SOCIOLINGUISTIC METHOD AND LINGUISTIC THEORY

DAVID SANKOFF

Université de Montréal, Montréal, Québec, Canada

1. Introduction

What we may call 'the sociolinguistic method' is neither new to socio-linguistics, nor universally adhered to by sociolinguists, nor—strictly speaking—a method. It is basically a working hypothesis with a distinctive (within linguistics) methodological and concetpual apparatus, built up over the last ten to fifteen years in response to the particular needs of research guided by this hypothesis. The essential point is that the primary data for the study of linguistic structure, function, and change is the spoken language, more specifically spontaneous unreflecting speech in its natural context. This principle is best exemplified by the research of William Labov and associates (LABOV, 1963, 1966, 1972a, 1972b, LABOV *et al.*, 1968, 1972, 1977, 1978), though the present paper is based on the work of the Montreal French Project (e.g. SANKOFF, 1978; THIBAULT, 1979; G. SANKOFF, 1980). We shall trace some of the consequences of the natural speech hypothesis, not only on the methodological level, but also extending into linguistic theory. On the theoretical level we focus on two debates: one about the existence of the 'syntactic variable' and the second on the 'wave' theory.

2. The sociolinguistic paradigm

First, we stress how radically different for linguistics is this preoccupation with natural speech. The primary source of data for much modern lin-guistics, especially syntax, is the introspection of linguists themselves about grammaticality, meaningfulness and paraphrase. The other major source, especially in phonology, is work with informants using classical

elicitation procedures. The closest approach to the study of natural speech
might be the transcription and editing, with the help of informants, of
narrative elicited in a rather formal context. All of these types of data
bear not so much on the language but rather on what someone thinks
about the language.

One might take the point of view that any distortions this introduces
are second-order effects—that the generalization to be drawn from one
type of data would be much the same as from the other, and this is no
doubt true in some situations for some purposes. It does not seem to be
true, however, for the study of urban speech communities favoured by
sociolinguists, loci of the confrontation of standard and non-standard
speech varieties, and dominant versus minority languages, where ideas
about who says what and how, in which contexts and for what purposes,
are greatly affected by a linguistic ideology propagated by the schools,
the media and other institutions (BOURDIEU and BOLTANSKI, 1975), and
generated in the social praxis of a society characterized by class inequality
and ethnic division. An informant's opinions and judgments reflect, in
unknown proportions, 'true' linguistic structure, unrealistic norms, and
false stereotypes. When the linguist doubles as informant, we can add
theoretical prejudice, conscious or unconscious, to the list of factors
intervening between linguistic structure and speaker's intuition.

In any case, one of the most important consequences of the natural
speech approach is not that it gets the 'right' answer where another method
gets the wrong one, but that it provokes different types of questions to
be answered, and hence prompts theorizing about language with focus
and scope distinct from linguistics based on introspection or elicitation.

On the methodological side, the most obvious characteristic which
distinguishes this kind of research is the importance it places on counting,
quantification and statistics, none of which play a role in more traditional
approaches to phonology, morphology, syntax and semantics. When
a corpus of natural speech is studied, whether produced by one or several
speakers in one or different contexts, it is not only the contrast between
what is said versus what does not seem to be said which must be accounted
for, but also that certain elements occur more frequently than others
and that these frequencies, not just presence and absence, are systematically
conditioned by co-occurring quantities in the phonological or syntactic
environment. These are striking facts of a linguistic nature, systematic
and suggestive of a range of generalizations. The methodology for ac-
curately describing these facts and the theoretical apparatus for explaining

them does not exist within paradigms which depend on introspection or elicited data.

Note that despite its assumptions about recurring events and patterns, and its reliance on counting and quantitative analysis, our approach cannot be characterized as any sort of strict positivism. Indeed, there is a debate within the field as to the appropriate domains of interpretation versus 'distributionalism', which is essentially a type of positivism. Further, work in this field inherently constitutes a critique of existing social institutions connected with language since it inevitably unmasks and demystifies oppressive ideology about popular or minority speech varieties. (I would not claim the same for more psycholinguistic approaches to the study of the spoken language.)

3. The demise of free variation

The developments we shall discuss form a logical progression, not always corresponding strictly to their chronological emergence but permitting a more coherent exposition.

