Why Sound Change is Gradual

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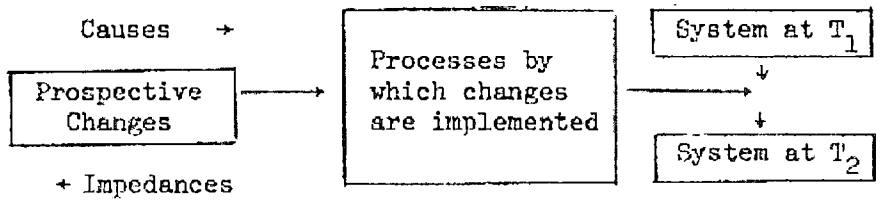
This is an attempt to determine the nature and causes of the gradualness of sound change by focusing attention on aspects of some causes and mechanisms of phonetic change.

1. A Note on Idiolects

It is not very interesting to say that a sound change has affected the idiolect of a speaker if his successive utterances of a given form are objectively different. Pronunciations which the speaker or even a phonetician may judge to be the same are never characterized by precisely identical acoustic signals or articulations. To define when an idiolectal sound change has occurred, it is therefore necessary to find a way to delimit "change" so that the term refers exclusively to variations which are in some sense directional. We can appeal to consistency and consider an idiolectal sound change to have occurred when a speaker's utterances of specific linguistic elements are consistently different, with respect to any feature of pronunciation, from utterances of the same elements spoken previously, but "consistency" clearly implies that sound change involves absolute progression, while evidence to be considered later suggests rather that there are periods of variation during which sound changes are inconsistently effected in idiolects. "Consistency" might therefore have to be replaced by a term that subsumes tendencies as well as absolute progressions. Changes in either the tendency or absolute consistency of production are the observable results of changes in neural linguistic programming.

2. Sound Change

Sound change seems to involve a multilateral interaction of causal and impeding factors.



As causal factors we may list:

1. Adoption of a new linguistic reference group;
2. The tendency toward easier articulation;
3. The tendency toward intelligibility;[1]
4. The tendency toward articulatory-perceptual stability;[2]
5. Restructuring by children;
6. Analogy to existing structures in the language;
7. Linguistic interference.

As impedances:

1-7 above;
8. Inertial effects ("force of habit");
9. Influence of competing changes.

Adoption of a new reference group can be a cause or an impedance, depending on whether or not a prospective change would render the speaker's idiolect more like the new reference dialect; similarly, the tendency toward ease of articulation is a cause or an impedance, depending on whether a prospective change would increase or decrease ease of articulation; etc.... It is not contradictory to list many of the same factors in both categories, but the fact that we must do so suggests that we have only listed cover terms for sets of richly diverse sub-factors whose complex local interaction is responsible for the favoring of particular changes. Notice also that if there are both causal and impeding factors, it is unnecessary to limit the class of "prospective changes;"[3] all conceivable changes are prospective, although all but a few are too heavily impeded to occur.

3. "Gradual"

Let us begin by considering the implications for gradualness of one of the ranges of causal forces mentioned in (2). But it will first be helpful to list here separately several possible meanings of "gradual" which can be applied to phonetic change, since these meanings are often consolidated in the literature without an accompanying explanation:

1. Proceeding by "imperceptible" gradations;
2. Arising gradually (over time) in the community;
3. Proceeding by lexical diffusion;
4. Characterized by periods of idiolectal variation;
5. Characterized by periods of dialectal variation;
6. Proceeding by clearly definable idiolectal stages (e.g., a>a$^{>}$>a$^{<}$>a...);
7. Proceeding by clearly definable dialectal stages;
8. Carried forward slowly through the constant onset of generations;
9. Not involving strictly binary values (cf. metathesis).

4. Social Factors

William Labov (1963, 1965) has experimentally studied thirteen on-going sound changes on the island of Martha's Vineyard and in New York City. He found a striking correlation between the advancement of particular sound changes and the incidence of certain social values. On Martha's Vineyard the increasing degree of centralization of the first member of /ay/ and /aw/ diphthongs proved to be closely associated with "positive orientation towards Martha's Vineyard."

According to Labov (1965), sound changes arise in one or two members of a subgroup of the speech community and are first generalized to all members of the subgroup. The point that will interest us here is that after a linguistic variable has become a "marker" of the subgroup, other groups which are in linguistic contact with the original group may adopt the change when they adopt the predominant social values of that group. On intuitive grounds alone we can predict that adoption of the original change by external groups is in some sense gradual because general changes in social value systems do not occur very rapidly at the community level. But to justify the premise that adaptive sound changes associated with changing social values occur gradually (sense 2), we must first show that there are not community-wide thresholds of social identification beyond which rather abrupt changes in community speaking habits occur. To do this, we could show that individuals tend to function independently in speech communities with regard to their adoption of speaking habits of external reference groups. As preliminary evidence for this claim, consider the case of speaker E. (Labov 1963, 300), whose mother remarked, "You know, E. didn't always speak that way... it's only since he came back from college. I guess he wanted to be more like the men on the docks..." For further evidence that idiolects adjust independently, we can turn to Labov's remark that "a marked contrast was observed between those who plan to leave the island and those who do not. The latter show strong centralization, while the former show little, if any" (see Labov (1963, 300) for the centralization values that justify this statement). If, as this evidence indicates, idiolects adjust independently to outside reference groups, there can be no rationale for community-wide thresholds of social identification in sound change, but it doesn't necessarily follow from this that such thresholds do not characterize the adjustment of individual speakers. However, it is very difficult to maintain that there are individual thresholds in light of Labov's evidence that the degree of centralization is proportional to the degree of positive orientation toward Martha's Vineyard (1963, 306). This strongly suggests that adaptive changes progress in individuals--and also therefore in the speech community--hand in hand with gradual value changes.

