What is to be learned?

William Labov, University of Pennsylvania

This paper is an effort to define the target of the language learner: asking, what are the data that the child pays attention to in the process of becoming a native speaker? In so doing, we will necessarily be engaged in the more general effort to define language itself. The general argument to be advanced here is that the human language learning capacity is *outward bound*, that is, aimed at the acquisition of the general pattern used in the speech community. The end result is a high degree of uniformity in both the categorical and variable aspects of language production, where individual variation is reduced below the level of linguistic significance.

Since this conference bears the title of *cognitive sociolinguistics*, I would like to take the time to address the role of cognition in the sociolinguistic enterprise. The third volume of Principles of Linguistic Change, now in press, carries the subtitle: *cognitive and cultural factors*. To begin with, the most general sense of *cognition* denotes any form of *knowing* as distinguished from feeling and volition. Most studies of cognition concern the process of understanding what is said, rather than how it is said. The study of the cognitive effects of sound change begins with a measure of listeners' abilities to identify the phonemes in the stream of speech and so retrieve the words intended by the speaker. Cognition is not of course limited to the content of what is being said, but is sensitive to systematic variation in the way in which the message is delivered, yielding information on speakers' relations to the addressee or audience as well as on their own social characteristics.

Information on social variation is probably stored separately, in a sociolinguistic monitor (Labov et al. 2006) which outputs estimates of social distance, affect and social attributes

of the speaker based on previously acquired data. In the study of linguistic change and variation, attributes that are easily observable and codified have been termed *social factors*: age, gender, ethnicity and neighborhood.

But the cognitive process also deals with "abstract polarities which may take the same form in many widely separated communities." (Labov 2001: Ch. 16). These "abstract polarities" will here be termed *cultural factors*. In the terminology adopted here, cultural factors will be distinguished from other social factors in their generality and remoteness from simple acts of face-to-face communication. They include such constructs as "Northerner", "Southerner", "New Yorker", "Philadelphian" as developed within and without the North, the South, New York and Philadelphia.

The construct of "social class" can be viewed either way: as an observable property of the speaker (occupation, residence), or as "status", a cultural factor not tied to any one concrete attribute.

Much of the data that I will use come from sociolinguistic analyses of variation in the speech community. This work strongly supports the central dogma of sociolinguistics that the community is conceptually and analytically prior to the individual. This means that in linguistic analysis, the behavior of an individual can be understood only through the study of the social groups of which he or she is a member. Following the approach outlined in Weinreich et al. 1968, language is seen as an abstract pattern located in the speech community and exterior to the individual. Language is a social fact, in the sense of Durkheim:

> ways of behaving, thinking and feeling, exterior to the individual, which possess a
> power of compulsion by which they are imposed on him (1937, p. 5, my translation)

The human language faculty, an evolutionary development rooted in human physiology, is then viewed as the capacity to perceive, reproduce and employ this pattern.

The opposing view, well established in the thinking of many students of the speech community, is that the individual constructs an idiolectal grammar on the basis of the particular set of input data to which he or she is exposed in the formative years. Since the language learning mechanism is not programmed to delete idiosyncratic constructs,

the end result is that each language learner winds up with a particular version of the grammar based on individual experience. The speech community is then seen as a vague average or assembly of these idiolectal variants. To understand how the language learning mechanism works from this perspective, we have to examine its operation in the individual learner.

This enthusiasm for the individual is not a new development. Durkheim notes ". . . the word compulsion, by which we define [social facts], has a risk of irritating the zealous partisans of an absolute individualism. As they believe that the individual is perfectly autonomous, it seems to them that one diminishes him each time that it appears that he does not act entirely by himself. (1937:6).

Although the critique of the idiolect in Weinreich, Labov and Herzog 1968 was widely accepted, the desire to focus on the individual recurs with striking regularity among sociolinguists. Thus Holmes 1969 on "The sociolinguistic individual" argues that

> the linguist should be able to pin-point the development of a language as a result of individual choices, and that the sociolinguist should try to relate changes in social structure to changes in individual cultural values as expressed through speech in social interaction. Individual behavior is thus seen as the proper starting point for sociolinguistic investigation

Similarly, Hymes 1979 would give "foundational status" to individual differences as a vantage point from which to study language in general. Le Page and Tabouret Keller (1985) see language as essentially idiosyncratic. Language is for them the linguistic repertoire of the individual; the individual is "the locus of his language." (P. 116). Johnstone's book on *The Sociolinguistic Individual* (1996) is devoted to the argument that we should think about language from the perspective of the individual speaker, rather than the perspective of the social aggregate or the abstract linguistic system

The general perspective put forward here reinforces the contrary view. It is argued that the individual does not exist as a unit of linguistic analysis. Though the recordings and judgments of sociolinguistic research are gathered from individual speakers, their idiosyncratic behavior is not our focus, but rather the extent to which they respond to wider community patterns.

The compulsion for the language learner to turn outward may be thought of as the result of a competition between two types of language learning. Let us conceive of one type which copies its communicative pattern faithfully from its first contacts with caretakers, and makes only limited modifications thereafter. The other type is programmed to keep smoothing the result with data from following contacts (up to a certain limit). This second type is outwardly bound, in the sense that it takes the community pattern as prior to the individual pattern. The suggestion here is that over a long period of time, the second type will survive, and has survived, at the expense of the first.

I will first review some of the evidence for this outward bound character of language as it affects the behavior of the language learner. We will then turn to the uniformity that is the end result of this character of language learning, considering first the uniform patterns of the metropolitan speech community—and then uniformity at an even larger scale of regional dialects involving as many as thirty or forty million speakers. Such regional uniformity makes it more difficult to account for the diversity of structure across regions and the sharpness of the boundaries between them. I'll conclude by attempting to state the conditions that give rise to such divergence, particularly between communities whose speakers are in close and continuous contact with each other.

1. The acquisition of the general

Evidence for the outward orientation of language learners is everywhere abundant since we have all been participant-observers in the process. Children learn language from their primary caretakers but quickly depart from the patterns provided by those caretakers if it does not match the pattern of the wider community. Payne 1976 was the most carefully constructed studies of how children turn away from the dialect pattern of their parents towards the pattern of the community in the new town of King of Prussia, where half of the population was drawn from metropolitan Philadelphia and half from out-of-state communities with very different vowel systems in Massachusetts, New York, Cleveland. The great majority of children who spent at least half of their formative years

in Philadelphia acquired the Philadelphia vowel variables. Table 1 shows the percent of those who acquired five of the Philadelphia variables, partially acquired, or retained the parental pattern.

Table 1. Acquisition of five Philadelphia phonetic targets by children of out-of-state parents in King of Prussia (from Payne 1976).

	(aw)	(ay)	(uw)	(ow)	(oy)
Acquired	40%	50%	52%	68%	60%
Partially acquired	40%	44%	48%	32%	30%
Not acquired	20%	6%	0	0	10%
Number of children with different parental targets for each vowel	(20)	(34)	(25)	(25)	(20)

The numbers here concern only those vowels where there was a radical difference between the parents' dialect and the Philadelphia dialect. This process of acquisition is of course limited by age of arrival in Philadelphia. Figure 1 shows that of the 34 out-of-state language learners, the 3 who came at 14-17 years of age acquired only (ow) fronting, while the majority who came before 4 years of age showed a high degree of adaptation to all five. Finally, we can observe some influence of social networks. Figure 2 shows that the number of times a person was mentioned by others in this series of interviews was directly and strongly related to the proportion of Philadelphia variables acquired. The children who were more integrated into peer networks were the mosz likely to have acquired the Philadelphia speech pattern.

Figure 1. Acquisition of Philadelphia phonetic variables by age of arrival (based on Payne 1976)
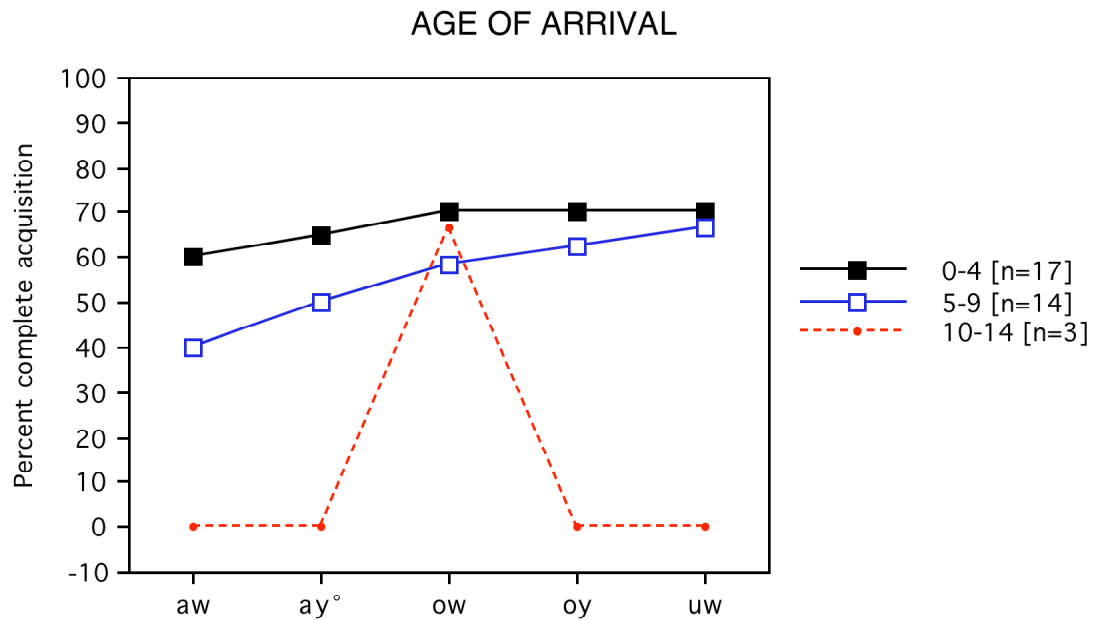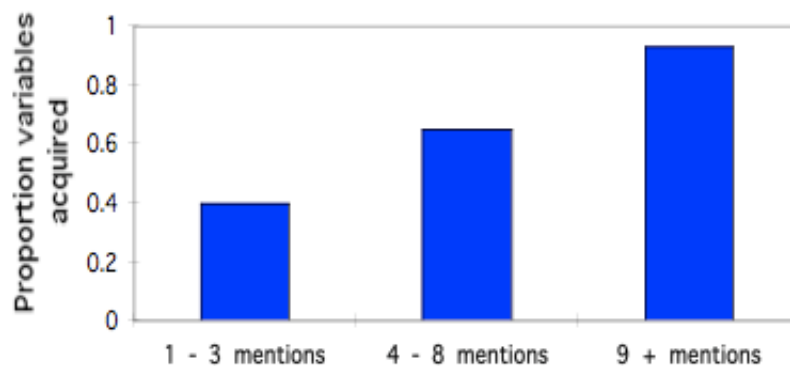
AGE OF ARRIVAL

Figure 2. Proportion of Philadelphia variables acquired by number of mentions by peers in King of Prussia interviews (from Payne 1976)

A second new community appears in the literature with Kerswill and Williams' research in Milton Keynes, composed of inmigrants from many different areas of England (Williams and Kerswill 1999, Kerswill and Williams 2000). Milton Keynes did not exist in 1971, but grew to 123,000 in 1981 and 176,000 in 1991. Three quarters of its residents came from the southeastern England: 35% from London, 32% from other

southern counties, but only 3% from the immediate sub-region within 15 minutes drive. This project was elegantly and carefully designed to record the phonology of 8 boys and 8 girls in each of three age levels: 4, 8 and 12 years old, together with the caretakers of each, a total of 96 speakers. The new Milton Keynes dialect that arose was a distinct entity: it combined the some features of London and the home counties with some remnants of the local dialect.

