

7 | On the Mechanism of Linguistic Change

IN our studies of Martha's Vineyard and the New York City speech community, regular relations have been found where previous reports showed chaotic oscillation or massive free variation. These findings have enabled us to state a number of sociolinguistic principles concerning the relations of stylistic variation, class stratification, and subjective evaluation. In other studies, such data have been applied to general problems of linguistic structure: particularly, the characterization of linguistic rules (see Ch. 8). The most general issues that have been raised so far concern the explanation of linguistic change, and in this chapter we will attempt to focus the data assembled so far on the mechanism of linguistic change, specifically, sound change.

The Problems of Linguistic Evolution

Despite the achievements of 19th-century historical linguistics, many avenues to the study of linguistic change remain unexplored. In 1905, Meillet (1921:16) noted that all of the laws of linguistic history that had been discovered were merely possibilities:

... it remains for us to discover the variables which permit or incite the possibilities thus recognized.

The problem as we face it today is precisely that which Meillet outlined over 60 years ago, for little progress has been made in ascertaining the empirical factors which condition historical change. The chief problems of linguistic evolution might be summarized as five questions:

1. Is there an overall direction of linguistic evolution?

2. What are the universal constraints upon linguistic change?
3. What are the causes of the continual origination of new linguistic changes?
4. By what mechanism do changes proceed?
5. Is there an adaptive function to linguistic evolution?¹

One approach to linguistic evolution is to study changes completed in the past. This has of course been the major strategy of historical linguistics, and it is the only possible approach to the first two questions—the direction of linguistic evolution, and the universal constraints upon change. On the other hand, the questions of the mechanism of change, the inciting causes of change, and the adaptive functions of change are best analyzed by studying in detail linguistic changes in progress. The mechanism of linguistic change will be the chief topic of the discussion to follow; however, many of the conclusions will plainly be relevant to the questions of inciting causes and adaptive functions of change, and it will be apparent that more complete answers to these questions will require methods similar to those used here.

An essential presupposition of this line of research is a uniformitarian doctrine: that is, the claim that the same mechanisms which operated to produce the large-scale changes of the past may be observed operating in the current changes taking place around us.

A Strategy for the Study of Linguistic Changes in Progress

Although answers to the five questions given above are the ultimate goals of our current research, they do not represent the actual strategy used. For the empirical study of changes in progress, the task can be subdivided into three separate problems which jointly serve to answer the questions raised above.

1. The *transition* problem is to find the route by which one stage of a linguistic change has evolved from an earlier stage. We wish to trace enough of the intervening stages so that we can eliminate all but one of the major alternatives. Thus questions of the regu-

1. This question is all the more puzzling when we contrast linguistic with biological evolution. It is difficult to discuss the evolution of the plant and animal kingdoms without some reference to adaptation to various environments. But what conceivable adaptive function is served by the efflorescence of the Indo-European family? On this topic, see Hymes 1961 and Ch. 9.

larity of sound change, of grammatical influence on sound change, of "push chains" versus "pull chains," of steady movement versus sudden and discontinuous shifts, are all aspects of the transition problem.

2. The *embedding* problem is to find the continuous matrix of social and linguistic behavior in which the linguistic change is carried. The principal route to the solution is through the discovery of correlations between elements of the linguistic system, and between those elements and the nonlinguistic system of social behavior. The correlations are established by strong proof of concomitant variation: that is, by showing that a small change in the independent variable is regularly accompanied by a change of the linguistic variable in a predictable direction.²
3. The *evaluation* problem is to find the subjective (or latent) correlates of the objective (or manifest) changes which have been observed. The indirect approach to this problem correlates the general attitudes and aspirations of the informants with their linguistic behavior. The more direct approach is to measure the unconscious subjective reactions of the informants to values of the linguistic variable itself.

With tentative solutions to these problems in hand, it would be possible to provide an explanation of a linguistic change which answers the three questions of inciting cause, mechanism, and adaptive function.³ As in any other investigation, the value of an explanation rises in relation to its generality, but only to the extent that it rests upon a foundation of reliable and reproducible evidence.

2. The concept of the linguistic variable is that developed in Labov 1966a and reflected in Ch. 2. It is further developed in the notion of variable constraints on variable rules (Ch. 8). The definition of such a variable amounts to an empirical assertion of covariation, within or without the linguistic system. It appears that the fundamental difference between an explanation of a linguistic change, and a description, is that a description makes no such assertion. In terms of a description of change, such as that provided by Halle 1962 there is no greater probability of the change taking place in the observed direction, as in the reverse direction. Note that the embedding problem is presented here as a single problem, despite the fact that there are two distinct aspects: correlations within the linguistic system, and with elements outside the system. The main body of this chapter provides justification for this decision.

3. To these three problems we can add the *constraints* problem and the *actuation* problem as developed in Weinreich, Labov, and Herzog 1968. The search for general

The Observation of Sound Change

The simplest data that will establish the existence of a linguistic change is a set of observations of two successive generations of speakers—generations of comparable social characteristics which represent stages in the evolution of the same speech community. Hermann (1929) obtained such data at Charmey in 1929, by developing Gauchat's (1905) original observations of 1899. We have such data for Martha's Vineyard, adding the 1961 observations to the 1933 data of the Linguistic Atlas (Kurath et al. 1941). For New York City, we add the current data of 1963 to the Linguistic Atlas data of 1940; in addition, we have many other reports, including the excellent observations of Babbitt in 1896 to add further time depth to our analysis (Frank 1948; Kurath and McDavid 1951; Hubbell 1950; Babbitt 1896).

Solutions to the transition problem proposed here will depend upon close analysis of the distribution of linguistic forms in *apparent time*—that is, along the dimension formed by the age groups of the present population. Such an analysis is possible only because the original simple description of change in *real time* enables us to distinguish age-grading in the present population from the effects of linguistic change (Hockett 1950).

