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The question of how a linguistic innovation, having arisen at one point in space, is spread from one locality to another is one of the great puzzles of language change and has been addressed by many researchers. For example, Bailey, Wikle, Tillery, & Sand (1993) presented a review of models of diffusion based on data collected in their Survey of Oklahoma Dialects. They found examples of:

1) hierarchical diffusion, by which innovations spread from the largest centers of population to smaller ones, from smaller cities to towns, and so on down the line, reflecting the gravity model formalized by Trudgill (1974), exemplified by the unrounding of *haw̄k* to *hock*;

2) counterhierarchical diffusion, whereby formerly rural forms were taken up by city dwellers, found for the quasi-modal *fixin' to*;

3) contagious diffusion, whereby an innovation spread across the state in a simple wave, traveling from one community to the next, found for the laxing of the nucleus of *field*. Another case of contagious diffusion, the laxing of the nucleus of *pool*, was overlaid by a component of hierarchical diffusion, suggesting what we might have suspected already: that the geographic diffusion of linguistic innovations need not conform to simplistic patterns, but may be complicated by the interplay of diverse factors.

The Mid-Atlantic region of the United States, from New York City to Baltimore, provides an ideal site for an investigation of the problem of linguistic diffusion. The phonemic split of short *a* into tense and lax classes has been documented in this area, but the lines along which the split occurs are different in different places. The New York City version was first documented by Babbitt in 1896 and further discussed by Trager (1930, 1934, 1940) and Cohen (1970), among others. The Philadelphia version of the split was documented by Ferguson in 1975, whose work has been followed by extensive study by Labov and his associates. (See especially Labov 1989.) But the environments for tensing in Philadelphia are a subset of those in New York, so logically it follows that there must be one or more isoglosses crossing the route from New York City to Philadelphia, as tensing conditions are dropped. While Labov and his students did exploratory interviews in a number of communities about fifty miles from Philadelphia in the early 1970s, information on the distribution of tense short *a* in the region was still sketchy. This situation is addressed in current research on linguistic diversity

and change in the Mid-Atlantic region at the Linguistics Laboratory of the University of Pennsylvania.

The data for this paper come from two sources: interviews conducted by telephone for the *Atlas of North American English* (Labov, Ash, and Boberg, forthcoming) and face-to-face interviews conducted specifically for the present project. The two types of interviews use many of the same techniques, including a section of spontaneous speech, elicited by topics of local interest, such as the state of the downtown area; questions on semantic differentials to elicit stressed tokens of specific words; a set of demographic questions; and a word list. All interviews are tape recorded and subsequently coded impressionistically for the variables under investigation. Acoustical analysis is conducted to the extent that resources permit. In the case of the word class assignment of short *a*, acoustical analysis provides valuable confirmation of the impressionistic coding, and it is especially helpful in cases where there is no clear distinction or separation of short *a* into tense and lax classes.

The face-to-face interviews employ a newly developed instrument, the Short Sociolinguistic Encounter, which is designed to provide the maximum amount of data on a specified, small set of variables. The interviews are anonymous in that speakers are not asked for their names, but quite a lot of demographic information is requested, such as parental nativity, parental occupations, and speaker's occupation, as well as the speaker's residence history. The interview can be completed in twenty minutes, though it frequently runs up to twice that. On the other hand, if the speaker's time is severely constrained, just the word lists and demographic information can be recorded in under ten minutes.

The selection of sites for fieldwork is guided by the object of sampling in proportion to the amount of variability. We looked at towns in northern New Jersey to find the boundaries of the New York City system—expecting, originally, to find isoglosses corresponding to the addition of constraints on tensing as we moved in the direction of Philadelphia. As will be detailed below, we found something completely different. In southern New Jersey and Delaware, we selected towns looking for the limits of Philadelphia influence. Again, our findings surprised us.

The phonetic realizations of tense and lax short *a* are as follows:

Short *a* is tensed to /æh/ and raised to [e:², e:³, i:³]

Lax short *a* (/æ/) remains in low front position as [æ]

Describing the variable in detail is a lengthy undertaking which is not in order here, but examples of the word class assignments of tokens by system type are given in Table 1.