Though the children's acquisition of language begins with their mother's vernacular, a competing pattern emerged in this new community which drew children away from their parent's original model. Kerswill and Williams provide a profile for the development of /ow/, the GOAT vowel, across three age levels of children together with the mean scores for their female caretakers. Figure 3 shows the frequencies of three groups of variants: back upgliding vowels with a central or back nucleus; front vowels with rounded glides, and front vowels with unrounded glides. The four-year-olds are quite parallel to their caretakers, while the eight and twelve-year-olds have shifted to the front nuclei with rounded glides. Clearly the eight year olds no longer take their parents' vowel systems as the target for language learning.

Figure 3. Phonetic targets of the GOAT vowel for Milton Keynes children by age (from Kerswill and Williams 1994).
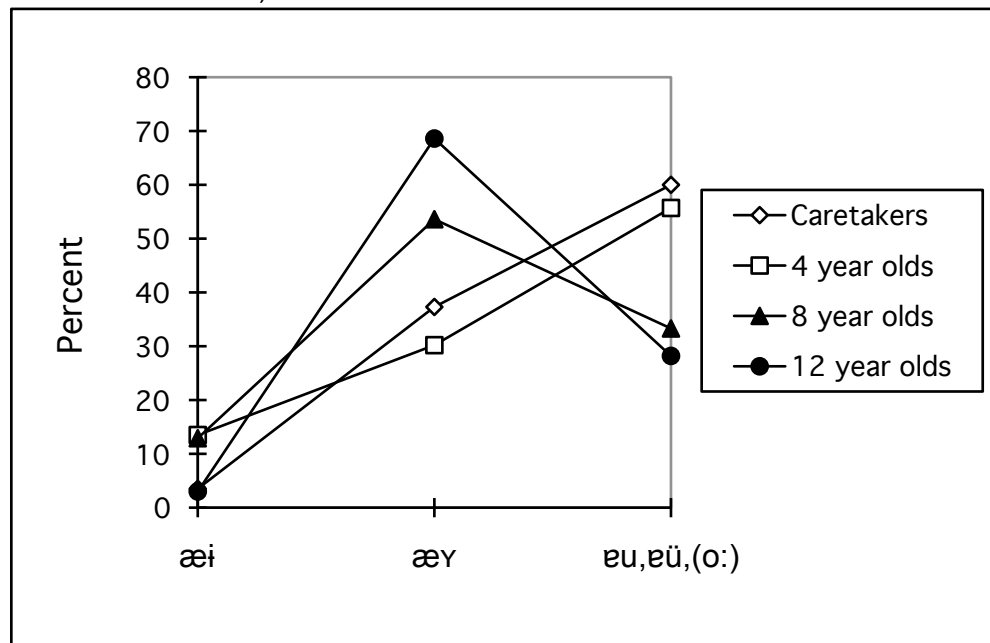
The pattern seen with relative influence of competing dialects is repeated with even greater clarity when the caretakers are not native speakers of the dominant language of the speech community. With the massive immigration into the U.S. from southern and eastern Europe in the late 19th century, large numbers of children acquired English in households where the caretakers were native speakers of Italian, Polish, Yiddish, Greek, and other languages other than English. It was a common conception that somehow the dialect of New York City was influenced by these mother-tongues. However, the influence of parents' language is regularly found to be the least of all sociolinguistic forces operating on children's language in North America. In some way that is not yet fully understood, children have the capacity to detect at an early age the fact that their parents' language is not fully representative of the speech community and so is not the proper target for their language learning. This appeared most dramatically in a comparison that I made between second and third generation New Yorkers in the raising of the variables (æh) and (oh). Table 2 shows the two generations for upper middle class Jewish younger men, and working class Jewish older women.

Table 2. Phonological variables for subjects with foreign- and native-born parents in New York City

| | Upper Middle Class Jewish Younger Men [21-39 yrs] | | | | Working Class Jewish Older Women [40-65 yrs] | | | |
| | (æh) scores | | (oh) scores | | (æh) scores | | (oh) scores | |
	2nd Gen.	3rd Gen.	2nd Gen.	3rd Gen.	2nd Gen.	3rd Gen.	2nd Gen.	3rd Gen.
N	3	6	3	6	6	3	6	3
Mean	31.0	30.3	27.0	24.5	28.6	28.6	19.9	20.6
Std dev	7.8	5.8	1.6	4.8	3.9	10.0	3.5	1.1
t		0.15		0.86		0.47		0.33

There were no significant differences between generations in the raising of (æh). This is the phonetic shift that follows the tensing of short-a in words like *bad, man, last* and *bath* from [æ] to [ɛ:] to [e:ə]. Furthermore, there were no significant differences between the 2nd and 3rd generations in the raising of (oh) in *coffee, talk, off* from [ɔ] to

[oːə] to [uːə]. In other words, the target for language learning was the same for children whose parents were speakers of Yiddish and those whose parents were native speakers of the New York City dialect.

When we consider the major social factors that influence language acquisition, a common-sense projection would look to the most closely tied to language—that is, the language spoken in the home, and the ethnic membership associated with this language. But in one study after another, we find that this expectation is defeated. We typically find that the significant independent variables in studies of the speech community are gender, age, social class, neighborhood, and (if we cross racial lines), race. Linguistically associated ethnicity, when it does appear, is the weakest of all. Table 3 shows the results of a multiple regression of one of the new and vigorous changes affecting the Philadelphia speech community, accounting for 56% of the variance in the Neighborhood Study of 112 speakers. Gender, age, upper working class status, and residence in two of the oldest settled working class neighborhoods are significant effects on the progress of this change. I have added the ethnic dimensions of this population to demonstrate their absence of significance. Italian, Jewish, Irish, Wasp membership all fail to affect linguistic behavior in this and other cases. Only German appears to be significant at the .05 level. This negative effect on fronting of -174 is the least likely to be the result of linguistic influence, since the German settlement was the earliest and dates back four or five generations. As in New York City, one is more likely to find a non-English mother tongue among the second and third generation of Italian and Jewish immigrants. I have also added generational status to the list of independent variables: it is not significant, confirming the equivalence of second and third generations found in the New York City study.

Table 3. Stepwise regression of second formant of F2 of /aw/ in the Philadelphia Neighborhood Study with gender, age, social class, neighborhood and ethnicity factors.. N=112. Adjusted r^2 = 56.6.

Variable	Coefficient	Probability
Constant	2049	≤ 0.0001
Female	122	≤ 0.0001
Age (*25 years)	-120	≤ 0.0001
Upper working class	138	0.0026
Wicket St. neighborhood	171	0.0007
Pitt St. neighborhood	101	0.0329
Italian	-14	0.804
Jewish	-94	0.293
Irish	16	0.776
Wasp	-25	0.681
German	-174	0.029
Generation in U.S.	1.6	0.945

These results confirm the central thesis of this discussion: that language learners in the United States take as their target the system of the broader speech community in preference to the system that they first acquired from caretakers in the earliest years. This finding merges with the Doctrine of First Effective Settlement (Zelinsky 1992): that the cultural pattern of the first settlers of an area determines the development that follows, even when very large numbers of newcomers arrive with very different patterns of their own.

The communal orientation of language learning is seen in speech communities throughout the world and is most visible in small speech communities with a high degree of exogamy. When there is a high proportion of out-marriage, women arriving from a different dialect or language area will be providing children with an initial linguistic model radically different from that of the community. Though there may be some pressure on mothers to adapt to the local norms, in many cases that adaptation will be quite limited. A noteworthy case is that of the Sui dialects studied by Stanford 2008.

North and South dialects of Sui differ markedly in lexicon, tone and with particular salience in first singular pronouns (North εj^2, South ju^2). Stanford finds that women from the South who marry into North households maintain their Southern pattern almost perfectly, and children acquire a significant amount of this matrilect in their initial language learning period of 3 to 5 years of age. However, the father's dialect is firmly established as the target of language learning in this community. Children above five are ridiculed for any use of their mother's speech pattern, and by age five to seven, children use the patrilectal forms. Stanford's study of eight children shows almost consistent patrilectal forms at age ten and consistent performance among adolescents.

This patrilectal norm is available for public discussion; there is a stereotyped saying applied to speech:

me^2	tsop^7	ni^4	ow^1	tsop^7	pu^4
` not	be-like	mother	should	be-like	father

A South-speaking married woman living in the North said of her 14 year old son:

He only says εj^2. If he said ju^2 people would laugh at him, 'You speak like your mother.' They would laugh, and he would be embarrassed. He's not willing to speak like his mother. He speaks like his father. (p. 572)

Another woman said of her children, "They said εj^2. If they said ju^2, then others would scold them. 'You eat our food, but you aren't like us.'"

Stanford's thesis is that the language learning of Sui children is directed to a particular group of speakers. Here the group of women from any outlying dialect or children influenced by them are excluded as models. But this is one of many specific cultural configurations that the language learning capacity will confront. Stanford finds the opposite pattern for Hmong dialects in Texas (2010), where women are expected to adapt to their husband's dialect. Thus the target of language learning can be culturally determined, rather than follow automatically a preference for peers over parents. The Sui case makes explicit some of the mechanisms that lead to uniform behavior and suggest

that the selection of the target group may also be defined by social processes in New York City and Philadelphia as well.