The evidence obtained in the research reported here indicates that the regular process of sound change can be isolated and recorded by observations across two generations. This process is characterized by a rapid development of some units of a phonetic subsystem, while other units remain relatively constant. It affects word classes as a whole, rather than individual words: yet these classes may be defined by a variety of conditions, morphophonemic and grammatical as well as phonetic. It is regular, but more in the outcome than in its inception or its development. Furthermore, it appears that the process of sound change is not an autonomous movement within the confines of a linguistic system, but rather a complex response to many aspects of human behavior.

Some comment is required on the possibility of observing regular sound change, since arguments inherited from the neo-grammarians

constraints on sound change is one theme in our current work on sound change in progress (Labov, Yaeger, and Steiner 1972). Some progress on the actuation riddle is suggested by the conclusion of this chapter.

controversy have impeded the progress of empirical research in this area. The inheritors of the neo-grammarians tradition, who should be most interested in the empirical study of regular change in progress, have abandoned the arena of meaningful research in favor of abstract and speculative arguments. Indeed, Bloomfield (1933:347, 365) and Hockett (1958:439,444) have maintained that phonetic change cannot in principle be observed by any of the techniques currently available.⁴ Hockett has proceeded to identify sound change with a level of random fluctuations in the action of the articulatory apparatus, without any inherent direction, a drift of the articulatory target which has no cognitive, expressive or social significance.⁵ All of the empirical observations of change in progress which have been reported are explained as the results of a complex process of borrowing, and are relegated to a type of linguistic behavior known as the fluctuation or conflict of forms. No claims are made for the regularity of this process, and so the basic tenet of the regularity of sound change has been deprived of all empirical significance. Furthermore, the changes which actually are observed are regarded as unsystematic phenomena, to be discussed with anecdotal evidence, subject to forces "quite outside the linguist's reach," factors which "elude our grasp," fluctuations "beyond our powers" to record (Bloomfield 1933:343-68).

The evidence of current research suggests that this retreat was premature, that the regular process of sound change can be observed by empirical methods. The refinements in methodology called for are not the mechanical elaborations suggested by the writers cited above; for the mere multiplication of data only confounds analysis

4. Hockett writes: "No one has yet observed sound change: we have only been able to detect it via its consequences. We shall see later that a more nearly direct observation would be theoretically possible, if impractical, but any ostensible report of such an observation so far must be discredited." His theoretical proposal is that "over a period of fifty years we made, each month, a thousand accurate acoustic records . . . all from the members of a tight-knit community." The suggestion to multiply the data in this way is not necessarily helpful, as the experience of sociological survey analysts has shown: for relatively small numbers are needed to measure change in a population if the bias of selection is eliminated or minimized. Otherwise, we merely multiply the errors of measurement.

5. According to Hockett, the variables responsible for sound change include "the amount of moisture in the throat, nose and mouth of the speaker, random currents in his central nervous system, muscular tics . . . the condition of the hearer's outer ear [presence of wax or dirt] . . ." (1958:443-444).

and perpetuates the bias of selection. It is rigor in the analysis of a population and in the selection of informants which is required. Furthermore, we need ingenuity in the resolution of stylistic variation, to go beyond the sterile method of endless dissection into idiolects. With such techniques, we find that regularity emerges where only confusion was seen before. Random fluctuations in articulation can certainly be found: indeed, this is the level of "noise" which prevents us from predicting the form of every utterance which our informants will make. But it would be an error to ascribe a major role to such fluctuations in the economy of linguistic change. The forces which direct the observed changes appear to be of an entirely different order of magnitude, and the changes take place much more rapidly than any process of random drift could account for.⁶

A single example of a sound change observed will be used to illustrate the general approach to solving the transition, embedding and evaluation problems. This example is one of the simplest cases—that of the centralization of (aw) on Martha's Vineyard, discussed in Ch. 1. In the development of this case, some new evidence will be presented on the mechanism of sound changes.

The Centralization of (aw) on Martha's Vineyard

We begin with a clearcut case for the existence of a linguistic change from observations in real time. In 1933, Guy Lowman found no more than the barest trace of centralization of /aw/; the significant variation observed was the fronting of /aw/ from [aʊ] to [æʊ]. In 1961, a comparable set of older eighth-generation descendants of Yankee settlers from the same villages showed a very pronounced centralization of /aw/—now clearly the variable (aw).

The *transition* problem is studied through a detailed examination of the distribution of forms through apparent time—that is, through the various age levels in the present population. The first step in the analysis is to construct a quantitative index for discrete values of the variable:

6. Thus the following table contrasts the two points of view:

Neo-grammarians:	sound change	fluctuation of forms	ultimate regularity
Present discussion:	sublinguistic fluctuations	sound change	ultimate regularity

aw-0	[aʊ]
aw-1	[a [^] ʊ]
aw-2	[eʊ]
aw-3	[əʊ]

The index of centralization was constructed from this scale by averaging the numerical values assigned to each variant. Thus (aw)-00 would mean no centralization at all, while (aw)-300 would mean consistent centralization at the level of [əʊ]. This index was applied to interviews with 69 informants by rating each of the words in which (aw) occurred. The first approach to the transition problem can then be made by correlating average (aw) index scores for these interviews with the age level of the speakers. The first three columns of Table 7.1 (a rearranged version of Table 1.2) show a regular correlation, in which the centralization index rises regularly for four successive age levels.

