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Evidence for Lexical Diffusion

The two remaining parts of this volume deal with the general principles that were the central concerns of the Neogrammarian linguists of the latter half of the 19th century: Leskien, Osthoff, Brugmann, Paul, and many others. The chief issues at stake are the traditional questions of whether sound change is or is not regular, and of how meaning is preserved, or is not, in the course of linguistic change. The quotations from Osthoff and Brugmann in section 1.2 make it clear that they were strongly oriented to the study of living languages and the program of using the present to interpret the past. They themselves did not control the techniques needed to deal directly with the speech community, and through an overemphasis on the role of the individual and of individual psychology, they removed themselves progressively farther from the possibility of doing so (Weinreich, Labov, and Herzog 1968). Their confidence in dialect geography could not then be supported by the mathematical methods needed to restore the underlying order to the apparent chaos of the surface data (chapter 17). Nevertheless, their fundamental insights into the nature of linguistic change have proved to be reliable guides for the study of the speech community, and the development of the evolutionary perspective of this volume. Many findings in the chapters to follow will provide strong confirmation of Neogrammarian principles. If the work presented here has a cumulative character, it is because it builds upon the firm foundation of Neogrammarian thought. Part D will deal with Neogrammarian position on the lexical regularity of sound change; part E with the Neogrammarian contention that sound change is modified only by the phonetic environment, and not by the need to convey information.

15.1 The regularity controversy

In chapter 1, the Neogrammarian controversy on the regularity of sound change was presented as a prototypical example of a long-standing, unre-

solved dispute over principles.[1] There is more than enough evidence to justify taking one position or the other – either that sound change is lexically regular or that it is not. But given this situation, one can take a firm position for one side only by dismissing or ignoring the evidence on the other side. We will see that some linguists acknowledge that there is evidence on both sides, while in practice they are committed to a single-minded program. Historical linguists assume that sound changes affect sounds, not words; exponents of lexical diffusion are intent on proving that sound changes affect words, not sounds.

The orientation toward linguistic research that is put forward in this volume approaches such controversies in a different spirit. It begins with respect for the intelligence of our predecessors, and for the evidence that led them to their conclusions. Careful consideration of the competing bodies of evidence leads to the conclusion that a higher-level theory is needed – one that will take into account, as well as account for, the findings on both sides of the controversy. Such a synthesis can be achieved only if we ascertain the conditions under which each of the opposing viewpoints is valid. This cannot be done by simply reshuffling the data already accumulated, or by manipulating and reorganizing what others have said – in a word, by trying to be more intelligent than our predecessors. The synthesis that is needed will make use of broader and richer data, drawn from a wider variety of sources and measured by more precise techniques.

Part D is devoted to the resolution, in this spirit, of the Neogrammarian controversy. It is now over a century old, and perhaps the most clearly stated issue in linguistic history. In the evolution of sound systems, is the basic unit of change the word or the sound? Our focus will be the question of the regularity of changes, as it was stated in categorical form by Osthoff and Brugmann (1878):

> [E]very sound change, inasmuch as it occurs mechanically, takes place according to laws that admit no exception. (translated in Lehmann 1967:204)

The obverse of this "exceptionlessness" is lexical regularity: that when a sound changes, it affects every word in which that sound occurs in the same phonetic environment.

The most important elements of the Neogrammarian position as formulated by Osthoff and Brugmann are hidden in the phrase *inasmuch as it proceeds mechanically*. This phrase is designed to cover two types of exceptions to exceptionlessness. The first is *analogical change*, which involves conceptual relations that are not mechanical (or phonetic) in character. It

[1] This and the following chapter contain revisions and reformulations of the point of view first presented in Labov 1981. A considerable number of new facts have been incorporated, along with discussions of the issues that followed in the 10 years after the article appeared.

is widely recognized that one of the major virtues of the Neogrammarian position was the systematic role allotted to analogy (Kiparsky 1989:364). The second is *dialect borrowing*, which is generally considered to involve social relations of relative prestige that are not mechanical. Much of the argumentation concerning the Neogrammarian position concerns the identification of these two processes; the second will play a major part in the discussion to follow.

With respect to the issue of the regularity of sound change, it seemed clear that, until recently, the Neogrammarians had won the day.[2] Although dialectologists and philologists generally were still impressed with the facts that pointed to the slogan *Each word has its own history*, the mainstream of linguistic theory seems to have been Neogrammarian throughout the first century of the controversy. This holds not only for the American structuralists, and the absolute stance taken by Bloomfield (1933) and Hockett (1958), but for recent mainstream theorists as well. In the various efforts to apply generative phonology to historical linguistics, the dispute with the Neogrammarians has been mainly over the question of grammatical conditioning, not over the regularity of sound change (Postal 1968; King 1969; Kiparsky 1971, 1989).[3] Thus it was possible for Hockett (1965) to place the Neogrammarian hypothesis among the four great breakthroughs of linguistics, on a par perhaps with the theory of evolution in biology. The scholars engaged in comparative reconstruction in Indo-European, Austronesian, Sino-Tibetan, and other language families continue to recognize the regularity of sound change as the basic principle that unifies, rationalizes, and legitimates their activity.

