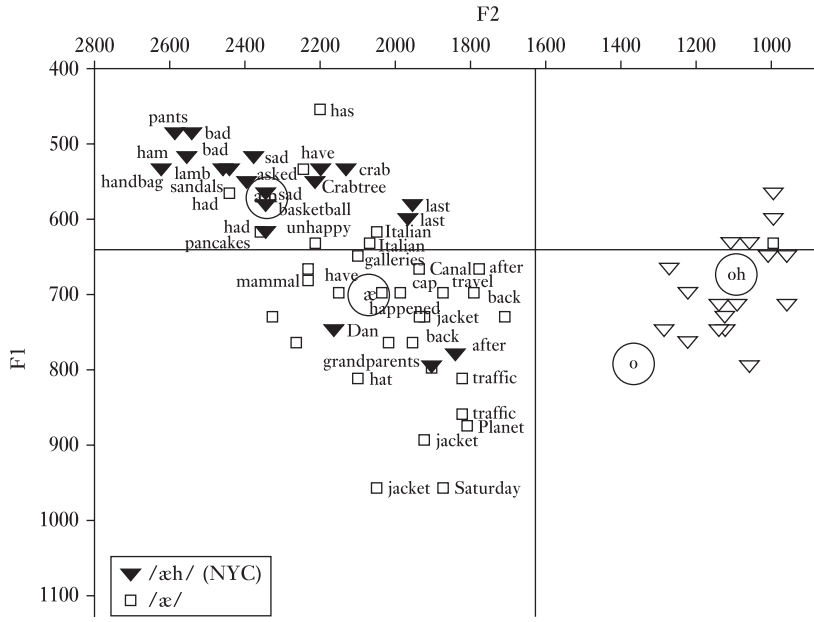

Figure 15.14 Short-*a* distribution of Sybil P., 69 [1996], New Orleans, LA, TS 611

basketball, *last*). The general constraint excluding function words is absent: *has*, *have* and *had* are all tense. This also suggests that, as in Cincinnati, the distribution has been generalized to include the voiced fricatives /v/ and /z/. On the other hand, the constraint against tensing in open syllables is present here, as shown by lax *mammal*, *planet*, *travel*, *traffic*.

New Orleans displays another feature that is uncommon in the South: the raising of /oh/ in *law*, *cost*, *hawk*, etc. to mid and lower high back position. ANAE, Chapter 18.4 shows that, for most Southern speakers, the nucleus of /oh/ is in the same position as /o/ in *cop* or *rock* and is distinguished by a back upglide. Outside of New Orleans, /oh/ raised to upper mid position is found in a continuous belt of East Coast cities ranging from Southeastern Connecticut to New York City (and Albany), Philadelphia and Baltimore. Figure 15.14 also shows the clear separation of /o/ and /oh/. The mean F1 of /oh/ is 677 Hz, comparable to the raised /oh/ of the Mid-Atlantic, which is defined by the criterion F1(oh) < 700.

A younger New Orleans ANAE subject is Elizabeth G., who was 38 years old when interviewed in 1996.[24] Again, the distribution of tense vowels matches the NYC system, including short *a* before front nasals, voiced stops (*dad*, *bad*, *sad*, *grabbing*) and voiceless fricatives (*ask*, *grass*, *glass*, *master*, *past*). Again, the class of function words is tense and not lax (*have*). The status of the open syllable constraint is severely weakened. The word *internationally* is clearly tense, and *ceramic* is in an

intermediate position. On the other hand, *Canada* and *catholic* are definitely in the lax set.

As further evidence of the weakness of the open syllable constraint in New Orleans, one may consider the speech of Dr John (Mac Rebennack), a prominent representative of the New Orleans musical tradition, who grew up in the Third Ward of the city during the middle of the twentieth century. In a broadcast of March 16, 2005, Dr John showed the following pattern in the distribution of tense and lax short *a*.[25]

tense (closed syllable)	*answer*, *fancy*, *hand*, *bad*, *dad*
tense (open syllable)	*piano (2)*, *classical*, *daddy*, *fascinate [2]*, *Manny*
lax (closed syllable)	*that*, *cats*, *fact*, *that's*, *at*
lax (open syllable)	*Allen*

Dr John's tensing pattern includes front nasals, voiced stops and voiceless fricatives, as in New York City, but open syllable words are treated in the same way as words with closed syllables.

In New Orleans, as in Cincinnati, the local pattern is receding. Two other New Orleans speakers analyzed acoustically are 38 and 44 years old; both show the nasal short-*a* system typical of the South, as in Shreveport and Baton Rouge.

The history of New Orleans points to repeated and extensive connections with New York City. While Cincinnati was an industrial rival of New York in the middle of the nineteenth century, the city of New Orleans had intimate and complementary relations, as the port of shipment for the cotton trade financed by New York bankers. This aspect of the history of New Orleans is described by McNabb and Madère (1983, Ch. 3, p. 1):

> From 1803 until 1861, New Orleans' population increased from 8,000 to nearly 170,000 [. . .] By 1830, New Orleans was America's third largest city, behind New York and Baltimore [. . .] During the Pre-Civil War period, a scarcity of capital in New Orleans forced seekers of large-scale investment to look to New York, London, or Paris.

Berger (1980: 137) summarizes the evidence for close relations between New Orleans and New York City in the middle of the nineteenth century:

> In the ante-bellum period, roughly between 1820 and 1860, financial, commercial and social relations between the city and the South were at fever pitch: New York banks underwrote the plantation economy, cotton was shipped routinely from New Orleans, Charleston, Savannah and Mobile to be trans-shipped to England, and Southern planters regularly combined business with pleasure in the Big Apple of the 1800s.

He goes on to cite the judgment of Foner (1941) as to the predominance of New York influence on the New Orleans economy: "Down to the outbreak of the Civil

War, New York dominated every single phase of the cotton trade from plantation to market."