The overall tendency of Table 7.1 represents an amalgamation of many different types of speakers and many different trends in the use of (aw). Fig. 7.1 presents a more detailed analysis of the transition problem for a critical subgroup. Here are displayed the percentage distribution of lexical items for eight individuals from 92 to 31 years of age. The horizontal axes show the four coded levels of the variable (aw). The vertical axes are the percentages of lexical items used with each variant. The vocabulary is broken into two sections that are tabulated separately: the solid line represents words in which (aw) is followed by a voiceless obstruent, as in *out, house, about, mouth*; the broken line represents all other words (and principally those ending in a nasal, as in *town, found*, or with no consonant final, as in *now, how*, etc.)⁷

The first diagram in Fig. 7.1 is not that of an individual, but shows the composite results for the four Linguistic Atlas informants interviewed in 1933. They show only the barest trace of centralization. The second diagram, *b*, is that of the oldest informant of 1961, a man

7. The phonetic conditioning of (aw) was actually more complex than this: both following and preceding consonants are involved. We have returned to the phonetic mechanism of the change in our recent studies of sound change in progress. Spectrographic studies confirm the gradual development of phonetic conditioning, the gradual rise in importance of a following voiceless obstruent, and the final development of discrete allophonic conditioning (Labov 1972c). The spectrographic displays suggest that there may not be a retrograde movement of the voiced environments, but rather that they are heard as the raising in voiceless environments reaches mid position.

TABLE 7.1
CENTRALIZATION INDEXES BY AGE LEVEL

Generation	Age	(aw)	(ay)
la	over 75	22	25
lb	61-75	37	35
lla	46-60	44	62
llb	31-45	88	81

92 years old. The average age of the Atlas informants was 65 years; Mr. H. H. Sr. would have been 64 years old in 1933, and so he is of the same age group. His centralization profile is quite similar to that of the Atlas informants in *a*. In *c*, we have an 87-year-old woman who shows only a slight increase in centralization. Fig. *d*, Mr. E. M., 83 years old, indicates a small but distinct increase in the occurrence of variant (aw-2). Mr. H. H. Jr., in *e*, is considerably younger; he is 61 years old, the first representative of the next generation, since he is the son of Mr. H. H. Sr. Here we have a marked increase in centralization, with both classes of words centered about a norm of (aw-1). In *f*, Mr. D. P., 57 years old, shows a distinct difference between words ending in voiceless obstruents and all others; the first are now centered upon a norm of (aw-2), while the second group is concentrated at (aw-1). This process is carried further in the speech of Mr. P. N., 52 years old, who shows perfect complementary distribution. Before voiceless obstruents, /aw/ has an allophone which is almost always (aw-2), while before other terminals it is usually uncentralized. And at this point, there is no overlap in the distribution. Finally, in *h*, the most extreme case of centralization, we see an even sharper separation: this is Mr. E. P., 31 years old, the son of Mr. D. P. in *f*.

On the right hand side of Fig. 7.1 are the figures for the actual numbers of lexical items observed, and the composite index scores for each of the eight cases. It may be noted that (aw) is only one-third as frequent as (ay), and the regularity which appears here does not require a vast corpus of observations. The regularity emerges through the controlled selection of informants, methods of elicitation, and of recording the data.

The eight diagrams of Fig. 7.1 represent the most homogeneous type of population. All of the speakers are Yankee descendants of the original settlers of the island, all are interrelated, many from the

same families, with similar attitudes towards the island. All had rural upbringing, and worked as carpenters or fishermen, with one exception. Thus the continuous development of centralization represents the very model of a neo-grammarians sound change, accomplished within two generations.

The *embedding* problem was first approached by correlating the centralization of the obviously related variables (ay) and (aw)—that is, the change of (aw) was embedded in the system of upgliding diphthongs. The Atlas records indicate a moderate degree of centralization in the 1930's, so that we know that the centralized forms of (ay) preceded the rise of (aw). The fourth column of Table 7.1 shows a close correlation of the two variables, with (ay) slightly in the lead at first, but (aw) becoming more dominant at the end. This pattern was repeated when the variables were correlated with a number of independent extralinguistic factors: the occupation, education, and geographic location of the speaker, and most importantly, the ethnic group to which he belonged. The significant differences in the transition rates of these various subgroups allowed the following statement of a solution to the embedding problem:

The centralization of (aw) was part of a more general change which began with the centralization of (ay). This initial change proceeded from a moderate level of (ay) centralization which was probably a regional and recessive trait inherited from the original settlers of the island. The increase of centralization of (ay) began in a rural community of Yankee fishermen descended directly from these original settlers. From there, it spread outward to speakers of the same ethnic group in other occupations and in other communities. The structurally symmetrical variable (aw) began to show similar tendencies early in this process. The change was also adopted by the neighboring Indian group at Gay Head, and a generation later, spread to the large Portuguese group in the more settled sections of the island. In these two ethnic groups, centralization of (aw) overtook and surpassed centralization of (ay).

Fig. 7.1 would lead us to believe that the phonetic environment of (aw) was a powerful factor in the initiation of the sound change. Moreover, we can observe that the centralization of (ay) also showed a strong tendency towards phonetic conditioning in Generation Ib, similar to that displayed for (aw) in Generation IIb.⁸ However, pho-

8. This phonetic conditioning is more in the nature of a continuum than that for (aw). Fig. 1.4, p. 19 gives the complete data for a speaker of the same age and background as Mr. H. H. Jr. of Fig. 7.1.