However, the evidence in favor of the belief that sound change proceeds word by word has not disappeared. Interest has persisted in the work of classical opponents of the Neogrammarians, beginning with Schuchardt.[4] Moreover, the evidence for lexical diffusion has continued to accumulate

[2] Recent years have seen numerous republications, translations, and reassessments of the Neogrammarians' work. Most American linguists have been introduced to the Neogrammarians through the account in Pedersen 1962. Lehmann 1967 includes translations of a number of important Neogrammarian documents. The most important papers debating the Neogrammarian position are reproduced in Wilbur 1977; and the introduction to that volume gives a detailed account of the academic setting of the controversy. For recent scholarly reviews of the controversy, I draw on Hoenigswald 1978, Malkiel 1967, and Fónagy 1956.

[3] Kiparsky 1989 presents the most comprehensive statement of these issues to appear in recent years. It begins with the "exceptionless hypothesis" of the Neogrammarians, and argues (1) that it is an emprical claim, (2) that it is not imcompatible with the fact that each word has its own history, and (3) that it is contradicted by much evidence of grammatical conditioning and lexical diffusion. Kiparsky's views were formulated after the position developed in this chapter was first presented in 1981, and are in part a response to them. This and the following chapters will attempt to take into account, and respond to, Kiparsky's positions on dialect borrowing, lexical diffusion, and grammatical conditioning.

[4] Schuchardt's statement "Gegen di Junggrammatiker" is reproduced in Wilbur 1977. A more complete presentation of his point of view is available in Schuchardt 1980.

in the research efforts headed by students of Chinese. The traditional calm acceptance of the regularity of sound change can be maintained only by ignoring these linguists, together with their results. This chapter will review the original research on lexical diffusion by Wang, Cheng, Chen, Hsieh, and Krishnamurti, and will add to this the more recent results of Li (1982), Wang (1989), and Shen (1990).

15.2 Recent evidence for lexical diffusion

Wang (1969) suggested that exceptions to regular sound change might be caused by the overlapping operation of two rules in a bleeding relationship. From the standpoint of the Neogrammarian hypothesis, this was a new idea: that irregularities might be the result of two regular sound changes, rather than the competition of sound change and analogy. As Wang began to gather empirical evidence for this idea, he discovered data that had more serious consequences for the Neogrammarian position – findings of considerable scope that cast doubt on the whole idea of change by regular phonological rule.

In 1962, Peking University published the *Hanyu Fangyin Zihui*, the results of a massive research project of the 1950s, with phonetic transcriptions of 2,444 morphemes in 17 modern Chinese dialects. With data from the Middle Chinese Dictionary and Sino-Japanese sources, these materials formed the basis of the Dictionary on Computer, or DOC (see Streeter 1977). Wang, together with Hsieh, Cheng, Chen, and others, used this data set to trace the paths followed by Chinese sound changes. As Wang has pointed out, Chinese data are particularly useful for testing the Neogrammarian hypothesis because the morphological analogies that can interfere with the regularity of sound change in inflectional paradigms are practically nonexistent.

It quickly became evident that the exceptionless character of sound change received very little support from Chinese data. One of the most concise statements of the position that emerged is given by Wang and Cheng (1977). They analyze the Neogrammarian position, summarized in the Bloomfieldian dictum that "Phonemes change," into two components: sound change is *phonetically gradual*, proceeding by imperceptible increments, but *lexically abrupt*, affecting all relevant words simultaneously. They then point to the unsuitability of this model for a wide range of discrete phonetic changes: flip-flops, metatheses, epentheses, deletions, and changes in point of articulation. Given this limitation, plus the existence of many competing forms and exceptions and the artificiality of many explanations of dialect borrowing, they propose a different model:

> We hold that words change their pronunciations by discrete, perceptible increments (i.e. phonetically abrupt), but severally at a time (i.e. lexically gradual) . . . (p. 150)

The strong position of Wang, Chen, Cheng, and Hsieh aligns them with the most radical of the Romance dialectologists, who were most skeptical of the Neogrammarian concept of sound laws.[5] For them, the process of change operates not upon sounds, but upon words. They call this conception *lexical diffusion*. They do not deny that sound change may be regular: in this respect, lexical diffusion may predict no less ultimate regularity than the Neogrammarian principle. However,

> [t]he difference lies rather in the description (and ultimately, the explanation) of the change mechanism, i.e. how the change is actually implemented. (p. 151)

Tone splitting in Chaozhou

For Wang and Cheng, lexical diffusion is plainly more than a working principle: it is a substantive solution for the transition problem. They support their position with an impressive demonstration of lexical split in the reflexes of Middle Chinese tone III in the dialect of Chaozhou (Cheng and Wang 1977). No matter how narrowly the phonetic environments are analyzed, the split into modern tones 2b and 3b persists. Neither the Middle Chinese initial consonants or final vowels nor the modern initials or finals explain the massive splitting of word classes. Table 15.1 shows a typical distribution of Chaozhou tones afer modern initials. Cheng and Wang locate 12 pairs that were homonymous in Middle Chinese but are now split in this way.

The Chaozhou data provide a dramatic example of an even split without phonetic motivation – and with no analogical or grammatical motivation. In response, a number of Sino-Tibetan historical linguists took the Neogrammarian position: they pointed out that these data had no bearing on the regularity of sound change, since it was clear to them that there must have been extensive dialect borrowing in 13th-century Chaozhou.[6] My own reaction at the time was that this was an illegitimate use of the concept of dialect borrowing. Instead of introducing hard data on dialect mixture, the respondents argued that since sound change is known to be regular, there *must have been* dialect mixture. There seemed to be no difference between these reactions and the automatic response of certain Neogram-

[5] Thus Gauchat: "The phonetic *law* does not affect all items at the same time: some are destined to develop quickly, others remain behind, some offer strong resistance and succeed in turning back any effort at transformation" (cited in Dauzat 1922, my translation).