We may start with the notion of free variation in traditional phonology. Given a number of allophones, once all contextual factors, such as the surrounding phonological environment of a segment, stress, relation to word and syllable boundary, and morphological status, have been examined for whether or not they determine, singly or in combination, the choice of an allophone, if some contexts remain in which two different allophones may both be realized, they were said to vary freely. Free variation was considered relatively rare, transitory, linguistically unimportant, and to reflect a certain pathology, if not in the language itself, at least in the linguistic analysis.

This concept was one of the first casualties of the sociolinguistic study of natural speech. First, rather than a pathological rarity, the alternation of variants even in the most carefully defined contexts, is widespread, both in terms of the number of phonemes subject to variation and the range of contexts in which it occurs. Second, the variation is not 'free', but highly structured, even if this structure is quantitative rather than the qualitative or categorical conditioning familiar in linguistics. For example, instead of 'allophone A in context X and allophone B in context Y', we have 'variant A occurs 80% of the time in context X but only 30% of the time in context Y'. Instead of 'feature R determines that allophone A be realized whereas feature Q excludes it', we have 'feature R

favors variant A and Q disfavors it'. Indeed, many of the quantitative results of this type are more subtle and accurate versions of qualitative claims of traditional phonological treatments, claims which suffer from 'categorical perception', a type of bias whereby certain variable tendencies are interpreted as categorical when intuition or unsystematic impressions are relied upon.

    A third aspect of the notion of free variation has to do with its alleged unimportance for linguistic theory. On the contrary, in any theory accounting for natural speech use, the study of variation becomes the key to understanding all aspects of the internal differentiation of language within a speech community, and even more important for linguistics, the processes of language change. Indeed, it is in these areas where sociolinguistics has had its greatest impact.

    To gather data for the study of variation, we note each occurrence of each variant or allophone in a corpus and code it for relevant phonological, morphological and syntactic features of the environment, as well as style, discourse type and any other pertinent situational or extra-linguistic features including the sociodemographic characteristics of the speakers.

    The working hypothesis underlying the analysis of the choice of one variant or another of a linguistic variable, which is what we call the *set of possible variants*, is due to LABOV (1969): that the various factors influencing this choice contribute their effects more or less independently of the other factors. We have been formalizing this (SANKOFF, 1975) as follows. Suppose there are two variants. Then

$$\log \frac{P}{1-P} = \mu + a + b + \dots$$

where P is the probability that the first variant will be used in a specific context, and $a, b, \dots$ are the effects due to various features or components of this context. μ is an average tendency pertinent to all contexts. The 'a', for example, refers to the effect of a given feature; it is included in the formula if and only if the corresponding feature is present in the context. This type of formula, with $\log(P/(1-P))$ depending linearly or additively on a number of effects, is well-known in statistics (e.g. Cox, 1970; HABERMAN, 1974), for modeling the dependence of probabilities on experimental parameters. Its manipulation tends to be more complicated than ordinary regression or analysis of variance, but presents no fundamental difficulties. JONES (1975) and others have developed programs

to analyze data, i.e. to estimate the factor effects, according to this model and we have also produced a number of programs specifically adapted to large sets of linguistic data, with their multiplicity of contextual features, often subject to co-occurrence constraints.

Note that in the formula, whatever the effects of the factors, as long as they are finite, P will be strictly between zero and one, i.e. the context will be variable and not categorical—speaking in terms of the model, not necessarily of the few observations we may have in this context. We will return to this point later.

The purpose of the data analysis, of course, is to accurately assess and compare the effects of the different features on the occurrence of the variants. With respect to phonological, morphological and syntactic features, this gives rise, as we have mentioned, to linguistic generalizations which are more detailed and refined than those obtainable from a qualitative approach. Thus while it is well known that the /l/ in il 'he, it' can be reduced (or absent) in French, careful study reveals that /l/-loss pervades the system of determiners and pronouns, that it is least stable in impersonal il and becomes increasingly stable as personal, plural, and feminine features are carried by the pronoun, that subject clitics are less stable than complements or determiners, and that a consonantal environment is more favorable to /l/-loss than a vocalic one (G. SANKOFF & CEDERGREN, 1971).