I. Adaptive sound changes which accompany changing social values occur gradually (sense 2).

5. Age-Grading

Labov (1965) observed that when social pressures remain constant, a linguistic variable which has become generalized to the initial subgroup or adopted by another group progresses within the group as a function of age and group membership. This observation has an interesting implication for the present question, for regardless of how we account for it, the existence of progressive age-grading seems to speak for the gradual (sense 2) advancement of those sound changes which can be gradual (sense 1; cf. metathesis). But King points out that:

> ...the age gradient showing that amount of centralization varies inversely with age...does not constitute evidence for a gradual shift in the 'habit of articulating' /ay/ and /aw/ through generations. What it does demonstrate is that most older speakers do not centralize at all when producing most instances of /ay/ and /aw/, whereas younger speakers do.
>
> (King 1969, p. 118)

Although it is of course strictly true that the existence of age-grading alone cannot be taken as evidence for a gradual shift, it is important to notice that if there is in fact no gradual shift associated with age-grading, the only way to account for age-grading is to suppose that as young speakers get older, their speaking habits become more like those of their elders; that is, King's distrust of age-grading as a criterion for gradual change is only warranted if it can be shown that there is a tendency for young people to centralize more and for old people to centralize less. This follows because, ceteris paribus, if there is no change on the part of the younger people to a habit of less centralization, their centralization will cause a sound change, since younger people eventually replace their elders in the speech community. There is no clear evidence for changes that are purely a function of age. In fact, Weinreich, Labov and Herzog (1968) remark that "all the empirical evidence to date indicates that children...preserve the dialect characteristics...of the peer group which dominates their preadolescent years."

II. Age-grading constitutes evidence for gradual change (senses 2 and 8).

6. Ease of Articulation

An interesting point arises in connection with the tendency toward ease of articulation. It is not true that all changes which make articulation easier--nor indeed that all those which do not--are capable of abrupt implementation. The deletion of final consonants ought to increase considerably the ease of articulation of English words, but if a speaker attempts to implement this change,

he fails as soon as he begins to speak at his normal rate. In fact, the only way to drop final consonants consistently is to speak so slowly that each word can be rehearsed silently before it is spoken. Even then, unusual amounts of attention must be devoted to the change being made. Even if a sound change affects only a single word, it generally[4] happens that speakers cannot substitute the changed form for the unchanged one, except with an intervening period of inconsistency.

But here it is essential to draw a distinction between new consistencies of articulation which can be brought about by simply changing the basis of articulation, and those which require in-speech spot adjustments. Basis changes primarily involve tract settings. The fact that many people find it easy to imitate foreign accents can be attributed to their swift learning of a few invariant basis rules of the languages in question. Basis changes can be effected quite abruptly at the utterance level because they require only a single pre-utterance decision on the part of the speaker. The difficulty with in-speech spot adjustments can be attributed to what was called earlier "inertia." More concretely, we can say that frequent repetition of articulations of segments and segment sequences leads to the formation of linguistic habits which must be broken just like any other habits, with resulting periods of idiolectal fluctuation while these habits are being changed. Of course, force of habit must also have a retarding effect on basis-type changes, but in this case the resulting fluctuation is most likely to be at the utterance, rather than the word, level.

III. It is possible for basis-type changes to be enacted abruptly at the utterance level, provided the speaker knows how the necessary adjustments are to be made and wishes to make them; but changes involving in-speech spot adjustments cannot in general be consistently enacted at will in speech at normal speeds and are therefore gradual (senses 2 and 4).

7. Restructuring by Children

If changes were carried out exclusively by the imperfect learning of language by children (in which case the assumption would have to be that this learning is systematically imperfect), changes would advance through the replacement of adult speakers by their progeny.

IV. To whatever extent sound changes are the product of imperfect learning, they are gradual (senses 2 and 8).

8. Lexical Diffusion

Lexical diffusion is not a cause of sound change but, putatively,

a process by which changes are implemented. William S-Y. Wang (1969) summarizes his lexical diffusion hypothesis as follows: "phonological change may be implemented in a manner that is phonetically abrupt but lexically gradual." Although Wang tentatively extrapolates his findings to all kinds of sound change, the safe version just quoted (with "may") is primarily intended to characterize changes which could not progress incrementally (e.g., metathesis). This kind of change is thought to originate at one place in an individual's lexicon and spread conditionally across the lexicon through time ("gradual," senses 2 and 4), where "change" here means a class of similar changes affecting the pronunciation of one or more classes of words. At the level of single words sound change is thought to occur when a new pronunciation enters into competition with an old one and eventually becomes predominant in the language. As evidence for lexical diffusion, Wang points to the existence in all languages of large numbers of morphemes with dual pronunciations.