2. Acquisition of variable patterns

The study of linguistic variation is often reported as a way of showing what differences exist in the population. In the term 'orderly heterogeneity', the emphasis is put on heterogeneity more than on order. Yet from the outset, the study of variation in spontaneous speech found much greater uniformity than we would expect from casual observation or reports by intuition. In the first study of internal constraints on linguistic variation (Labov, Cohen, Robins and Lewis 1968), Table 4 was put forward as a surprising demonstration of uniformity among eleven members of the Jets in South Harlem. For every speaker,

(1)   there is more deletion before consonants than before vowels, both for monomorphemes and past tense clusters

(2)   there is more deletion in monomorphemes than in past tense clusters, both before consonants and before vowels.

The one exception is the case of Turkey, who has only one monomorphemic token before a vowel. Otherwise, these regularities apply even to very small numbers.

Probabilities also approach more precisely their limiting values as the number of tokens increases. Figures 4a and 4b show the relation between quantity of data and approximation to this limit. At the extreme left, with lower numbers, we see a certain degree of scattering; but not to the right, as token numbers rise. In the most favored case, that is, in monomorphemic clusters before following consonants, only one speaker, Its, with deletion in 9/15 cases, deviates from the general pattern that approaches 90% deletion.

Table 4. Proportion of –t,d deletion for eleven members of the Jets in single interviews

| | Monomorphemic | | Past tense | |
	before consonants	before vowels	before consonants	before vowels
Stanley	19/20	7/10	2/6	0/14
Rednall	25/26	5/9	2/5	0/3
Hop	18/21	4/9	5/7	1/3
Larry	36/38	2/8	5/9	0/25
Vaughn	35/42	4/11	4/12	1/16
Doug	28/30	4/8	1/3	0/3
Tyler	16/17	4/7	1/5	0/3
Its	9/15	1/1	1/4	0/2
Stevie	21/21	2/4	7/11	2/13
Turkey	11/13	0/1	3/3	2/13
Rip	11/12	1/2	2/7	1/8
TOTAL	229/255	34/70	33/72	7/103
% -t,d deletion	90	49	46	07

Figure 4a. Proportion deleted of monomorphemic –t,d clusters by following environment n monomorphemes for eleven members of the Jets.
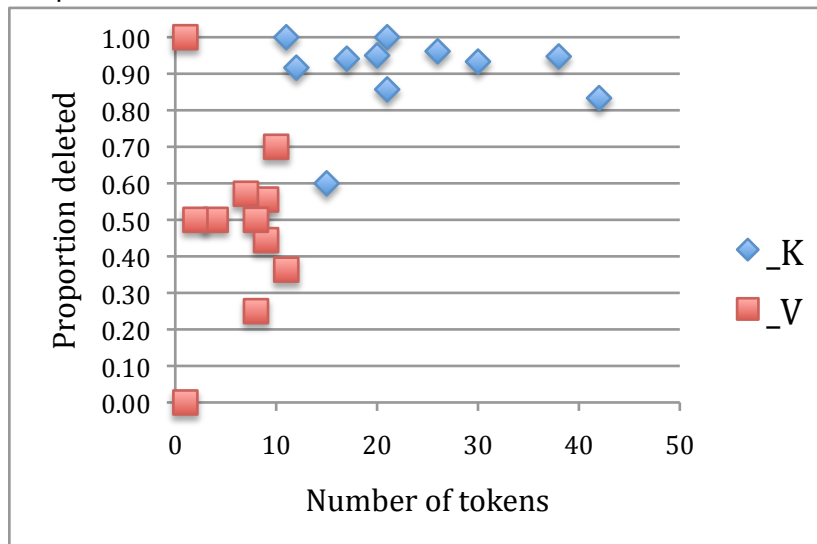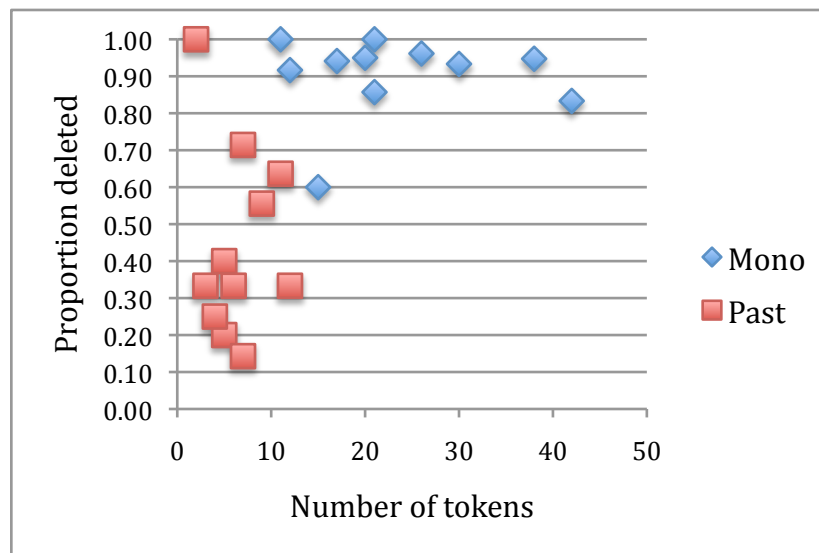
Figure 4b. Proportion of –t,d clusters before consonants deleted by grammatical status for eleven members of the Jets.

The most detailed investigation of –t,d deletion was carried out by Guy (1980) in connection with the study of Linguistic Change and Variation in Philadelphia. His first publication on this variable confronted directly the topic of this paper: whether t/d deletion was a characteristic of the group or the individual. The major finding was that agreement with the community norms rose to higher and higher levels as the quantity of data increased. The white Philadelphia speech community was marked by a low probability of deletion before pause, as opposed to higher values for African American speakers and New Yorkers. Studies of the acquisition of this variable process (Roberts 1997) show that these uniform constraints are acquired by very young children age 3 to 5. Even more remarkable is the early acquisition of the Philadelphia pattern of tensing of short-a (Roberts and Labov 1995). The short-a tensing configuration is one of the key patterns defining the Philadelphia dialect. Thus the raising of (æh) showed sharp stratification by social class, but no social differentiation at all as to which vowels were tensed (Labov 1989). One of the lexically specific features of his distribution is the selection of three affective adjectives ending in /d/—*mad, bad, glad*--- as tense, while the fourth such adjective—*sad*—is lax, along with all other words with short-a before /d/. This is probably the one feature of Philadelphia English that is recognized and commented on, and there is a certain degree of correction in reading and word lists. But

as Table 5 shows, there is almost no variation in spontaneous speech across the social spectrum.

Table 5. Tensing and laxing of short *a* before /d/ in the spontaneous speech of 112 adults in the Philadelphia Neighborhood Study, including speakers from all social classes.

	Tense	Lax
bad	143	0
mad	73	0
glad	18	1
sad	0	14
dad	0	10

While the phonetic raising and fronting that follows tensing is variable and highly stratified by social class (Labov 2001, Ch. 5), the structural base of the tensing process is extraordinarily uniform. The central problem is to discover what form of communication is responsible for the uniformity of this pattern. Our oldest upper-class speaker has the same short-*a* system as our oldest lower-working-class speaker; they do not communicate directly, and the chain of speech events that links them would be difficult to trace.

3. Acquisition of what is new.

The uniformity of the speech community makes it all the more difficult to understand how change in the community pattern comes about. The study of change in progress shows children learning to talk from their parents, then learning to talk differently from their parents, and then even more mysteriously, continuing such differences in the same direction over many generations. To understand change, we have to understand how children identify the newer pattern in the community system that they are learning, adopt that pattern, and then move further in that direction.
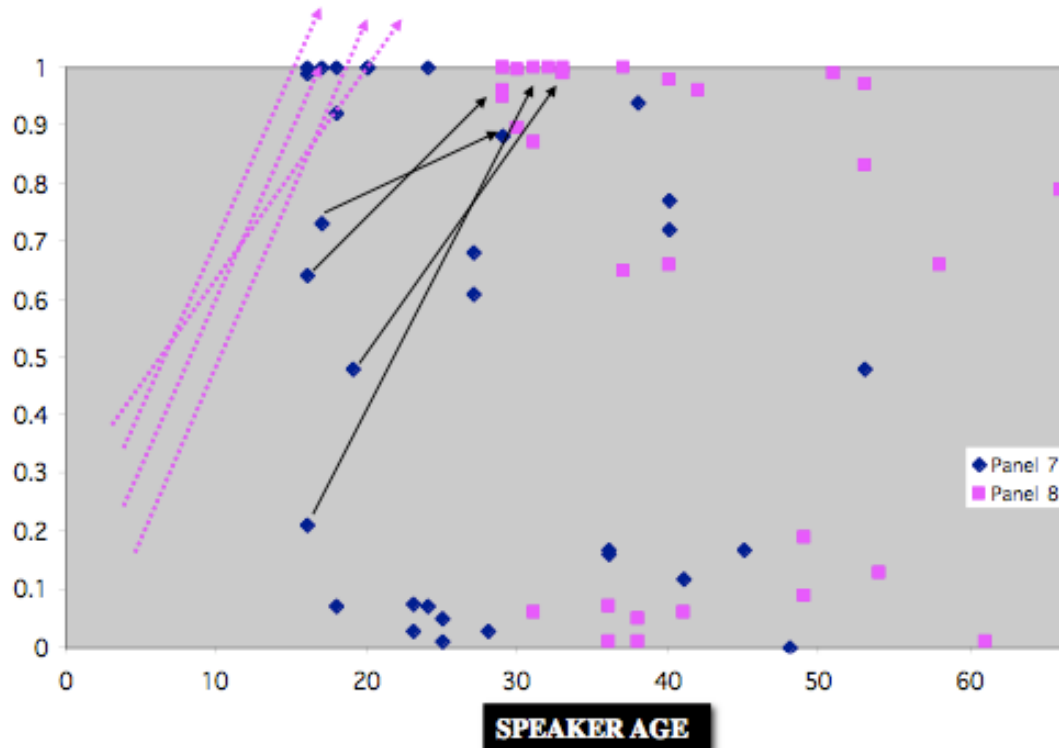
3.1. Change from above

When a new pattern enters a community from the outside, its identification as "new" is not difficult to trace. We observe this in the importation of the new r-

pronouncing norm into New York City (Labov 1966) and other formerly r-pronouncing areas (Labov et al. 2006, Ch. 7). The new target is associated with speakers of higher prestige and very often identified as non-local.