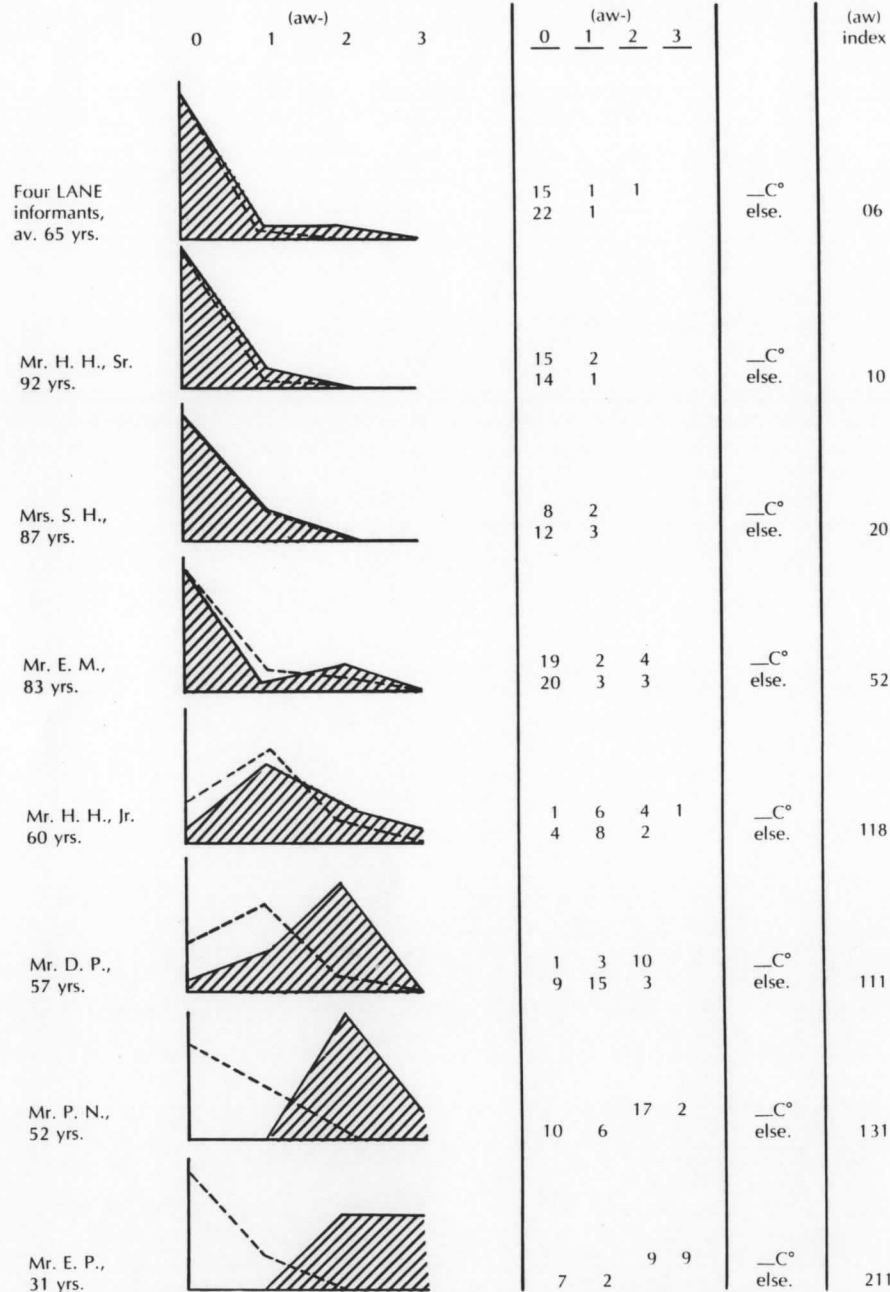


Fig. 7.1. Stages in the centralization of (aw) on Martha's Vineyard, Mass. Solid line: (aw) followed by voiceless obstruent; broken line: all other words.

netic restriction on (ay) was overridden in the following generation, so that Generation II shows a uniform norm for (ay) in all phonetic environments. This development would support the view that phonetic conditioning does not play a significant role as an inciting cause of the centralization of (aw), but acts rather as a conditioning factor which may be eliminated by further change.

On Martha's Vineyard, the *evaluation problem* was approached by analyzing a number of clues to the subjective attitudes towards island life which appeared in the course of the interviews. Attitudes towards summer tourists, towards unemployment insurance, towards work on the mainland, towards other occupational and ethnic groups, were correlated with data obtained from community leaders and historical records, and then with the linguistic variables. It appeared that the rise of (aw) was correlated with the successive entry into the main stream of island life of groups that had previously been partially excluded. It was concluded that a social value had been, more or less arbitrarily, associated with the centralization of (ay) and (aw): to the extent that an individual felt able to claim and maintain status as a native Vineyarder, he adopted increasing centralization of (ay) and (aw). Sons who had tried to earn a living on the mainland, and afterwards returned to the island, developed an even higher degree of centralization than their fathers had used. But to the extent that a Vineyarder abandoned his claim to stay on the island and earn his living there, he also abandoned centralization and returned to the standard uncentralized forms.

The solution to the evaluation problem is a statement of the social significance of the changed form—that is, the function which is the direct equivalent on the noncognitive level of the meaning of the form on the cognitive level. In the developments described here, the cognitive function of /ay/ and /aw/ has remained constant. It is plain that the noncognitive functions which are carried by these phonological elements are the essential factors in the mechanism of the change. This conclusion can be generalized to many other instances of more complex changes, in which the net result is a radical change of cognitive function. The sound change observed on Martha's Vineyard did not produce phonemic change, in which units defined by cognitive function were merged or split. But many of the changes in progress that have been observed in New York City did produce such mergers and splits on the level of the bi-unique phoneme. One such change is the raising of (oh), the vowel of *law*,

talk, off, more, etc., which will serve to illustrate many aspects of the mechanism of linguistic change not relevant to the simpler example on Martha's Vineyard.

The Raising of (oh) in New York City

It was not possible to make a direct attack upon the transition problem in New York City. Although the records of the Linguistic Atlas showed sporadic raising of (oh) at a fairly low level, the Atlas informants in New York City were not selected systematically enough so that we could construct a comparable sample in 1963.⁹ Furthermore, an overall comparison of the usage of this variable by older and younger speakers did not show the clearcut and regular progression which we saw for (aw) on Martha's Vineyard. It was suspected that the reason for this difficulty was the greater tendency towards stylistic variation among New Yorkers, and the heterogeneity of the population in terms of socioeconomic class and ethnic membership. Therefore it was necessary to attack the embedding problem first, before the transition problem.

