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ABSTRACT

This volume is a prepublication edition of four papers presented at a briefing held for representatives of government agencies, foundations and other organizations, November 12, 1970 at the National Museum of History and Technology of the Smithsonian Institution. "Linguistics as a Pilot Science," by Joseph H. Greenberg, examines the impact which developments in linguistics have and are still having on developments in other fields of science such as psychology and anthropology. "Applied Linguistics in a Broad Context," by Norman A. McQuown considers problems of language in conjunction with those of culture and social relations as they relate to communicative activity in a world-wide context. In "Frontiers of Linguistic Theory" Morris Halle uses a discussion of the placement of stress in English words as the basis for certain speculations about the role of innate capacities in the child's acquisition of language. Finally, William Labov's paper "The Place of Linguistic Research in American Society" emphasizes the theme "that the most important applications of linguistic method in education do not lie in the area of grammatical research but rather in the formal study of verbal interaction and the value systems inherent in this behavior" and therefore urges that linguistics deal more with everyday speech. (FWB)

Linguistics in the 1970's

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This volume is a pre-publication edition of four papers presented at a briefing held for representatives of government agencies, foundations and other organizations, November 12, 1970 at the National Museum of History and Technology of the Smithsonian Institution. The briefing was co-sponsored by the Linguistic Society of America, the Center for Applied Linguistics and the Smithsonian Institution.

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Linguistics as a Pilot Science

by Joseph H. Greenberg

At various times linguistics has served as a model for other sciences, invariably other social sciences rather than natural sciences. For example, during the nineteenth century, when linguistics was basically comparative and historical, there were a number of attempts to develop a comparative mythology, comparative law, etc., in conscious imitation of the linguistics of the period. Similar utilizations of linguistics as a model have occurred since then, each based on the linguistics of the particular period. Most recently, the approach of generative grammar has been applied in anthropology to the analysis of kinship terms, and has likewise had a considerable impact on psychology and philosophy.

It is the purpose of this paper to discuss several of these attempts. What, in each case, did linguistics seem to promise, and what were the reasons for the degree of success and failure in each case? In the process of seeking answers to such questions, we incidentally raise fundamental issues regarding the nature of the divisions among the sciences, the degree of unity of their methods, their criteria of success and the factors leading to success or failure in accordance with such criteria.

The following comparisons may help us to visualize the range of problems with which we are concerned and may serve as a basis for the consideration of those instances in which linguistics has provided a model for other sciences.

Let us suppose that we have a certain domain covering a portion of the earth's surface and that this domain has certain apparently natural divisions delimited by geographical features. We will call each division a field. Each field has a group of workers who, as a general rule, confine their labor to the field in question and are supposed to produce crops as the fruit of their labor. Each worker uses whatever method he wishes, although there seems to be only a limited variety of such methods,

so that many workers use essentially the same methods. There is a tendency for workers in the same field to share the same methods and for these to differ somewhat from those of closely neighboring fields. Moreover, there are recognizable similarities which recur in the methods used everywhere.

However, these fields, for some unknown reason, display vast differences in productivity: how can these differences be accounted for? Several explanations can be offered, some of which imply built-in remedies. These include the following: (1) There is an insufficient quantity of workers in the unproductive fields. Therefore, let us improve the yield of the more unproductive fields by increasing the number of workers. (2) The fault is rather in the quality than the quantity of the labor force. For some reasons, certain fields attract the best workers. Perhaps the better wage scales, or even the very fact that these fields have been more fruitful in the past attract the better workers, those who seek the satisfaction that comes with successful effort. These first two diagnoses tend to coincide in regard to remedies. Let us increase both the quantity and quality of the workers in the more unproductive fields by additional incentives. (3) Perhaps the fault lies not so much with the nature of the labor force as with the methods they are using. All fields should use the methods employed in the most successful ones. This explanation is not as different from the previous one as might appear at first sight. If the workers in the unproductive fields were more intelligent, they would have acquired and utilized the methods which have proved most efficient elsewhere. This is a widely-held view. In practice, since it is by and large the natural sciences which have had the greatest success, their methods are advocated for the less productive ones, e.g. the social sciences and the humanities. In this analysis, the methodology of all sciences should be essentially the same and is best exemplified by the natural sciences. This is sometimes called Scientism. (4) The exact opposite of the foregoing hypothesis is the true one. Every field has its own unique best method. However, by luck or brains some workers have discovered the best method and others have not. The only directive suggested by this analysis is, so to speak, to keep plugging. Let us be on the alert for signs of a "breakthrough", and throw in our resources at the crucial moment. This

is sometimes called the "cutting edge" philosophy. (5) The fault may be neither in the capacity of the laborers or in the methods they employ, but in the nature of the fields themselves. Some are simply inherently more productive than others. The appropriate response, if we accept this explanation, is resignation. There is nothing we can do about it. (6) Finally, perhaps the divisions which we assumed as natural to begin with are not really so. What we considered to be unitary fields are actually heterogeneous, hence any attempt to look for a set of methods to apply to such an artificially determined entity is foredoomed to failure.

The tendency to use another field as a model stems from the third of the above explanations which might be restated in terms of our overall metaphor as, "the grass is greener on the other side of the fence." As was noted in our discussion of this alternative, in practice it boils down to imitation of the natural sciences. Linguistics, on the basis of its subject matter a social science, has invariably served as a model for some other social science or humanistic discipline. It can be shown that this was because it exhibited in its methods and results the characteristics of some particular science, or of the mathematical and logical pursuits, which are, strictly speaking, not empirical sciences, but enjoy comparable prestige both in their own achievements and in the use of mathematical methods in the natural sciences.

We may say, then, that comparative historical linguistics in the nineteenth century was imitated because it seemed to be successful like evolutionary biology. During the period of structural linguistics, roughly speaking 1930-1960, linguistics was imitated because it seemed to be successful like chemistry in its isolation of fundamental units. In the recent period, with the advent of generative grammar, linguistics has appeared to be successful after the manner of logic and mathematics in that the grammatical sentences of a language are generated from a set of abstract entities designated by symbols through a set of rules for their formal manipulation.

Finally, in the investigation of universals both within the developing trend of generative grammar and in other approaches, linguistics seems to be gaining another kind of success which might be compared to that of physics, namely the attainment of a set of invariant relations,

i.e. laws, something which has commonly been regarded as the ultimate goal of all the sciences. However, as we shall see, unlike physics, these laws are not in general quantitative.

In discussing each of these cases, we will attempt to analyze the extent to which a real analogy between linguistics and the particular non-behavioral science exists, the extent to which applications in other fields really followed the linguistic model to which it supposedly adhered, and what characteristics of language itself inhibited or facilitated its employment as a model in each particular instance.

The first example which has been mentioned is that of nineteenth century linguistics. During this period linguistics furnished the basic model of a science which by the use of a comparative method obtained significant historical results. It is possible to distinguish three ways in which comparative linguistics was successful and thus provided a model for imitation by other disciplines.

The first of these is the explanation of degrees of similarity and differences among languages by a dynamic process of change. Such an approach, already well established by 1820, involves the rejection of the traditional static or creationist view in favor of an evolutionary approach. If, for example, a number of languages, A, B, C, etc., show far-reaching similarities not shared with another group of languages, D, E, F, etc., the creationist theory would simply assert that such differential similarities had existed from the beginning without essential change and that the existence of natural groupings reflected the ground plan of creation. The evolutionary explanation is that A, B, C, etc. had only differentiated in course of time, and that at an earlier period there was a single ancestral language, A', from which they had evolved by differential changes. Similarly, D, E, F, etc., had descended from a different ancester, D'. Further similarities and differences of still more extended groupings would be explained by the postulation of still earlier remote ancestors and still earlier differentiations. If, for example, both A, B, C, etc., and D, E, F, etc., share common features as against some further grouping G, H, I, etc., this was explained by assuming a remoter ancestor A", which later differentiated into the more recent ancestral languages A' and D'.

The second achievement was that as a by-product of this kind of

explanation, many peculiarities of existing languages could be explained historically as arising out of features of the common ancestral language by a process of change. For example, the vowel variations of English sing, sang, sung, and variation in other verbs involving at present different vowels, could be explained as arising from an earlier, more regular system arrived at comparatively by analyzing similar variations in other related languages going back to the same ancestral Proto-Indo-European system.

The third aspect was that by this process of comparison it was possible to reconstruct the hypothesized ancestral language in many details. Indeed, as early as the 1860's, Schleicher even ventured to construct a folktale in Proto-Indo-European.

The resemblance of all this to evolutionary biology should be evident. In Darwinian theory differential resemblances among species are explained by a process of change from different common ancestral species, now extinct. Similarly, specific peculiarities of species are explained historically as changed forms of the earlier ancestral structures which gave rise to them. Thirdly, and once more in a manner parallel to that of comparative linguistics, the characteristics of such ancestral forms are to a great extent inferred by comparison of later forms and are often actually found in the fossil record.

The acceptance of evolutionary explanations preceded that in biology by about half a century. The same August Schleicher just mentioned as the author of a fable in Proto-Indo-European was well aware of the resemblance, and in 1873 he spelled out the comparison in detail in a work entitled "Darwinism and Linguistic Science". Another prominent linguist of the period, Max Mueller, stated that "in matters of language, I was a Darwinian before Darwin."

While linguistic comparison led to the classification of languages into linguistic stocks on a worldwide basis, one particular instance, already alluded to several times, was of central significance: namely, Indo-European. The achievement of comparative linguistics in demonstrating that most of the languages of Europe were related to those of a large section of Asia extending from Armenia through northern India including, in particular, Sanskrit, the language of the sacred books of Hinduism, and its further success in penetrating into the abyss of

prehistory and reconstructing the very words and grammatical structure of the ancestral Indo-European language, aroused the historical imagination of educated men in the nineteenth century. Applications of the methods of comparative linguistics to other fields followed, notably mythology, religion and law.

It might have been thought that this would be accomplished by grouping bodies of myth, religious beliefs or whatever else was being investigated into families of related traditions and then proceeding to comparison and reconstruction. Such a mode of application may be called formal in that the methods of the field to be imitated are applied to new materials while retaining their original form. In fact, this was not done. The methods employed were in far greater direct dependence on the actual data and results of comparative linguistics. The method to be discussed may therefore be called a material imitation.

One reasoned as follows. If, to take the example of Indo-European, there existed an Indo-European language, then there was a population which spoke it and which had non-linguistic institutions -- political, religious, etc. These other institutions must have developed from their original forms to those of the contemporary peoples just as the language had.

Indeed, linguistic reconstruction itself gave some information about the terminology involved in these other institutions. Just as one could reconstruct a root *dent 'tooth', so one could reconstruct *dyēus (cf. Greek Zeus) for the name of the sky god. Hence, it was thought, by comparing the religious beliefs and the myths concerning this divinity, one would arrive at the original set of beliefs and myths, just as one could reconstruct the sounds that made up his name.