Berger's aim was to buttress the case for the derivation of the NYC palatalized mid central vowel from New Orleans; this is the opposite direction of influence from the one proposed here for the short-*a* pattern.[26] The gravity model and the historical facts argue rather for a greater direction of influence from the larger city. We find many descriptions of commercial and social relations between New Orleans and New York in the five-volume history of *The Old Merchants of New York City* by John Scoville (1870); the typical pattern involves movement of New Yorkers to New Orleans. In Scoville's Chapter 3, we read that Walter Barrett took a letter of credit for one million dollars to New Orleans by way of Wheeling, hoping to outstrip his competitors in buying up that year's cotton crop (p. 26). It is reported that the founder of the great New York mercantile firm of E. K. Collins & Son had a house in New Orleans (p. 141). Among the oldest commercial firms of New York City was Brown Brothers & Co., who established in 1842 a branch in New Orleans under the name of Samuel Nicholson, "who had been many years their clerk" (p. 187). Bradish Johnson, head of the firm of Johnson & Lazarus, had a brother Henry who was located on a plantation in New Orleans. When Henry died, he left the plantation to Bradish, who proceeded to New Orleans and established more favorable conditions for the 250 slaves, many of whom were able to purchase their own freedom (p. 185). In Scoville's description of the prominent Seixas merchant clan, founded by Benjamin Seixas in 1780, we read: "Madison [Seixas] is in New Orleans, and a partner in the large firm of Glidden and Seixas" (Scoville 1870, Vol. II: 127).

Among the bankers closely tied to New Orleans there were many representatives of the large Sephardic Jewish families (Lazarus, Seixas). Scoville frequently underlines the importance of the Jews in early nineteenth-century New York:

> The Israelite merchants were few then [1790], but now they have increased in this city beyond any comparison. There are 80,000 Israelites in the city. It is the high standard of excellence of the old Israelite merchants of 1800 that has made this race occupy the proud position it does now in this city. (Ibid.)

We can see how intimate the relations were between the Jewish population of the two cities by examining Korn's history *The Early Jews of New Orleans* (1969), which deals with social and business relations from 1718 to 1812. References to New York City are found on 55 pages – a larger number than for any other city.[27]

Following the publication of ANAE, I received a letter from Mr Herman S. Kohlmeyer Jr, Senior Vice President of the investment firm A. G. Edwards, who described himself as "the last person in New Orleans who still makes his living from the cotton trade." His account leaves no doubt that Jewish merchants with strong New York City connections played a formative role in the upper-class speech of New Orleans:

> I am the great-grandson of some of our top cotton merchants [. . .] as is my closest friend. They were all German Jewish immigrants who came over in the 1830–1860 era [. . .] I remember very well friends of my father's generation who talked about how hard they "woiked" before they went home to their house on "Foist" Street. That was very much our upper class speech, as much with the Christians and with the Jews.[28]

The detailed linguistic resemblances between New York City and New Orleans involve both of the pivot points that have been found to determine the main directions of development of North American English dialects: the status of short *o* as an integral phoneme, distinct from long open *o*, and the status of short *a* (Labov 1991). As in New York, the New Orleans raised /oh/ ensures the separate status of short *o* as the phoneme /o/.[29] As in New York, New Orleans divides short *a* into two distinct classes, separating tense vowels before front nasals, voiced stops and fricatives in closed syllables from voiceless stops and liquids. However, the New Orleans configuration is only superficially similar to that of New York: it is a phonetically conditioned set of allophones rather than a grammatically and lexically specified distribution.

15.6.5 The common pattern

In the four cases of diffusion of the New York City short-*a* pattern presented above, phonetic conditioning by the following segment is the common thread, though the phonetic pattern is not perfectly transmitted. As Dinkin (2009) points out, the diffusing pattern tends to regularize and simplify. While NYC differentiates the voiced velar stop /g/ from the nasal velar /ŋ/, /æ/ regularly becomes lax before /g/ as the system spreads geographically. Tensing before voiceless fricatives is sometimes generalized by extension to tensing before voiced fricatives. But the most regular differences are found at a more abstract level. The function word constraint is lost: with few exceptions, *can*, *am*, *and*, *have*, *has*, *had* are tense, though they are always lax in NYC. The second major difference is the loss of the constraint against tensing in open syllables, which is quite general – though not complete – in New Orleans. It might seem at first glance that this represents the loss of a phonological constraint. But, on reflection, it may be seen as the loss of the effect of inflectional boundaries in closing the syllable. When short *a* is tensed in all open syllables, there is no longer a difference between [Cardinal] /mæniŋ/ and /mæhn#iŋ/ [the pumps], or between monomorphemic /bænər/ and /bæhn#/ər/, a person who bans. The adults who adopted the NYC system did not observe that tense /mæhn#iŋ/, /bæhn#ər/, /pæhs#iŋ/, /pæhs#ər/ were bimorphemic, while /mæniŋ/, /bænər/, /kæsəl/, /bæfəl/ are not. Accordingly, they generalized the tensing of bimorphemic words to all words of this phonetic shape. This is consistent with the proposition that the main agents in diffusion are adults, who are less likely to observe and replicate abstract features of language structure.

15.7 The Transmission and Diffusion of Mergers and Splits

The argument so far has not considered the type of structural diffusion that is most frequent and prominent in historical linguistics and dialectology, namely mergers. Herzog's corollary of Garde's Principle (Herzog 1965; PLC, Vol. 1) states that mergers expand geographically at the expense of distinctions; there is massive empirical evidence of such expansion.[30] Though the adoption of a merger is not conventionally considered to be structural borrowing, it must be viewed as such, since the recipient dialect loses one of its categories in adopting the structure of the expanding dialect. Up to this point we have been arguing that adults do not easily acquire new structural categories; but the evidence so far does not bear on the loss of a category.

Herold's proposal concerning the diffusion of a merger argues that speakers of a two-phoneme system, coming in contact with a one-phoneme system, find that the contrast is not useful and so cease to attend to it (1990, 1997). Chapter 2 of this volume provides some evidence to support this asymmetric mechanism. There is ample evidence that merger in perception precedes merger in production (Di Paolo 1988, ANAE, Ch. 9), and near-mergers give us a static view of such a situation (Labov et al. 1991; PLC, Vol. 1, Ch. 12). But this does not tell us how a merger in the adult speaker's perception would be transmitted to the speaker's children. There are indeed numerous cases of a contrast strongly maintained among adults but solidly merged in the speech of their children. Herold (1990) provides a detailed view of a parent with a clear, non-overlapping distinction between /o/ and /oh/ and a son with total merger.