The variable (oh), as we have defined it in Ch. 3, is a part of the system of long and ingliding vowels in the *r*-less vernacular of New York City. Thus we will code the six variants of (oh) in *law, lore, talk, stork, broad, board, all, etc.* (p. 76).

Ch. 3 describes the methods used for isolating a range of well-defined contextual styles in the speech of individual informants. Average index scores were determined for each style, and a systematic sampling of a large urban population undertaken. The embedding problem was then attacked by correlating the five chief linguistic variables each with each other, and with other elements of the linguistic system, with the level of stylistic variation in which they were recorded, and with the independent variables of socioeconomic class (occupation, education, and income) sex, ethnic group, and age level.

In our studies of hypercorrection in Ch. 5, we presented (p. 128) a style stratification diagram for (oh) in which the transitional state

9. Convenience was apparently a greater factor in the selection of Atlas informants in New York than on Martha's Vineyard. The great bulk of the New York population was poorly represented in the sample, including the working class and lower middle class. The old-family stock used for Atlas interviews represents only a very small fraction of the ethnic composition of the city, at most 1 or 2 percent.

of this variable is seen in synchronic section. Fig. 5.2 thus indicates that the change has not yet affected all social classes: (oh) is not a significant variable for lower-class speakers, who do not use particularly high values of this vowel and show no stylistic stratification at all. Working-class speakers show a recent stage in the raising of (oh): very high vowels in casual speech, but otherwise very little stratification in the more formal styles, and little tendency towards the extreme, hypercorrect (oh-4) and (oh-5). But lower-middle-class speakers show the most developed state of the sound change, with high values in casual speech, and extreme stylistic stratification. Finally, the upper-middle-class group is more moderate in all respects than the lower middle class, still retaining the pattern of stylistic stratification.

The ethnic group membership of New York City speakers is even more relevant to their use of (oh) than socioeconomic class. Fig. 7.2 shows the differences between speakers of Jewish and Italian background in the treatment of (oh) in casual speech. For all but the upper middle class, the Jewish group uses higher levels of (oh).¹⁰ Table 7.2

10. The black group does not show any significant response to the variable (oh), and shows a constant index of performance at a low level. As noted above, the lower class in general is similarly indifferent to (oh). Table 7.2 shows Jewish and Italian ethnic groups only, with the lower class excluded.

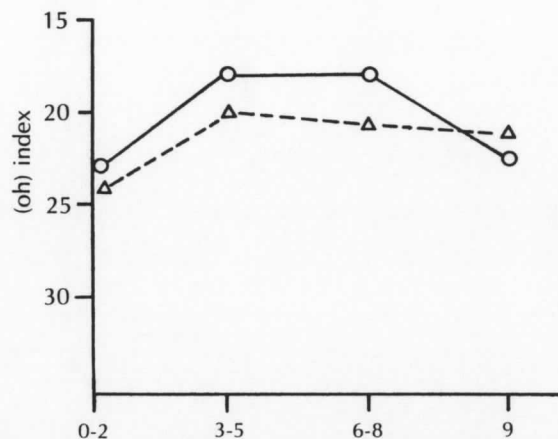


Fig. 7.2. Class stratification for (oh) by ethnic group in casual speech. Solid line, Jews; broken line, Italians. SEC: 0-2, lower class; 3-5, working class; 6-8, lower middle class; 9, upper middle class.

TABLE 7.2
AVERAGE (oh) INDEXES BY AGE LEVEL
AND ETHNIC GROUP IN CASUAL SPEECH

Age	Jews	Italians
8-19	17	18
20-35	18	18
36-49	17	20
50-59	15	20
60-	25	30

shows that both Jewish and Italian speakers have participated in the raising of (oh) but the increase seems to have reached its maximum early for the Jewish group, and later for the Italian group. A separate solution for the transition problem is therefore required for each ethnic group.

The transition problem for the Italian group can be seen analyzed in Fig. 7.3. The procession of values is not absolutely regular, since

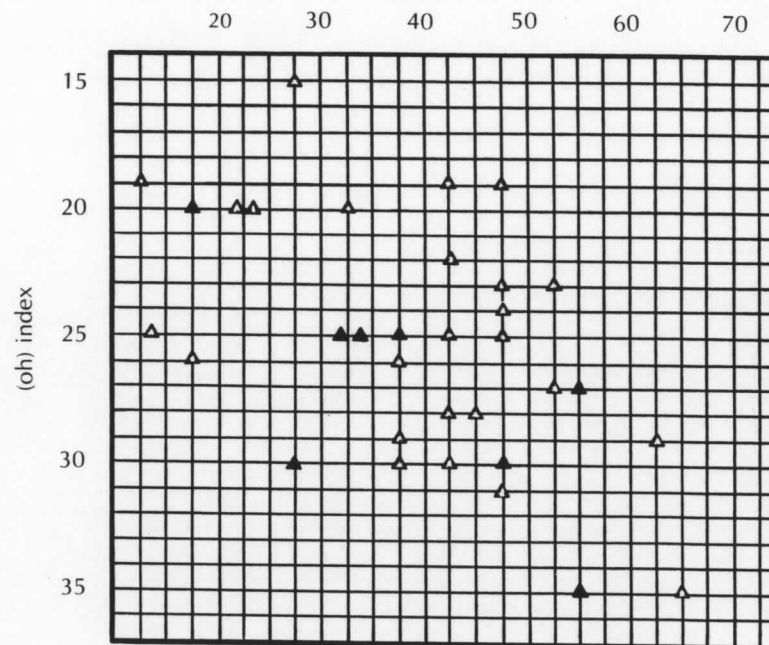


Fig. 7.3. Distribution of (oh) index scores for Italian subjects by age. \triangle women; \blacktriangle men.