Another example is law. The eminent jurist, Sir Henry Maine, sought to construct the original legal institutions of the Indo-European peoples by the comparative method. It was no accident that his work was largely based on his own experience in India, the home of Sanskrit, that language whose discovery by Europe served as midwife to the birth of comparative linguistics. Maine, in his work of 1872, Village Communities in East and West, states explicitly that he is constructing a comparative jurisprudence after the model of comparative philology.

He remarks, however, (p. 80: "I should, however, be making very idle

pretension if I held a prospect of obtaining, by the application of the Comparative Method to jurisprudence, any results which in point of interest or trustworthiness are to be placed on a level with those which, for example, have been accomplished in Comparative Philology. To give only one reason, the phenomena of human society, laws and legal ideas, opinions and usages are vastly more affected by external circumstances than language. They are more at the mercy of individual volition and consequently much more subject to change effected deliberately from without."

Here Maine has, with uncanny accuracy, put his finger on some of the main factors which make language a uniquely favorable area of human behavior for the discovery of historical relationships. Language is relatively impervious to external environment and planned changes. Even drastic changes in other institutions will affect only a marginal portion of the vocabulary and barely, if at all, its grammatical structure. Language contains literally thousands of lexical and grammatical forms, each constituted by an essentially arbitrary pairing between sound and meaning. If there are widespread resemblances in those forms in one group of languages as against another, the explanation must be historical rather than functional. This is the celebrated principle of the arbitrariness of the linguistic sign whose classic statement is that by Ferdinand de Saussure, the great Swiss pioneer of structural linguistics. No other body of human custom has this characteristic to anything like the same extent. Hence, outside of language, only more limited and less certain results are possible, as Sir Henry Maine so clearly saw.

The historical emphasis of the nineteenth century, while surviving and retaining considerable importance, nevertheless has largely given way in the twentieth century to an interest in the understanding of language in terms of its internal structure rather than as a product of historical evolution. The general trend, because of the strategic role of the concept of structure, is generally known as structuralism. It was far from being a unified movement, consisting as it did of various schools and independent researchers in Europe and the United States. Roughly speaking, by 1930 this movement had come to dominate scientific linguistics. Its great success was the development of rigorous, or what at the time seemed to be rigorous, techniques for the description of

language. In its earlier period, the topic of theoretical concentration was the study of the phonological or sound systems of languages. It developed general methods by which the sound systems of any language could be analyzed as made up of a very limited number of basic entities, e.g. 30 or 40 so-called phonemes. It is out of sequences of these, in themselves meaningless elements, that the thousands of meaningful units, e.g. words, of a language are formed. Later, the same basic mode of analysis was extended to the grammatical level. Here also it seemed that there was a basic unit, which was called the morpheme, and which was in general smaller than the word. For example, un-child-like could be analyzed as consisting of three morphemes. On both these levels, the phonological and grammatical, it was believed that a language could be exhaustively described by the isolation of a fundamental unit and the laws of their combination. This model was most fully developed in American structuralism.

It does not seem far-fetched to compare this kind of analysis with that of chemistry. Just as the myriad objects of the natural world could be analyzed as consisting of various combinations of a limited number of fundamental chemical elements, so the infinity of sentences of a natural language could be described as made up of combinations of a large but finite number of morphemes, and these in turn by a very restricted number of phonemes.

We derive some notion of how impressive such achievements might seem to non-linguists from the truly ecstatic remarks of the eminent French anthropologist, Claude Lévi-Strauss, delivered at a large international meeting of anthropologists organized by the Wenner-Gren foundation in New York in 1952. Lévi-Strauss here compares the rise of structuralism in linguistics in its significance for the human sciences to that of the Newtonian revolution for the physical sciences: "Linguists have already told us that inside our mind there are phonemes and morphemes revolving one around the other in more or less the same way as planets around the solar system."

Much as a century earlier, there were now uses of linguistics as a model for other fields, which could once more be distinguished as material or formal. In the first type, the material, the language of the science itself is analyzed. Fostered in some instances by the

successes of linguistics, but in other cases apparently as independent instances of the same trend, many in the 1940's and 1950's came to the belief that their respective fields might be advanced by the analysis of the language employed in the science itself. It thus became fashionable to speak of the language of the law, etc. Two examples of this during the period under discussion are Kenneth Burke's A Grammar of Motives (1945), and Harold Lasswell's Language of Politics (1949). It cannot be really argued that in any of these attempts there was more than a superficial resemblance to the linguistics of the period. This was probably owing to the far greater specialization that existed as against a century earlier.

Thus, unlike the more recent period, it was possible for Sir Henry Maine to have at least a broad acquaintance with a field as remote from his own as comparative philology.

In contrast to these material applications, the formal mode of imitation was quite seriously attempted in American anthropology, which has always been close to linguistics, and indeed considers that field to be a branch of cultural anthropology. At the same Wenner-Gren conference mentioned earlier, one of the topics proposed for discussion was "the cultural equivalent of the phoneme".

The promise held out by the linguistics of this period was that by the application of an analogous method to the data of non-linguistic culture, functionally relevant units of description might be isolated in terms of which the culture as a whole could be described. This seemed highly desirable because it was widely held that the cultural anthropologist had no basis in principle for choosing what to observe or for analyzing these observations once they were made.

A valiant attempt to develop methods for the application of structural linguistic methods to non-linguistic cultural data was that of the eminent American linguist, Kenneth Pike, in a series of stimulating volumes called, Language in Relation to a Unified Theory of the Structure of Human Behavior. Judged, however, by the test of application, this attempt must be judged a failure. I know of no instance in which a cultural anthropologist has been able to transpose with any real success linguistic methods into cultural materials on this model. Pike's attempt has, however, bequeathed to the language of anthropological theory the

widely used terms 'emic' and 'etic'. These words are abstracted from 'phonemic' and 'phonetic' respectively, and herein lies the heart of the matter. For the hope implicit in the application of these methods was that just as the linguist distinguishes mere physical (i.e. phonetic) non-functional variation from functionally relevant phonemic variation, so the cultural anthropologist might, for example, by observation of the variant renditions of a religious ceremony, abstract those which were merely etic, or culturally irrelevant, from those which were emic, or functional. Otherwise put, the criterion of functional relevance leads us to analyze a phonetic universe which is continuous into discrete contrasting units.

Once again, one of the characteristics of language not shared by other aspects of cultural behavior obtrudes itself. Language is basically a code by the use of which we frame messages which have a meaning in a quite definite way. The linguist's method in phonemic analysis was essentially to call a difference between sounds 'phonemic' if it had the systematic function of distinguishing messages from each other as against those differences which did not. But a religious ceremony, while in a very broad sense meaningful, does not send messages, as it were, with such precision that we can say when the message is the same or different. Or again, for all its esthetic glories, the storm in the third movement of Beethoven's pastoral symphony cannot substitute for a meteorological report.

We may mention in passing two other aspects of structural linguistics which circumscribed its usefulness in application to the cultural realm. This particular theory of linguistics, because it was strictly synchronic, that is, described linguistic structures in a single time frame, was not equipped to handle cultural change. Further, being non-quantitative, it would, when applied to fields like economic behavior, substitute an analysis of the behavior of buyers and sellers in a market situation for statistical studies of economic processes. This limitation, more inherent in linguistics than its confinement to static description, will be examined in connection with a later topic of this paper.

One should not leave this aspect of linguistics without some further mention of Claude Lévi-Strauss, whose model in a way quite distinct from Pike's, has been deeply influenced by a more European form of structural

linguistics which emphasizes abstract oppositions. For him, it is one of the strands of a highly sophisticated approach which has been at once broadly influential and highly controversial. It is not within the necessarily limited scope of this paper to discuss the theoretical aspects of these contributions of Lévi-Strauss.

The last decade has seen, under the leadership of Noam Chomsky, the rise to a commanding position in American, and indeed in world linguistics, of a new approach to linguistics, that of generative grammar. It should be noted that this viewpoint in linguistics is clearly related to a broader movement which involves a reaction both against the logical positivism which had dominated American philosophy in the previous period and against behaviorism, which held a similar position in American psychology and philosophically had close ties with positivism. Although in the form of generative grammatical theory it is clearly a theory which deals with language as such, broadly considered it is another instance of the influence of one field on another, for two developments within philosophy, in particular, are part of the essential background of this movement. The first of these is the currency of certain critiques of positivistic accounts of natural science theory, particularly that of physics, and the second is the formalization of logic and of the foundations of mathematics.

With reference to the former, through the analysis of Toulmin, Harré and others, it became clear that in actual practice physics did not conform to the models regarding theory construction advanced by positivistic philosophers of science. Theoretical concepts and laws were not constructed directly out of and defined by reference to observables. Although there is a necessary ultimate confrontation with empirical observations, the theories themselves were not arrived at by simple generalizations from observed facts. These were constructed much more freely and imaginatively, and their connection with observations was highly complex and indirect.

Now the brand of structural linguistics practiced by American linguists did in fact particularly emphasize a kind of rigorous descriptive procedure based quite directly on observables. In this respect, and in its rejection of mentalism, it was widely viewed as solidary with the behaviorism which ruled American psychology during the same period.

While these developments in the philosophy of science provided the motives for the re-examination of basic assumptions of American descriptive linguistics, it was the much older developments in the formalization of logic and mathematics which became the fountainhead for the actual techniques employed in the new approach. A generative grammar resembles such formalizations in an essential way. There are certain initial symbols or sequences of symbols corresponding to the primitive terms and axioms of formalized systems and certain explicitly formulated rules for transforming them. These operations are purely formal in that the semantic interpretations of the symbols do not figure in determining the application of the rules. Ultimately the terminal symbols generated by these procedures do receive empirical linguistic interpretation, phonetic or semantic.

This approach involves not merely technical differences from the older theory, but a different conception of language. Language becomes not so much a set of actual sentences as an internalized mechanism of rules for producing sentences. When a language is learned it is this mechanism which is learned. The sentences of a language are a theoretic infinity produced by this finite mechanism. It is clear that the acceptance of this view regarding the nature of language, incompatible as it is with behaviorism, has profound implications for psychology, and has indeed already had a significant impact on that science. In terms of our analysis, this is a material rather than formal influence. Given that psychology must deal with human language as a psychological mechanism, a change in the conception of that mechanism entails changes in the psychological analysis of that mechanism.

Another influence has been in anthropology, a field always sensitive in the recent period to developments in linguistics. The most concrete effect has been in the study of kinship terminology, which had earlier been subject to formalized treatment. The work of Lounsbury, Hammel, and others has translated this into a generative treatment in that from certain fundamental terms of a system, others are produced by a formal application of rules. In a sense this is an application of generative theory to language itself, since kinship terms are part of the lexicon of a language. It may be called formal, however, in that the methods of generative grammar are transferred to a new field. This

may seem odd, but it rests on the fact that the lexicon in standard generative theory has not itself been treated generatively, but rather as an unordered set of items. Dissatisfaction with this situation has led to various attempts at the production of a so-called generative semantics.