Chapter 6 referred to Johnson's 2010 study of the geographic boundary of the low back merger in Eastern Massachusetts (Figure 6.13). Across three older generations, the boundary was stable: the Eastern New England merger showed no signs of expanding towards the Rhode Island border. But in two small towns, Sekonk and Attleboro, Johnson found children in the fourth to sixth grade shifting to the merger, including some whose parents both made the distinction (Figure 6.14). He attributes the change to the inmigration of commuting families from the Boston area. Yang (2009) provides a calculation which shows that a moderate proportion of inmigrant children with the merger (21.7 percent) can trigger the acquisition of the merger by children of parents who have the distinction.

The transfer of linguistic patterns from parent to child is not limited by the relative complexity of what is being transmitted. The continuity of the New York City split short-*a* system from 1896 to the present and the uniformity of the Mid-Atlantic short-*a* system in Philadelphia, Reading, Wilmington and Baltimore indicate that such patterns can be faithfully transmitted across generations through children's language learning abilities. However, there is evidence that a pattern of this complexity cannot be learned as a second dialect, even by children. These volumes have cited several times the results of Payne's study of the acquisition of the Philadelphia

dialect by children of out-of-state parents in King of Prussia (1976, 1980). She found that children under 10 years of age acquired the phonetic variables of the Philadelphia system after only a few years in King of Prussia, but only one of thirty-four children of out-of-state parents acquired the lexical and grammatical conditioning of the short-*a* system. For our present purposes, it is relevant to recall the degrees of approximation to the Philadelphia system exhibited by children of out-of-state parents (PLC, Vol. 1, Ch. 18). This is parallel to what we have seen happening in North Plainfield, Albany, Cincinnati and New Orleans: diffusion of the phonetic conditioning of the NYC system, without its lexical, grammatical or syllabic conditioning. In this complex case, children who must learn the system from their peers rather than from their parents will not achieve the precise acquisition of the system that is characteristic of normal parent-to-child transmission.

This conclusion is consistent with the fact that the distinction between transmission and diffusion is maximal in the case of splits. The converse of Garde's Principle is that splits are rarely reversed. Britain's (1997) account of the complexities of the /u/ ~ /ʌ/ split in the Fens shows the irregular result of a rare case of expansion of a split, where the two-phoneme system is favored by social prestige. The constraint on learning a new phonemic contrast applies equally to studies of the children of inmigrant parents. Trudgill examined the ability of twenty adults born in Norwich to reproduce the local distinction between the vowel classes of *own* [ʌun] and *goal* [gu:l]. Ten whose parents were born in Norwich did so; the ten whose parents were born elsewhere did not (Trudgill 1986: 35–6).

This confirms the position of RWT that an *unbroken* sequence of parent-to-child transmission is required to maintain complex patterns of phonetic, grammatical and lexical specification like the NYC short-*a* pattern. Therefore, if speakers from other dialect areas enter the community in large numbers, their children will dilute the uniformity of the original pattern. Although the Mid-Atlantic dialects are quite stable at present, there is some indication of such a weakening. Lexical diffusion of open syllable words before /n/ has been observed since 1980 (Labov 1989b, Roberts and Labov 1995); some neighborhoods report general tensing before /l/ (Banuazizi and Lipson 1998); some inmigrant groups do not show the Philadelphia pattern even in the second generation (Friesner and Dinkin 2006) and still other neighborhoods show shifting to the default nasal system, as in certain small towns of Southern New Jersey (Ash 2002). In a study of twelve white New Yorkers, Becker and Wong (2009) found the traditional NYC pattern among older and middle-aged speakers – but not among speakers 18 to 32 years old, who seem to be shifting to the default nasal system.

To examine more closely the difference between transmission by children and diffusion by adults, we turn to a complex phonological change, which is free of such lexical and grammatical specification: the Northern Cities Shift. The structural complexity involved here has to do with the intricate interrelations among vowels as they evolve in chain shifts within and across subsystems (Martinet 1955, Moulton 1960).

15.8 Diffusion of the Northern Cities Shift

The Northern Cities Shift, first described in this volume in Figure 1.4, has been a point of reference in many of the preceding chapters. Figure 15.15 shows in detail how the NCS is realized in the vowel system of Kitty R. of Chicago in 1993, when she was interviewed at the age of 56. The general raising of /æ/ to upper mid position is marked by the solid black squares, and the fronting of /o/ by the small empty squares, with five tokens well front of center. Diamonds indicate the backing of /e/ with a mean F2 of 1864 Hz, only 320 Hz higher than the F2 of /o/ (1544 Hz). /ʌ/ is shifted well to the back, overlapping /oh/, which has not lowered extensively.

The geographic distribution of the NCS was displayed in Figures 8.3, 10.1 and 10.3. Figure 15.16 displays the area dominated by the NCS by means of the ED structural criterion, as it was first defined in Figure 8.1. In this map, grey circles indicate speakers for whom the difference between the mean F2 of /e/ and the

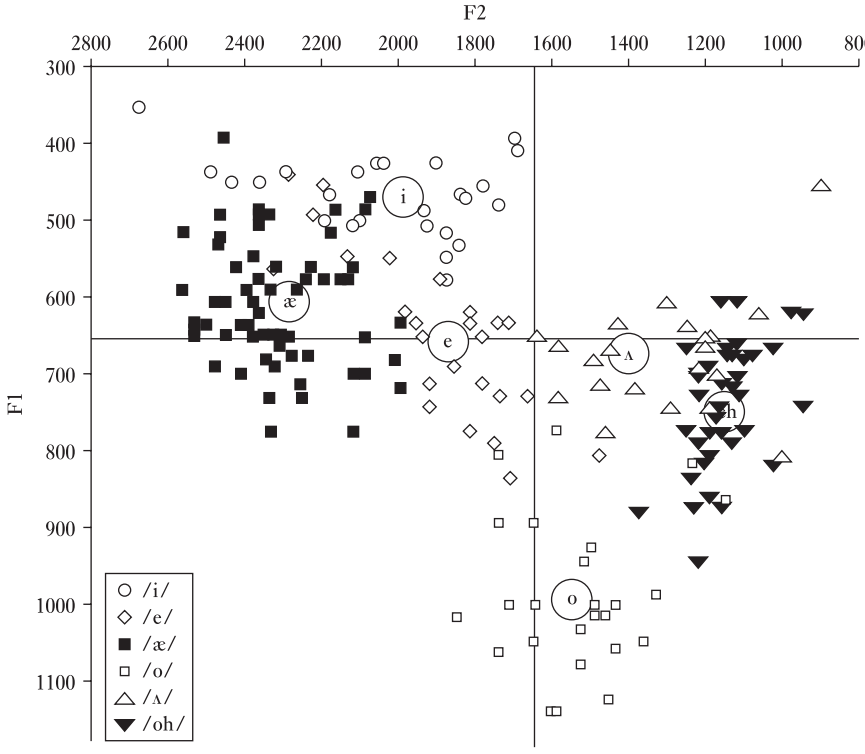

Figure 15.15 The Northern Cities Shift in the vowel system of Kitty R., 56 [1993], Chicago, IL, TS 66