	Philadelphia	New York City	Other (Nasal)
<i>mad, bad, glad</i>	tense	tense	lax
<i>cab, sad, badge, bag, et al.</i>	lax	tense	lax
<i>bath, laugh, pass, et al.</i>	tense	tense	lax
<i>cash, hash, et al.</i>	lax	tense	lax
<i>ham, hand, man, et al.</i>	tense	tense	tense
<i>hammer, Spanish, et al.</i>	lax	lax	lax or tense
<i>ran, swam, began</i>	lax	tense	tense

Table 1. Short *a* systems found in the Mid-Atlantic region

New York City shows tensing of short *a* before all voiced stops, voiceless fricatives, and front nasals. Philadelphia has tensing before front voiceless fricatives (i.e. *cash* is excluded) and front nasals. In both cities, tensing is limited to closed syllables only. It also applies before an inflectional boundary that begins with a vowel, as in *planning*, and it is highly variable before a derivational boundary. Weak words—that is, those whose only vowel can be schwa—have lax short *a*, despite the presence of other tensing conditions, as in *am*, *and*, and the auxiliary *can*. There are numerous lexical exceptions. For example, *avenue* is tense in New York City, while all other cases of short *a* before /v/ are lax. Other exceptions will be given below.

From the first documentation of the variants, there has been debate over whether the differentiation of short *a* into tense and lax classes is a phonemic split or a complex rule; but now it is generally agreed that the evidence supports the argument for a phonemic split. The reasons are (Labov 1994):

1. There are stable lexical distributions that cannot be predicted by any phonological or grammatical rule.

2. As Payne's work (1980) and Roberts & Labov's (1995) show, children who move to Philadelphia acquire the phonetic patterns of the Philadelphia dialect within a few years, but only children of Philadelphia-born parents are completely consistent in the Philadelphia short *a* distribution.

3. Children from New York City use a lexical strategy in acquiring the Philadelphia pattern, while children from outside the area use a rule-governed phonetic strategy.

4. Middle Atlantic speakers show more categorical discrimination of the [æ-e:] continuum than do speakers from one-phoneme areas.

A vastly simplified alternative to the split phoneme system is a one-phoneme nasal system, in which short *a* is tensed before following nasals. In one variant, open syllables may constitute a tensing environment, and in another variant, tensing may occur only in closed syllables. Another alternative is a one-phoneme system in which the height and frontness of the vowel may vary considerably, but it is subject to simple phonetic conditioning and dis-

regards grammatical and lexical peculiarities. This is what Labov terms a “continuous distribution” (2001). Even within this type of system, there may be a big difference between tense and lax tokens, or the distribution may be more or less continuous. In most cases, the fronted and raised tokens cover a sizable amount of vowel space, while the lax tokens cluster more closely together.

Now we turn to the data from the Mid-Atlantic speakers. All of them have tense short *a* before front nasals in closed syllables, as in *man*, *hand*, and *Camden*. The question is what happens in other environments. In what follows, the short *a* systems of speakers are evaluated on the basis of four criteria, shown as strings of designations of tense and lax in the map legend in Figure 1. Data from 121 speakers is plotted. In all, about 4200 tokens of short *a* in the targeted categories were coded for these speakers.

In the strings of designations of tense and lax, the first position represents tense or lax realizations of short *a* in the three affective adjectives *mad*, *bad*, *glad* (abbreviated *mbg*). In the Philadelphia system, these tokens have tense short *a*, while all other short *a*'s preceding voiced stops are lax, as in *sad*, *cab*, and *flag*. In New York City, these words have tense short *a*, along with all other short *a*'s preceding voiced stops or voiced affricates: *cab*, *flag*, *badge*—subject to exceptions for weak words such as *had*.