socioeconomic membership, sex, and other factors affect the values; nevertheless, there is a steady upward movement from the oldest speakers on the right to the youngest speakers on the left. Within the present sample of New York City speakers, this is the finest resolution of the transition problem which can be obtained.¹¹

The *embedding problem* for (oh) requires an intricate set of correlations with other elements in the linguistic system, in addition to the extralinguistic correlations exemplified above. We find that (oh) is firmly embedded within the subsystem of long and ingliding vowels, and also related structurally to other vowel subsystems. Quantitative studies of these relations fall into five sets:

1. There is a strong correlation between the height of (oh) and the height of the corresponding front ingliding vowel (eh) in the word class of *bad, ask, dance*, etc. This variable originated as a raising of /æh/, but early in the evolution of New York City speech it merged with /eh/, the word class of *bare, bared, where*, etc. The relation between (eh) and (oh) is strikingly parallel to that of (ay) and (aw) on Martha's Vineyard. The front vowel was raised first, as early as the 1890's in New York, and the back vowel followed. Like (aw) on Martha's Vineyard, the variable (oh) became specialized in the usage of a particular ethnic group: to the extent that the Italian group shows higher use of (eh) in casual speech, the Jewish group shows higher values of (oh), until the difference is largely resolved in the youngest age level by merger of (eh) and /ih/, (oh) and /uh/.
2. The variable (oh) also has close relations with the higher ingliding vowel /uh/. As we observe higher and higher variants of (oh) in the casual speech of the younger informants, it becomes apparent that a merger of (oh) and /uh/ is imminent. This merger has undoubtedly occurred in the youngest speakers in our sample from the working class and lower middle class. In fact, we have many informants who show the merger even in the most formal styles, in the reading of isolated word lists, and we can conclude *a fortiori* that the merger exists in casual speech. Close study of the variants of their casual speech shows the merger as an accomplished fact: though most listeners who are not conscious of

11. Fig. 7.3 includes Italian informants who refused the original interview, and whose speech patterns were sampled by the television interview, as described in Appendix D of Labov 1966a.

the overlap will hear *sure* as higher than *shore*, it is in fact indistinguishable out of context.

3. There is also a close correlation between (oh) and /ah/, the long tense vowel heard in *guard, father, car*, etc. The variable (ah) represents the choice of back or center options for the subclasses of *hot, heart, hod, and hard*. High values of (oh) are correlated with low back positions of *heart, hod, and hard* (with the last two generally homonymous); lower values of (oh) are correlated with low center positions of the vowels in these word classes. This correlation is independent of socioeconomic class or ethnic group. Whereas (oh) is firmly embedded in the sociolinguistic structure of the speech community, /ah/ is not. As a linguistic variable, (ah) seems to be a function only of the height of (oh): a purely internal variable.¹²
4. (oh) is also related to the variable height of the vowel in *boy, coil*, etc., (oy) in the front upgliding system. The height of the vowels in *coil* and *call* seem to vary directly together in casual speech, but only (oh) is corrected to lower values in more formal styles. (oh) carries the major burden of social significance, and is the focus of nonsystematic pressure from above.
5. Finally, we find that (oh) and (oy) are jointly correlated with the variable (ay), which represents the backing or fronting of the first element of the diphthong in *my, why, side*, etc. High values of (oh) and (oy) are correlated with back values of (ay), and low values of (oh) and (oy) with low center values of (ay).

Beyond these immediate correlations, there are more indirect, diffuse relations with such variables as (aw) and /ih/, through which (oh) is connected with all of the other vowels in the vernacular system of New York City speech. This is not the place to pursue the full details of this intricate set of structural correlations within the linguistic system: however, it should be apparent that a full solution to the embedding problem will reveal the ways in which the internal relations of linguistic elements determine the direction of sound change. We can summarize the most important relations that center about (oh) in the following notation, which defines the structural units on the left hand side of the equations as linguistic variables:

12. The quantitative correlations are given in Labov 1966a: Ch. 12. The relationship of (oh) and (ah) held even within a single ethnic group. For a spectrographic display of all these correlations, see Labov, Yaeger, and Steiner 1972.

(oh) = $f_1(\text{St, C, E, A, Sx, (eh)})$	St = style
(ah) = $f_2(\text{(oh)})$	C = socio-economic class
(oy) = $f_3(\text{(oh)})$	E = ethnic group
(ay) = $f_4(\text{(ah)}) = f_4(f_2(\text{(oh)}))$	A = age level
(ay) = $f_5(\text{(oy)}) = f_5(f_3(\text{(oh)}))$	Sx = sex

In New York City, the *evaluation problem* was approached more directly than on Martha's Vineyard. The unconscious subjective reactions of the informants to each of the variables were determined. The details of this method have been presented in Ch. 6; in general, we can say that the reliability of the tests can be measured by the high degree of uniformity showed by New Yorkers in contrast to the scattered results from those raised outside of New York City.

The subjective reaction responses to (oh) give us a clear view of the social significance of the variable, as shown in Table 7.3. The majority of informants responded to the test in a way consistent with the stigmatized status of high (oh).¹³ Just as the solution to the embedding problem showed no significant stylistic response to (oh) for lower-class speakers, here we find that lower-class speakers showed no significant (oh)-negative response. The other groups showed (oh)-negative response in proportion to the average height of (oh) used in their own casual speech, and to the degree of stylistic stratification in their speech patterns. This result illustrates the principle which holds quite generally in New York City: that those who used the highest percentage of a stigmatized form in casual speech were the most sensitive in stigmatizing it in the speech of others. Thus the lower-middle-class speakers between the ages of

TABLE 7.3
(oh)-NEGATIVE RESPONSE BY
SOCIOECONOMIC CLASS AND AGE LEVEL

Age	Socioeconomic class				N
	0-2	3-4	5-8	9	
20-39	25%	80%	100%	60%	4 10 11 5
40-59	18	60	62	57	11 15 13 7
60-	33	[00]	—	—	6 1 — —

13. The (oh)-negative response shown here consisted of rating three speakers lower on a scale of job suitability when they pronounced sentences with high, close (oh) vowels, as compared to sentences with no significant variables. Those making the ratings were unaware that they were rating the same speakers.