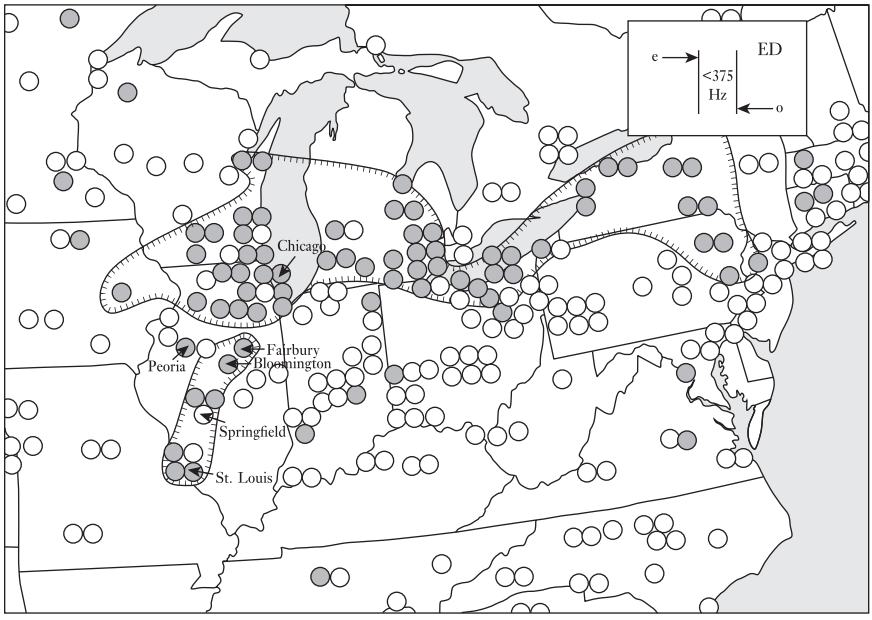

Figure 15.16 The ED measure of the advance of the Northern Cities Shift in the Inland North and the St Louis corridor. Grey symbols: F2(e) – F2(o) < 375 Hz

mean F2 of /o/ is less than 375 Hz. The figure adds an isogloss circumscribing the St Louis corridor, a stream of NCS features extending from Chicago to St Louis, which appeared in Figures 8.3 and 10.3 and is the more direct focus of this section.

The most striking feature of the Northern Cities Shift relevant to this study of transmission and diffusion is the uniformity of the pattern over the very large area of Figures 10.3 and 15.16. The history of westward settlement must be taken into account in order to understand this uniformity. The earliest records we have of the chain shift of /æ/, /o/ and /oh/ date from the 1960s. Chapter 5 argued that the initiating event of the NCS took place a hundred years earlier, during the construction of the Erie Canal in Western New York State. A koineization of various complex short-*a* systems to the simple general tensing of /æ/ seems to have occurred when workers and migrants from all over the northeast were integrated into the rapidly expanding cities of Rochester, Syracuse and Buffalo. The unrounding and centralization of /o/ had already taken place in Western New England (ANAE, Ch. 16). The westward migration of entire communities, described in Chapter 10, set the conditions under which the chain shift was transmitted faithfully across the Inland North as far as Wisconsin.

The linguistic boundary separating the Inland North and Midland vowel patterns is the sharpest and deepest division in North American English phonology

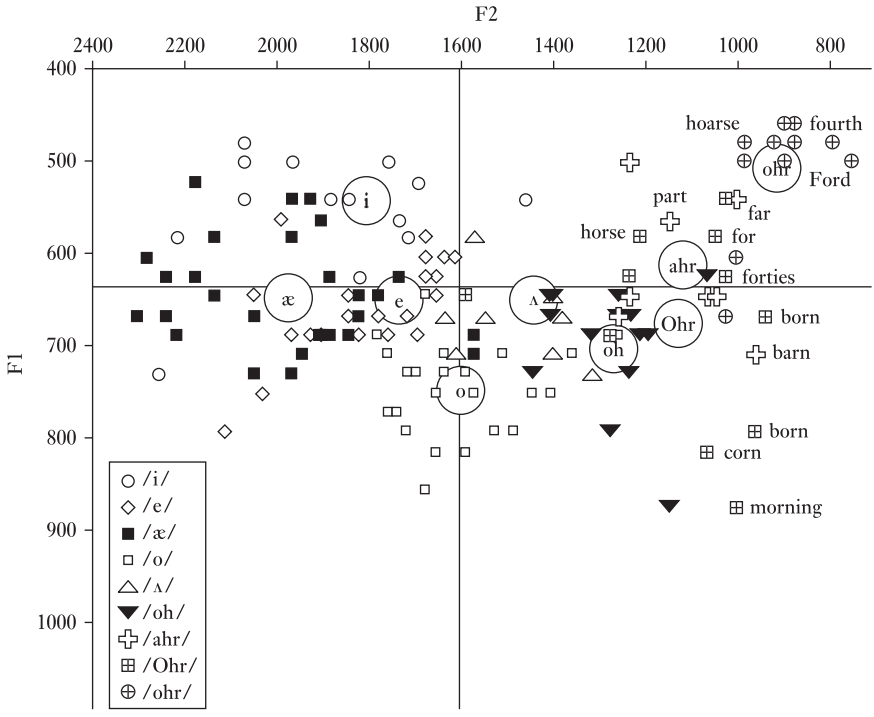

Figure 15.17 Northern Cities Shift and merger of /ɔhr/ and /ahr/ for Martin H., 48 [1994], St Louis, MO, TS 111. (On this chart, /Ohr/ = /ɔhr/)

(Figure 10.3). The isogloss bundle that separates these two areas combines five measures of the progress of the NCS, the Southern limit of Canadian raising of /ay/, and the Southern limit of dialects with /aw/ backer than /ay/ (ANAE, Ch. 11). Figure 15.16 shows that the front–back approximation of /e/ and /o/ is quite generally absent in the Midland region, except for St Louis and nearby communities. The city of St Louis, located as it is squarely in Midland territory, has recently developed many of the elements of the NCS. This city has long been known to display a mixture of Northern, Midland and Southern features (Murray 1993, 2002), but recent decades have witnessed a strong shift to Northern phonology. The characteristic St Louis merger of /ahr/ and /ɔhr/ in *are* and *or*, *card* and *cord*, *barn* and *born*, etc., has all but disappeared among younger speakers, who display instead the general merger of *or* and *ore*, *cord* and *cored*, along with a clear separation of this class from /ahr/ in *are* and *card* (Majors 2004).