Finally, both within and outside of generative theory in the last decade there has been an increasing interest in the universal features of language. Any linguistic theory must be able in principle to deal with all languages and insofar as this is possible there must be significant properties common to all the world's languages which make this possible. Only one aspect of this many-faceted problem can be dealt with here. Although there are very few factual statements about all the languages of the world which are unconditionally true (e.g. statements of the type all languages have vowels), there are many which take a conditional form and can therefore be stated in the form of a logical implication (e.g. if a language has nasalized vowels it always has oral [i.e. non-nasalized] vowels, but not necessarily vice-versa). More than any other linguist, Roman Jakobsen has pioneered in showing the extensiveness and the theoretical significance of such lawlike relationships. Essentially, what they reveal is an ordered and to a great extent generalizable hierarchy of human preferences as revealed in human language. They involve a hierarchy, since it can be said that the implied is being favored because the other member cannot be found in its absence, while the opposite relation does not hold. Thus, in the earlier example, oral vowels are favored over nasal vowels since nasal cannot occur unless oral vowels are present, but oral vowels <u>can</u> occur even in the absence of nasal vowels. Such hierarchies show a degree of generalizability in that certain broad common features are found to apply in large number of cases. One example is in phonology, where in general the disfavored sound is more complex in that it involves additional movements of the articulatory organs. This additional articulation is called the mark, and hence the disfavored articulation is called marked as against the unmarked, favored articulation. This theory of marking was originally developed in the Prague school of structuralism and was soon extended to grammatical relations. At the present time the theory of marking has become a central theoretical concept, and is applied in

general to hierarchical preferences in any aspect of language, whether a mark is literally present or not.

Marking is by no means the only type of linguistic principle involved in universals. The emergence of this and other general principles seems to be leading to a body of interrelated generalizations which might be compared to laws in physics. They are not, however, in general quantitative. This does not prevent them from being mathematical in the sense that all formal relationships are essentially mathematical, even when they are not quantitative. The definition of mathematics as the science of quantity is of course long out of date and many branches of mathematics, e.g. topology, group theory, are not quantitative. Hence the Galilean vision of mathematics as the language of science is still valid, but involves a broader conception of mathematics.

What, then, of our original questions regarding the degree of distinctiveness of methodology in different scientific fields in the light of the foregoing reflections based on several instances of the employment of linguistics as a model in other fields. The main principle which seems to emerge may be summarized as follows. Such attempts have in general not succeeded, because language as a subject matter possesses certain peculiarities such as the arbitrariness of the relation between form and meaning, the existence of large numbers of basically independent form-meaning items, and its nature as a basic code in accordance with which an infinity of messages with fairly specific and well defined meanings is possible. Yet in every instance there is a general principle involved. For example, in regard to any subject matter, there are favorable grounds for inferring historical connections to the degree to which the connection between form and function is arbitrary. In linguistics, this relationship holds to a marked extent, whereas in certain other fields in which attempts at discovering historical relationships have been made, the results have been less successful, because the relationship between form and meaning is far less arbitrary than in linguistics. Different fields, then, differ in the extent to which certain characteristics do or do not obtain. Hence, even though the investigation of all such characteristics involves general principles they will, in practice, be applicable to a lesser or greater degree to different subject matters. Linguistics seems to be peculiarly rich in possessing to a high degree a number of characteristics which provide grounds for varied types of success.

Applied Linguistics in a Broad Context

by Norman A. McQuown

In 1970, we live in a world in which the mechanics of mass communication media has been perfected to the point where low-level orbiting terrestrial satellites give us pictures of tomorrow's weather. High-level fixed-point terrestrial satellites transmit to us today's news as it happens. Video-tape preserves for us in palpitating sound and living color an ever-increasing quantity of human communicative interaction. It bombards our senses with persons and events fictive, fictionalized, and occasionally even real. In such a world, the problems of communication intrude upon our every waking moment. These problems are multiple and diverse. Typically, their mechanical aspects achieve solution relatively quickly. Typically, too, their other aspects either fail of solution totally or achieve solution only slowly and painfully. The resistance of inanimate substance to investigation falls far short of that of animate human intelligent matter. The latter is endowed with language, distinguished by other cultured habits, and governed by social relations. In the world of 1970, this endowment, this distinction, and this government become ever more complex and their necessary interrelations ever more complicated. We find it impossible, therefore, to consider, in isolation one from another, the problems of language, those of culture, and those of social relations, as they relate to all of this communicative activity. In speaking of applied linguistics, we shall also, necessarily, treat of applied social and cultural anthropology and of other applied social sciences. We shall necessarily treat their application to the solution of problems of communication not parochially but in a world-wide context.

The problems which will be of interest to us in this broad survey of applied linguistics, therefore, are those of the teaching and learning of languages. We shall consider them, as vehicles of cultural acquisition

and interchange, in the context of the full range of the ethnic and societal group-affiliations manifested by their speakers. Such group-affiliations are many and varied. They range from those of the age-group within which initial learning of the mother tongue takes place, through those of the higher age-grades traversed in the process of socialization, through those of the other social levels into which the learners seek access, to those of the different ethnic groups with which the learners hope to establish communication, into those of the specialized work-groups within which the learners may wish to exercise their professions or those of the particular play-groups within which the learners may engage in recreation. The languages employed by the members of such a range of groups are similarly many and varied. In day-to-day contacts, the languages of the initial age-groups alternate with those of other age-grades, those of other social levels, and those of other ethnic communities, and, within all of these, with those of varied work-groups and play-groups. With the gradual disappearance of extreme ethnic localism, on the one hand, and the gradual relaxation of sharp social barriers in complex societies, on the other, there has been a tremendous increase, in recent years, both in the amount of inter-ethnic and inter-group dialog, and in the number of individuals who in the normal course of their lives find themselves engaged in such dialog.

In 1870, everyone learned the mother tongue informally in the family circle, many learned another variety of the same language formally in "grammar" school and a privileged few learned one or more additional languages in institutions of secondary and higher education. In 1970, in bilingual communities, some learn not one but two mother tongues in the family circle, many learn a second (or a third) language as the vehicle of fundamental education, some learn a third (or a fourth) language as the medium of higher education, and a few learn still other languages as tools of scholarly or professional investigation and communication. In complex societies, as social mobility becomes available to the many, increasing numbers of individuals learn other varieties, regional, social, or professional, of the mother tongue. In the more highly developed societies, the number of additional languages, of other ethnic or other social groups, among which selected individuals may choose is, in 1970, at least ten-fold what it was in 1870. The number

of potential group-affiliations available, in 1970, to such selected individuals, furthermore, is at least a hundred-fold what it was a hundred years ago. This exponential increase in inter-ethnic and inter-group contacts, a result of expanding commerce and developing technology, has stimulated the development of the field of linguistics, on the one hand, and the fields of cultural and social anthropology, on the other.

Explosive expansion of certain ethnic groups during the present century has forced equally vigorous containing activities on the part of others. Such containing activities, in two world wars and their aftermaths, have involved both the hardware and the software of technology. In these activities, the development of modern physical, chemical, biological, and engineering science has been a pace-setter for the development of modern social and humanistic science (including linguistics, and cultural and social anthropology, both pure and applied). These latter have lagged behind, however, and even though in 1970 their index of development may be ten times what it was in 1870, it still has far to go to catch up with that of the technology and the engineering of the harder sciences. In the 1970's, therefore, if we are to achieve a more appropriate developmental balance among the diverse components of the full range of scientific disciplines; both pure and applied, a more rational plan must be devised. A more appropriate distribution of effort, both in research and in development, must be worked out. Such effort must be both adequately financed and appropriately staffed.

In the relatively neglected fields of the social scientific and humanistic portions of the continuum, particularly in those areas which bear on communicative dialog, long-range priorities must be set up and persistently and consistently followed. The logistics of supply of personnel and materials, over a minimum period of ten years, must be carefully worked out. A decade is a minimum period for the application of such priorities, and too short a period for the working out of the logistics of steady supply.

I propose that those fields of that portion of the continuum of scientific research and development whose products bear most directly and most immediately on successful communicative dialog be given top priority during the coming decade. Among such fields are those of anthropology, both social and cultural, sociology as it bears on group processes

(including social psychology, and social psychiatry), linguistics (including sociolinguistics, ethnolinguistics, and psycholinguistics, and the general field of language in culture), languages (including both English in its many varieties and a broad spectrum of foreign languages as vehicles both of scientific and of more broad y cultural communication) -- all of these both in their more theoretical research aspects and in their more practical developmental aspects (including practical application to specific problems of communication in concrete situations). In the applied-science category, already established fields, such as applied anthropology, clinical psychology, social work, applied linguistics, language teaching (both of English and of foreign languages and both to individuals whose mother tongue is the medium for class-room instruction and to those for whom it is not), teaching of rhetorical persuasion and elocution, and teaching of the arts of popularization and of advertising -- all of these should be encouraged to expand and to diversify in close interaction with their more research-oriented counterparts.

Taking into account the present and immediate future of the political situations at home and abroad, I propose the following order of priority for geographic areas: (1) the United States of America, (2) the Union of Soviet Socialist Republics (including its satellites), (3) China (including the countries on its periphery), (4) India, (5) Japan, (6) Germany, (7) Brazil, (8) Spanish America, (9) Western Europe (other than Germany), (10) the Islamic countries, (11) Sub-Saharan Africa, (12) the Caribbean, (13) all others. In view of the fact that a sizable amount of basic research and of practical application of materials from a broad range of languages has been initiated in the past decade, and that much research into the societies and cultures of small isolated ethnic groups has been accomplished in the past century, I recommend that in the immediate future first priority be given to social and cultural anthropological investigation of familial and other social groups, within such ethnic groups, and of social levels, work-groups and play-groups within complex societies. Second priority, nonetheless, should be given to continued investigation of the speech forms in the full range of geographic areas, with, however, a new focus, not on "standard" varieties of the languages spoken there, but rather on the differences among the

sub-varieties spoken by familial and other social groups, minority ethnic groups, and inferior social levels, work-groups, and play-groups within the larger societies. Third priority should be given to the preparation of practical training materials designed to present the speech forms uncovered by such sociolinguistic investigation in their appropriate social and cultural contexts in each of the social groups described. Fourth priority should be given to the preparation of bilingual teachers competent to handle such practical training materials in the class-room or in the field. Fifth priority should be given to the preparation or to the in-service training of investigators and developers (linguists, and other anthropologists, in the broadest sense) to establish the linguistic and other sociocultural facts to be incorporated into the practical training materials, and to be made available to the teachers who will make use of them. In the past decade a goodly number of such linguists and other anthropologists have been trained for the tasks of basic research in these fields. In-service training for some of these would supply initial personnel for the newly oriented tasks. Continued basic training in general linguistics and in general anthropology would ensure an adequate supply of personnel, not only for the on-going tasks of basic research, but also for those required by the new orientation.