A dramatic example of how such change from above leads language learners to depart from their parents' model is seen in the study of the shift from apical to uvular /r/ in Montreal (Sankoff, Blondeau and Charity 2001). The new uvular from spread geographically from the Quebec City area, but was also identified with continental standard French. Figure 5 shows the percent uvular /r/ by age, with black symbols showing percent [R] At upper left are eight black symbols for adolescent youth who had achieved 100% uvular (r) in 1971. By 1984 (the magenta symbols), the remainder of the young people in the panel study had made the transition to categorical uvular pronunciation. The parents of all these children grew up in a community that was close to 100% apical (r), and based on the direct evidence of interviews in which parents of these young people were also recorded, know that many of the parents were 100% apical speakers.. It is clear that the majority of adolescent speakers in 1971 had taken as their target a form of /r/ quite distinct from that of their parents and achieved consistent control over this uvular form. By 1984, all speakers under 30 had done so.

Figure 5. Percent use of uvular /R/ in 1971 to 1984 in Montreal French. Magenta arrows show putative trajectories for adolescents added in 1984 whose parents were 100% users of apical /r/.

Children's acquisition of change from above can be observed most clearly in Johnson's study of the spread of the low back merger in eastern Massachusetts (2010). Here there is no issue of consciously assigned prestige, but rather a linguistically motivated consequence of contact with children from other regions. In the region of eastern Massachusetts around Boston, there is a complete merger of /o/ and /oh/ in *cot* and *caught, Otto* and *auto,* etc. while in the region of Rhode Island surrounding Providence, this distinction is maintained. Despite the general tendency of mergers to expand at the expense of distinctions (Herzog's corollary to Garde's principle), Johnson found that this boundary was stable across two or three adult generations. Figure 6 shows the results of Johnson's study of 14 families in the border town of Seekonk, where the youngest generation has shown a rapid shift towards the merger. In grades 2-6 there is a solid belt of 10 black symbols indicating complete merger, while older children maintain the distinct system of the community and younger children have not completely emerged from the influence of their parents.

Figure 6. Low back vowel systems in Seekonk children by grade and parental system.
Elementary schools: A = Aitkin, M = Martin, N = North. (Johnson 2010: Fig. 5.3)
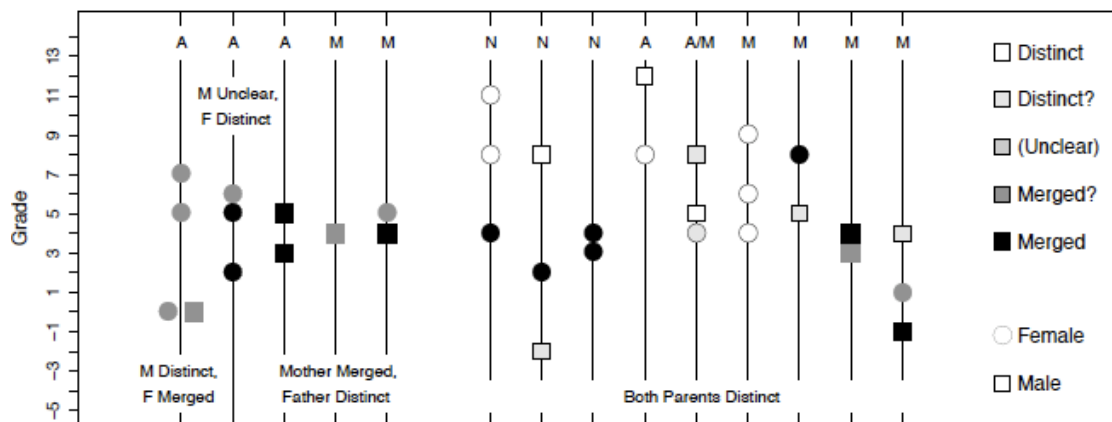
We can trace this effect to the waning influence of parents by comparing the relative
influence of mothers and fathers. Since female caretakers are the primary source for first
language learning, we can expect the effect of having a mother with a distinct system
would outweigh the effect of a father with a distinct system. Table 6 is drawn from
Johnson's School Survey in another border town, Attleboro, where children responded to
seven minimal pairs as 'same' or 'different'. Having a mother who makes the distinction
(but a father who doesn't) yields twice as a high a distinctness score as the reverse
situation. The result leans in the direction opposite from the categorical adoption of the
father's pattern in Sui society.

The New England study gives us a concrete view of the gradual erosion of
parental influence in favor of the new community pattern. Johnson explores the
hypothesis that this new pattern is the result of inmigration of children from the merged
area, and Yang (2009) provides the calculation that no more than 20% of children with
merged systems would be required to effect this sudden change.

Table 6. Distinctness scores for Attleboro 8th grade subjects cross tabulated by parents'
dialect origins.

	distinct mother	merged mother
distinct father	2.59 (N=24)	0.83 (N=6)
merged father	1.67 (N=6)	0.70 (N=37)

Though parents' influence may be eroded, there is reason to think that it is not completely eliminated as children mature. Perhaps the most abrupt break between parents and children is found when a pidgin with no native speakers shifts to a creole as a generation of children grow up with this as their first language. Sankoff studied this process in the development of the future marker BAI of Tok Pisin. Adults tended to give this formative secondary stress, realizing 'He will go' as /em bai i-go/, while children tended to reduce /bai/ to [bə] or even [b]. Figure 7 shows the major shift in secondary stress in this community from parents at 35 to 70% to children at 5 to 45%. However, the lines connecting parents to children remain parallel, indicating that parental influence continues even when children have absorbed the new community norms.

Figure 7. Percent secondary stress on future marker BAI by parents and children (source: G. Sankoff).
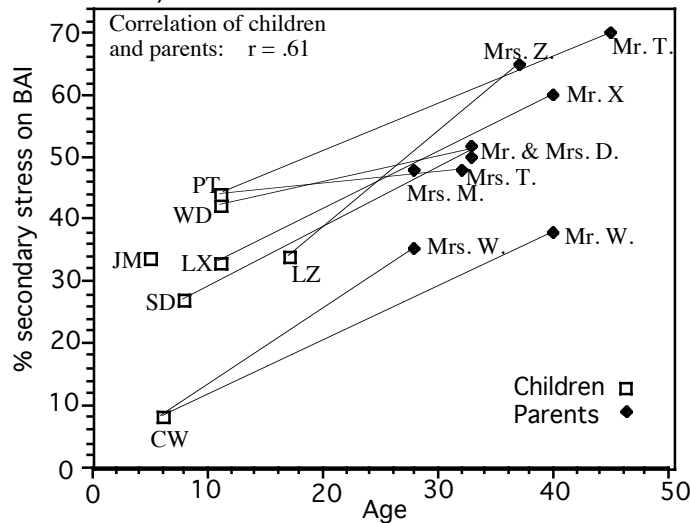
3.2. Change from below.

We can observe internal change, change from within the system, in the Philadelphia pattern of short-a tensing. This distribution is not fixed but shows accretion of new environments. One such environment is short-a before nasals in open syllables. In the Philadelphia Neighborhood Study of the 1970s showed lexical diffusion to 5 of 41 words of this phonotactic shape: *planet, flannel, manage, camera.* Table 7 shows that adults in the 1970s had only a moderate degree of tensing of *planet* while children 3 to 5

yeaars old in 1990 had increased the level to 93%. More recently, Brody 2008 found that both children and adults in the same South Philadelphia neighborhood had reached 100% tensing of *planet* but 100% lax pronunciation of all other words in this environment. The target of language learning for Philadelphia children is therefore not the pattern of their parents but an updated pattern which contains an age vector. How that vector is acquired by 3 year old children is a problem that lies at the forefront of our efforts to understand the mechanism of linguistic change.

Table 7. Tensing of short-a before intervocalic /n/ by adults and children in Philadelphia (from Roberts and Labov 1995).

	Adults 8-80 1974-77		Children 3-5 1990	
	N	%	N	%
All _NV	256	0.04	250	57
planet	17	18	134	93
Janet	3	0	41	37
hammer	3	0	28	4

In addition to this isolated case of lexical diffusion, Philadelphia is characterized by a series of regular sound changes which affects all words with a given phoneme. Let us now turn to community distribution of these sound changes across generations and what it means to the language learner. Figure 8a is a scattergram showing the distribution of individual mean values for the fronting of /aw/ in Philadelphia by age and social class. The lines are partial regression lines for individual social class groups, with slopes and intercepts calculated separately for each.[1]

The lower working class shows no participation in the change, with a flat regression line. The solid dark regression line for the lower middle class shows the steepest slope, indicating the highest rate of change, while the upper working class (black dashed line) is just behind.

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[1] The social class groups represent divisions of a 16-point index equally weighted for education, occupation and house value. For details see Chapter 5 of Labov 2001.

The most striking and important feature of Figure 8a is the parallelism of the regression lines for the upper working class, lower middle class, middle middle class, and upper class. The 13 upper class speakers (barred line) show a slope parallel to the slope of the leading group, the lower middle class. The r-correlation of the 31 upper working class subjects with age is -.57; for the 13 upper class subjects, -.66. Both correlations are significant at p < .01. This means that in every social class and every generation, children acquire linguistic targets which are different from their parents. What information do children obtain from their daily experience which directs their learning patterns to these progressively advanced targets? One explanation of the diffusion across social classes that has been advanced is that speakers copy the linguistic forms of groups which they take as reference groups, that these "acts of identity" are symbolic tokens of claims for membership in those groups (Sturtevant 1947, Le Page & Tabouret Keller 1985. Whatever the cause of this remarkable uniformity in the direction of change, this logic does not apply here. Children of the Philadelphia upper class are specifically instructed that they are *not* middle class. It is inconceivable that they are motivated to adopt progressively fronter forms of /aw/ by the desire — conscious or unconscious — to be identified with the middle class or the upper working class.