The second position in the string represents tense or lax short *a* before front voiceless fricatives. In coding the data, tokens with following /*s*/ were distinguished from those with following /*f*/, but there was rarely a difference between the two, so the findings for the two categories were combined. In both Philadelphia and New York City, short *a* is also tensed before /*θ*/, as in *bath*. This environment occurs rather infrequently in natural speech, but *bath* and *math* were included in the word list. Tensing before /*θ*/ was not common in the New Jersey interviews—and *math* is commonly lax in Philadelphia anyway¹—but when it did occur, it was noted as reinforcement of the Philadelphia system. In the New York City system, tensing occurs also before /*ʃ*/, and this too was noted when it occurred.

The third position in the string represents tense or lax short *a* before intervocalic nasals. As was noted above, this is subject to grammatical conditioning in Philadelphia, whereby tensing occurs before inflectional suffixes that begin with a vowel (as in *planning*), but only variably before derivational suffixes (as in *classics*). Tense short *a* in *planning* was not considered as tensing before intervocalic nasals, and, indeed it was virtually universal: Tokens of interest include *hammer*, *flannel*, *Spanish*, and so on.

¹ It qualifies as an exception by being an abbreviation of a word in which the short *a* would occur in an open syllable.

The fourth position in the string represents tense or lax short *a* in the three strong verb preterits *ran*, *swam*, *began* (abbreviated *rsb*). In Philadelphia, these are lax in the core pattern, though all other tokens of short *a* before nasals in closed syllables are tense. New York generalizes the pattern to include tensing in these words.

The tensing strings plotted in Figure 1 represent an average of about 35 tokens per speaker across the four categories. The string *ttll* represents the pure Philadelphia system, and it is indicated by a filled square on the map. The string *tt-l* represents the Philadelphia system, except information on short *a* before intervocalic nasals is lacking.² A second Philadelphia-like system is represented by the string *ttlt*, indicating a system with tensing in *mad*, *bad*, *glad* and before front voiceless fricatives, but with loss of the exceptions for *ran*, *swam*, *began*, which become tense. These speakers are shown by a filled triangle.

First we will consider the southern half of the region, south of Trenton, where we would expect the Philadelphia system to prevail. The picture here is one of loss of the Philadelphia system outside the largest cities. I believe it is a case of loss of the Philadelphia system, rather than gradual acquisition of it by speakers outside the metropolitan areas, for several reasons:

1. The Philadelphia system is notoriously difficult to acquire. Payne (1980) was the first to establish this, and her findings have been confirmed repeatedly since (e.g. Roberts and Labov 1995). Those who exhibit the Philadelphia system in New Jersey, Wilmington, DE, and Baltimore, MD, provide evidence that the system was originally established over an extensive territory outside Philadelphia.