Sixth priority would be the preparation of materials setting these developments in the broader context of national and international affairs. Without such explanations and without the work of persuasion which must accompany them there is little hope that a plan such as the one here proposed will achieve either the basic support necessary for its initiation or the continuing support necessary for its maintenance. In today's presentation I take no more than the first step toward that goal.

In the last century, the languages and cultures acquired in the schools of the United States of America were limited to those of our classical grandfathers, pre-Christian (Hebrew and Greek) and Christian (Greek and Latin), and of our Renaissance and Reformation fathers (largely French and German). Toward the end of that century, we began to awaken to those of more remote relations (Sanskrit and Arabic). In this century, more intimate contact was forced on us, by two world wars, both with those of our Western cousins (Russian, Italian, Spanish) and

with those of other more distant human relatives (Chinese, Japanese, Bahasa Indonesia, Hindi, Bengali, Tamil, Telegu, Swahili, Hausa, Modern Arabic, among the major ones and Korean, Tagalog, Vietnamese, Laotian, Thai, Burmese, Tibetan, Nepali, Panjabi, Marathi, Singhalese, Kannada, Malayalam, the Bantu languages, other Nigerian languages, Amharic, Berber, Persian, Afghan, Mongolian, Turkish, Greek, Bulgarian, Serbo-Croatian, Albanian, Rumanian, Portuguese, Hungarian, Finnish, Estonian, Latvian, Lithuanian, Polish, Czech, Slovak, Dutch, Danish, Swedish, Norwegian, and Icelandic, among the minor ones). More recent events have extended the range of languages and cultures available to us in our schools to include some which had been for us up to now relatively remote and obscure (Yucatec Maya of Mexico, Quiché Maya of Guatemala, Quechua and Aymara of Andean South America, Zulu of South Africa, Ibibio and Kpelle of West Africa, Kurdish of Iraq, Iran, and Turkey, Georgian and Armenian of the Caucasus, Maori of New Zealand, Chamorro of Guam, Eskimo of Arctic America, Cree of central Canada, and Navajo of our American Southwest). Where a century ago it may have been possible to acquire instruction in fifteen languages and cultures, it is now possible, somewhere in the United States, to be introduced to 150.

In the last decade, however, we have gradually turned from a somewhat reluctant although inescapable concern with peoples (and their languages and cultures) in the world without to an even more reluctant and even more inescapable concern with people (and their speech and manners) in the world within. We have not yet fully discovered (although we inevitably will) that the macrocosm we have explored abroad is almost fully replicated in the microcosm which we have begun to explore at home. We are discovering that we are a nation of many nations, and a society of many sub-societies. We have gradually come to recognize that half the population of some of our major urban centers neither speaks what we thought was English nor behaves as we thought speakers of English should behave. We are now being forced to recognize that very large proportions of the population of some of these same major urban centers speak not English but Spanish and manifest cultural attributes which are as sharply distinctive one from another as a legal system which exercises the writ of habeas corpus to gain some limited liberty for a putative criminal is from one which employs the device of the amparo to prevent the indefinite

imprisonment of an innocent person for a crime which he did not commit. We are even being obliged to attend to the linguistic and cultural differences and the educational and occupational frustrations of minuscule minorities of America's original inhabitants, now being brought into ever more frequent contact with the nation's majorities, in the ultimate encroachment on the American indigenous world. We are discovering, finally, that even among those who share the same skin color, who speak what seems to be, for the most part, the same language, and, initially at least, who share many of the same morals and mores, communication may constitute such a serious problem that physical annihilation of one's interlocutor seems to constitute the only truly satisfying solution.

If in our previous brushes with ethnic, social, cultural, and linguistic differences the world around tested and tempered our analytic tools, our current skirmishes with these same differences on the domestic front will require that we hone them to a razor's edge.

So we must begin with basic research into the mechanisms themselves of inter-personal, inter-ethnic, inter-social, inter-cultural, inter-linguistic communication. We must construct tools for the micro-analysis of the diverse media (among which speech and body-motion are central) of inter-action as they function, at one and the same time, in all these contexts. We must create frames for the precise description not merely of the media of inter-action but, even more importantly, of each of the contexts in which these media operate. We must manufacture the mechanical and electronic aids which will turn out to be indispensable both to the analysis and recording of the data as they are isolated and to the synthesis and storage of the results as they are accumulated. We must recognize that such instrumental aids in passing on the results of analysis to those who would learn about them in theory or would apply them in practice are, in these contexts, equally essential.

We must go on to the training of research workers who will tackle -- preferably in research teams -- the many facets of communicational activity, one by one, each in its many contexts. We must proceed to choose from among such workers -- or from others who join the effort at this point -- those who will take the individual research results and incorporate them into teaching materials for acquainting the many with these results and for training some few in their practice in actual

problem situations. We must go on to extract those results which are of such generality that they may be incorporated into instruments of mass-training, our textbooks of social, cultural, and linguistic deportment; and we must train certain individuals to prepare such textbooks. Finally, we must prepare new teachers, and we must give in-service training to old ones, in the efficient and effective use of such texts in mass education.

To the extent that it becomes possible to progressively incorporate new knowledge of social, cultural and linguistic deportment into the teaching materials employed in our educational system and into the conscious (and unconscious) behavior of our teachers, to that extent will we see the severity of the communicational problems lessen, and to that extent will we be able to solve the more substantive problems (both human and non-human) of our natural environment. A concerted effort during the next decade -- with the program I have suggested and the priorities I have outlined -- might have some appreciable effect on the temper of the times and on the solution of the more substantive problems of our (and the world's) society.

Whose responsibility is it to initiate this effort? From what sources may we expect financial support? On what personnel may we count in the initial phases? From what organisms may we expect on-going guidance in the effort and continuing monitoring of the results? Answers to such questions are prerequisites to any further steps.

Although it would seem that the professional organizations of social scientists and of language teachers might have an important contribution to make to the proposed program, nevertheless, an organism less immediately concerned might more properly -- and perhaps even more effectively -- initiate such effort. Such an organism might more readily make specific suggestions without seeming to defend professional interests or to engage in special pleading. The Center for Applied Linguistics of Washington might conceivably be able to fulfill the function of middleman in convening a planning conference to which representatives of government agencies (which have to face the problems of communication to which we have alluded), of private foundations (interested in promoting efforts which might lead to their solution), and of professional organizations (which might provide professional sounding boards for the proposals made and personnel-recruitment agencies for the implementation of those

proposals which meet with approval) would be invited. Among government agencies within whose domain these problems fall we might mention the Department of Health, Education, and Welfare, The National Endowment for the Humanities, the National Science Foundation and the Smithsonian Institution. Among private foundations which in the past have been involved in similar efforts we might mention the Ford Foundation, the Rockefeller Foundation and the Carnegie Corporation. Among professional organizations we might mention the Linguistic Society of America, the American Anthropological Association, the Modern Language Association and the National Council of Teachers of English. A conference in which these and similar organisms were represented would meet the requirements of the public interest and could conceivably produce specific recommendations to the legislative and to the executive arms of government which could serve as the basis for specific legislation and for specific executive dispositions. That a coordinated national effort is required is becoming increasingly apparent. That such an effort can produce substantial results is clear from the long-term results of such previous all-out efforts as the Manhattan Project which gave us atomic energy, the Space Program which opened up extra-atmospheric space to our use or the National Defense Education Act which multiplied ten-fold our capacities for teaching foreign languages and made a small start on our capabilities for teaching about foreign societies and cultures.

If by some superhuman miracle we should succeed in putting our own house in order and if by our unfortunately all-too-human efforts we should manage to revive the American dream, we might then once again present a face of which we are not ashamed to the rest of the world. But if, by some super-American miracle, we should have the foresight to include in our own preliminary planning a panel of fellow-sufferers from abroad, and if we should -- in very farsighted self-interest -- incorporate into our own research and training programs (which bear on the solution of our own internal problems) a selected group of scholars, teachers, administrators and social workers from selected areas abroad (in which other groups and other nations face similar problems of communication with their own minorities and between factions in their own majorities), we might thereby ensure that continued development both at home and abroad which alone will make it possible for us to benefit from

our common good fortune. If we could bring into some early phase of our planning: French Canadians and Anglo-Canadians; separatist Puerto Ricans and unionist Puerto Ricans; Castroite Cubans and non-Castroite Cubans; indigenist Mexicans and integrationist Mexicans; Hispanophile Colombians and Colombian autonomists; elitist Brazilians and popularist Brazilians; prof-Frei Chileans and pro-Allende Chileans; elitist Peruvians and Peruvian populist militarists; pro-American Japanese and Nipponese autonomists; Taiwanese exiles and Maoist Chinese; followers of Ho and followers of Thieu in Vietnam; majority Pakistanis and majority Hinduists, as well as minority Panjabis, Orissans, Tamils, Malayalams, and Marathis in India; Palestine Liberationists and post-Nasserite Egyptians; Arab-Christian Lebanese and Israelite Jews and Arabs; Armenians, Bessarabians, Hungarians, Germans, and Finns, inside and outside the Soviet sphere of influence; pro-British and anti-British Irishmen; Nigerians and Ghanaians; separatist Angolans and unionist Angolans; apartheid victims and their Afrikaans victimizers; Kenyans and Ugandans; Icelanders and Danes -- to touch only on some of the problem areas the world around -- what we could learn from them about the essential nature of our common problems and what they could learn from us about potential tools for their common solution would accomplish two things: 1) it would give us time in which to solve our own internal problems; 2) and it would contribute so substantially to the solution of similar problems abroad that our current international burdens would be materially lessened.

Vehicles for the kind of "mutual consultancy" advocated here already exist: in this Hemisphere, the Cultural Council of the Organization of American States, the Inter-American Indian Institute, the Inter-American Program for Linguistics and Language Teaching; and, on a world scale, the agencies of UNESCO devoted to the study and solution of similar problems. Professional organizations which operate on an international scale likewise exist. Among them are: the Institute for the Study of Man housed by the Smithsonian Institution, the Sociolinguistics Research Committee of the International Sociological Association, the Comité International Permanent des Linguistes and the Council of Europe. Among private foundations which operate on an international scale we might mention: the Ford Foundation, the Rockefeller Foundation, the Nuffield Foundation, the Gulbenkian Foundation, and the Wenner-Gren Foundation for

Anthropological Research. All these and many more should be happy to contribute to a coordinated plan for a decade in which a major focus on the problems of communication is the order of the day. Project Communication is not only now urgently needed, but it is doubtful that we can long survive without it.

If, provisionally, we accept this proposal and, equally provisionally, we assume that the United States of America is capable of the kind of effort at home and abroad which it would entail, what are the concrete resources (on the research front and on the practical application front) which the program would require?