20 and 39, who use the highest values of (oh) in their own casual speech, show 100 percent (oh)-negative response. Similarly, we find that the percentage of (oh)-negative response among Jewish and Italian speakers is proportionate to the height of (oh) in casual speech.

This solution to the evaluation problem can hardly be called satisfactory. It is not clear why a group of speakers should adopt more and more extreme forms of a speech sound which they themselves stigmatize as bad speech.¹⁴ Some further explanation must be given.

First of all, it has become clear that very few speakers realize that they use the stigmatized forms themselves. They hear themselves as using the prestige forms which occur sporadically in their careful speech and in their reading of isolated word lists. Secondly, the subjective responses tapped by our test are only the overt values—those which conform to the value systems of the dominant middle-class group. There are surely other values, at a deeper level of consciousness, which reinforce the vernacular speech forms of New York City. Our early evidence for this conclusion was anecdotal. But more recent studies of the black English vernacular in New York City have demonstrated the existence of such covert norms through alternate scales on subjective reaction tests (see Ch. 8).

In the case of the alternate preference of Jewish and Italian ethnic groups for (oh) and (eh), we can put forward a reasonable suggestion based upon the mechanism of hypercorrection.¹⁵ The influence of the Yiddish substratum leads to a loss of the distinction between low back rounded and unrounded vowels in first-generation Jewish speakers of English, so that *cup* and *coffee* have the same vowel. In second-generation speakers of Jewish descent, the reaction against this tendency leads to a hypercorrect exaggeration of the distinction, so that (oh) becomes raised, tense and over-rounded. A parallel argument applies to Italian speakers. This suggestion is all the more plausible since hypercorrection has been demonstrated to be an important mechanism of linguistic change in a variety of circumstances.¹⁶

14. Many subjects reacted to the test with violent and unrealistic ratings; as, for example, marking a person who used high vowels for *coffee* and *chocolate* as not even speaking well enough to hold a factory job.

15. I am indebted to Marvin Herzog for this suggestion.

16. As noted in Ch. 5, *hypercorrection* is used here not to indicate the sporadic and irregular treatment of a word class, but the movement of an entire word class

The Mechanism of Sound Change

Solutions to the transition, embedding, and evaluation problems have been illustrated by two examples, drawn from Martha's Vineyard and New York City. It is possible to apply the results of our work with these and other variables to a provisional answer to the question: what is the mechanism by which sound change proceeds? The following outline is based upon analysis of twelve sound changes: three on rural Martha's Vineyard, and nine in urban New York City.¹⁷

1. The sound changes usually originated with a restricted subgroup of the speech community, at a time when the separate identity of this group had been weakened by internal or external pressures. The linguistic form which began to shift was often a marker of regional status with an irregular distribution within the community. At this stage, the form is an undefined linguistic variable.
2. The changes began as generalizations of the linguistic form to all members of the subgroup; we may refer to this stage as *change from below*, that is, below the level of social awareness. The variable shows no pattern of stylistic variation in the speech of those who use it, affecting all items in a given word class. The linguistic variable is an *indicator*, defined as a function of group membership.
3. Succeeding generations of speakers within the same subgroup, responding to the same social pressures, carried the linguistic variable further along the process of change, beyond the model set by their parents. We may refer to this stage as *hypercorrection from below*. The variable is now defined as a function of group membership and age level.
4. To the extent that the values of the original subgroup were adopted by other groups in the speech community, the sound change with its associated value of group membership spread to these adopting groups. The function of group membership is now redefined in successive stages.

beyond the target point set by the prestige model. This mechanism is evident on Martha's Vineyard, as well as New York.

17. The stages suggested here are necessarily ordered in approximately the manner listed, but there are some rearrangements and permutations in the data observed.

5. The limits of the spread of the sound change were the limits of the speech community, defined as a group with a common set of normative values in regard to language.
6. As the sound change with its associated values reached the limits of its expansion, the linguistic variable became one of the norms which defined the speech community, and all members of the speech community reacted in a uniform manner to its use (without necessarily being aware of it). The variable is now a *marker*, and begins to show stylistic variation.
7. The movement of the linguistic variable within the linguistic system always led to readjustments in the distribution of other elements within phonological space.
8. The structural readjustments led to further sound changes which were associated with the original change. However, other subgroups which entered the speech community in the interim adopted the older sound change as a part of the community norms, and treated the newer sound change as stage 1. This *recycling* stage appears to be the primary source for the continual origination of new changes. In the following development, the second sound change may be carried by the new group beyond the level of the first change.
[Stages 1-8 dealt with *change from below*; stages 9-13 concern *change from above*.]
9. If the group in which the change originated was not the highest-status group in the speech community, members of the highest-status group eventually stigmatized the changed form through their control of various institutions of the communication network.
10. This stigmatization initiated *change from above*, a sporadic and irregular correction of the changed forms towards the model of the highest status group—that is, the *prestige model*. This prestige model is now the pattern which speakers hear themselves using: it governs the audio-monitoring of the speech signal. The linguistic variable now shows regular stylistic stratification as well as social stratification, as the motor-controlled model of casual speech competes with the audio-monitored model of more careful styles.
11. If the prestige model of the highest-status group does not correspond to a form used by the other groups in some word class, the other groups will show a second type of *hypercorrection*:

shifting their careful speech to a form further from the changed form than the target set by the prestige group. We may call this stage *hypercorrection from above*.