As for extralinguistic features, coding speakers according to their age is a powerful, though not infallible, way of detecting and measuring the progress of linguistic change. Incorporating social class or speaker's sex in the analysis enables us to measure the social differentiation of language and to pinpoint the social origin of change processes. Thus workers drop /l/ more frequently than bourgeois speakers (or obversely, bourgeois speakers insert it more frequently) in all linguistic contexts. Men drop it more frequently than women.

4. The syntactic variable

In turning from phonology to syntax, we encounter a major problem: that of equivalence, i.e. how to ascertain which structures or forms may be considered variants of each other and in which contexts. This was rarely a problem in phonology since invariance of meaning under substitution of allophones is a widely valid criterion, easy to apply, because it depends only on the recognition of two lexical forms as semantically

identical or qualitatively different. Trying to substitute non-equivalent forms leads to discrete changes of meaning—viz. the concept of 'minimal pair'. This is not the case in syntax. The substitution of different forms often leads to very subtle semantic distinctions, and there is frequently cause for debate as to whether or not there is any change.

Thus the unequivocal basis for phonological equivalence served sociolinguistics as well as it served other approaches to phonological theory, but as in other theories, when notions of syntactic equivalence were required, disagreement and controversy prevailed. This is certainly not because notions of equivalence are peripheral to modern syntactic theory. On the contrary, equivalence, semantic invariance, meaning-preservation, paraphrase and like concepts are basic, the various transformational theories being cases in point.

Early extensions of sociolinguistic analysis to morphosyntactic variation borrowed the notion of the semantic equivalence of transformed and untransformed sentences from generative transformational grammar. Instead of counting two phonological variants in a variety of contexts, studies of syntactic variation counted, under a variety of conditions, the number of sentences in which a given optional transformation had applied versus the number where it had not, even though it could have. Each case was checked to see whether the contrasting variant could be substituted without changing the sense of the sentence.

This approach proved to be unsatisfactory for two kinds of reasons. First, the assumption that transformations are always meaning-preserving is even less defensible for speech in context than in discussion based on intuitions. Second and more important, forms which seem to be equivalent to each other in context, frequently could only be derived by way of very different transformational paths. One could not be considered the transform of the other. Some examples are: different verbal constructions used to convey the same semantic time and aspect: *je ferai / je vais faire*, 'I will do' (SANKOFF & THIBAULT, 1978) and different complementizer constructions for a given type of verb complement: *je fais ce qu'il veut / je fais qu'est-ce qu'il veut*, 'I do what he wants' (KEMP, 1979).

This latter problem did not occur in phonological variation, incidentally, since phonological variants may generally be analyzed as being generated though the application of rules within the generative phonological framework.

Once the transformational criterion of equivalence is lost, and indeed any criterion based on structural relationships, what is there beside in-

tuition about identical reference which might allow us to postulate equivalence? The quantitative use of natural speech data provides a novel criterion leading to new and far-reaching theoretical consequences.

The clue for the discovery of this criterion existed already in the work on phonological variation. As we have mentioned, coding of tokens for sociodemographic characteristics of speakers leads to the discovery of internal differentiation of the speech community with respect to the variable concerned. There is a weak sort of complementarity of distribution in operation here. In those segments of the speech community where one variant is much used, the other is rarely used, and vice versa. Where one variant is used in moderate amounts, so is the other. Now, looking at this relationship backwards, if we could somehow identify such a pattern of internal differentiation in the community, might this help us to identify the variable involved? We suggest the answer is yes, as long as we have some further grounds, no matter how meagre, for postulating equivalence. That is, we do not have to prove any type of strict semantic invariance. For example, one might expect, and indeed it is empirically the case, that in a given speech community, in a specific speech situation, discourse of a particular type (e.g. narrative) on the same topic will require the expression of completed past action at a certain rate (e.g. once per hundred words), or of restricted relativization at a certain rate. And from our understanding of the discourse, we can decide, with some degree of confidence, when these rather broad functions are being fulfilled. Then, after counting the occurrences of the syntactic structures carrying out these functions, we can test for weak complementarity of distribution. If one form which can fulfill the function is abundant in one segment of the community while another construction is absent or nearly so, if the reverse pattern holds somewhere else in the community, and if the two competing forms are both of moderate abundance elsewhere, then we have weak complementarity and hence equivalence. Of course, this is discourse equivalence or functional equivalence and not necessarily semantic equivalence of syntactic forms—if such a relationship could ever be defined to the satisfaction of all linguists. The boundary between semantics and discourse function is unlikely ever to be a matter of general consensus—there is little agreement even on the details of the semantics/syntax distinction. What is important here is that whatever distinctions the analyst may wish to draw between two forms showing weak complementarity, these distinctions can have little consequence for the speakers, for the communicative uses of language within the community. Consider