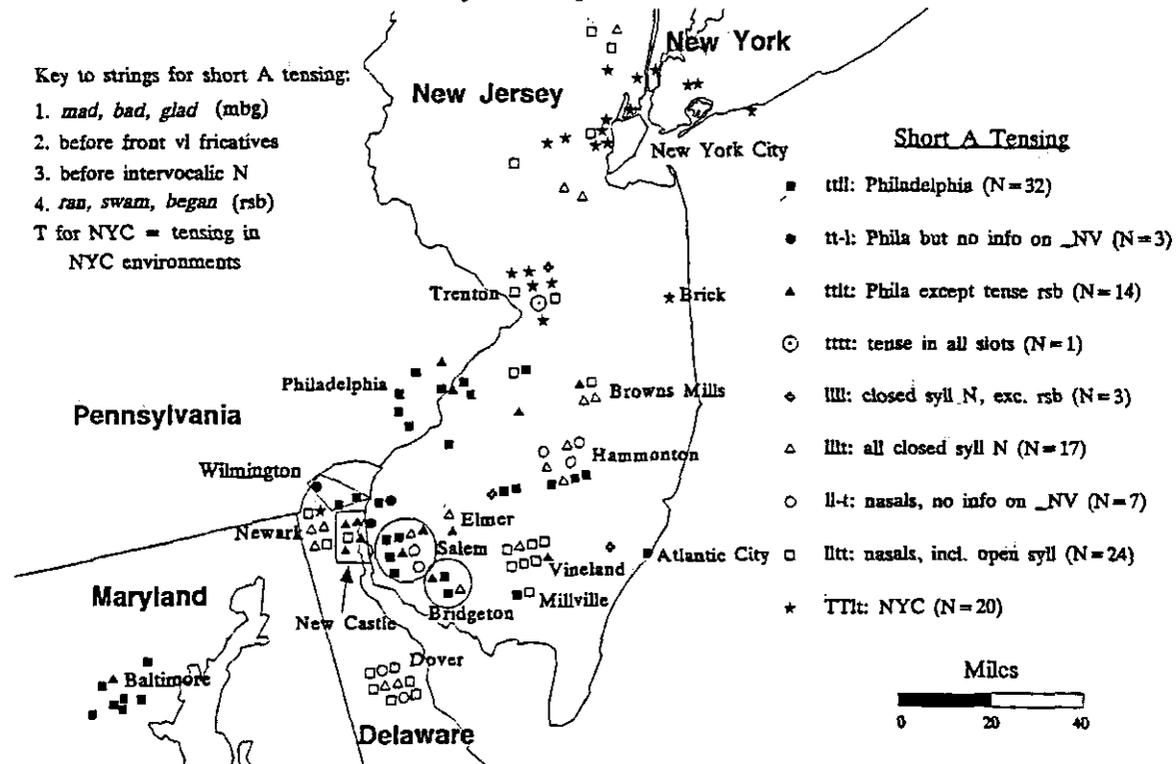
2. The distribution of more Philadelphia-like systems and more nasal systems shows age-grading, as will be discussed in more detail below: the speakers with more Philadelphia-like systems tend to be the older speakers, and those with more nasal systems tend to be the younger speakers.

3. In one town, at least—Hammonton, NJ—there is a split between people from the town itself and speakers from outside the town, with natives of the town being further along in adopting the nasal system. This too will be described in more detail below.

The Philadelphia system is lost and transformed into a nasal system in steps, as schematized in Figure 2.

² The first word list used in the short interviews was deficient in not including any words of this type, and so it occasionally came about that a speaker produced no tokens in this category.

Figure 1. Short A Tensing in the Mid-Atlantic Region
 Each symbol represents one speaker



	Slot	1	2	3	4
		mbg	vl fric.	—VN	rsb
Philadelphia system		t	t	l	l
Step 1 Philadelphia except tense	rsb	t	t	l	t
Step 2 Tensing before front nasals in closed syllables only		l	l	l	t
Step 3 Tensing before front nasals in closed and open syllables		l	l	t	t

Key to tensing slots:

- 1 *mad, bad, glad* (mbg)
- 2 before front voiceless fricatives
- 3 before intervocalic front nasals
- 4 *ran, swam, began* (rsb)

Figure 2. Steps in the transition from the Philadelphia system to a nasal system

In the loss of the Philadelphia conditioning of short *a* tensing, the first element to be abandoned is the laxing of *ran, swam, began*, represented by the tensing string *ttlt*, and symbolized by a filled triangle in Figure 1. These words join the rest of the pre-nasal closed syllables in having tense short *a*. Indeed, even Philadelphians are somewhat variable in the laxing of *ran, swam, began*, as is shown by the one filled triangle among the Philadelphia speakers and another just across the Delaware River in Pennsauken, NJ. (This was demonstrated more than a decade ago by Labov 1989.)

There are two speakers (in Trenton and Egg Harbor Township) who produce lax short *a* in *mad, bad, glad*, and before voiceless fricatives and who also have lax short *a* in *ran, swam, began*. They are represented by a tensing string of *llll*, which is plotted as an open plus sign. This yields a plain nasal system, except for retaining the lexical exceptions of *ran, swam, began*. The speaker in Trenton actually produced one tense token of *ran* but was otherwise consistently lax, except for pre-nasal short *a* in closed syllables. These two speakers must be acknowledged as being inconsistent with the overall pattern. What is most remarkable, however, is that so few speakers are inconsistent with the pattern. As will be seen below, one additional speaker presents a pattern that is not shared by many. To find only three

speakers out of 121 who deviate from the pattern in idiosyncratic ways demonstrates that the options for speakers are strictly limited, which lends weight to the argument that an orderly transformation from one state to another is in progress.