[6] This response was offered at the 1975 meeting of the LSA in San Francisco, where Chen and Hsieh first presented the Chaozhou data. Since then, it has been developed in Egerod 1976, 1982; Pulleyblank 1978; and Chan 1983. The initial counterresponse was that this criticism did not take into account the specific location of the split and the presumed borrowings. The splits are not randomly distributed throughout the lexicon, but are concentrated in certain etymological classes.

Table 15.1 Distribution of Middle Chinese tone III in modern Chaozhou by Middle Chinese initials (from Cheng and Wang 1977:94)

Middle Chinese initial	Chaozhou tone	
	2b	*3b*
b	6	7
v	1	3
d	11	14
dz	6	2
z	3	3
ḍ	3	4
dẓ	1	3
ẓ	3	5
dj	2	1
g	6	4
ɣ	14	15
TOTAL	56	61

marians to Gauchat's data on Charmey (see chapters 4, 16): they argued that the fluctuation of /l'/ and /y/ in the middle generation must have been the result of those speakers' borrowing half of their forms from their parents and half from their children. It also seemed to me unlikely that dialect borrowing would be specialized to reflexes of Middle Chinese tone III.

Final consonant shifts in Atayalic dialects

In 1982, Li published data on variation in the Atayalic dialects of Formosa, which showed the type of implicational scaling in word-final consonantal changes exemplified in table 15.2, for 10 speakers of the Skikun dialect. (Though Li presents a number of other sound changes, this velar/labial shift involves the largest number of words and the greatest number of informants.) Li concludes that there is evidence of a general drift in Atayalic dialects toward simplification of features of final segments, and that the changes are phonetically abrupt, and lexically gradual: "The Skikun speakers between ages 80 and 32 apply the rule -p > -k and -m > -ŋ to different lexical items and they differ in the number of items to which the rule applies, largely depending on the age and sex of each individual speaker" (1982:186).

The implicational scale of table 15.2 presents the 10 individual lects as vertical columns; each horizontal line shows a different linguistic environ-

Table 15.2 Lexical diffusion in velar/labial shift in Skikun (from Li 1982)

S.T. *f84*	*S.P.* *f80*	*Y.K.* *f71*	*B.M.* *m65*	*P.S.* *m61*	*Y.S.* *m54*	*M.W.* *m50*	*Y.N.* *f55*	*H.Y.* *m46*	*Y.K.* *m36*	*W.B.* *m32*	
qciyap	-p	-p	-p	-p	-p	-p	-p	-p	-k	'opposite shore'
ʔiyup	-p	-p	-p	-p	-p	-p	-p	-p	-k	'goshawk'
qatap-	-p	-p	-p	-p	-p	-p	-p	-p	-k	'scissors'
tgtap	-p	-p	-p	-p	-p	-k	-p	-p	-k	'to fan'
ghap	-p	-p	-p	-p	-p	-p	-p/k	-p	-k	'seed'
qurip	-p	-p	-p	-p	-p	-p	-p/k	-p	-k	'ginger'
hmap	-p	-p	-p	-p	-p	-p	-k	-k	-k	'stab'
pshup	-p	-p	-p	-p	-p	-p	-k	-p	-k	'suck'
hmop	-p	-p	-p	-p	-p	-p	-k	-p	-k	'do magic'
talap	-p	-p	-p	-p	-p	-k	-p	-k	-k	'eaves'
tgiyup	-p	-p	-p	-p	-p	-k	-k	-p	-k	'sink'
miyup	-p	-p	-p	-p	-p	-k	-k	-k	-k	'enter'
qmalup	-p	-p	-p	-p	-p	-k	-k	-k	-k	'hunt'
mgop	-p	-p	-p	-p	-p	-k	-k	-k	-k	'share one cup'
qmuyup	-p	-p	-p	-p	-p	-k	-k	-p	-k	'fold'
kmiyap	-p	-p	-p	-p	-p	-k	-k	-k	-k	'catch'
mnep	-p	-p	-p	-k	-p	-k	-k	-k	-k	'to fish'
msuyap	-p	-p	-p/k	-k	-p	-k	-k	-k	-k	'yawn'
qom	-m	-m	-m	-m	-m	-m	-m	-ŋ	-ŋ	'anteater'
syam	-m/ŋ	-m	-m	-m	-m	-ŋ	-m	-ŋ	-ŋ	'pork'
qmtam	-m	-m	-m/ŋ	-m	-m/ŋ	-ŋ	-m	-ŋ	-ŋ	'swallow'
rom	-m	-m	-m	-m	-ŋ	-ŋ	-m	-ŋ	-ŋ	'needle'
qinam	-m	-m	-m	-m	-ŋ	-ŋ	-ŋ	-ŋ	-ŋ	'peach'
hmham	-ŋ	-m	-m/ŋ	-m	-ŋ	-m	-ŋ	-ŋ	-ŋ	'grope'
yuhum	-ŋ	-m	-m	-m	-ŋ	-ŋ	-m	-ŋ	-ŋ	'gall'
prahum	-m	-m	-m/ŋ	-ŋ	-ŋ	-ŋ	-ŋ	-ŋ	-ŋ	'lips'
tmalam	-m	-ŋ	-m/ŋ	-m	-ŋ	-ŋ	-ŋ	-ŋ	-ŋ	'taste'
mtlom	-m	-m	-m	-m	-ŋ	-ŋ	-ŋ	-ŋ	-ŋ	'burn'
lmom	-m	-m	-ŋ	-ŋ	-ŋ	-ŋ	-ŋ	-ŋ	-ŋ	'burn'
mktlium	-m	-m	-m	-ŋ	-ŋ	-ŋ	-ŋ	-ŋ	-ŋ	'run'
cmom	-m	-m	-ŋ	-ŋ	-ŋ	-ŋ	-ŋ	-ŋ	-ŋ	'wipe'
mnkum	-ŋ	-m-	-m	-ŋ	-ŋ	-ŋ	-ŋ	-ŋ	-ŋ	'dark'