Figure 8a. Scatterplot of the fronting of (aw) by age and socioeconomic class, with partial regression lines for social classes, from the Philadelphia Neighborhood Study [N=112]. LWC = lower working class; UWC = upper working class; LMC = lower middle class; MMC = middle middle class; UMC = upper middle class; UC = upper class.
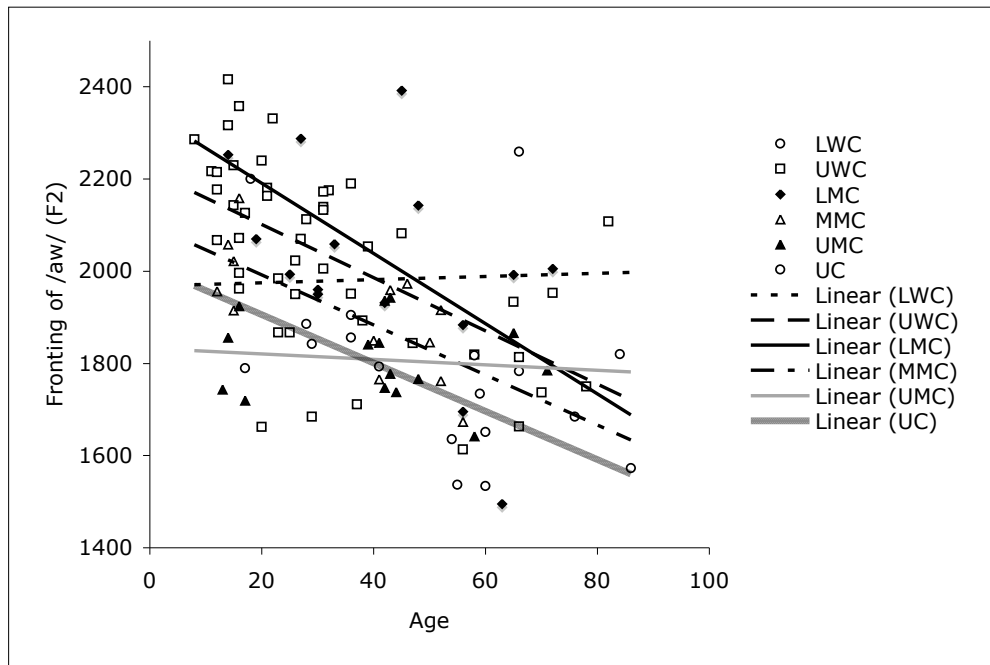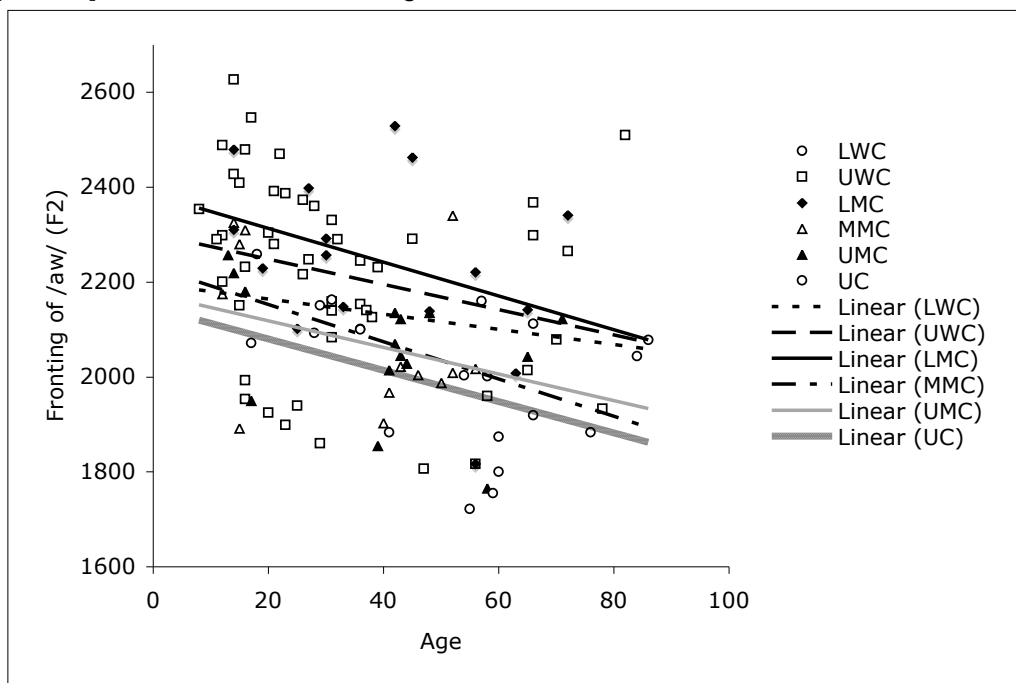

Figure 8b. Scatterplot of the fronting of (eyC) by age and socioeconomic class, with partial regression lines for social classes, from the Philadelphia Neighborhood Study [N=112]. Social classes as in Figure 6a.
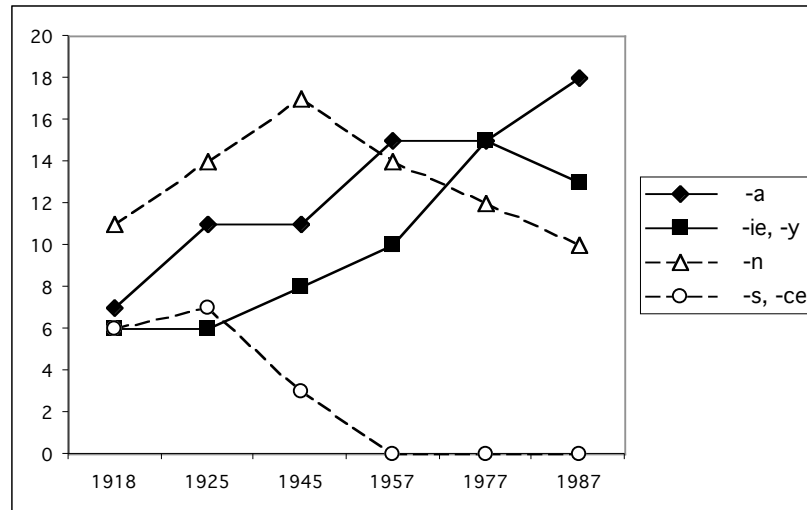
3.1. The ratchet principle.

If the vowel system learned by every Philadelphian moves steadily ahead of the vowel systems of their parents, how does the language learner acquire this new target? One possibility can be drawn from Lieberson's study of patterns in the popularity of personal names. Lieberson (2000) reviews the massive data that show how this choice follows long-term trends for 80 to 100 years in the same direction.[2]

Figure 9 plots endings of the 50 most common names for girls born in Illinois from 1918 to 1987. Names ending in -*a*, like *Rebecca, Eva* and *Julia*, have shown a steady increase over this period, along with names ending in –*ie* or –*y* like *Amy,* while the choice of names ending in –*n* (*Jane*) and -*s* (*Alice, Doris, Janice*) has declined.

While some sociologists have attributed the rise of fashions in personal names to conscious imitation of celebrities who carry those names, Lieberson shows that in almost every case the celebrity's name was already on the increase, responding to the social evaluation that was already present. As with linguistic change, the mass media follows community change after some interval in time: they reflect change rather than generate it.

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[2] Four years after Lieberson named his daughter *Rebecca,* he found a half-dozen Rebeccas responding when he called his daughter's name at preschool. I had the same experience with my own daughter Rebecca.

Figure 9. Endings of 50 most common girls' names in Illinois, 1918-1987 (Lieberson 2000)

Lieberson argues that such long-term trends are the product of a structural factor, the "ratchet principle", which operates independently of other pressures in social life. When a feature of social behavior is recognized as "new", forms that shift further in that direction will be preferred as being in fashion, and older forms will be dispreferred as being out of fashion. The parallel between fashion in clothes and sound change is striking. Like vowels, skirts can only descend or rise within limits. Lieberson argues that when that limit is reached, the change may be reversed, but the ratchet principle is not violated, since the reversal is accompanied by other changes. In sound change, [e:] may rise to a limiting height of [i:], but then descend to [ɪy] and [əy] after diphthongizing.

Volume 1 of *Principles of Linguistic Change* sets out a number of unidirectional principles that predict and control the path of linguistic change, and Chapter 6 of volume 3 goes further in this direction. For some of these principles, like the expansion of mergers at the expense of distinctions, we have a satisfactory explanation: for others, like the raising of long vowels in chain shifts, we do not. The ratchet principle gives us another account for the unidirectional character of linguistic change. It shows us that systematic social change does not necessarily involve conscious choice, and that a wide variety of changes can be driven by a structural principle of great generality. But it does not define for us the linguistic correlate of "in fashion" or "out of fashion." Furthermore, the data on personal names reflects unconscious influence on conscious choices made by

adults; it does not bear directly on the behavior of children in the process of forming and solidifying their linguistic systems. Data on personal names reflects regional trends, but it is not detailed enough to tell us whether members of all social groups are making the same choices or moving in the same direction. These data do demonstrate most clearly that our individual choices are constrained by long-range powerful constraints that we are not aware of—social facts as Durkheim defined them.