In the next step, two Philadelphia conditioning factors are dropped at once: tensing before voiceless fricatives and tensing in the three lexical exceptions *mad*, *bad*, *glad*. This yields a tensing string of Illt, represented by an open triangle. As can be seen in Figure 1, all speakers are either tense in both environments—mbg and preceding front voiceless fricatives—or lax in both environments. The result is the first stage of the nasal system, with tensing only found pre-nasally in closed syllables, represented by open triangles. It should be noted, however, that there remain aspects of the Philadelphia system which are not within the scope of this study. For example, grammatical conditioning is retained, in that weak words remain lax, tensing before derivational suffixes is disfavored, tensing in abbreviations such as *math* is disfavored, and so on.

Finally, tensing is added before intervocalic nasals, represented by open squares for 24 speakers on the map. In seven cases, there is unfortunately no data on tensing before intervocalic nasals. Those in New Jersey all occur in the company of speakers who tense only in closed syllables, and those in Dover, DE, are in company in which the majority of speakers tense both in closed and open syllables. It is reasonable to project that the speakers with missing data speak as their compatriots do.

This is the progression of stages schematized in Figure 2 above. It is now instructive to consider several of the sites individually. The Philadelphia system is solid in the city itself, and it extends east across the Delaware River into the New Jersey towns (not labeled on the map) of Pennsauken, Mount Holly, Maple Shade, Deptford, and Medford. One speaker in Mount Holly is an exception, with a pure nasal system, represented on the map by an open square. This is 9-year-old Leah, a very bright youngster who talked expansively and read the word list easily. Upon first consideration, her nasal system might be interpreted as the result of having non-local parents. Her father, whom I also interviewed, is represented on the map as the speaker in the Trenton area who tenses in all environments.³ Her mother is from Car-

³ He has a mixed history in terms of nativity, residence; and parental nativity, however. He lived his first five years in Bordentown, NJ, a short distance south of Trenton on the Delaware River, and then he grew up in Yardville, a suburb of Trenton. His father was from Philadelphia, and his mother was from British Guyana. Apparently, he learned part of the pattern from his father—tensing in *mad*, *bad*, *glad* but not before other voiced stops, and tensing before front voiceless fricatives but not

lisle, PA, which is outside the area of the phonemic split of short *a*. On the other hand, it may be that Leah represents the vanguard of change, which is illustrated further in the communities that are a little more distant from Philadelphia.

Browns Mills (pop. 11,000) provides further evidence of the importance of parental influence. One speaker, 42-year-old Dottsie, had lived in Browns Mills all her life. She exhibits the Philadelphia system, except she tenses *swam* and *began*, though not *ran*. The other three symbols—they are actually four speakers, because I interviewed two young sisters together and conflated their data, since there were no inconsistencies between them—have pure nasal systems. One of the adults' parents were both from Browns Mills, and the other's mother was from there, though her father was from north-central Pennsylvania; the girls' father was from Trenton and their mother was from nearby in New Jersey. However, Dottsie's parents were from Philadelphia. She acquired the Philadelphia system with the phonemic split (modified by only partially tensing *rsb*), while the others acquired a system with only one short *a* phoneme.

Hammonton, NJ, (pop. about 12,000) is a second place where different systems rub shoulders. After recording several people who showed no evidence of Philadelphia influence, I recorded just the word list read by a man who had lived in Hammonton all his life but whose parents were from a small place a dozen miles southeast of Hammonton. Unlike all the others, he produced the Philadelphia tensing of *mad*, *bad*, *glad* and, variably, the laxing of *rsb*. I then collected word lists from several more speakers. As I chatted with a 59-year-old woman and her 35-year-old daughter (whose two children had recorded the word list), the grandmother remarked that she and her family, who originally lived in the country outside the town, speak differently from the townfolk. "We say *b/æh/d*," she said, "and *they* say *b/æ/d*." Indeed, she and her daughter produced the Philadelphia system, while her grandchildren produced the nasal system of their father and the other Hammonton speakers. This strongly implies that the whole area had the Philadelphia system at an earlier stage, that this system was abandoned earlier in the town, and that now it is being eroded further by migration from the countryside to the town.