ment, in this case a particular word. The most conservative lect is that of the two oldest speakers S.T. and S. P. at left: their final consonants are the same as that of the full form of the word given in that column. The first part of the table shows the gradual replacement of the labial voiceless stop by a velar voiceless stop. The most conservative environment for final

/p/ is *qciyap*, where all speakers but the youngest keep the original labial; the most innovative is *msuyap*, where five speakers have velar /k/, and one varies between /p/ and /k/. The implicational scaling for age indicates that for the age dimension, the presence of a velar for a speaker of a given age implies that all younger speakers will have a velar, and the presence of a labial implies that all older speakers will have a labial. On the lexical dimension, it indicates that if a given word has a final labial, all words above it will have a labial; if it has a final velar, all words below it will have a velar. The table is not presented as a perfect implicational scale: there are "scaling errors." For example, the fourth item *tgtap* shows a scaling error for Y.N., who has final /k/, though the use of a final labial by the two younger speakers H.Y. and Y.K. would predict a /p/ for her as well. However, the overall regularity of the pattern is evident, and is submitted to support the conclusion that the significant linguistic environments for the change are individual words.

The second part of table 15.2 shows the corresponding shift for the final labial and velar nasals.

Vowel merger in Shanghai

In 1990, Shen presented similar tables documenting the progress of a vowel merger in Shanghai, collapsing the Middle Chinese distinction that is represented as /-ang/ vs. /-eng/ in Beijing, and as front /-ã/ vs. back /-ɑ̃/ in Shanghai. Shen obtained discrimination data from 376 Shanghai speakers, who were presented with a series of items, each consisting of three words that differed only in the vowel, and were asked to judge which if any of the three was different. There was extensive lexical variation: correlation of the merger with frequency of the word showed an r of .67. Furthermore, there was extensive homophone splitting: words that had the same vowel historically differed from each other about 20% of the time (Wang 1989:21–23).

Lexical diffusion in other language families

Evidence for lexical diffusion is of course not confined to Sino-Tibetan. The papers in Wang 1977 offer evidence from Swiss German, Classical Tibetan, Old Welsh, and Swedish, as well as discussions of acquisition in English and Chinese. Chen and Wang (1975) draw further arguments of lexical diffusion from Sherman's (1973) study of the historical development of English forestressing of nouns derived from verbs. Chapter 16 will consider work by Ogura (1987), which argues that the English Great Vowel Shift proceeded by lexical diffusion. Krishnamurti (1978) traces the development of Dravidian consonant clusters, using computational methods to analyze data presented by Burrow and Emeneau (1961); his results leave no doubt that these sound changes proceeded with the word, not the phoneme, as the basic unit.

15.3 Lexical diffusion in the speech community

With the exception of Shen's experiments in Shanghai, the evidence presented so far is based on changes long completed. This section will turn to evidence for lexical diffusion in studies of the spontaneous use of language within the speech community. The change in progress that we will examine is the tensing of short **a** words in the Middle Atlantic states, with special attention to Philadelphia. American dialects in general exhibit a fronting and raising of this class, and a number of chapters have dealt with the mechanism in one form or another.

The fronting and raising of short **a** continues a process that began in the 10th century. An earlier raising of long **ā** to **ɔ̄** (in *boat, stone,* etc.) had left a hole that was filled by lengthening of short **a** in open syllables. Fronting, raising, and participation in the Great Vowel Shift led to a merger of *name, gave,* etc., with several other classes in modern /ey/. The residual instances of short **a**, all in checked syllables, are now being affected in all American dialects of English. The most favored subset for raising are words ending in final front nasals: *hand, man, ham,* etc., which are raised almost everywhere. In the Northern Cities Shift, all short **a** words are tensed and raised. But in the Middle Atlantic states, the raising and tensing affect only some short **a** words, following a complex set of conditions that vary systematically from New York to Philadelphia to Baltimore. Chapters 3 and 4 dealt with this Middle Atlantic situation as part of the description of the Philadelphia vowel system, and chapter 11 treated the tense/lax opposition in Philadelphia as an example of a phonemic split.