Figure 15.17 shows the St Louis vowel pattern in the system of Marvin H., who was interviewed in 1994, at the age of 48.[31] We observe on the one hand the traditional back merger before /r/. At the upper right, one can see, tightly clustered, the traditional /ohr/ class (*hoarse*, *four*, *Ford*). In mid position is the class of /ɔhr/ (*for*, *born*, *horse*, *corn*, *morning*) alongside /ahr/ (in *part*, *far*, and *barn*). The distinction

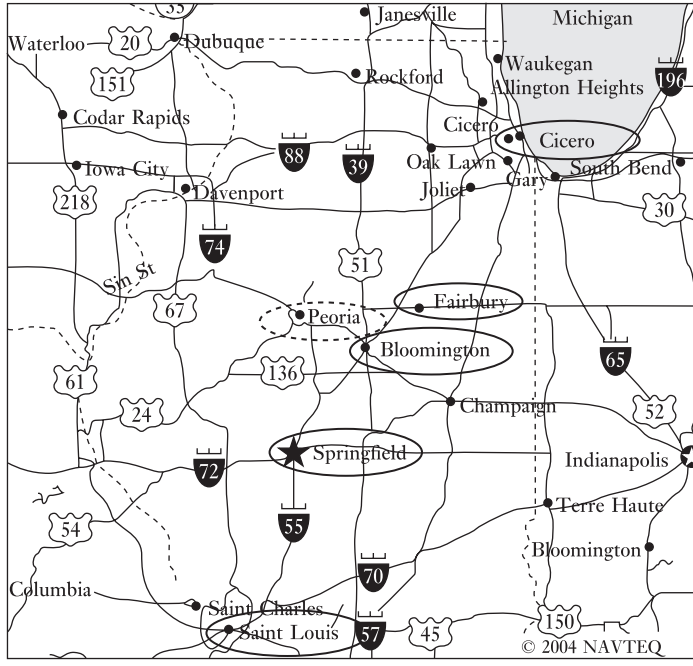

Figure 15.18 The corridor along Route I-55 from St Louis to Chicago

between *hoarse* and *horse*, *four* and *for* is well maintained, as well as the merger of *for* and *far*, *born* and *barn*. At the same time, the distribution of the NCS vowels matches the Chicago pattern of Figure 15.16 quite well. All /æ/ tokens are raised to mid position, /o/ is well fronted and /e/ is backed close to the midline. The difference between the second formants of /e/ and /o/ is only 134 Hz. /ʌ/ is moderately back, and some tokens of /oh/ are quite low. It is apparent that Marvin H. has combined the traditional St Louis pattern with the Northern Cities Shift.

This recent development in St Louis is not an independent phenomenon, distinct from the chain shift in the Inland North. Many ANAE maps show diffusion of NCS features along a narrow corridor extending from Chicago to St Louis along Route I-55 (Figure 15.18). This is the route of travel and interchange between Chicago and St Louis, and, for many citizens of St Louis, it is the most common highway to follow as they leave their home city. I-55 from Chicago to St Louis coincides with the Eastern end of Route 66, the westward highway that is so deeply embedded in American folklore. The ANAE data for this corridor are based on speakers from three cities along the interstate highway (Fairbury, Bloomington, Springfield), along with four speakers from St Louis.[32]

In Figure 15.16, fifty-nine out of the sixty-seven speakers within the Inland North isogloss satisfy the ED criterion, a *homogeneity* of .88. A similar proportion of speakers in the St Louis corridor do so: seven out of nine.

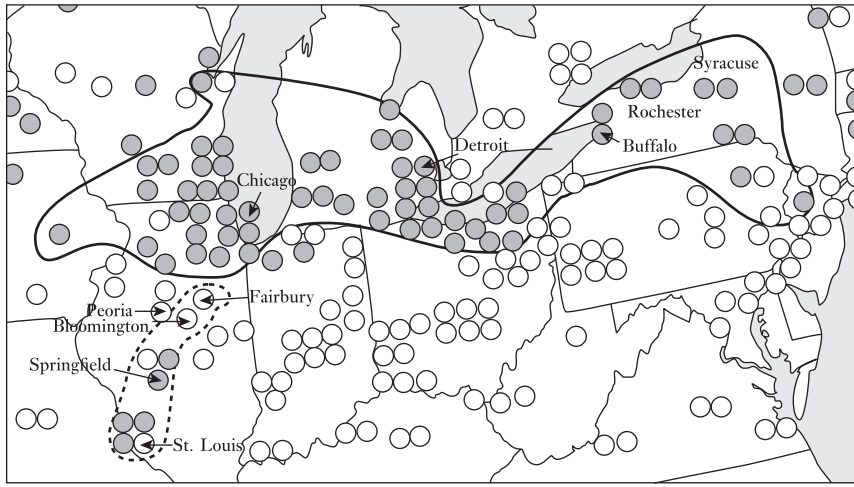

Figure 15.19 The UD measure of the advance of the Northern Cities Shift in the Inland North and the St Louis corridor. Grey symbols = UD measure: F2(ʌ) < F2(o). Solid isogloss = the Inland North as defined by the ED measure