for example the case where weakly complementary forms are distributed according to the age of the speaker. Here one form can usually be thought of as replacing the other over time. If they are not syntactic equivalents at some point in time, then what is? This leads, parenthetically, to one often expressed point of view—there are no syntactic variables. But this is clearly a matter of definition. In any case, there is some important type of variation occurring at the syntactic level which has far-reaching implications for the process of linguistic change. For example, using weak complementarity, we were able to confirm (SANKOFF & THIBAULT, 1978) the incipient process of suppletion of *aller* 'to go' in the *passé composé* in the French spoken in Mɔntreal—while one segment of the community uses the expected *je suis allé* 'I went', another use almost exclusively *j'ai été* which, out of context, would be glossed 'I have been'. Weak complementarity shows that they serve identical functions in discourse for different members of the community, a result which would have been inaccessible without interpreting, counting and statistically analyzing thousands of tokens of these forms in natural speech. In another study, we have produced the same type of evidence for equivalence in the use of *avoir* and *être* as auxiliaries in compound tenses for a class of intransitive verbs, despite hypotheses of aspectual distinctions proposed by others on the basis of introspection.

This type of consideration becomes central to a sociolinguistic theory of syntactic change. When discourse equivalents coexist in weak complementarity over a period of time, we may expect this equivalence to become grammaticalized—functional equivalents become syntactic equivalents, with consequent ramifications for the whole syntactic system.

In the pronoun system of Montreal French, LABERGE (1977) studied the almost complete replacement of the first person plural conjugation in French, using the subject clitic *nous* 'we', by the third person singular conjugation using *on*, traditionally glossed 'one'. She showed that this has been at least partly grammaticalized in that non-cliticized co-referents to the subject *on* are generally derivatives of *nous*, as in *on a fait notre mieux* 'one did our best'. Other repercussions are the displacement of *on* from its indefinite usages by *ils* 'they' and *tu* or *vous* 'you' to avoid ambiguity. Thus an important segment of the syntactic apparatus has undergone adjustment due to the ongoing grammaticalization of what was once a stylistic discourse variable.

Based on many other studies of the syntax of Mɔntreal French, it is

our belief that this type of discourse-directed change is at least as important if not more so than the processes of gradual internal grammatical restructuring we find in traditional theories.

5. On waves

Once we have established criteria for the identification of linguistic variables, phonological or syntactic, other questions arise over the analysis of variation data.

There have been two paradigms within which linguistic change and variation have been studied based on natural speech data. One approach which we have discussed breaks down the context of use of a variable into component features and assigns each possible feature a relative weight in favouring one variant over another. These weights are then combined according to a simple model in order to arrive at the overall tendency of the given context. The other approach rejects the decomposition of linguistic context effects into feature effects and prefers to compare entire contexts.

Thus the 'wave theory' (e.g. BAILEY, 1973) envisages linguistic change, i.e. from one variant to another, originating in a highly specific linguistic context in the discourse of a particular segment of the speech community. As time progresses, a wave of change proceeds along both linguistic and extralinguistic dimensions. The original innovators, or their descendants, use the new variant in more and more general contexts, while speakers distant from the centre of innovation start to use it, but only in the original restricted environments. This is illustrated in Figure 1 where the contexts in which the new variant first appeared are to the left and the most conservative contexts to the right. The innovating speakers are at the top, the conservative ones at the bottom. The dotted lines represent the position of the wave 'front' at successive points in time and the heavy line represents its position today.