The field of theoretical linguistics is, today, no longer privy to any one nation or any one world area. Fundamental linguistic theory is being developed in Japan (Hattori), in India (Pandit), in the Soviet Union (Shaumjan), in Israel (Blanc), in Czechoslovakia (Vachek), in East Germany (Bierwisch), in West Germany (Winter), in France (Martinet), in Scotland (Lyons), in England (Robins), in Nigeria (Bamgboşe), in Canada (Joos), in Brazil (Rodrigues), in Peru (Escobar), and in the U.S.A. (Jakobson, Harvard; Chomsky, M.I.T.; Lounsbury, Yale; Harris, Pennsylvania; Hockett, Cornell; Pike, Michigan; McCawley, Chicago; Chafe, Berkeley).

Fundamental social and cultural anthropological theory is likewise no longer an Anglo-American monopoly. It is being developed in Japan (Nakane), India (Srinivas), France (Lévi-Strauss), England (Evans-Pritchard, Firth, Leach, Meyer-Fortes, Schapera), Brazil (Ribeiro), Mexico (Aguirre), and in the U.S. (Parsons, Harvard; Harris, Columbia; Geertz, Princeton Institute for Advanced Studies; Wallace, Pennsylvania; Murdock, Pittsburgh; Wolf, Michigan; Eggan, Chicago; Spiro, San Diego; Goldschmidt, UCLA; Foster, Berkeley).

Applied linguistics has developed considerably throughout the world in the last decade. Among organizations involved are: the Center for Applied Linguistics of Washington, the Centro de Lingüística Aplicada of São Paulo, the Instituto Caro y Cuervo of Bogotá, the British Council of London, the Bureau d'Étude et de Liaison pour l'Enseignement du Français dans le Monde of Paris, and the Sprachkybernetisches Zentrum of Heidelberg.

Applied anthropology is as yet less well organized, but current

projects and personnel of interest to the proposed program may be discovered, e.g. in the pages of the Sociolinguistics Newsletter edited by Rolf Kjolseth, Professor of Sociology at the University of Regensburg in West Germany; or in those of the Boletín of the Inter-American Program for Linguistics and Language Teaching's Committee on Ethnolinguistics and Sociolinguistics, edited by Mervyn Alleyne of the University of the West Indies in Jamaica. Useful leads to research and its practical applications in the whole field may likewise be found in the pages of the Linguistic Reporter published by the Center for Applied Linguistics of Washington and in the Center's library and files.

What are the most recent trends in research and its practical applications which the proposed program might make some use of and which it might encourage? Basic research into the mechanism of communication itself has been undertaken, on a limited scale, over the past fifteen years: at Chicago (McQuown), at Pittsburgh (Condon), in Philadelphia (Birdwhistell), in New York (Pittenger, Hockett, Scheflen) and in London (Crystal). All of these efforts have had a common focus on speech and body motion, and the approach has been determinedly micro-analytic. The new fields of paralinguistics and kinesics have arisen out of this focus, and new data on English prosody and paralanguage and on American body motion constitute initial results.

Some small attempts have been made to apply the new techniques to other communities speaking other languages (Mexican Spanish and Yucatec Maya; Southern British and Parisian French; Near Eastern Arabic and Far Eastern Indonesian). On another level, studies in differences between standard and sub-standard urban dialects are being carried on -- with limited resources and inadequate personnel -- in: Chicago, Detroit, New York, and Washington in the United States; and in San Juan de Puerto Rico, Mexico City, Caracas, Santiago de Chile and Buenos Aires in Spanish-speaking Iberoamerica; and in Recife, Salvador, Rio de Janeiro, São Paulo, and Porto Alegre in Portuguese-speaking Iberoamerica.

On still another level, studies in the problems of bilingual communities have been carried on for a great many years in Europe and in Anglo-America. Noteworthy among them are the life-long studies of Norwegian Americans carried on by Professor Einar Haugen of Harvard University. Currently the Centre International des Recherches sur le

Bilinguisme in Quebec, under the executive directorship of Professor William F. Mackey, is functioning as a clearinghouse and is engaged in limited research into the problems of bilingual communities.

With nothing less than a coordinated effort on all these fronts -- an effort which attempts to stimulate basic research and research training on the microanalytic level for the full variety of contact situations, to encourage full investigation of the basic facts (linguistic, sociolinguistic and sociocultural) on the urban dialect front, and to foster further investigation of the linguistic, sociolingustic and sociocultural dimensions of specific bilingual communites, in themselves and in their relations to a surrounding monolingual community -- can we hope to make any real headway in the basic research essential to any lasting progress in Project Communication.

Only by careful coordination of efforts on these major research fronts with efforts on a wide spectrum of relatively minor but crucially interstitial fronts can we hope to provide for a smoothly running research program. Among such crucial interstitial fronts one might mention: auditory and visual focus-permitting prosthetic devices; computer-aided linguistic analysis, synthesis, and storage; demography as it bears on the possibility of new inter-ethnic and inter-social group confrontations; the editorial function in modern media for mass-information; or the particular constellations of societal, cultural and individual factors which control the timing of the transfer from the mother tongue as a medium of classroom instruction to some other tongue used for educational purposes.

Only by a careful ordering of research efforts and training efforts in tandem with practical application efforts can we safeguard ourselves against the repetitive phenomenon of applying too much money (with technically inadequate materials and with poorly trained professional personnel) to the wrong problem at the wrong place at the wrong time.

Among practical applications which follow from the major foci of research and research training which we have indicated, we might cite those of: social psychiatric counselling; the teaching of English (reading and composition, both oral and written) in the elementary schools; the preparation of teachers for functioning in an integrated school with students of diverse societal, cultural and linguistic backgrounds; and the training of partially bilingual teachers to teach in balanced bilingual schools.

Among applications which follow from the minor foci, we might mention: 1) the training of electronic technicians to attend to the needs of adequate audio-visual prosthesis for the investigator and audio-visual presentation by the teacher; 2) the training of computer analysts and computer programmers in the essentials of societal, cultural and linguistic analysis, so that they may be helpful in providing linguists and other social scientists with computational aids to the analysis and presentation of societal, cultural and linguistic data; 3) the sensitizing of demographers to the societal, cultural and linguistic attributes of individuals in larger populations, so that they may not only provide statistics on actual numbers of individuals so characterized, but likewise provide estimates on "critical mass" in a situation of rapid change; 4) the training of editors in the mass media to perform their functions not only artistically but also with specific knowledge of audiences and audience characteristics and with specific focus on societal and cultural features whose incorporation will facilitate communication with specific societal and cultural groups, or on features specifically chosen so as to facilitate inter-group communication; 5) the training of educational administrators to demand a broad-gauged societal, cultural and linguistic analysis of the realities of a bilingual school and to require equally broad-guaged training of teachers who must function in a situation in which transfer from one language to another as the medium of instruction is essential to equitable educational opportunity.

It is to be hoped that the forces at our disposal are equal to these tasks.

Frontiers of Linguistic Theory

by Morris Halle

Linguists are often asked by laymen why anyone not interested in mastering a foreign language should be interested in the study of language. The best answer to this question was, I think, provided over a century ago by the French physiologist Claude Bernard who remarked that language was the best window into man's mind. There is good reason to believe that Bernard chose language over other manifestations of man's mind because even a century ago language was understood in much greater detail and to a greater depth than any other mental phenomena of comparable complexity. To get a picture of the difference one might compare a detailed standard grammar of any well-studied language such as, for instance, Whitney's Sanskrit Grammar (1879) with even the most profound description of any other mental phenomenon, e.g. with Wertheimer's justly celebrated study, Productive Thinking (1945).

In spite of large gaps in their knowledge, linguists have long been able to make use of a detailed format for grammars which told the grammarian what facts should be specifically noted and how these facts should be described. Thus, grammars of the type of Whitney's Sanskrit Grammar usually contain a phonology, which lists the sounds and gives some rules about how particular sounds are modified in specific contexts; a morphology, which describes the inflections of words (declension and conjugation) and the principles of word formation; and finally, a syntax which deals with such topics as word order, the use of forms of the nouns, adjectives and verbs in various syntactic environments, as well as other matters (the latter admittedly being often an odd collection of curiosa without much rhyme or reason). Moreover, the way many of these topics are to be treated has also been fixed for a great many years: in the phonology the focus has always been on what we should today call segments, or phonemes and allophones, and to some extent also

on phonetic features. In the morphology the focus has been on what today would be called morphemes, and on phonological processes such as umlaut, ablaut, infixation, reduplication, etc. which characteristically took place under morphologically defined conditions. Finally, in syntax, the area where the most dramatic changes have taken place recently, certain questions have always been discussed in some detail, e.g. the expression of various grammatical relations (subject, object, complement) and the devices utilized for this purpose.

Even this very superficial recitation of the main formal features that have been standard in many grammars for centuries is quite impressive. It becomes more so when it is contrasted with the highly informal character of the description of productive thinking that can be found in Wertheimer's excellent book. Moreover, when we compare Wertheimer's description of thought with that of a psychologist from another school, say a behaviorist, or with that of a psychoanalyst, we cannot fail to be struck by the fact that the sort of agreement which has existed among students of language for quite a long time concerning fundamental issues such as those mentioned above, simply does not exist among students of thought. And I believe that it is not unfair to say that the same lack of agreement is found among students of mental phenomena other than thought, e.g. among those who study memory, learning or personality.

It is obvious that the reason for the relatively high degree of agreement concerning fundamental issues that appears to prevail among students of language must not be attributed to personality traits of the individuals who are attracted to the field of linguistics. Anyone with personal acquaintances among linguists surely must know that we are no less combative than other academics, or, for that matter, than hard hats, hotel clerks, or admirals. If we don't disagree violently on some of the fundamental questions of our field, the reason can only be that it is all but impossible to do so, that all attempts to describe language in ways that radically depart from the standard procedure have invariably failed. (We need only recall the failures of the periodic attempts to describe languages without having recourse to the "word", or to the "speech sound".) In sum, I would suggest linguists agree about some fundamental issues because the standard answers appear so clearly to represent correct insights about the nature of language.

We must now return to the layman whose question why anyone not interested in learning a language should be interested in the study of language started off this paper. He might well grant that we have established that linguists know a great deal that is true about the nature of language, but he is quite likely to tell us that he is still in the dark about how this knowledge provides us with a window into man's mind. I might begin to answer this question by explaining that when I speak of man's mind I am referring to those properties of the human organism which make it possible for men to do such things as draw inferences from premises, remember complicated sequences of events, recognize complex visual shapes, follow elaborate instructions, invent stories or songs, paint pictures, design ornaments, and -- learn languages. It is obvious that for an organism to accomplish the things just enumerated it must possess particular properties; e.g. congenitally blind creatures do not have the ability to recognize complex visual shapes or to paint pictures, while congenitally deaf creatures do not have the ability to recognize melodies. We can therefore conclude that creatures who were able to paint -- as for example the Cromagnon men who inhabited the caves in the Pyrennees -- were also sighted. This is hardly an earth shaking conclusion, nor was it meant to be one. I mention it here only because it is a simple illustration of how less self-evident properties than sight might reasonably be attributed to organisms once it is known that they possess particular abilities, and we shall make use of this type of inference in what follows.