Moving on to Bridgeton (pop. 19,000), there again Philadelphia-like and nasal-like systems coexist. The most mainstream speakers are the most Philadelphia-like. The two who are completely Philadelphia are a woman

before /*ʃ*/. On top of that, he dropped the lexical exceptions of *rsb*, and, furthermore, he generalized tensing before nasals to include tensing in open syllables. This mixed system truly constitutes an exception.

and a man in their mid-forties. The man is furthermore the son of Philadelphians, so the evidence given above would have us predict that he would have the Philadelphia pattern in any case; but the woman's parents are from Bridgeton, and she has the same system. Another Bridgetonian who tenses *rsb* likewise has local parents, but at 27, he is almost a generation younger than the other two speakers, perhaps representing the beginnings of the simplification of the system that is found elsewhere.

The Bridgeton speaker with the most advanced nasal system is an exceptional case, and it is hard to say what her speech represents. She is a 29-year-old woman who seems to be quite close to the African-American community. Her speech contains many features of AAVE, such as substitution of /f/ for /θ/, use of habitual *be*, and copula absence. When I asked about the ethnic composition of her high school, she gave me a long, vague reply, the essence of which was that she did not distinguish among ethnic groups. She herself was entirely Euro-American, however, with a measure of Blackfoot Indian added. In any event, it is difficult to judge the meaning of her short *a* productions.

The speakers from Salem (pop. 6900) exhibit systems ranging from a solid Philadelphia pattern to tensing only before nasals in closed syllables. The two speakers with the most solid Philadelphia pattern are, again, a man and a woman in their mid-forties whose parents were from Salem. The speakers with versions of a nasal system are all teenagers. The two with a nasal system but lacking data on short *a* before intervocalic nasals are sisters whose father is from Ohio, and their mother is originally from Indiana but came to Salem at the age of 10. Lest that be taken as the full explanation for their having a nasal system, however, it is found that the third nasal system (with lax short *a* before intervocalic nasals) is produced by another teenaged girl whose father is from Salem; however, her mother is from Connecticut and therefore most likely has a nasal system also. One of the speakers with a Philadelphia system except for tensing of *rsb* is another teenaged girl whose father is also from Salem; her mother lived in a number of different places in Delaware while growing up. Thus there is considerable variability, but the evidence weighs in favor of the conclusion that younger speakers are retreating from the Philadelphia system in favor of a simple nasal system in southwestern New Jersey.

A further piece of the South Jersey story is afforded by the two speakers from the small town of Elmer (pop. 1600), slightly northeast of Salem. These are Travis, 50, and his 13-year-old son. Travis' parents were from Philadelphia, and he lived his first five years in Gloucester City, NJ, not far from Philadelphia. His family then moved to a rural area near Elmer, where he grew up. He produced the Philadelphia-like system with tensing in *rsb*. His

son had lived all his life in Elmer, and he produced the pattern of tensing only before nasals in closed syllables. This switch from complex lexical and grammatical conditioning to simple phonetic conditioning in one generation strengthens the evidence for a radical change in progress.⁴

A little further east lie Vineland, NJ (pop. 55,000), and Millville (pop. 26,000), just to the south. Here the transition to a nasal system has advanced considerably further. The only speakers who have a Philadelphia-like system are a 76-year-old man in Vineland (whose parents were from Philadelphia) and a 31-year-old man in Millville (with local parents). The other speakers are five teenagers plus adults aged 26, 45, and 57, all with nasal systems. Thus we find that there are remnants of the Philadelphia system, but they are just that. The furthest point in New Jersey to exhibit the Philadelphia system is Atlantic City (pop. 38,000), represented by just one speaker so far. It is consistent with all the evidence of age-grading that this man is an octogenarian. His background somewhat favors his acquiring the Philadelphia system since his mother was born in Philadelphia; however, she grew up in Atlantic City. His father was born in Italy. Clearly, further data on Atlantic City are called for.