How does this compare with the other way of looking at change, as represented by the formula

$$\log \frac{P}{1-P} = \mu + a + b \ ?$$

If the different values of a represent the tendencies of different speakers to use the new variant, and the values of b symbolize the effects due to the various contexts, consider what happens when we rank the speakers

and the contexts in order of these parameter values. As μ increases with time, without any change in the a or b, the values of P increase throughout the diagram, with the highest values in the upper left-hand corner. For a fixed threshold, say $P = 0.5$, if we divide the contexts where the new variant is used more than this proportion of the time from those where
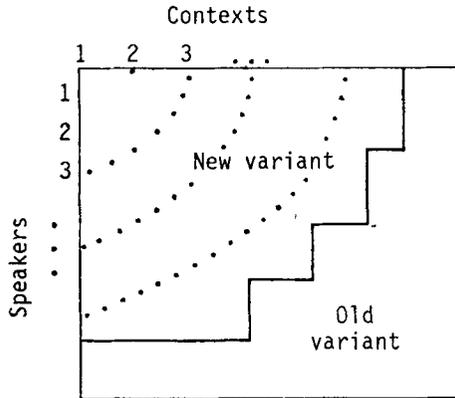

Fig. 1

it is used less, we obtain a wave front just like one of the dotted lines in the diagram. And as time increases, this wave sweeps across the figure from upper left to lower right, just as in the wave theory.

What then is the difference between the two approaches? The main difference is that in strict versions of the wave theory the new variant supersedes the old in cells directly below and to the right of cells already having the new variant, and this replacement must be relatively complete in one cell before it spreads rightward to its neighbour. In other words, $P = 1$ in cells above and to the left of the wave front and $P = 0$ below and to the right. But we already know that these categorical values are not attainable through our formula as long as the parameters are finite. According to the formula, then, all cells will be variable at the same time.

It would seem that an examination of the data would suffice to choose between these two models, but the situation is somewhat more complicated. Data on syntactic variation tends to be very tedious to collect, as one may have to listen to many hours of tape-recordings of natural speech before finding more than a few tokens. And the analytic enthusiasm of linguists knows no bounds, so that the more data they collect the more contexts they will discover. This leads to very sparse data arrays. And

if there are zero or one or even two or three tokens in a cell, it is likely that they will be mostly categorical in appearance, i.e. all tokens in a cell of the new variant or all of the old variant. And it will generally be possible to order speakers and contexts to produce a configuration as in the diagram. In addition, less strict versions of the wave theory will permit a narrow band of variable cells along the wave front as well as a few inconsistent cells in an array, called 'scaling errors'. Thus, choosing among the two theories on the basis of data is no easy matter, and this is reflected in the literature where certain data sets have been analyzed in opposing ways by different authors.

A recent mathematical discovery, however, has changed the way we look at this problem. It is true that the formula will not produce $P = 1$ or $P = 0$ as required by the wave theory as long as μ and the a and the b are all finite. But in analyzing the data to estimate these parameters according to the fundamental criterion of maximum likelihood it is sometimes found that some parameters tend to become infinite. This renders the formula inoperative as it stands, but the natural extension of the maximum likelihood principle leads to well-defined estimates for the cell probabilities as follows: suppose the data can be arranged as in Figure 2 where the 'mixed' blocks do not overlap with respect to rows or columns.
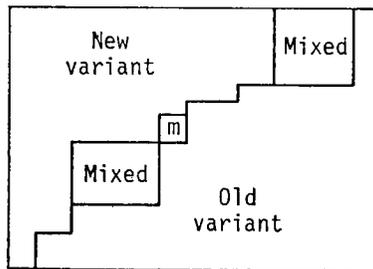

Fig. 2

Then the maximum likelihood estimates of P will be 1 in the upper roughly triangular region and zero in the lower region, i.e. categorical. In the 'mixed' regions P will be between zero and one (variable).

Thus the analysis by the formula and the wave theory analysis converge, with the help of this new theorem (ROUSSEAU & SANKOFF, 1978). Whereas previously the strict form of the wave theory which denies the simultaneous existence of variability in many contexts, and the additive model analysis which postulates simultaneous variability in all contexts, each had their

own methodologies whose results naturally tended to support their respective theories, the integrated mathematical approach now available (SANKOFF & ROUSSEAU, 1979) permits an objective assessment of the relative importance of variability and categoricality in a data set.