4. Uniformity and divergence on a larger scale

Recent studies of large metropolitan areas — New York, Philadelphia, Montreal, Detroit, etc. — have all indicated that they are geographic unities. The *Atlas of North American English* shows us geographic uniformity on a much larger scale, with a great many cities moving in the same direction. The Northern Cities Shift is a systematic rotation of six short vowels shown in Figure 10, the defining linguistic characteristic of the region around the Great Lakes of North America, known as the Inland North. Figure 11 shows the remarkable geographic uniformity of this chain shift, in this case illustrated by the UD criterion:; that wedge, the STRUT vowe], is located further back in the vowel system than short /o/ (the vowel of *LoT)*. The agreement on this criterion is overwhelming: the homogeneity within the region is .87; the consistency with which the black symbols are located within the Inland North is .85. Above the North/Midland boundary we see an overwhelming concentration of black symbols; below the boundary practically none.
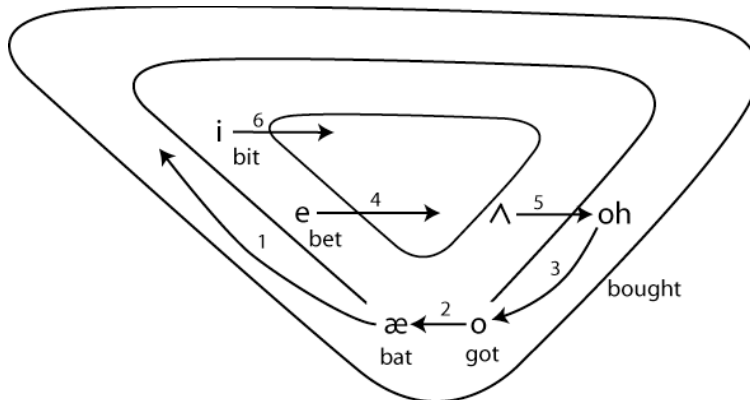
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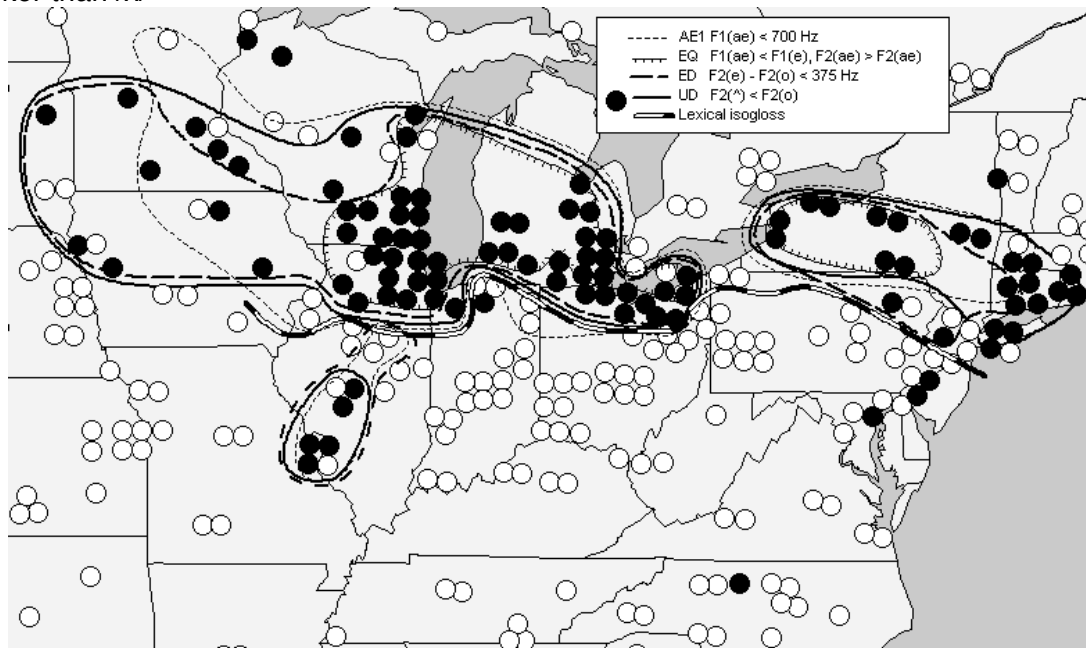
Figure 10. The Northern Cities Shift

Figure 11. Uniformity of the Inland North as defined by four coinciding isoglosses. Black symbols: speakers satisfying the UD criterion: /ʌ/ is backer than /o/. White symbols: /o/ is backer than /ʌ/


The uniformity of the geographic distribution in Figure 9 is characteristic of the ANAE results as a whole. The vowel systems of North American English were studied by a sample of 762 subjects in 323 communities, representing all 223 cities with a population of over 50,000 in 1990. It was not possible to confine the study to speakers whose parents were local to the area, since in many regions of the South and West they form a very small percentage of the population. The first two speakers who answered their telephone and answered "Yes" to the question "Did you grow up in (this city)?" were accepted as representative of that city. Given the mobility of the North American population, it was inevitable that a large proportion of these subjects grew up with parents who spoke a dialect quite different from the community, just like the children in King of Prussia. If we add to this the influence of friends and neighbors who were not local, one might expect that the end result would be maps of a pepper-and-salt pattern in which the local dialect was obscured by individual variation. Instead, the *Atlas* shows remarkably uniform displays similar to that of Figure 11.   Measures of homogeneity and consistency are almost all above .80 (ANAE Ch. 11). The consolidation of community

dialects seen in King of Prussia is characteristic of the larger speech communities of the U.S.

For each generation of speakers growing up in the Northern dialect area, children may acquire the community pattern: a relatively back position of wedge. Figure 12 shows that the opposition between backed /ʌ/ in the North and fronted /ʌ/ in the Midland is a recent creation. There is no significant difference for those speakers above 60 years of age, and there is no overlap for the speakers under 20. Multiple regression analyses of the second formant of /ʌ/ show in the North an age coefficient of 22.8 Hz for each 20 years of age (F2 becoming lower for younger speakers), and in the Midland, the opposite direction of -24.8 for each 20 years. This means that in each region, children depart from their parents' system in the opposite direction. The question then remains, what do language learners in the North learn about the social significance of linguistic variables that differentiate them from language learners in the Midland?

There are two basic routes to follow in attempting to answer this question. One is mechanical momentum, following unidirectional principles of chain shifting. Chain shifting itself can be seen as the product of a mechanical process of probability matching, where mean targets shift automatically in the direction of greater margins of security (Labov 1994: 586-7). Thus the Northern Cities Shift can be seen as a series of re-adjustments following the early 19th century generalized tensing of short-a in New York State, which created a gap in the system of short vowels. Children who acquire systems undergoing chain shifting will realize each element of the shift in a progressively more advanced form.

Figure 12. Second formant of /o/ by age in the North and in the Midland.
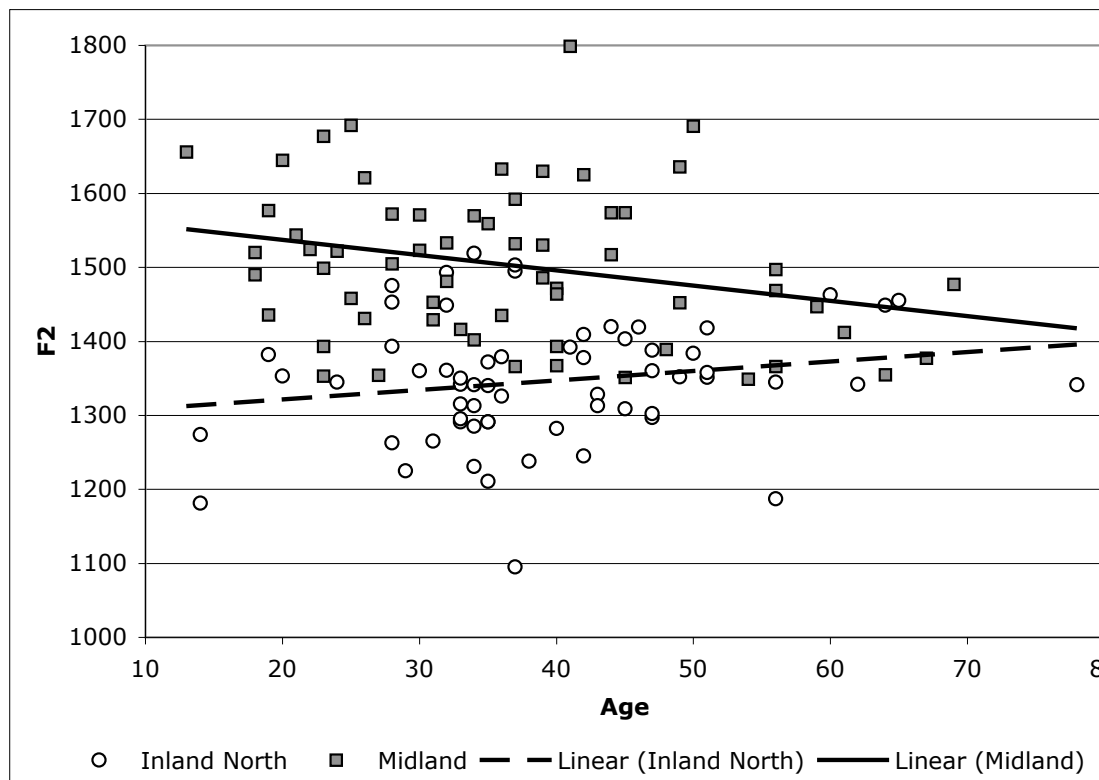
If we add to this the ratchet principle, no further assessment of the social meaning of forms is required other than the ability to distinguish a "new" variant from an "old" one. One might see the opposing movements of the wedge vowel, and the accompanying rotation of the Northern Cities Shift as a whole, as reflecting the operation of the ratchet principle in opposite directions. Given the two different directions of movement, Midland children may perceive back wedge as old-fashioned and fronted wedge as in fashion; while Northern children may have the reverse perception. The difference directions followed by the North and the Midland would then be the result of the logical development of initial changes which set off two opposing sets of unidirectional changes. This model can be developed in much greater detail in the North than in the Midland, which lacks the linguistic uniformity of the North.

4.1. The acquisition of social values.

We have good evidence of the correlation of the Northern Cities Shift with social dimensions, primarily from Eckert's intensive study of adolescents in Detroit area high schools (2000). The backing of /ʌ / was quite prominent in her study; in fact, it was

Eckert who first discovered this most recent link in this vowel rotation. Table 8 shows that this sound change is strongly related to membership in *Burnout* social networks: Burnouts being that non-conformist group most alienated from adult norms. The more complete the speaker's participation in this local community of practice, the more likely they were to use strongly backed versions of /ʌ /. Eckert leaves no doubt that language learners in this area acquire the association of /ʌ / backing with Burnout behavior. In this case, gender differences are not significant.

Table 8. Factor weights for advanced tokens of fronting of / ʌ / by gender and social group in a Detroit high school (from Table 5.7, Eckert 2000).

Burnout girls	Burnout boys	Jock girls	Jock boys
.79	.63	.22	.30

Given this finding, how then do we account for the pattern of Figure 9, which indicates that this is not a local phenomenon in any way peculiar to Detroit? How does it come about that language learners throughout this vast area, involving 88,000 square miles and 34 million people, have all shifted in the same direction? One possibility, a very likely one, is that Eckert's analysis of the social class situation in the Detroit high schools applies generally throughout the North. Thus the backing of wedge may be seen as a symbol of resistance to the corporate structure of the educational system in Rochester, Syracuse, Buffalo, Cleveland, Detroit, Chicago, Milwaukee, and all the smaller cities in between.