When one considers how children learn languages, one cannot help but be struck by two facts. The first of these is the speed with which this is accomplished. Children obtain a very good command of their mother tongue by the time they are three, and often quite a bit earlier. Second and third languages are often acquired even more rapidly, sometimes in less than six months. The second fact to be considered is that much of what a child learns about his language is never taught to him, if for no other reason than that none but a professional linguist would ever notice that there is anything to be taught. For example, few here will argue that they were taught the fact that in

John promised Mike to take him to the movies

him refers to Mike, whereas in the completely parallel sentence

John persuaded Mike to take him to the movies

him refers to John. Somehow children learn this fact and myriads like it quite easily and rapidly, and without benefit of special instruction. Any scientific account of man's ability to learn language must therefore explain not only the speed with which language is learned, but also how it is learned when much that is learned is never explicitly taught. The only plausible explanation for these facts is that in learning a language the child has access to some sort of framework or theoretical apparatus that makes it possible for him in the overwhelming majority of cases to draw correct inferences, better yet, to reach correct conclusions on the basis of very little concrete evidence. In other words, if we want to account for man's ability to learn languages we must postulate that man has access to a theoretical apparatus of some sort, and that this theoretical apparatus is an integral component of the human mind.

This brings us back to the theoretical framework regularly employed in linguistic descriptions. I shall try to show next that this theoretical framework exhibits the required properties, that it allows us, indeed, forces us to draw correct inferences about linguistic phenomena on the basis of very little data. My exposition will be quite elementary in the sense that it will not presuppose prior acquaintance with any of the facts or the logical devices to be employed. It will, however, be somewhat technical. I am interested in demonstrating as precisely as possible how the theoretical apparatus of linguistics allows one to employ very gross and obvious facts about the way we speak in order to discover further, more subtle facts, for it is the possession of this property above all that leads me to suppose that the proposed apparatus correctly captures a very crucial aspect of man's linguistic ability. I should also like to note here that a demonstration like the one below could not have been attempted until relatively recently. Although many parts of the theoretical apparatus that I shall utilize here have been known for a long time, certain portions that are absolutely crucial to my demonstration are very recent discoveries. It is this fact that situates the demonstration on the frontier of linguistic theory and thus justifies the title of this paper.

The empirical subject matter that I have chosen to deal with here is the placement of stress in English words. The first fact to be noted

about stress placement is that it differs from language to language. In Finnish it falls on the first syllable of the word, in Polish it falls on the last syllable but one, and in French the last syllable of the word is stressed. When a speaker of any of these languages learns English, mastering the position of stress in the word is a matter of some difficulty. It is obvious that native speakers of English must also have expended some effort on learning how to stress English words, for knowing where to place the stress in the word is part and parcel of what we mean when we say that a person has command of English.

One of the most surprising discoveries that Chomsky and I made in the course of our studies for The Sound Pattern of English (1968) was that the stress in a large class of English words is totally predictable from the phonetic form of the word. That is, given the sequence of consonants and vowels that compose the word, the location of the stress in the word can be determined automatically. This discovery was surprising because most textbooks had for many years specifically denied this and, moreover, because the rule that we discovered did not resemble that of any Germanic language, but was instead all but identical with the stress rule of Classical Latin.

In order to see how the rule operates we observe that the vowels of English fall into two disjoint classes, tense and non-tense (lax). Rather than explain the phonetic difference between these two sets of vowels, we give examples of the distinction below:

(1) a. tense: p͡ile, p͡eel, p͡ale, p͡ole, p͡ool, f͡oul

b. non-tense: p͡ill, f͡ell, p͡ulse, p͡ull

The first thing that is to be observed about stress in English is that its location is more readily stated when the end, rather than the beginning of the word, is taken as the point of departure. If considered from this point of view, stress can go on any one of the last three syllables (cf. (2)); on the other hand, if the origin is placed at the beginning of the word there are many more positions.

(2)

antepenult	penult		last
America	Arizona	Wisconsin	Tennessee
aluminum	arboretum	carborundum	supreme
aluminium			
original	suicidal	orchestral	parole
origin	horizon	utensil	divine
antidisestablishmentarian		developmental	Tippecanoe
endocrinological		anthropomorphous	
epistemological			

When we examine the phonetic composition of the examples it is not hard to establish the principles of stress location:

(3) a. The stress is on the antepenultimate vowel if the last vowel is non-tense and the penultimate vowel is non-tense and followed by at most one consonant.

b. The stress is on the penultimate vowel if the last vowel is non-tense and the penultimate vowel is either i) tense, or ii) followed by two or more consonants.

c. The stress is on the last vowel if the last vowel is tense.

These rules are so wordy that it is evidently desirable to restate them with the help of a more perspicuous formalism (4):

(4) a. $V \rightarrow [1 \text{ stress}] / [X \text{ ——} C_o [^{-}_{V}{}^{\text{tense}}] C_o^1 [^{-}_{V}{}^{\text{tense}}] C_o]$

b. i) $V \rightarrow [1 \text{ stress}] / [X [\frac{\quad}{+\text{ tense}}] C_o [^{-}_{V}{}^{\text{tense}}] C_o]$

ii) $V \rightarrow [1 \text{ stress}] / [X \text{ ——} C_2 [^{-}_{V}{}^{\text{tense}}] C_o]$

c. $V \rightarrow [1 \text{ stress}] / [X [\frac{\quad}{+\text{ tense}}] C_o]$

The string to the left of the slash (/) is to be read "place primary stress ([1 stress]) on the vowel (represented by the letter V)." The string to the right of the slash represents the salient features of the word as they play a role in determining the location of stress in accordance with (3). The pair of bold face square brackets [ ] indicates the beginning and end of the word. C_o and C_2 stand for sequences of zero, and two or more consonants respectively, whereas C_o^1 represents a sequence of at most one consonant. The horizontal line indicates where the vowel

to be stressed is located, and X represents a sequence of any number of vowels and/or consonants within a word. As shown in (5) below, the word aluminum fits the analysis of rule (4a).

(5) al u m i n u m

$$[X \text{ ——— } C_o \quad [^{-\text{tense}}_{V}] \; C_o^1 \quad [^{-\text{tense}}_{V}] \; C_o]$$

Up to this point the formulas in (4) are nothing but straightforward translations into an algebraic symbolism of the statements in words given in (3) above. We shall now impose a number of formal constraints on these statements; in doing this we shall force these statements into a particular mold so that they will no longer be simple translations of the English statements in (3). By forcing our statements into a particular mold we are implying that there is a preferred way for recording observations about language. Clearly such an implication is justified only to the extent that we can demonstrate that the mold chosen is appropriate to the subject matter, to language. A good way to demonstate that the mold really fits would be by showing that with the help of statements conforming to the proposed mold we can learn new and interesting facts about language.

Let us assume that the statements in (4) are actually rules which take a sequence of letters, where each letter represents (as a first approximation) a sound, and indicate the location of the stress by placing a "1" above the appropriate vowel-letter. In other words, we picture stress assignment as a process where a sequence of letters like aluminum is analyzed in accordance with the various alternatives provided by the statements in (4), the applicable analysis (cf. (5)) is found, and then the sequence is modified to al$\overset{1}{\text{u}}$minum which, incidentally, is regarded as distinct from the former. This rather mechanical way of looking at the stress rules is not just pedantry; it is an essential step in showing what is involved in knowing a language.

When one reads over the rules as stated in (3) = (4), one notices readily that they are somewhat too prolix, too "wordy". This prolixity can be remedied by making use of the locution "otherwise", i.e. we can replace (3) by the less prolix (6):

(6) a. The stress is on the antepenultimate vowel if the last vowel is non-tense and the penultimate vowel is non-tense and

followed by at most one consonant;

b. otherwise, the stress is on the penultimate vowel if the last vowel is non-tense;

c. otherwise, the stress is on the last vowel.

The less "wordy" statement will be shown to have linguistically interesting consequences. We shall therefore digress briefly and ask what formal devices would be needed so that in the statement of our rules we may make use of the locution "otherwise". The formal reconstruction of this concept demands that we impose the following conditions on the rules:

(7) Rules apply in a linear order;
i.e. we test each of the rules in (4) in order to find out whether or not it applies, first (4a), next (4bi), next (4bii) and finally (4c).

(8) For certain sets of rules -- and in particular for the set in (4) -- a special condition of disjunctiveness holds.

Whereas in general more than one rule may apply to a given word, no more than one of the rules in a disjunctive set may apply to a given word, and, moreover, the rule that applies is the one ordered earliest in the set. To see what this means, assume that the rules in (6) are disjunctively ordered. Clearly (6a), which is identical with (4a), applies to the word aluminum as shown in (5) above. Since (6) is a disjunctive set no further rules can apply to this word. This is important since, as formulated above, the last vowel of the word aluminum is non-tense so that (6b) would also be applicable, but this would lead to two stressed syllables in the word, which is clearly an incorrect consequence. The reason that (6b) does not apply, in fact, is the word "otherwise", which introduces it and is the way everyday language expresses the formal constraints of a disjunctively ordered set of rules.

We spoke above of the needless prolixity of the rules in (3) = (4) and noted that by use of the concept "otherwise" or its formal equivalent "disjunctively ordered set of rules" a less prolix statement can be obtained. To see the improvement we translate (6) into the symbolic notation developed above:

(9) a. $V \rightarrow [1 \text{ stress}] / [X \text{ ——} C_0 [^{-}{}^{\text{tense}}_{V}] C_0^1 [^{-}{}^{\text{tense}}_{V}] C_0]$

b. $V \rightarrow [1 \text{ stress}] / [X \text{ ——} C_0 [^{-}{}^{\text{tense}}_{V}] C_0]$

c. $V \rightarrow [1 \text{ stress}] / [X \text{ ——} C_0]$

This translation brings out a very interesting formal property, namely, in (9) we can obtain the later rules by deleting portions of the earlier rules. Thus we can obtain (9c) from (9a) by deleting the substring $C_0 [^{-}{}^{\text{tense}}_{V}] C_0^1 [^{-}{}^{\text{tense}}_{V}]$, and we obtain (9b) from (9a) by deleting in the latter the substring $[^{-}{}^{\text{tense}}_{V}] C_0^1$. This property of later rules being -- as it were -- contained within earlier rules is a unique feature of disjunctively ordered rules. Only and all sets of disjunctively ordered rules possess it. To bring out this property more clearly we shall abbreviate (9) by enclosing the substrings to be deleted in parentheses as shown in (10):

(10) $V \rightarrow [1 \text{ stress}] / [X \text{ ——} (C_0 ([^{-}{}^{\text{tense}}_{V}] C_0^1) [^{-}{}^{\text{tense}}_{V}]) C_0]$

We shall make the assumption that (10) is the form in which the stress rule appears in a true grammar of English. We achieve this by establishing yet a further condition:

(11) The prolixity of a rule or set of rules is measured by the number of symbols (C, V, - tense, etc.) appearing in the statement of rules. All other things being equal, less prolix formulations are always to be chosen over more prolix formulations.