The tensing of short **a**

There is a sizeable literature on the raising of short **a** in the Middle Atlantic states, beginning with a series of articles by Trager (1930, 1934, 1940), Cohen's (1970) analysis of New York City and surrounding New Jersey, and Ferguson's (1975) description of the Philadelphia system. Payne (1976, 1980) deals with the acquisition of the phonetic process of raising and the distributional pattern of which words are raised. Halle and Mohanan (1985) and Kiparsky (1989) relate these data to the phonological framework developed in their articles. Harris (1989) compares data from Belfast with the New York City and Philadelphia reports in relation to the theory of lexical phonology. Labov (1989a) is a detailed quantitative study of the tense/lax opposition in the speech of 100 Philadelphians. Before the end of part D, I will attempt to clarify a number of the unresolved questions raised in all of these treatments of short **a**.

In the Middle Atlantic dialects, a set of words with short low nonperipheral [æ] is opposed to another set with nuclei that are fronted to a peripheral position – generally mid to high, long, with a centering inglide (i.e.,

[e:ə]). As before, I will refer to this opposition as lax vs. tense. Figure 15.1 enlarges the view provided by figure 11.7; it shows for both New York City and Philadelphia the set of following consonants that yield tense vowels (when the next segment is [+consonant] or a Level 2 or word boundary): the outer line shows the New York system, and the inner line shows the consonants that condition tensing in Philadelphia, a proper subset of the New York system. The Philadelphia system is close to the minimal or core set that conditions the tensing of low vowels in English generally – front nasals and voiceless fricatives.[7]

In additon to the basic conditioning of the following consonant, there is an extensive set of special phonetic, grammatical, and lexical conditions for tensing to apply. It will be useful here to consider the relation of the major Philadelphia subconditions to the Neogrammarian hypotheses that sound change is lexically regular and mechanical in its operation.

1 *The tensing operation.* Short **a** is tensed before the set of consonants in figure 15.1 only when it is in a closed syllable. Thus *ham* and *hand* have tense vowels, but *hammer* has a lax vowel. This is a simple phonetic condition. But if the following syllable is a Level 2 inflectional suffix, the vowel remains tense, as in *hamming it up*. Again, *man* is tense, both as noun and verb, and *manner* is lax (since a vowel follows the consonant directly). But *manning* (as in *Who is manning the store?*) is tense, since the syllable is open only by virtue of the inflectional suffix *-ing*. This is clearly grammatical information, but no problem arises for the Neogrammarian principles, since this effect can plainly be attributed to analogy: tense /æh/ occurs in the participle *manning* by analogy with the simple verb *man*.

2 *The weak word condition.* To be tensed, the vowel in question cannot

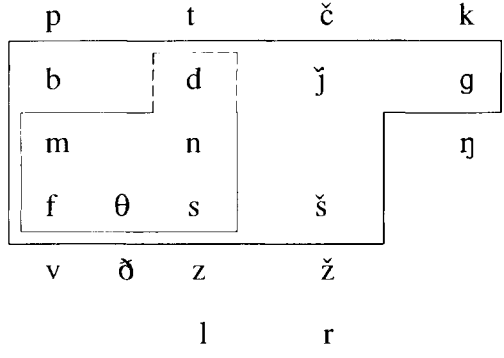

Figure 15.1. Consonants following short **a** that condition tensing in Philadelphia (inner line) and New York City (outer line)

[7] As Ferguson first pointed out, this odd combination of features is also characteristic of the broad **a** class (though the nasal environment is even more limited). When we make the obvioius adjustment of front nasals to back nasals, it also applies to the tensing of short open *o*.

be in a "weak word," that is, one whose only vowel can be shwa. This condition is stated as though it were a phonetic condition, but weak words are of course a subset of "function words": auxiliaries, articles, etc. The classic contrast is tense *tin can* vs. lax *I can*. But any grammatical implications of this condition can also be handled by analogy. Auxiliaries such as *am* and articles like *an* have shwa in normally unstressed position, and shwa is a lax vowel; the marked stressed forms can be said to be lax by analogy with the unstressed forms.

3 *Derivational suffixes.* If a Level 1 derivational suffix follows the consonant after the vowel, there is considerable variation in the frequency of tensing. Thus we find widespread variation in *Lassie*, [laesi] or [le:əsi], and *plastic*, usually [plaestɪk] but possibly [ple:əstɪk]. The variability of the first may be said to reside in the variable identification of the isolated word *lass* as the first part of *Lassie* on the analogy of *Pat:Pattie::lass:Lassie*. But there is no free form *plast* that might support the same argument for *plastic*.

4 *Strong verbs.* Strong verbs ending in nasals remain lax, contrary to the general rule. Thus Philadelphians pronounce lax *ran, swam, began*, but tense *man, Dan, slam, understand*, etc. There is some variation in the *ran, swam, began* class; but the condition that excepts irregular verbs ending in nasals from the general rule is a strong one. In Philadelphia, the vernacular preterit of the verb *win* is always pronounced with a lax vowel, [wæn]. This kind of grammatical information certainly cannot be handled in the Neogrammarian framework. Nor can it be characterized as a unique exception, in the light of Toon's (1976) study of variability in the raising of West Germanic short **a** before nasals in Old English texts. In three sources – the Lindisfarnane Gospels, the Rushworth Gospels, and the Durham ritual – Toon found that the sound change is complete except for Class III strong verbs, which are lax as a group. Of the 106 tokens of these verbs in the Lindisfarnane Gospels, 106 were lax. The Philadelphia *ran, swam, began, /wæn/* are the sole surviving members of this class in the environments of figure 15.1.