The city of Wilmington (pop. 72,000) has the Philadelphia system, as does Baltimore (pop. 736,000). New Castle, DE (pop. 4800), just a few minutes' drive from Wilmington, is essentially like Philadelphia, though it does show some weakening of the system. The prohibition against tensing in *ran*, *swam*, *began* is lifted for all five speakers (the oldest of whom is 41), and one young speaker, an 18-year-old man, has gone all the way to a nasal system with tensing even in open syllables. The smaller communities in New Jersey just across the Delaware River from Wilmington (Penns Grove and Pennsville) maintain the Philadelphia system completely intact. It is all the more striking, then, that the smaller cities in Delaware outside these major urban centers show no sign of the Philadelphia pattern. With one exception, all the speakers from Newark (pop. 25,000) and Dover, the state capital (pop. 28,000), have nasal systems. The one exception, in Newark, tenses variably before voiced stops other than in *mad*, *bad*, *glad*; he produced tense short *a* in *cab*, *bag*, *wagon*, *sad*, and *tag*. But his parents are from New York City, and his family moved to Newark when he was 2. Again, this supports the thesis that word class assignments are learned from one's parents, and it removes this speaker from the roster of true exceptions.

⁴ Grammatical conditioning is not entirely abandoned. The speakers with a nasal system retain lax short *a* in weak words such as *am* and the auxiliary *can* in almost all cases.

Now we turn to the city of Trenton, the capital of New Jersey, with a population of about 89,000, just 25 miles from Philadelphia and 55 miles from New York City. Here we find yet a different picture. The Trentonians whose parents are also from Trenton exhibit a New York City-like system of short *a*: they tense short *a* at least sometimes before voiced stops other than in *mad*, *bad*, *glad*, they tense at least sometimes before the palatal voiceless fricative /θ/, and they tense in *rsb*. The Trenton speakers who do not exhibit these characteristics are those whose parents are not from Trenton. The Yardville man who now lives in Mount Holly has already been discussed. The speaker with lax short *a* everywhere except before nasals in closed syllables (excluding *rsb*) has parents born in the "Newark, NJ area." Newark itself exhibits a solid New York City pattern, but if this speaker's parents were from a short distance away, they could have the nasal system that is found in most of northern New Jersey. The two Trenton speakers with tensing before all nasals also have non-local parents. One is the teenaged daughter of a Japanese woman and a father from Scranton, in northeastern Pennsylvania; the other is the teenaged daughter of a man from western Pennsylvania and a woman who grew up in Detroit, Michigan. Both histories place these speakers outside the influence of the New York City system of short *a* tensing.

While New York City influence might thus seem to hold sway in Trenton, the story is not that simple. First of all, tensing by Trentonians in New York City environments is variable. All the Trenton speakers represented by stars on the map produced some tokens with tense short *a* before voiced stops or /ʃ/, but other words had lax short *a* before voiced stops and /ʃ/. A true New Yorker would tense consistently in those environments. Trenton speakers are under the influence of Philadelphia in other ways, too. Trentonians use the Philadelphia term *hoagie* for a sandwich of coldcuts, lettuce, tomato, dressing, and other ingredients on a long roll. They are familiar with the generic term *sub*, and the establishments that offer this delicacy are commonly billed as "sub shops." Trentonians also usually know that this item is called a *hero* in New York, but they do not use that term themselves.