We must now demonstrate that these formal conditions are indeed of some value to us in deepening our understanding of the nature of language, in general, and of English, in particular. Observe first that rule (3b) = (4b) does not tell us how to stress bi-syllabic words such as those in (12) where the first syllable ends with a non-tense vowel followed by no more than one consonant:

(12) venom mucous Paris Medal missile villa

Rule (6b) = (9b), on the other hand, does handle these words properly, for it supplies stress to the penultimate syllable of any word to which (6a) = (9a) does not apply and which, moreover, has a last vowel that is non-tense. Notice that there is no necessity that this be the case; English bi-syllabic words of this type might very well have been stressed on the last syllable. Nor were bi-syllabic words of this type taken into consideration when the stress rules were formulated above (cf. (2)). In

other words, what has happened here is that when we tried to describe the facts for one set of words we automatically also described the facts for a totally different set of words. Extrapolations of this sort are of great importance, for they testify to the correctness of the proposed formal constraints which provided for these extrapolations in the first place.

Two further sets of facts can be extrapolated from (9) which were not implied by (3). First, monosyllabic words with non-tense vowels such as those in (1b) are not handled by (3), for (3a) applies to tri-syllabic and longer words, (3b) to bi-syllabic and longer words, and while (3c) applies also to monosyllables, it requires that their vowel be tense. Hence such words are outside of (3), nor were they considered when the rules were formulated. The formulation (9), however, implies that such monosyllabic words will receive stress. Again there is nothing automatic about this fact and monosyllabic words with non-tense vowels could logically very well have been stressless.

The second class of cases is provided by examples in (13):

(13) Suèz Madrìd Berlìn Vermònt Japàn Saigòn

All these words would normally have received initial stress by (9b). In fact, the town Berlin, New Hampshire pronounces its name with initial stress. The name of the German capital is therefore clearly an exception, i.e. it is marked in some way so that (9b) does not apply to it. But once it has been marked as an exception to (9b), its stress is automatic -- it goes on the last syllable -- because (9c) as stated will supply final stress to all words that have not been operated on by (9a) or (9b). Thus, the formal features of the rules we have adopted force us to conclude that, given certain facts about a language, certain other facts should also be true of the language, and as we have just seen, these conclusions are indeed true.

The question may now be raised what is the broader, extra-linguistic significance of the various constraints that we have imposed on the form of the language rules which have been discussed above. We have shown that if we impose these conditions on statements dealing with a particular body of data we can deduce from these statements that certain other facts are true about the language. Consider now this observation from the point of view of a person learning a language. Clearly he must have some way

of committing to memory the facts that he learns, e.g. that America is stressed on the antepenult, whereas Arizona is stressed on the penult. We have shown that if he commits these facts to memory in a particular form, he will also be able to deduce further facts as well. In other words, if he commits to memory certain facts in the form proposed he gets further facts about English for free, as it were. From the point of view of a person learning a language this is not a bad bargain. Consider further that when a child learns his mother tongue he is exposed to the language in the most unsystematic fashion, so that enormous portions of the language are presented to him only in the most fragmentary fashion or not at all; yet in spite of this highly unsatisfactory apprenticeship, a child learns the language without difficulty and with astonishing rapidity. The only way in which this achievement becomes at all comprehensible is if we can assume that the child has available some sort of device which leads from a very small amount of data to the correct inferences about a large additional set of facts. In other words, the conditions under which children learn suggest rather forcefully that children must get a lot for free as it were. And the formal apparatus I have sketched above is a possible mechanism whereby this extra information is made available to children at no cost.

This proposal would, however, almost immediately elicit an objection. The objection might run as follows: Granted that the ability to learn languages presupposes access to some sort of theoretical apparatus of the type mentioned above, it is, however, far from obvious how the child might acquire the knowledge that is implicit in this theoretical apparatus. This becomes particularly clear if we grant that the theoretical apparatus to which a child must be presumed to have access is essentially identical with the theoretical apparatus of linguistics. We know that in the case of linguistics the theoretical framework is the outcome of long study and reflection; to suppose that each child goes through something analogous to the history of linguistics is patently absurd. This leaves but one alternative; we must suppose that the child is born with access to the equivalent of the theoretical apparatus of linguistics.

That living organisms should have innate capacities of great complexity without even being aware of this fact is not as surprising as it might appear at first sight. No one would suggest that the elaborate

navigational capacities of fish or birds are acquired by lengthy exercises, or that their possessors are in any sense aware of possessing these capacities. If we want to understand why salmon swim thousands of miles from some particular place in a river to the ocean and back again we do not investigate the reenforcement schedule to which young salmon are subject; instead we study various hormonal and neurological mechanisms in the salmon which are as innate as his ability to digest food or to obtain oxygen from water. Much the same no doubt is true of the child. In addition to its capacity to breathe, digest food, react to pain, the child also possesses the capacity to learn language, a crucial aspect of which must be what was referred to above as access to the equivalent of the theoretical apparatus of linguistics. But this is just another way of saying that access to the equivalent of the theoretical apparatus of linguistics is one of the mental capacities of the child, or rather that part of the child's mental endowment is something that is very imperfectly reflected in the theoretical apparatus of linguistics. It, therefore, stands to reason that the study of language is a plausible means towards obtaining insight into the mental capacities of man.

The Place of Linguistic Research in American Society

by William Labov

In the first two-thirds of this century, linguistic research has followed two distinct traditions in its relation to society: a social and an asocial one. At the turn of the century, some of the most prominent historical linguists were convinced that our field would benefit from a close association with sociology, and that the explanation for historical change would be found in the fluctuating course of the social developments in which language was embedded. In 1905, Meillet argued

> ... from the fact that language is a social institution, it follows that linguistics is a social science, and the only variable to which we can turn to account for linguistic change is social change, of which linguistic variations are only consequences. (1949:164).

But as a matter of historical fact, linguistics did not follow this path. Partly as a reaction against the crude sociologizing of the times, and partly for good theoretical and strategic reasons, linguistics reconstructed itself as an autonomous, self-contained discipline that argued its case from purely internal evidence. Ferdinand de Saussure (1962) established a strong, almost unshakable distinction between language and speech: language (langue) as our abstract knowledge of linguistic structure, speech (parole) as what we actually say. This involved a curious paradox: for langue, which Saussure considered to be the social aspect of language, was conceived of as so general that a linguist could obtain data on it from any given individual, even from himself. But parole, the individual aspect of language, was thought of as so variable that it could only be studied by a kind of social survey.

For various sound and strategic reasons, linguistics has never maintained a close connection with language as it is actually used. Traditionally and obviously, historical linguistics is based on the evidence of literary texts, which survive by the grace of various happy

historical accidents. To this material, the dialectologist and anthropologist added the evidence obtained by direct questioning of informants. It is seldom possible to spend enough time in the field to acquire the kind of native competence needed to observe language in actual use, and formal elicitation of this sort is an essential first step. In the last twenty years, the most striking advances in our knowledge of language have been achieved by capitalizing on the Saussurian paradox to its logical extreme: taking as the primary data the linguist's own intuitions about grammatical and ungrammatical sentences. Thus whether we like it or not, the major current of linguistic research in the past four decades has carried us further away from the speech of every-day life. The vast body of data from the ordinary use of language by native speakers in the linguist's own society has not been accessible for linguistic analysis.

During this period, the major applications of linguistics to the needs of society as a whole were in the teaching of foreign languages. During World War II, for example, linguists participated in a strenuous effort to teach languages to service personnel as efficiently and rapidly as possible. Today we have many institutions and techniques which have inherited the impetus of that effort. Yet linguists have had less success in applying their ideas to the teaching of English in American schools, and even less in the teaching of reading. In 1970, we must confess that current linguistic theory is not being applied in any sizeable way to educational problems or other social questions. Despite the fact that most linguists are equipped with a strong social conscience, it is not immediately apparent to them that theoretical linguistics can make a contribution to the urgent social problems of our time. It can be argued that linguistic research should be supported as a part of our general desire to find out more about the nature of man, and that most claims for immediate application are illusory. The recent failure of attempts at mechanical translation is a typical case of premature application without sufficient basic knowledge. Potentially, the social value of abstract research is very great; there can be no disagreement about the need to continue research into linguistic structures on the basis of our intuitions about grammaticality, and there is a general confidence that this program will eventually have strong social applications.

But in the past fifteen years, there has been a noticeable movement away from the extreme asocial position in theoretical work towards a view of linguistic structure and evolution which includes the evidence of every-day speech outside of the university community. This movement has been motivated primarily by the desire to find a sounder empirical base for linguistic theory, and by a conviction that social factors play a larger role in the evolution of language than most linguists have been willing to admit. The movement towards a socially realistic base in research was also a response to the feeling that linguistic knowledge should be applied, if possible, to the urgent social problems of the inner cities. This program requires an enlargement of our notion of langue or the "competence" of the native speaker, to include skill in the use of language--what Hymes has called "communicative competence". It has been necessary to break down the institutionalized barrier between language and speech, and make everyday speech available as evidence for linguistic theory; this in turn has required the removal of the barrier between the linguist and the human being.

Such efforts have necessarily developed an interdisciplinary character. From sociology, linguists have drawn on survey methodology, as in the surveys of the social stratification of language in New York (Labov 1966), Detroit (Shuy et al. 1968) and Salt Lake City (Cock 1969), and of bilingual communities (Fishman et al. 1968). Techniques of working with small groups have become even more important, along with the sociometric tools needed to analyze these groups. The basic techniques of participant-observation, common to anthropology and sociology, have been utilized most widely outside of the United States, but recently some excellent results have been obtained in Harlem, Washington and Berkeley in studies of the Black community (Labov et al. 1968, Hannerz 1970, Mitchell-Kernan 1969) and in the Spanish-speaking communities (Fishman et al. 1968, Gumperz and Hernandez 1970). Direct observation of family life has been achieved through the use of multiple television cameras in the home, a technique developed by anthropologists and psychiatrists, and this data is now being analyzed with the help of linguistic techniques (de Havenon 1970). To some extent, contact with psychology has been the most fruitful, but also the most baffling. The method of controlled experimentation has until recently been limited to

the laboratory, and much of our psycholinguistic data is based on the forced choices of captive subjects, the university students. Since language is sensitive to direct observation, and tends to change when it is confronted directly, these data must be matched with other methods of formal elicitation, rather than with natural, unreflecting speech.