A second measure, displayed in Figure 15.19, shows even more clearly how the St Louis corridor is differentiated from its Midland neighbors. Stage 2 of the NCS, the fronting of /o/, and stage 5, the backing of /ʌ/, have the effect of reversing the relative front–back positions of these two vowels by comparison with neighboring dialects. As defined in Chapter 8, the UD criterion defines the progress of the NCS: speakers involved in this chain shift are those for whom /ʌ/ is further back than /o/ (grey circles on Figure 15.19). Of all the measures of of the NCS, presented in Chapter 8, this one yields the sharpest differentiation between the Inland North and the Midland. Homogeneity within the Inland North is even greater than for the ED measure: sixty-five out of sixty-seven subjects in the Inland North satisfy the UD criterion, or .94. The almost total absence of grey symbols in the Midland area of Figure 15.19 contrasts with the five grey symbols in the St Louis corridor. Though this corridor is represented in ANAE by only four cities and nine speakers, the probability that this feature occurs in the corridor by chance is less than 1 in 1,000.[33] On the other hand, UD marking is significantly less frequent here than in the Inland North: only five of the nine speakers in the St Louis corridor are marked with grey symbols.[34]

Figures 15.16 and 15.19 illustrate the diffusion of the NCS along I-55 from Chicago to St Louis. However, it appears that the NCS along this corridor is not the same linguistic phenomenon as that found in the Inland North. There is good reason to believe that the systematic chain shift mechanism, triggered by the general raising of short *a*, is not driving the shift in the St Louis corridor.

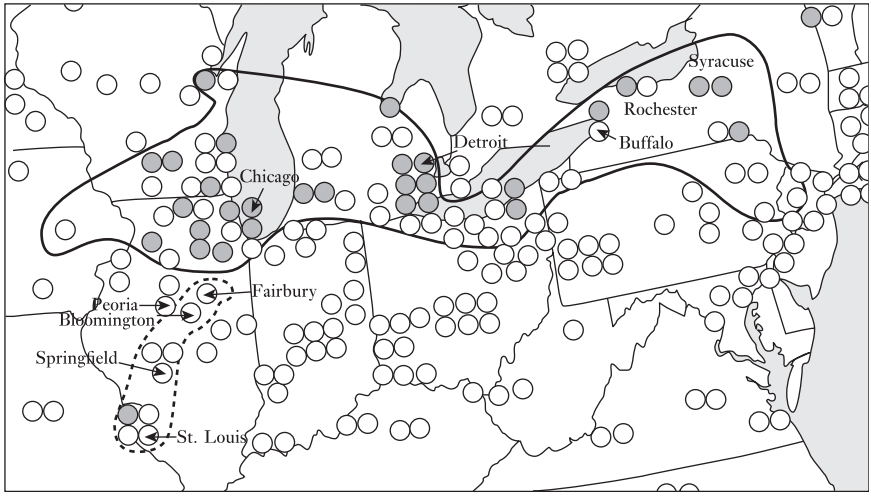

Figure 15.20 Speakers who meet all criteria of the Northern Cities Shift: AE1, O2, EQ, ED, and UD. Solid isogloss = the Inland North as defined by the ED measure

Figure 15.20 is a map of the same region, displaying speakers for whom the NCS is complete, in other words speakers who show all the relevant criteria. In addition to the ED and UD criteria, these include:

AE1: general raising of /æ/ in non-nasal environments, F1(æ) < 700 Hz
O2: fronting of /o/ to center, F2(o) < 1500 Hz
EQ: reversal of the relative height and fronting of /e/ and /æ/:
F1(e) > F1(æ) and F2(e) < F2(æ).

Figure 15.20 shows that only twenty-eight of the sixty-seven Inland North speakers meet this strict criterion – or 42 percent. Sixteen of the twenty-eight are located in the largest cities: Detroit, Rochester, Syracuse, Chicago. On the other hand, the St Louis corridor contains only one such speaker, Martin H. in Figure 15.17 – and there are no others outside of the Inland North.

The other eight speakers in the St Louis corridor show an approximation to the NCS rather than the complete pattern of Figure 5.15. Five speakers in the corridor meet the AE1 criterion; but only two are marked for O2 and only one for EQ. The inference to be drawn is that the new vowel patterns of St Louis are not a locally evolved and transmitted structural consequence of the general raising of short *a*, but rather the result of the borrowing of individual elements of the NCS from the Inland North region centered on Chicago.

The geographic distribution of the various stages of the NCS in the Inland North and along the St Louis corridor makes it clear that there is much more variation

Table 15.1 Stages of the Northern Cities Shift found in nine speakers from Northern Illinois and in nine speakers from the St Louis corridor – with ages, rank ordering, and correlation of age with rank

Northern Illinois	AE1	O2	EQ	ED	UD	Age	Rank
Sterling IL	√	√	√	√	√	34	1
Elgin IL (1)	√	√	√	√	√	19	1
Elgin IL (2)	√	√	√	√	√	42	1
Joliet IL	√	√	√	√	√	30	1
Rockford IL (1)		√	√	√	√	37	2
Belvidere IL	√		√	√	√	33	2
Hammond IN	√	√	√			45	3
Rockford IL (2)	√				√	65	4
Lena IL	√					47	5
r-correlation							.74
age coefficient						.	.08*
St Louis Corridor							
St Louis MO (1)	√	√	√	√	√	48	1
St Louis MO (2)	√	√		√	√	57	2
Springfield IL AK	√			√	√	60	3
Fairbury IL	√			√		25	4
Bloomington	√			√		27	4
Springfield IL (1)				√		32	5
Springfield IL (2)					√	67	5
St Louis MO (3)					√	53	5
St Louis MO (4)				√		38	5
r-correlation							–0.21
age coefficient							n.s.

in the corridor. St Louis speakers are generally in advance of the speakers from the smaller cities along Route I-55. This would not seem to be much different from the view of diffusion obtained in the Brunlanes Peninsula by Trudgill (1974a) in Figure 15.2. In the "cascade" model displayed there, change moves from the largest city to the next largest, and so on down, rather than moving steadily across the geographic landscape as in the contagion model (Bailey et al. 1993). But the progress of the NCS in the St Louis corridor, including St Louis itself, is marked by irregularity in both structure and age distribution.