12. Under extreme stigmatization, a form may become the overt topic of social comment, and may eventually disappear. It is thus a *stereotype*, which may become increasingly divorced from the forms which are actually used in speech.
13. If the change originated in the highest-status group of the community, it became a prestige model for all members of the speech community. The changed form was then adopted in more careful forms of speech by all other groups in proportion to their contact with users of the prestige model, and to a lesser extent, in casual speech.¹⁸

Many of the stages in the mechanism of sound change outlined here are exemplified in the two detailed examples given above. The centralization of (aw) on Martha's Vineyard appears to be a stage 4 change from below. It may indeed have reached stages 5 and 6, but the techniques used on Martha's Vineyard did not provide the evidence to decide this question. There is no doubt, however, that the centralization of (aw) is a secondary change, produced by the recycling process when the centralization of (ay) reached stage 8.

To place the raising of (oh) in this outline, it is necessary to consider briefly the evolution of the New York City vowel system as a whole. The first step in the historical record is the raising of (eh). We have reason to believe that the merger of /æh/ with /eh/ began in the last quarter of the 19th century (Babbitt 1896). The upward movement of the linguistic variable (eh) continued beyond this merger, leading to the current cumulative merger of /eh/ with /ih/ among most younger New Yorkers. For the entire community, (eh) is subject to the full force of correction from above: the change has reached stage 11 so that the linguistic variable is defined by covariation with social class, ethnic membership, age level, and contextual style. The raising of (oh) was the first recycling process which began when (eh) reached stage 8. The major burden of the raising of (oh) has been carried by the Jewish ethnic group; the extreme upward social mobility of this group has led to a special sensitivity to (oh)

18. We find some support in these observations for the idea that people do not borrow much from broadcast media or from other remote sources, but rather from those who are at the most one or two removes from them in age or social distance.

in the lower middle class. Thus the merger of /oh/ and /uh/ has gone quite quickly, and (oh) has reached stage 11 for the lower middle class; yet it has hardly touched stage 1 for the lower class.

The third stage in the recycling process occurred when (oh) reached stage 8. The structural readjustments which took place were complex: (oy) and (ah) were closely associated with (oh), and were defined as linguistic variables only by their covariation with (oh). Thus the raising of (oy) and the backing of (ah) were determined by internal, structural factors. Change from above is exerted upon (oh), but not upon (oy). In careful speech, a New Yorker might say [its ɔ:l tɪn fu:-ɪ], *It's all tin foil*. But the shift of (ah) and (oy) have in turn led to a shift of (ay), and this process has apparently begun a third recycling. Indeed, the backing of (ay) has reached stage 8 itself, and produced an associated fourth recycling, the fronting of (aw). There are indications that (ay) has evolved to stage 9, with the beginning of overt correction from above, although (aw) has reached only stage 4 or 5 (Labov 1966a:Ch. 12).

It is evident that the type of structural readjustments that has been considered here requires a linguistic theory which preserves the geometry of phonological space. The structural relations found here are strikingly parallel to those established by Moulton (1962) in his study of covariation of mid and low vowels in Swiss German dialects. The techniques, the area, the societies studied are quite different, and the coincidence of results provides strong empirical evidence for the functional view of phonological structure advanced by Martinet (1955). Nevertheless, the purely internal equilibria projected by Martinet do not provide a coherent theory of the mechanism of sound change. In the scheme that has been outlined here, they are only part of a more comprehensive process, embedded in the sociolinguistic structure of the community.

Conclusion

This discussion has focused on the theme that internal, structural pressures and sociolinguistic pressures act in systematic alternation in the mechanism of linguistic change. It can no longer be seriously argued that the linguist must limit his explanations of change to the mutual influences of linguistic elements defined by cognitive function. Nor can it be argued that a changing linguistic system is autonomous in any serious sense. Here I have attempted to carry the

argument beyond the mere cataloguing of possibilities by introducing a large body of evidence on sound changes observed in progress. On the basis of this evidence, we can make the stronger claim that it is not possible to complete an analysis of structural relations within a linguistic system, and then turn to external relations. The recycling process outlined here suggests the kind of answer we can make to the basic questions of the inciting causes of linguistic change, and the adaptive functions of change, as well as the mechanism by which change proceeds. We can expect that further investigations will modify the outline given here, but that data from the speech community will continue to form an essential part in the analysis of linguistic change.

8 The Study of Language in Its Social Context

THE first seven chapters of this volume have documented an approach to linguistic research which focuses upon language in use within the speech community, aiming at a linguistic theory adequate to account for these data. This type of research has sometimes been labelled as "sociolinguistics," although it is a somewhat misleading use of an oddly redundant term. Language is a form of social behavior: statements to this effect can be found in any introductory text. Children raised in isolation do not use language; it is used by human beings in a social context, communicating their needs, ideas, and emotions to one another. The egocentric monologues of children appear to be secondary developments derived from the social use of language (Vygotsky 1962:19) and very few people spend much time talking to themselves. It is questionable whether sentences that communicate nothing to anyone are a part of language. In what way, then, can "sociolinguistics" be considered as something apart from "linguistics"?

One area of research which has been included in "sociolinguistics" is perhaps more accurately labelled "the sociology of language." It deals with large-scale social factors, and their mutual interaction with languages and dialects. There are many open questions, and many practical problems associated with the decay and assimilation of minority languages, the development of stable bilingualism, the standardization of languages and the planning of language development in newly emerging nations. The linguistic input for such studies is primarily that a given person or group uses language X in a social context or domain Y. A number of recent reviews have discussed work in this area (Fishman 1969) and I will not attempt to deal with these questions and this research here.