However, uniformity within the Inland North must be confronted with the sharp divergence between the North and the Midland. We have no reason to believe that a similar analysis of opposing social values would not apply to Midland high schools.[3] In fact, one such study has been carried out. Habick (1980, 1991) reports an acoustic study of the vowel systems of high school students in Farmer City, a Midland community in northern Illinois. His account of the social networks is parallel to Eckert's: the two leading groups were opposed by their conformity to or resistance to adult norms of

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[3] Eckert's 1989 social analysis of the high school, *Jocks and Burnouts*, is widely used in schools of education throughout the country.

behavior. The non-conformist group called themselves "Burnouts", as in Eckert's work. The conformist group, equivalent to Eckert's *Jocks,* called themselves "Rednecks". As in Eckert's work, the non-conformist youth were in the advance of recent changes in progress. In the Midland community, this involved the fronting of /ʌ/, rather than backing. Table 9 shows the number of individuals whose acoustic analysis shows extreme fronting and overlapping with /e/, those with a close approximation to /e/, and those with a central /ʌ/, far from /e/. Burnouts are strongly in the lead in this sound change, Rednecks follow, and the older generations are far behind.[4] We might then propose that whatever sound changes are occurring will be interpreted by adolescents as symbols of nonconformity to the established system and seized as ways to accentuate their local identity.

Table 9. Distribution of fronting of /ʌ/ by social groups in Farmer City, Illinois (based on Table 9-2, Habick 1980)

| Group	Distance from /e/		
	Overlapped	Close	Far
Burnout	6	3	0
Redneck	3	6	1
Parents	1	2	4
Grandparents	0	1	5
Kentucky	0	0	7

The concept of local identity applies well to small rural communities (Martha's Vineyard (Labov 1963), Ocracoke (Wolfram 1994). But such local values do not account for the larger uniformities that are displayed here. We have to consider that the sound shifts in progress are associated with regional values that transcend face-to-face interaction, and that these associations of linguistic systems with regional values are within the cognitive purview of adolescent language learners. To pursue this concept further, we have to examine the origins of the North/Midland division.

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[4] The fact that this is a North Midland characteristic, is emphasized by the comparison with a group of recent immigrants from Kentucky, a South Midland area, who showed no fronting at all.

5. The effect of settlement and communication patterns

We can trace the North/Midland opposition of linguistic systems to the settlement patterns of the mid 19th century. Figure 13 shows the distinct streams of westward settlement reflected in the study of house construction patterns by Kniffen and Glassie 1966. The northern settlement stream came from New England Yankee communities, while the Midland area was settled by people from the Quaker Philadelphia area and Upland Southerners from Appalachia. The boundaries between these two settlement streams falls along on the boundary of Northern and Midland dialect areas, reflected both in lexicon and chain shifting (the barred black and white isogloss in Figure 9). The boundary passes south of the northern tier of counties in Pennsylvania, south of the Western Reserve in the Cleveland area, shifts towards the northern edge of Indiana and then southward to include the northern third of Illinois.

Figure 13. Westward settlement streams as shown by building material. Source: Kniffen and Glassie 1966: Fig.27
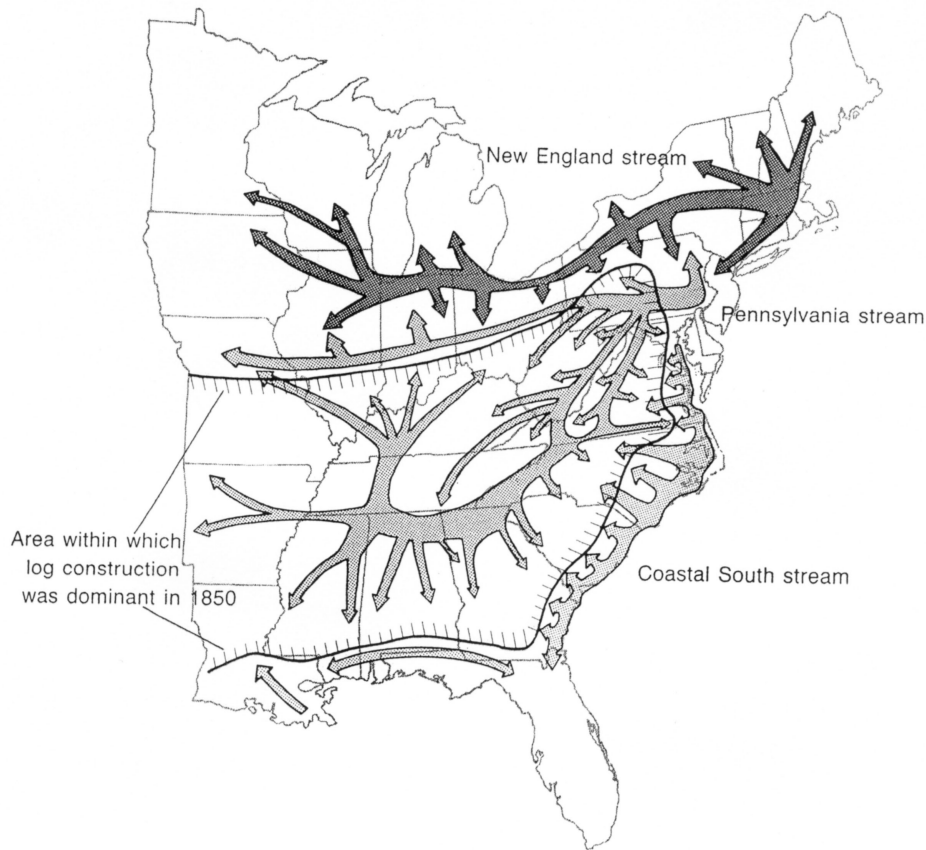

The triggering event for the Northern Cities Shift may be traced to the formation of a koine in the short-a patterns of western New York State in the course of the great population movements initiated by the construction of the Erie Canal (Labov 1985; in press Ch. 5). This pattern was transmitted to the regions around the Great Lakes by Yankee settlers and over the course of time led to increasing differentiation from Midland vowel systems. Given the fact that the differentiation dates back 150 years, the central problem remains: how is that differentiation maintained? One might suppose that present-day communication patterns continue these settlement histories, and that the North/Midland boundary would follow Bloomfield's generalization:

> When any innovation in the way of speaking spreads over a district, the limit of this spread is sure to be along some lines of weakness in the network of oral communication, (1933:476)

However, the opposite seems to be the case. Airline traffic and telephone circuits link the Inland North cities of Syracuse, Rochester and Buffalo with New York City, not Chicago; the Midland cities of Columbus, Indianapolis and Chicago are tightly tied to the Northern city of Chicago. Figure 14 shows the communication patterns of the U.S. as calculated by Thiemann et al. 2009 from an analysis of the movement of 8.97 million notations of currency movement.[5] The North/Midland boundary in northern Pennsylvania does fall along a trough in communication (confirming findings from average daily traffic flow reported in Labov 1974). But there is no red line indicating boundaries of communication density anywhere near the North/Midland line. It is evident that the North/Midland boundary does not represent a break in the network of communication. On the contrary, it is orthogonal to communicative patterns and requires some other explanation. We need to account for the inhibition against accommodation of speakers on either side of the North/Midland boundary who for a century and a half have avoided influencing each others' vowel systems.

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[5] Data derived from the website wheresgeorge.com. See Brockmann et al.

Figure 14. Border identification based on currency flux. Blue = modularity maximum. Links are drawn from the frequency with which they appear in shortest-path tree clustering. Red = borders based on height in the clustering tree. (from Thiemann et al. 2010, Figure 4b).
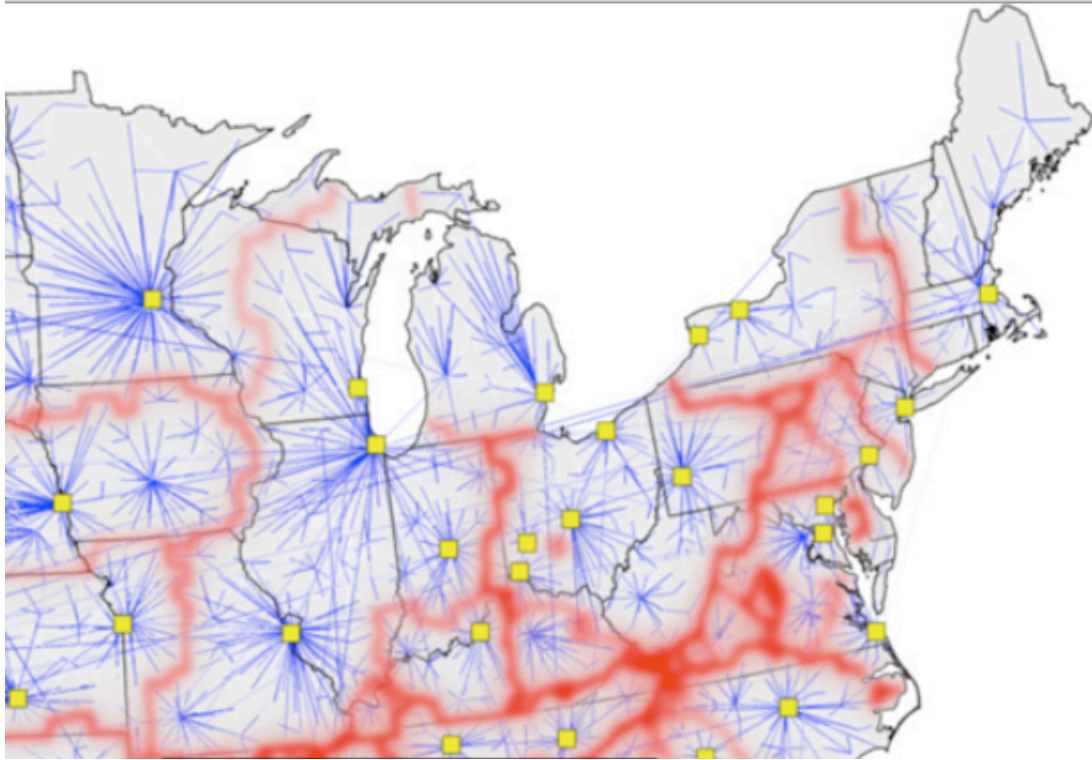
6. The acquisition of cultural values

We now turn to the possibility that the absence of linguistic influence across this boundary is the result of opposing value systems attributed to these opposing linguistic systems and that such attributions are available to language learners. Chapter 10 of Labov 2010 develops this thesis in some detail with many citations of the cultural clash between the Yankee and Midland settlers in Ohio, Indiana and Iowa. Yankees moved in huge populations together; built cities, schools and universities; and imposed their moral judgments on the rest of the world.