To the extent that the NCS is the result of the incrementation of sound changes by successive generations of children, we should find a clear relationship between age and the advancement of the shift. The ANAE study of the NCS in the Inland North as a whole shows significant age coefficients at the .01 level for the raising of /æ/, the fronting of /o/, the backing of /e/ and the backing of /ʌ/ (ANAE, Ch. 14). Table 15.1 compares the nine subjects of the St Louis corridor with nine speakers from Northern Illinois who are located within the Inland North. Check marks indicate whether a

given speaker satisfies the criterion for five systematic measures of the NCS (AE1, O2, EQ, ED, UD). It is apparent that the shift is more advanced in Northern Illinois, but the crucial question is the trajectory of the change in apparent time. In the right hand column, each speaker is ranked for degree of advancement within his or her region by the number of criteria satisfied, and this ranking is then correlated with the age of the speaker. While the speakers from Northern Illinois show a sizable *r*-correlation of .74 with age, a small negative correlation of –.21 appears for the St Louis corridor. A regression coefficient for age on ranking of .08, significant at the .05 level, is found for Northern Illinois, indicating that a difference of fifty years between two speakers would project to a shift of four units in the rankings. No significant regression coefficient is found for the St Louis corridor.

This result suggests that the advancement of the NCS in the St Louis corridor is not the result of incrementation by children within the speech community, but rather the result of the influence of the Inland North speech pattern on adults. The conversion of the St Louis system to that of the Inland North may eventually lead to the participation of young children in the process and to further incrementation within the community, but the present situation seems to reflect a slower and less regular shift among adults – the result of diffusion along the corridor.

Martin H. appeared in Figure 15.20 as the only ANAE subject from St Louis to represent the NCS fully. A more characteristic view of how the NCS is realized in St Louis may be obtained from Figure 15.21, which plots the vowel system of

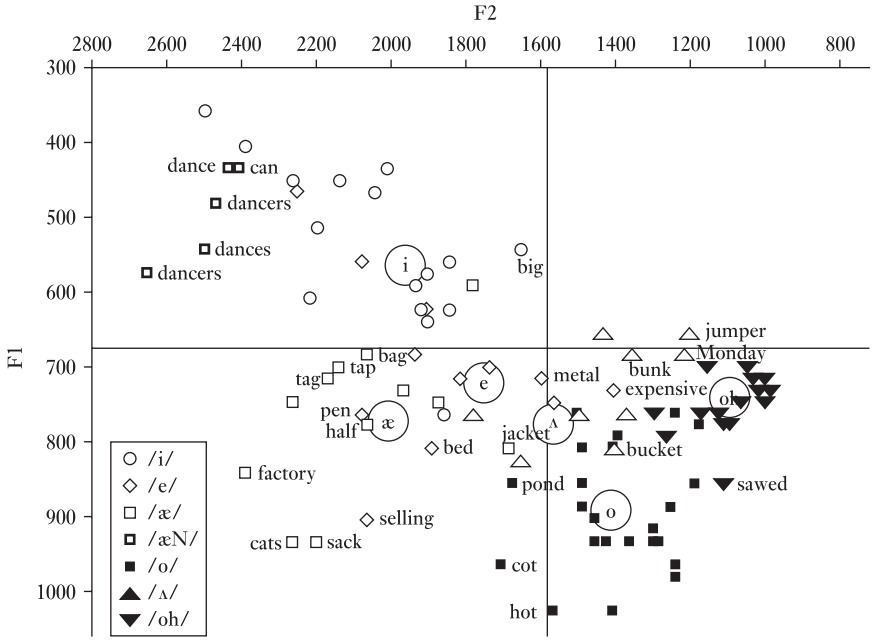

Figure 15.21 NCS vowels of Rose M., 38 [1994], St Louis, MO, TS 161

Rose M., the fourth St Louis speaker of Table 15.1.[35] Only one of the NCS movements is vigorously represented: /e/ moves down (*bed*, *selling*) and back (*metal*, *expensive*). There are traces of the other shifts: /ʌ/ has moved back to a moderate degree and, as a result, there is considerable overlap between /e/ and /ʌ/. Two tokens of short *o* have moved front of center (*pond*, *hot*), but the general /o/ mean, 1405 Hz, is well back of the normalized general F2 mean of 1590 Hz. The most striking deviation from the NCS pattern is the behavior of /æ/. Instead of a general movement to upper mid position, Rose M. shows the nasal system characteristic of the Midland: only the allophones of /æ/ before nasals move to mid front position (*dance*, *dancers*, *can*). The majority of the /æ/ tokens remain in low front position, even though a few /o/ tokens cross the center line.

15.9 The Social Context of Transmission and Diffusion

Our studies of the spread of the New York City short-*a* system and of the Northern Cities Chain Shift have allowed us to differentiate the diffusion of linguistic change across communities from the transmission of sound change within the speech community. At the outset, it was argued that change from below is driven by the continuous process of incrementation by children, who reproduce in full and advance their parents' system. Such incrementation can be quite rapid, so that a vowel can move from low to high position in the course of three generations; yet it preserves the integrity of the system, acquired with the speed, accuracy and faithfulness of first-language learners. In the incrementation of change, children learn to talk differently from their parents and in the same direction in each successive generation. This can happen only if children align the variants heard in the community with the vector of age: that is, they grasp the relationship: the younger the speaker, the more advanced the change. In such interrelated chain shifts as the NCS, the various elements advance together.

On the other hand, contact across communities involves learning, primarily by adults, who acquire the new variants of the originating community in a somewhat diluted form. As summarized in the first section of this chapter, recent studies of language change across the lifespan show us that adults are capable of changing their language, but at a much slower rate than children. Adult learning is not only slower, but it is also relatively coarse: it loses much of the fine structure of the linguistic system being transmitted. Our results coincide with evidence from numerous studies of second language acquisition that adult learners are far less capable than children of recognizing and reproducing the fine-grained structure of social variation. We can now address the question: what kinds of population structures and movements set the conditions for transmission or diffusion?