It seems reasonable to view this competition between two or more forms which are not incrementally derivable from one another as a special case of the idolectal variation observed by Labov to be characteristic of changes which <u>are</u> derivable by incrementation.

V. Sound changes characterized by lexical diffusion are gradual (senses 3, 4 and 5).

9. <u>Functionalism</u>

A second account of the way in which sound changes proceed is offered by Martinet. Involved in his "functional" view of sound change is the assumption that, subject to systemic pressures, articulatory targets shift slowly, with the result that individual segment productions cluster about the slowly moving norm. This view entails the assertion that sound changes which <u>can</u> be gradual, <u>are</u> gradual (senses 1 and 2). But the only kind of evidence that could reinforce this aspect of Martinet's claim is lacking, namely evidence that targets shift slowly. Moreover, Labov's studies reveal extensive fluctuation in individual speakers' pronunciations of forms containing a linguistic variable, even when the same form is repeated with only a short interval between productions (Labov 1963, 287-89). For example, productions of single words containing /ay/ typically fluctuated between [a͡i], [a^i], and [ɐ͡i] in the speech of many speakers. King (p. 118) denies that such variations are of sufficient magnitude to indicate anything but fluctuations in performance, but his claim is not substantiated. In fact, it is difficult to see what kind of evidence could be used to justify this claim; and there are some arguments against the performance error hypothesis. The fluctuations observed on Martha's Vineyard are not completely arbitrary; speakers limit fluctuations so as to produce variations along some parameters, but not others. Finally, the performance error hypothesis is not consistent with the observation that some word classes exhibit no centralization at all (1963, 289); we would expect to find performance errors in all words containing /ay/ and /aw/.

VI. Evidence from Labov's studies on Martha's Vineyard suggests that some sound changes are gradual (sense 4) because they are characterized by periods of idiolectal variation.

10. Two Kinds of Change

Sturtevant (1917) and many others have pointed out that there are some changes for which it is inconceivable that they progressed by incremental stages. Processes in this category are those involving a change in the order of segments, probably also those involving a change of articulators, some dissimilations, losses, additions, etc. The word "abrupt" (King and Wang) or "sudden" (Sturtevant) is used to refer to this kind of change; changes not characterized by binary distinctions are considered potentially gradual (sense 9). Labov's observation of intermediate centralization values seems to indicate that the distinction is a viable one, but the existence of extensive idiolectal fluctuation suggests that idiolectal gradualness is more interestingly viewed as a consequence of this fluctuation in itself than as a phenomenon associated with progressive intermediate stages.

11. Staging

The question of staging (see senses 6 and 7 of "gradual") is of little interest in the present context. Talk of stages usually presupposes that the endpoints of a change are known, but the grounds for saying that one change has occurred and not two or three are never very clear. To the extent that dialectal stages exist, they might as well be viewed as separate changes. Idiolectal stages, if they exist, either must be identified with individual instances of articulation, in which case the notion of a stage becomes trivial, or, if individuals do in fact demonstrate distinct levels of consistency, would become meaningless in the context of community normalization; on the other hand, if all idiolects manifested identical stages at the same time, separate dialectal changes could again be postulated.

12. Summary

At the community level sound change is gradual. We may attribute this fact variously and in different degrees to the necessity for community normalization of individual variations, to the close relation between sound change and the gradual adoption of external values by communities of speakers, to age-grading which appears to be partly a function of pre-adolescent peer group identification, to systematic or normalized restructuring by children, to the lexical diffusion process, and to psychophysical properties of the organism which make it generally impossible for changes to be implemented abruptly.

Idiolectal gradualness, on the other hand, is probably best associated with periods of fluctuation between different levels of consistency or tendency of production.

Footnotes

1. To say that intelligibility is a cause of sound change does not necessarily entail the prior assumption that speakers have registered that their own or someone else's speech is to some extent unintelligible. Speakers might favor a change without being aware of the reasons for their preference. The commonplace observation that people are not aware of changes in their speech has led to the belief that changes are "imperceptible"; but to say that speakers are in all senses unaware of sound changes is to attribute to linguistic systems a mystical mobility of their own. To the epithet "imperceptible" we must probably add "on reflection."

2. See K. N. Stevens "The quantal nature of speech" in Human Communication, A Unified View by Stevens, Denes and David. The speech parameters are not as continuous as they are said to be in many phonetics handbooks; the commonest places of articulation appear to be at those points where articulatory perturbations produce the most minimal variations in acoustic output.

3. "Prospective" and "possible" are not to be confused. The set of possible changes is the set of changes which actually occur--a subset of all prospective changes.

4. This will depend in part on the frequency of the word in question, of course. It would be fairly easy for most speakers to change their pronunciation of Pulitzer consistently from [pʊlɪtsɚ] to [pyulɪtsɚ], or vice versa, but very difficult to change and from [ænd] to [ʌnd].

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