Taxed with being busybodies and meddlers, apologists own that the instinct for meddling, as divine as that of self-reservation, runs in the Yankee blood; that the typical New Englander was entirely unable, when there were wrongs to be corrected, to mind his own business. –(Power 1953: 6)

The Yankee view of the Midland settlers was equally negative. Those who moved as individuals or families were often identified as "Southerners", along with those coming North from Appalachia:

> In McLean County, Illinois, "the Northerner thought of the Southerner as a lean, lank, lazy creature, burrowing in a hut, and rioting in whiskey, dirt and ignorance"
>
> (History of McLean County 1879:97)

These testimonies of cultural conflict indicate that isolation was not the source of differentiation: there was plenty of contact between Yankee and Midland settlers.[6] We learn that the cultural conflict was maintained along very same line that marks the linguistic opposition, from Figure 15, based on an entirely different type of data. This is the work of the political scientist Daniel Elazar, who developed a framework for characterizing the political cultures of the U.S.

Moralistic. This group expects the government to help people achieve good lives. Governmental service is "public service." The community can intervene in private affairs if it serves communal goals.

Individualistic. This group views government in utilitarian, individualist terms. Politics is a business, like any other, which is dominated by "firms" (parties). Government should not interfere much in individuals' lives.

Traditionalistic. This group combines hierarchical views of society with ambivalence about the "government-as-marketplace." Popular participation is scarcely important in comparison with elite participation. There is also a strong preference to maintain the status quo, as evidenced by the South's general resistance to the Civil Rights movement.

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[6] Further evidence showed that the fundamental source of conflict was over positions on slavery (Labov in press, CH. 10). The moralistic position of many Yankee preachers frequently centered on the expressed need to denounce slavery and to sever ties with any church that tolerated it.

Figure 15. Distribution of political cultures in North America (from Kilpinen 2009, based on Elazar 1972, Fig. 11)[7]

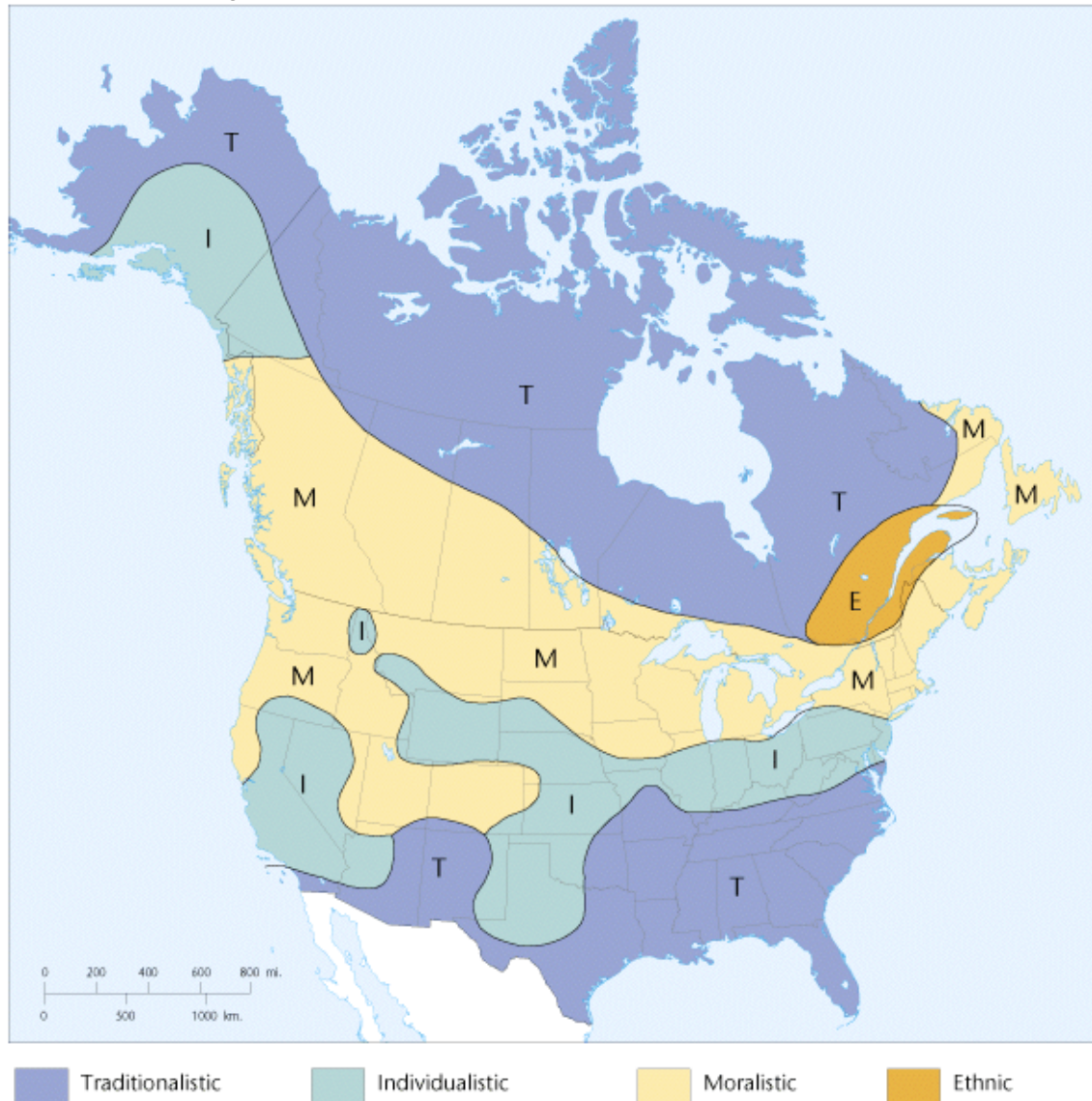Traditionalistic   Individualistic   Moralistic   Ethnic

Figure 15 is based on a very large number of community studies quite independent of any dialect data, but it is evident that the distribution of these three political cultures coincides with the dialect regions North, Midland and South. The

[7] The label "Ethnic" identifies communities where political culture is dominated by the needs and interests of ethnic groups distinct from the general population.

characteristics of the moralistic group fit closely the Yankee traits described by the various historians cited above, and the individualistic group displays the opposition to Yankee reliance on control through governmental action that is attributed to Upland Southern inhabitants of the Midland. Chapters 10 and 11 of PLC 3 develop further the historical and experimental evidence for the association of regional dialects with value systems. The political implications of Figure 13 are underlined by the finding that the Northern dialect area coincides with the Blue States of the 2004 Kerry/Bush election and that long-term cultural differences in attitudes towards racial inequality are correlated with both the political and linguistic developments.

7. From local nonconformity to community norms.

From the evidence put forward here, we see the possibility that the development and maintenance of the North/Midland opposition has been favored by association with large scale opposing cultural factors. We also see evidence that on the local scale, linguistic change is led initially by local groups who conform minimally to community norms. This is a puzzle; how are the new linguistic impulses acquired by the majority of language learners who will become the dominant exponents of the dialect of next generation? The key to this question may be found from two converging findings. (1) The leaders of linguistic change in the adult community are not lower class drop-outs, but high status adults in the local community with a history of local activism (Labov 2001, Ch. 12), and (2) the majority in the high school population are not the extreme polar groups, but those self-characterized as "in-betweens" (Eckert 2000, Habick 1980). The inference is that the new linguistic forms are adopted by those who sympathize and associate themselves with Burnout symbols, but maintain a path of upward mobility, using educational routes to upward social mobility and skilled occupations. The new linguistic forms then achieve respectability, and become associated with the dominant norms that are modeled for the next generation.

We must still confront the uniformity of rapidly evolving regional dialects of North America and their association with opposing value systems. The question may be raised as to how salient these value systems are for adolescent leaders of linguistic change. The cultural associations of the Southern Shift and the Southern dialect region,

which I have not examined here, are so salient that they hardly need further investigation (Preston 1987, 1996).

7. Conclusion

On the whole, we cannot doubt the importance of studying linguistic variation in face-to-face interaction. Recent ethnographic work has illuminated our understanding of how linguistic influence flows across social networks, and how the face-to-face negotiation of personal identity accelerates the shift of targets in the course of change in progress. But the larger uniformities shown here, in both the slope of variation and the structural base for variation, require further inquiry into what the language learner must know. The problem was confronted by Fridland (2000) when her study of Memphis showed the same trend of glide weakening of /ay/ across white and black populations, though there was very little communication between them. Searching for the social base for such uniformity, she argued that "these shared practices do not necessarily require individuals' social cohesion but merely require shared historical experience and a strongly circumscribing environment that places speakers in a similar social position relative to the external social world." These are the cultural factors that the cognitive apparatus of the language learner must grasp. The same argument would apply to the uniformity of the direction of linguistic change in metropolitan communities like Philadelphia and in the Inland North as a whole.

We then have gained some idea of what is to be learned, and how the language learner looks outward to master the broader community patterns. But we do not know how the language learner acquires this knowledge of the association of cultural patterns with linguistic systems. We think immediately of the mass media as a source of hints, jokes, stereotypes and implicit understandings. Yet whatever information comes from the posturing of actors and the self-corrections of announcers, it is distributed evenly across the North/Midland line, and might well be absorbed by language learners on both sides of the fence. Somehow, high school students in Midland cities like Columbus must understand that the peers they meet from Northern cities like Cleveland are not models of linguistic influence: they are playing a different game with different rules and different

stakes. One may say that this is no more difficult to understand than the confrontation of any two cultural configurations, but that does not make it less challenging for the linguist.

There is one concrete direction for research that may lead to greater understanding in the future. Studies of social networks identify the importance of weak ties in identifying the leaders of linguistic change and diffusion. But we see this from studies within the community. We have not followed the flow of linguistic influence to those leaders across weak ties by recording the broader interactions that might be the conduits of linguistic influence across metropolitan areas. We identify block captains in our local neighborhoods but we have not recorded the meetings that bring block captains together across the city. We have recorded conversations among basketball players, but not the exchanges between teams in competition; we have not followed the linguistic consequences of interstate competition. Probably the one area where such cross-cutting influences can most easily be observed is in the university but the study of university students and their conservative dialect-leveling carries us further than we want to go from the leaders of linguistic change.

The study of linguistic variation is sometimes pursued as a way of showing how different people are from one another. And it is perfectly true that the larger our data base becomes, the more subtle differences among subgroups of the population will be found to reach levels of statistical significance. I have tried to turn the focus away from those minor subdivisions and ask us to account for the breathtaking uniformities that result from the outward orientation of the language learning faculty. Along with those uniformities we find abrupt discontinuities between black and white, North and Midland, Canada and the U.S. For each such division, we can search for a first explanation in the absence of communication among language learners. Given no such discontinuity, explanation may be found in the compatibility of the linguistic structures involved. A third possibility is inhibition from opposing cultural values, but the input to the cognitive processes of the language learners remains to be determined.