6. Conclusion

The two debates we have sketched illustrate the outcome of the sociolinguistic method. They could hardly have been conceived before they arose in the study of quantified natural speech data. Yet they are crucial to understanding important linguistic processes and their formal expression.

References

BOURDIEU, P., and L. BOLTANSKI, 1975, *Le fétichisme de la langue*, Actes de la Recherche en sciences sociales, vol. 4, pp. 2–31

BAILEY, C.-J. N., 1973, *Variation and linguistic theory* (Center for Applied Linguistics, Arlington, Virginia)

COX, D. R., 1970, *The analysis of binary data* (Methuen, London)

HABERMAN, S. J., 1974, *The analysis of frequency data* (University of Chicago Press)

JONES, R. H., 1975, *Probability estimation using a multinomial logistic function*, Journal of Statistical Computation and Simulation, vol. 3, pp. 315–329

KEMP, W., 1979, *L'histoire récente de ce que, qu'est ce que et qu'osque à Montréal: trois variantes en interaction*, in: Le Français parlé: Etudes sociolinguistiques, ed. P. Thibault (Linguistic Research Inc., Edmonton)

LABERGE, S., 1977, *Etude de la variation des pronoms sujets définis et indéfinis dans le français parlé à Montréal*, Ph. D. thesis (Université de Montréal)

LABOV, W., 1963, *The social motivation of a sound change*, Word, vol. 19, pp. 273–309

LABOV, W., 1966, *The social stratification of English in New York City* (Center for Applied Linguistics, Washington, D. C.)

LABOV, W., 1969, *Contraction, deletion, and inherent variability of the English copula*, Language, vol. 45, pp. 715–762

LABOV, W., 1972a, *Sociolinguistic patterns* (University of Pennsylvania Press, Philadelphia)

LABOV, W., 1972b, *Language in the inner city* (University of Pennsylvania Press, Philadelphia)

LABOV, W., A. BOWER, D. HINDLE, E. DAYTON, M. LENNIG, and D. SCHIFFRIN, 1978, *Linguistic change in Philadelphia*, Technical Progress Report on NSF Grant (U. S. Regional Survey, Philadelphia)

LABOV, W., P. COHEN, C. ROBINS, and J. LEWIS, 1968, *A study of the non-standard English of Negro and Puerto Rican speakers in New York City* (U. S. Regional Survey, Philadelphia)

LABOV, W., and T. LABOV, 1977, *Learning the syntax of questions*, in: Recent advances in the psychology of language, eds. R. Campbell and P. Smith (Plenum Press, New

York), Also as: *Das Erlernen der Syntax und von Fragen*, Zeitschrift fur Literaturwissenschaft und Linguistik, vol. 23/24. Also as: *L'apprentissage de la syntaxe des interrogations*, Langue Française, vol. 34, pp. 52–80

LABOV, W., M. YAEGER, and R. STEINER, 1972, *A quantitative study of sound change in progress* (U. S. Regional Survey, Philadelphia)

ROUSSEAU, P., and D. SANKOFF, 1978, *Singularities in the analysis of binomial data*, Biometrika, vol. 65, pp. 603–608

SANKOFF, D., 1975, VARBRUL *version* 2 (unpublished program and documentation)

SANKOFF, D., 1978, *Linguistic variation: Models and methods* (Academic Press, New York)

SANKOFF, D., and P. ROUSSEAU, 1979, *Categorical contexts and variable rules*, in: Proceedings of the Scandinavian Conference on Syntactic variation, ed. S. Jacobsen (Stockholm)

SANKOFF, D., and P. THIBAULT, 1978, *Weak complementarity: Tense and aspect in Montreal French*, in: Proceedings of the Conference on Syntactic Change, eds. D. Strong and B. Johns (Ann Arbor, Michigan)

SANKOFF G., 1980, *The social life of language* (University of Pennsylvania Press, Philadelphia)

SANKOFF, G., and H. J. CEDERGREN, 1971, *Some results of a sociolinguistic study of Montreal French*, in: Linguistic diversity in Canadian society, ed. R. Darnell (Linguistic Research Inc., Edmonton), pp. 61–87

THIBAULT, P., 1979, *Le Français parlé: Etudes sociolinguistiques* (Linguistic Research Inc., Edmonton)