A more profound connection with Philadelphia is in the word class assignment of the preposition *on*. In Philadelphia (and south) this word has the phoneme /oh/, long open o (phonetically [ɔ]). In New York and everywhere in the North (including the Inland North) it has /o/, short o ([ɑ] or a nearby low, unrounded vowel). On this point too, Trenton goes with Philadelphia: Trentonians say /ohn/ for *on*. Yet in the word class assignments for short *a* words, Trenton shows evidence of New York influence. It should be repeated that it is not just like New York, though, since, as noted above, Tren-

tonians' tensing in the New York City environments is variable. Rather, it seems that while other communities (both in South Jersey and North Jersey) are generalizing the pattern in the direction of a nasal system, Trenton is generalizing in the direction of the overall New York City pattern. (The same is found for a 14-year-old girl in Brick, NJ, on the Atlantic coast due east of Trenton.) It remains to be seen where Trenton is going with its short *a* pattern. It is truly a borderline community.

As for the New York City area, in North Jersey we find the same general result as in South Jersey: away from the biggest cities, there is just a nasal system. In keeping with the heavy stigmatization of New York City speech, the New York City system does not extend very far outside the city limits. The stars on the map that are furthest from the city in northern New Jersey represent an 81-year-old man in North Plainfield whose speech is thoroughly that of New York City, and a 58-year-old man in adjacent Plainfield, whose speech was more difficult to assess. His short *a* tokens cluster much more than that of a typical two-phoneme speaker, and he demonstrates more variability in the core categories, but ultimately he exhibits the New York pattern. The open square just west of Staten Island, representing a nasal system just outside New York, is a 17-year-old girl in Linden, NJ. The New York City star next to the square is also in Linden, representing a 32-year-old man. Again, where there are different systems side by side, there is evidence of age-grading.

Looking at the map now to consider the distribution of dialect variants and its implications for a theory of linguistic diffusion, it seems possible to draw some general conclusions.

The Philadelphia short *a* pattern is an urban phenomenon, with a distribution following the cascade model described by Callary (1975), among others. It prevails in Philadelphia, Wilmington, and Baltimore, and it was established along the earliest and most traversed route to Philadelphia, the Delaware River. It also was the system of the thinly spread population of south-central New Jersey.

Towns and cities that are closest to Philadelphia either geographically or in terms of regional importance (meaning Wilmington and Baltimore) maintain the Philadelphia system essentially intact. Elsewhere there is a strong tendency to move away from the complex conditioning of short *a* tensing that characterizes Philadelphia to a simple nasal system. This is all that is found in the towns in Delaware that are any distance from Wilmington, and it is also proceeding in the South Jersey towns of Salem, Bridgeton, and Elmer. Those places along the Delaware River, including New Castle, DE, had strong ties with Philadelphia from the time of first settlement. The New Jersey towns that are more inland, Browns Mills, Hammonton, and

Vineland, have moved further from the Philadelphia system. The evidence of age-grading is clear: there are no counterexamples to the observation that, where nasal and split systems coexist in one community, the younger speakers, those in their teens and twenties, are the ones who exhibit the nasal system. There are no older speakers with a nasal system in a place where the youngest speakers have the Philadelphia system.

A methodological conclusion can be drawn from the findings described here. While we normally seek to interview speakers who are most representative of their localities in terms of residence and parental nativity, the speakers who are somewhat marginal in those respects provide a dimension of additional richness to the data. They serve, in a sense, as test cases for the integrity of the local system, telling us about the importance of parental nativity, duration of residence, and the degree to which a given system can be readily acquired.

The data on short *a* from the Mid-Atlantic region presented here provide a textbook example of the influence of several elements that have long been identified as significant factors in the distribution of linguistic change: settlement history, population distribution, and nativity. All these factors come into play in describing the case of the distribution of the Mid-Atlantic short *a* systems and the changes that are taking place in this region. As Bailey et al. found (1993), even in this rather small area, several processes can be at work at once: the hierarchical model is maintaining short *a* in the biggest cities, while contagious diffusion seems to be responsible for the erosion of the short *a* pattern in South Jersey. As was stated at the outset, we expected to find quite a different picture in terms of isoglosses traversing the distance between New York and Philadelphia. The surprising results reported here remind us that we can take little for granted in the study of linguistic variation.

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