5 *The* mad, bad, glad *class.* All vowels followed by voiced stops are lax, except for those of *mad, bad*, and *glad*, which are always tense. The three words involved are all common affective adjectives, and so we might want to construct some kind of general rule to account for them. But *sad*, another common affective adjective, is lax along with all other short **a** words ending in /d/.[8] This is massively regular for the entire Philadelphia speech community – a clear case of lexical diffusion, arrested in mid-career at some point in the past.

[8] The stability of *sad* in Philadelphia will be demonstrated in table 15.5. It is not impossible that further progress of this sound change will make use of the obvious generalization. Some tendency to pronounce tense *sad* in word lists has been observed in Payne's work in the Philadelphia suburbs.

We must therefore concede that not all sound change in Philadelphia is Neogrammarian: one such process, at least in the past, did not share the Neogrammarian syndrome. To make further progress in understanding when regular sound change operates, and when sound change advances one word at a time, we will have to look more closely at short **a** in Philadelphis, to see what kind of rule is at work.

Unpredictable lexical distributions

Trager approached the problem of whether tense /æh/ and lax /æ/ constitute one phoneme or two in the framework of autonomous phonemics. Minimal pairs like *can* [N, V] vs. *can* [Aux], or lexical exceptions like New York City *avenue*, were not the only evidence. The fact that one could not predict whether *jazz* or *wagon* was tense or lax for any given speaker was the major factor that led Trager to entitle his 1940 article "One Phonemic Entity Becomes Two: The Case of 'short *a*'." Cohen (1970) found such extensive and unpredictable irregularity in the margins of the New York City and New Jersey rules – before voiced fricatives and velar stops, in polysyllables – that he concluded that no rule could be written. As noted above, the pronunciation of some groups of words is unpredictable in Philadelphia; for example, short **a** followed by an -stV- sequence (*master, plaster,* etc.) shows extensive individual variation that cannot easily be reduced to rule. In both New York City and Philadelphia, it is difficult to predict the pronunciation of "learned words" like *alas, wrath, Gath,* and *adz*, which are acquired late in life.

The present configuration of tense /æh/ and lax /æ/ in Philadelphia leads to the strong inference that lexical diffusion operated at some earlier state in the history of this redistribution. So far, the view of lexical diffusion is no more direct than the view obtained from the DOC studies. However, in dealing with other aspects of linguistic change, LCV found that the most profitable strategy is to track the mechanism involved by observing change in progress, rather than by weighing the residues of processes no longer operating. It was therefore welcome news to find that, in a subarea of the lexical distribution of short **a** in Philadelphia, lexical diffusion is still at work.

As noted in the previous section, one subcondition of tensing is that a consonantal segment or boundary must follow the first consonant after short **a**. Thus even when short **a** is followed by consonants /m/ and /n/, most favorable to tensing, we would find lax /æ/: *manner, camera, planet, damage, flannel.* I was more than a little surprised when, during an early exploration of the Philadelphia suburb of Radnor, I came across a group of 12-year-olds who read lists with *planet* tense, but the other words lax. This was not an isolated event. In every area of the city, LCV found the same tendency for speakers to break the pattern of the earlier distribution, pronouncing *planet* as tense. Word list data for 31 Philadelphians from

King of Prussia are shown in table 15.3. There is a trend to tense vowels throughout the _NV subclass, but *planet* leads the list with twice the frequency of any other word: two-thirds of the speakers read it with a tense vowel.

LCV also found lexical diffusion in the _LV subclass. In New York City, following /l/ is among the least likely environments for tensing. But Philadelphia postvocalic /l/ is most often realized as an unrounded mid back glide, and there is a general tendency for a nucleus followed by a lax glide to become tense. For adults as well as children, *pal* is homonymous with *Powell*: both words show a long tense nucleus followed by a back glide. Table 15.3 shows word list data from the same 31 King of Prussia subjects, comparing *personality, pal, algebra,* and *California.* Here *personality* and perhaps *pal* are good candidates for lexical diffusion; the data from spontaneous speech point in the same direction.[9]

Table 15.3 Tensing of short **a** in open syllables in King of Prussia (from Payne 1976)

		N	*% Tense*
_NV			
	planet	62	68
	damage	31	35
	manage	31	32
	flannel	31	23
	camera	31	19
	family	31	19
_LV			
	personality	30	20
	pal	31	6
	algebra	30	0
	California	31	0

[9] The selection of *planet, pal,* and *personality* in the process of lexical diffusion is of course far from arbitrary. The effect of frequency is present, as in the earlier stages of the short **a** rule. The role of affect in *mad, bad,* and *glad* reappears in *pal* and *personality.* Phonetic conditioning can also be detected, not in the precise form of output rules like the fronting of /ow/, but in a rougher approximation: for example, *mad, bad,* and *glad* with grave initials, opposed to *sad* with a nongrave initial. The inclusion of the initial liquid cluster *gl* seems hard to explain, since such environments tend to lower F2 and F1 in the phonetic output (see *glass, traps,* and *black* in figure 6.10). Yet it is repeated in the selection of *planet* as a leading element in the change. More importantly, the following /ɪt/ syllable of *planet* contributes to the tensing of the first vowels, as opposed to the darker /l/ of *flannel* (first pointed out to me by C.-J.N. Bailey, p.c.). This echoes the umlaut rule of the Atlanta dialect described by Sledd (1966), which opposes *pillion* to *pillow.*

Table 15.4 looks more closely at the situation by adding the data from spontaneous speech, and by separating children (age 9–15) from parents (age 37–52). It appears that the pattern of lexical diffusion is not an artifact of word lists.[10] For both adults and children, in both styles, the leading position of *planet* is preserved. Children show an overwhelming tendency to tense *planet*; only two use a lax vowel consistently. Other words are moving as well, but *planet* is obviously the leader.