This inquiry first examined the short-*a* system of New York City, which has been transmitted within that city with few recorded changes from 1896 to the end

of the twentieth century. The geographic uniformity of the NYC speech community, from Queens and the Bronx to Jersey City and Newark, suggests the uniform conditions under which an unbroken sequence of parent-to-child transmission can take place. The fact that the original population absorbed very large numbers of European immigrants, yet still maintained this continuity, is a tribute to the force of the doctrine of first effective settlement (Zelinsky 1992). It also shows that the concept of "unbroken sequence" does not imply that all transmission is necessarily within the nuclear family. Second-generation children of non-native speakers are capable of disregarding their parents' non-native features from such an early age that they become first dialect speakers of the local vernacular (Labov 1976). In contrast, it appears that children of native speakers of other dialects cannot match this performance (Payne 1976).[36]

The Inland North is a much larger territory, encompassing 88,000 square miles and some 34 million people. How can we account for the uniformity of the vowel system and its directions of age throughout this vast area? The settlement history of this region associates this uniformity with the migration of intact communities westward, in which entire cohorts of children, parents, kin and communal groups moved together. In his history of the westward migration, Richard Lyle Power points out that

> [m]ass migrations were indeed congenial to the Puritan tradition. Whole parishes, parson and all, had sometimes migrated from Old England. Lois Kimball Mathews mentioned 22 colonies in Illinois alone, all of which originated in New England or in New York, most of them planted between 1830 and 1840. (1953: 14)

The Yankee migration to the Inland North continued the cultural pattern of New England settlement, described by Fischer (1989) as a largely urban movement with a stronger emphasis on the nuclear family than is found in competing traditions.[37] New England folkways were transmitted intact in the course of these migrations (Fischer 1989, Frazer 1993, Carnes and Garrity 1996, Chapter 10 of this volume). Uniform transmission is favored by the two measures of stability in the community of New England settlers provided by Fischer (1989): high persistence[38] (75–96 percent) and low internal migration (pp. 814–15). We can attribute the uniformity of the phonology of the Inland North to the continuity of transmission within the inmigrating families and communities over the past century and a half, in which sound changes are steadily incremented by child language learners. This is the social structure that supports linguistic transmission over many generations.

From the account of the initiating conditions for the NCS in Western New York State, we know that this westward migration also absorbed substantial numbers of speakers of other dialects. While the NCS is a system of mutually interacting dependencies of some complexity, it does not have the grammatical and lexical intricacy of split short-*a* systems, and the social conditions for intact transmission may not be as stringent.

The uniformity of the vowel systems in cities of the Inland North may be contrasted with the great variety of systems found in the Midland. Widely differing patterns and directions of change are to be found in Philadelphia, Pittsburgh, Columbus, Cincinnati, Indianapolis and St Louis (ANAE, Ch. 19). Midland linguistic heterogeneity may be correlated with a pattern of westward migration that contrasts with the Yankee pattern just described. The initial Quaker settlers moving westward from Philadelphia placed a strong emphasis on the creation of farm communities, while the other component of Midland settlement – the back-country population of the upland South – created even smaller units of isolated households. Fischer gives only moderate levels of persistence for Quaker populations (40–60 percent), and low levels for the upland South (25–40 percent).

Nevertheless, large Midland cities did form, as various combinations of trade and travel brought populations together from various areas. The structure of the traditional St Louis dialect differentiates it from all other Midland cities. It is the result, not of large-scale migration from any one region, but of a mixture of Southern, Midland and Northern speakers in the second half of the nineteenth century (Frazer 1978; Murray 1993, 2002). It is undoubtedly the Northern component that distinguishes St Louis from the surrounding area. Frazer (1978) finds that St Louis and the adjoining counties of Illinois form a speech island in regard to eight Northern lexical items[39] and to several features of pronunciation that mark the area as Northern, as opposed to South Midland: (1) /aw/ in *south* or *down* is not fronted; (2) /iw/ in *dew*, etc. is not fronted; (3) /oh/ does not have a back upglide; (4) /ay/ is not monophthongal before resonants; and (5) the front short vowels are not ingliding. None of these are elements of the NCS, but together they suggest that St Louis would be receptive to a chain shift that originated in the Northern phonological system.[40]

Frazer (1978) points to ideological factors that reinforced the effect of Northern dialect features on speakers in St Louis, particularly those of German origin. The Yankee anti-slavery ideology was attractive to the Germans of St Louis, who shifted from the Democratic to the Republican Party in the election of 1860.[41] We can therefore project a receptivity to Northern influence from a period well before the development of the NCS in the middle of the twentieth century. But the diffusion to St Louis of the uniform, communally created Inland North dialect was not accomplished by a communal migration. Rather, we must suppose continued contact through the movement of adults, largely commercial, along the corridor now centered on Route I-55.[42] This is the social context that is associated with a partial transfer of the structure being borrowed.

The diffusion of specific linguistic structures is one of many changes that spring from adult language contact. Trudgill (1986) describes the various scenarios of dialect leveling (the elimination of marked variants), simplification, and their combination in koineization. Such cases represent more radical losses of structural features than those we have dealt with here. The diffusion of the short-*a* pattern or of the NCS implies the expansion of marked forms into an environment that is receptive to them

and does not require radical deletions or reversals to accommodate them. All of these contact phenomena share the common marks of adult language learning: the loss of linguistic configurations that are reliably transmitted only by the child language learner.

15.10 Prospectus

This chapter began with the observation that both family-tree models and wave models are needed to account for the history of, and relations within, language families. Family trees are generated by the transmission of changes internal to the system of the speech community, while the wave model reflects the effects of diffusion through language or dialect contact. We then considered the general consensus of a strong constraint against the diffusion of abstract linguistic structures in language contact. The main thrust of this chapter is to advance an explanation for this difference by attributing internal developments to generational learning – the incrementation of change in an unbroken sequence of parent-to-child transmission – and by assigning the major effects of diffusion to the results of extra-generational learning by adults. If this is the case, it follows that the results of language contact will be less regular and less governed by structural constraints than the internal changes that are the major mechanism of linguistic diversification in the family-tree model. The difference will still be a matter of degree, since recent studies of language change across the lifespan have shown that adults do participate in ongoing change, though more sporadically and at a much lower rate than children.

When linguistic forms are diffused through contact among single adults or individual families, less regular transmission can be expected. The cases studied here suggest the basic reason why structural borrowing is rare: the adults who are the borrowing agents do not faithfully reproduce the structural patterns in the system from which they are borrowing.

The main body of this chapter applies this thinking to the study of dialect diffusion, focusing on two cases found in the ANAE data. There is evidence that the complex short-*a* tensing system of New York City has diffused outward to at least four different areas. The resulting systems resemble that of New York City in its superficial outline – the phonetic conditioning of tensing by the following segment – but differ from the original model in the absence of grammatical conditioning, in the open syllable constraint and in specific lexical exceptions. The Northern Cities Shift developed simultaneously in all areas of the Inland North. The chain-shifting mechanism operates with a high degree of consistency, linking the movements of six vowels in an overall rotation. But the transmission of the NCS along the St Louis corridor produces a more irregular result, indicating that the individual sound changes are diffusing individually rather than as a systematic whole.