Lexical diffusion in the working-class neighborhoods

The vowel shifts studied by LCV are initiated and led by speakers in particular locations within the social structure (Labov 1980, 1990). But the lexical diffusion documented above for the middle-class suburb of King of Prussia is not limited to any one social group. Data from working-class neighborhoods in Kensington and South Philadelphia show the same pattern. These data illustrate the extraordinary stability of the core pattern: that is, words governed by subconditions 1 and 5. Labov (1989a) examined short **a** words in the spontaneous speech of 100 working-class speakers in the LCV Neighborhood Study, and found only one exception to the general pattern of tensing governed by the phonetic pattern of figure 15.1 and subcondition 1. It is even more remarkable to find such consistency in the highly specific lexical subcondition 5, as shown in table 15.5: in 259 spontaneous uses of *bad, mad, glad, sad,* and *dad,* one exception was found to the rule that vowels in the first three words are tense, the others are lax.

Table 15.6 shows that there is much less stability in the marginal distributions before intervocalic consonants that show lexical diffusion in King of Prussia. The __LV class provides the largest amount of data. One can observe a steady movement from 0% tensing among the oldest speakers,

Table 15.4 Tensing of short **a** by age and style in King of Prussia A/B/C = no. all tense / no. tense and lax / no. all lax (from Payne 1976)

	Adults, 37–52 years		*Children, 9–15 years*	
	Speech	*Word list*	*Speech*	*Word list*
planet	1/2/4	1/0/8	12/1/2	17/2/2
damage		0/0/9		10/0/11
manage		0/0/9		9/0/12
flannel	0/0/9	2/0/5		7/0/14

[10] In the King of Prussia interviews, Payne designed special techniques to concentrate occurrences of *planet* in spontaneous speech.

Table 15.5 Tensing and laxing of short **a** before /d/ in Philadelphia spontaneous speech

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

Table 15.6 Tensing and laxing of short **a** before /l/ in Philadelphia spontaneous speech ( ) = unclear cases

		AGE			
		8–19	*20–39*	*40–59*	*60+*
ALL _LV WORDS					
	Tense	7	6	(1)	0
	Lax	8	15(3)	7	10
INDIVIDUAL WORDS					
alley	Tense	5	(1)	(1)	0
	Lax	6	3	3	3
personality	Tense	2	(1)	0	0
	Lax	2	3	(1)	0
Italian	Tense	0	1	0	0
	Lax	4	3	4	2
Allegheny	Tense	0	0	0	0
	Lax	0	4	0	1

to a slight tendency toward tensing among speakers in their forties and fifties, to about 30% tensing among speakers in their twenties and thirties, to almost 50% tensing among preadolescents and adolescents. This increse does not occur evenly across all words. Table 15.6 also shows the record for the four most common words: *alley, personality, Italian,* and *Allegheny.* It is clear that tensing is concentrated in the first two. As in King of Prussia, the results show that *personality* is rapidly becoming a tense word. The same pattern can be observed in the _NV class, though the individual words are not as frequent.

Further progress of /æ/ tensing among young children

In 1990, Roberts began an investigation of the acquisition of sociolinguistic variables by young children, 3–4 years old, in the white community of South Philadelphia (1993), developing indications in the earlier work of Guy and Boyd (1990) and Labov (1990) that children acquire specific Philadelphia variables quite early in life. In this research, Roberts used a variety of techniques to obtain as much data from children at this age as is normally obtained from interviews of one to two hours with adults. The recording, which involved as many as 13 sessions with the same child, was done at a day-care center. To enrich the data on specific variables, Roberts used games and puppet plays to introduce names with phonological features of special interest in the development of the Philadelphia dialect. Included among these were short **a** words, particularly those that had shown indications of lexical diffusion in progress: words with short **a** before intervocalic laterals and nasals, and the class consisting of *mad, bad,* and *glad.* The results allow us to compare the state of the Philadelphia dialect in 1973, among adults and adolescents, with the developments among 3- and 4-year-olds in 1990. These children resembled the adults in their uniform use of the core pattern: for example, 30 tokens tense out of 31 for *mad* and 42 tense out of 42 for *bad,* as opposed to 42 lax out of 43 for *sad.*[11]

Roberts obtained considerable data on the pronunciation of three words with short **a** before intervocalic /l/ (*Sally, Allen,* and *alligator*), and five words with short **a** before intervocalic nasals (*planet, Janet, animals, camera,* and *hammer*). Table 15.7 shows the data for the 11 children from whom the most data were obtained. The first column shows all 11 children. The second uses the pronunciation of the word *giraffe* to distinguish between those children who had fully acquired the Philadelphia dialect and those who had not. The pattern for these 7 children is somewhat more consistent than for the 11 as a whole.

By this evidence, the tensing of short **a** before intervocalic /l/ has progressed considerably. The three words *Sally, Allen,* and *alligator* all show rates of tensing higher than 50%, though they do not give us enough evidence to show that the earlier pattern of lexical diffusion has continued.[12]

The results for short **a** before intervocalic nasals are more promising. Good data were obtained from the children on two of the words in table 15.3: *planet* and *camera.* In the King of Prussia study in 1973, *planet* showed twice as high a rate of tensing as other words, about 61% in word

[11] In is interesting to note that the one tense token of *sad* was given by a child with one black parent. In other respects as well, his speech pattern differed from that of most of the children.
[12] It was not possible to get good data on the words that had shown lexical diffusion among adults – *Italian, personality,* and *Allegheny* – since these words are not in the active vocabulary of 3-year-olds.

Table 15.7 Tensing of short **a** before intervocalic laterals and nasals by young Philadelphia children

	All children [N = 11]		*Children with consistent /æh/ in* giraffe *[N = 7]*	
	Tense	*Lax*	*Tense*	*Lax*
Sally	19	16	11	9
Allen	10	8	5	5
alligator	19	5	12	3
planet	87	5	57	1
Janet	14	14	8	6
animals	0	34	0	21
hammer	1	15	1	7
camera	0	41	0	24
giraffe	27	11	23	0

list data. In the spontaneous speech of adolescents, the rate was higher, about 80%. The South Philadelphia 3-year-olds of 1990 showed almost categorical tensing of *planet*. For all 11 children, the rate is 94.5%, and when we consider only those children who appear to have mastered the Philadelphia system, it reaches 98.3% – only one exception was recorded. On the other hand, words with a following /ər/ syllable, *hammer* and *camera*, are almost categorically lax. Instead of a general advance, there seems to be a polarization of tensing in this subset.

Might this distribution be the product of phonetic conditioning? The analysis of short /i/ in Southern English by Sledd (1966) shows that unstressed -/ɪt/ will condition brighter vowels in the preceding syllable, and the difference between *planet* and *camera* can be accounted for in this way. The absence of tensing in *animals* may be linked to the fact that polysyllabic words with initial short **a** have already appeared to favor laxing words with following voiceless fricatives like *aster* and *aspirin*. But it is very difficult to give a phonetic motivation for the contrast between *Janet* and *planet*. *Janet* was chosen to be phonetically comparable to *planet*; with the initial palatal /dʒ/, it should favor tensing even more than *planet*, with an initial obstruent-liquid cluster. Yet the difference between the tensing of the two words is large: *planet* shows almost 100% tensing, and *Janet* 50%. The most recent study of short **a** in Philadelphia therefore supports the earlier findings that assignment to the tense class is proceeded by a lexical redistribution of individual words.

15.4 Summary of the evidence so far

At this point no reasonable person would maintain what might be called the Neogrammarian dogma: that sound change is always gradual, always regular, affecting all words at the same time. The question now is whether the Neogrammarian position retains any substantive value. Are *some* sound changes phonetically regular and lexically abrupt? Chen and Wang (1975:257) come close to saying no:

> This lexically gradual view of sound changes is incompatible, in principle, with the structuralist way of looking at sound change.

A later statement of Wang (1979) is more moderate: "The Neogrammarian conception of language change will probably continue to be part of the truth." And in response to the first presentation of the approach taken in these chapters (Labov 1981), a number of statements on behalf of lexical diffusion began with an acknowledgment that both Neogrammarian regularity and lexical diffusion exist. Yet over the past decade, it has become evident that the lexical diffusionists do not accept the existence of regular sound change in the sense that the Neogrammarians conceived it: a phonetically motivated change of an articulatory target that affects every word in which that target occurs. Wang and Lien (to appear) reinterpret the Neogrammarian position as a description of the output of a change, and not of the process of change itself. They return to the position of Chen and Wang (1975) that lexical diffusion is "the basic mechanism in the implementation of sound change." To the best of my knowledge, no partisan of lexical diffusion has presented evidence of regular sound change.[13] In each case examined, the fundamental mechanism of change argued for is that words migrate, one at a time, from one class to another (Barrack 1976; Toon 1976, 1978; Hooper 1976; Krishnamurti 1978; Milroy 1980; Bauer 1982, 1986; Phillips 1980, 1984; Fagan 1985; Ogura 1987; Shen 1990; Wang 1977, 1989). This long list of publications would lead an outside reader to the impression that the evidence is mounting inexorably in favor of the principle of lexical diffusion. But there is an unfortunate bias in what kinds of reports are submitted. Those who work within the historical/comparative framework continue to assume regularity. Though papers have been published that criticize certain claims for lexical diffusion, it would not occur to a historical linguist to write a paper reporting that

[13] Wang and Lien refer to an unpublished study of the Wenxi variety of the Shanxi dialect by H. Wang (1990), which does appear to recognize regular change as well as lexical diffusion. She identifies "conditioned and diffusional sound change," which "involves a change in phonemic categories which are restricted by phonological conditions, but not by words and contexts."

his or her latest investigation showed regular sound change. Indeed, no one would publish such a report, for it does not bring anything new to light.

The next chapter will attempt to restore the balance by reviewing the data presented so far from the Neogrammarian perspective. It will then present some direct evidence to support the Neogrammarian view that it is sounds that change, and not words.