The basic techniques for working with speech must be designed to solve the contradiction between the need to observe closely and the need to minimize the effect of that observation. Many empirical studies converge to show that speakers must be expected to show a range of speech styles sensitive to the roles of speaker and addressee, to the topic, channel and situation (as demonstrated in an experimental setting by Ervin-Tripp 1964, and in a semi-natural setting by Gumperz 1964). Of all these styles, the most casual (the "vernacular") appears to be the most systematic and most useful for explaining historical change, bilingual interference, and school performance. But the vernacular is used only when the minimum degree of attention is paid to speech, and whenever the speaker is being observed by an outsider--as in a face-to-face interview--he will pay some attention to speech forms, shifting irregularly towards the formal end of the style spectrum. Sociolinguistic techniques are designed to solve this apparent contradiction by converging on the data from a number of standpoints: interviews, casual and anonymous observation, group sessions, and long-term participant-observation, along with various techniques for distracting the speaker's attention from his speech. The study of language in its social context also includes the study of formal institutions and formal speech styles, but its principle techniques are devoted to approximating a description of the vernacular of every-day life.

There remains the basic problem for the study of syntax: most sentence structures of interest for theory do not occur often enough to make naturalistic observation worth-while. Here it is necessary to develop techniques of intervention in a natural setting where the data is enriched, or subjects' responses are studied, under conditions where the subjects are not aware of being observed or tested. Let us consider the important case of self-embedded sentences, such as

(1) The boy the alligator the man shot ate laughed at God.

The acceptability of such sentences prompted Chomsky to argue, with other evidence, that finite-state grammars were not adequate to generate human language (1957). Chomsky pointed out that the rules of embedding could produce on principle sentences of this type with four, five or six levels of subordination--that is, indefinitely complex sentences--which were difficult to understand only because of performance factors. Yet some linguists still challenged this point fifteen years later (Reich 1969) since no such sentences had ever been observed in actual use; all we have are our intuitive reactions that they seem grammatical, and such intuitive judgments may be the product of other modes of mental operation that are distinct from natural grammars.

We cannot wait for such embedded sentences to be uttered. But a group of students at Columbia helped to test the status of such sentences empirically by injecting into their every-day conversations the question

(2) Say, do you think that the report that the stuff they put in diet soda causes cancer is a hoax?

Some sophisticated linguists predicted that people would give no sign of understanding such sentences, or might do just as well with alternate forms which skewed and distorted the grammar, such as

(3) Say, do you think that the stuff that the report they put in diet soda causes cancer is a hoax?

But the results of this naturalistic experimentation in every-day life showed clear comprehension of (2) and a very different pattern of confusion and disruption of the conversation in response to (3). Our conclusion is that native speakers of English do grasp the grammatical structure of self-embedded sentences in ordinary conversation: that they are grammatical in the strongest sense. Further development of methods such as these will allow us to explore complex syntax within the context of daily life.

With this introduction to methodological problems involved in the study of language in its social context, we are ready to examine some results of this study, and the new theoretical questions which these findings have raised. I will first consider sociolinguistic studies of linguistic

diversity in urban communities (§1), and then take a new look at the traditional, geographic study of rural dialects (§2). The next section will deal with the co-existence of separate systems, and the linguistic and educational problems of bilingualism in the United States (§3). I will then turn to the direct investigation of the social evaluation of languages and dialects, and the current social and political issues to which this research is relevant (§4). Finally, I will return to the impact of the knowledge we have gained on immediate educational questions, and discuss the contradiction between this general linguistic knowledge and the theoretical bases put forward by psychologists for compensatory education (§5). Here, in the study of the relation of language and thought, we will see that the most abstract investigations of the semantic basis of grammatical structures have an important place in issues of central concern to American society.

1. Linguistic diversity

The largest body of sociolinguistic research has focused on the social differentiation of language--differences among socioeconomic groups, ethnic groups, age levels and the sexes. Three speech communities have been studied most intensively: New York City (Labov 1966), Detroit (Shuy et al. 1968) and Hillsboro, North Carolina (Levine and Crockett 1966); less systematic studies have been carried out in Chicago, Salt Lake City, Austin, and Los Angeles. Recently, some of the same techniques have been used in analyzing the sociolinguistic patterns of the Black speech communities in the same areas (Labov et al. 1968, Wolfram 1969, Anshen 1969). Perhaps the major finding of this research is that the language of every-day life is more systematic than it seemed to earlier linguists. Not only do most people speak in grammatical sentences most of the time, but much of the variation which was thought to be random and chaotic turns out to be rule-governed in intricate ways. For example, the contraction and deletion of the copula in Black English is quite variable, with speakers sometimes saying He is over there, sometimes He's over there, and sometimes He over there. The traditional approach to such oscillation was to call it "dialect mixture" outside of the realm of linguistic analysis: in this case, two white forms are

seen to be alternating with one Black form. Since the copula has become an issue in educational programs (see §5), it will be useful to look at sociolinguistic evidence on this point.

Careful study of the natural speech of Black children, adolescents and adults shows that the use of these forms of the copula obeys natural laws that are the same as those governing contraction in colloquial white English. For example, we find far more contraction and deletion after pronouns than after other subjects: we are more apt to say He's here and The man is here than He is here and The man's here. Similarly, Black speakers will drop the 's much more often after pronouns than other noun phrases, favoring He here and The man is here. But neither contraction nor deletion of the copula is found where stress falls on it. We say That's where he is, or Yes he is, but not That's where he's or Yes, he's, just as Black speakers do not say *That's where he or *Yes, he. We can explain these facts only by concluding that Black English has the basic contraction rule which changes He is here to He's here, and in addition, a rule for variably deleting 's to give He here. Studies of natural speech in a dozen cities by five investigators have confirmed the intricate pattern of constraints which govern these two processes of contraction and deletion in parallel ways.

Such findings have another consequence: they force us to revise our notion of what kinds of linguistic rules can appear in our grammars. In abstract linguistic discussions, we consider that rules may be obligatory, and always apply, or optional, so that the use or non-use of the rule is completely unrestrained. In the latter case, the two possibilities are said to be in free variation. Nothing further can be said about constraints upon such variation. But working with natural speech, we are able to show that the rule-governed patterns of speech go further into human behavior than we had previously taken into account, and that optional rules of language can apply more often in one context than another in a regular way.

As another example, we can consider the variation in the pronunciation of final and pre-consonantal /r/ throughout the Eastern United States--in Boston, New York, and the coastal Southern states. These are all traditionally "r-less" areas, where the abstract /r/ is not actually pronounced as a consonantal [r], so that fear is pronounced [fi·ə] and

card [kɑ · d]. Today we find great variation in the pronunciation of this /r/ in all areas. Though one cannot predict what any one speaker says in any one word, certain extraordinary regularities emerge when any few speakers talk for any period of time. The higher the social status of the group, the more [r] is pronounced. The more formal the stylistic context, the more [r] is pronounced. The pattern which emerges is that of Figure 1, where the vertical axis is the percentage of the prestige pronunciation [r], and the horizontal axis is Style, ranging from Casual on the left to most Careful on the right. We see that everyone follows the same curve of style shifting--more [r] with more careful speech. When a professor from New York City begins a lecture, he usually begins with a high percentage of [r] which drops rapidly as he warms to his subject, and rises again to a high point for the finish. Black speakers are quite sensitive to this variable: for them it is one of the most important indicators of formal style. The Hawaiian Creole spoken throughout the state ("Pidgin") is also an "r-less" system--witness the stereotyped Hawaiian slogan mo betta--and here more than anywhere else, the pronunciation of /r/ in words like better is a mark of careful, formal speech.

From these intricate sociolinguistic patterns we find emerging a number of interesting questions for future research. First of all, we find that it is a curious fact that the same linguistic features are

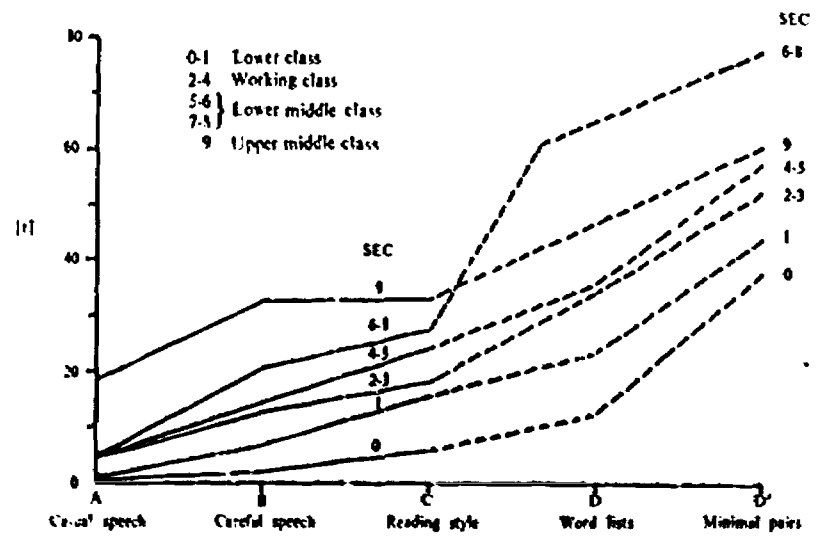

Fig. 1. Class stratification of (r)

used for style shifting and for class stratification. Earlier, common-sense writings of American linguists claimed that there was no connection between cultural varieties of language and functional levels, but we find that they are clearly interdependent as shown in Figure 1. On the one hand the entire population is differentiated by their use of [r], or double negatives, or dependent pronouns as in My sister she's got a new fella. But at the same time, each sub-group is similar in that the same variables are shifting in the same direction as context changes. Some of these style ranges overlap, which produces a problem of interpretation: a cab driver speaking carefully may use the same forms as a salesman speaking casually. At first glance, it would seem that the system would work much better if different features were used for different functions. In more stable societies with less social mobility, there are tendencies towards such separation, but the structure of our society is such that careful speech is normally identified with the patterns used by the next higher status group with which the speaker is frequently in contact.

A second problem arises from the existence of variable rules themselves. There is a rule of English which says that you may optionally drop the d in the word old and also the d in the verb rolled, but that you will do the former more often than the latter. Formally, it is written:

$$[\text{-cont}] \rightarrow \langle \emptyset \rangle \; / \; \begin{bmatrix} +\text{cons} \\ \alpha\text{tens} \end{bmatrix} \quad \langle \emptyset \rangle \quad \begin{bmatrix} \underline{\qquad} \\ \alpha\text{tens} \end{bmatrix} \quad \#\# < \text{-syl} >$$

The angled brackets at the right of the arrow indicate a variable rule, and the angled brackets on the right of the "/" sign indicate the variable constraints upon the rule. This expression can be read back in ordinary language as "A stop is variably deleted when it is preceded by a consonant of the same voicing (or tensing) and followed by a word boundary, more often when it is not preceded by a grammatical boundary than when it is, and more often when it is not followed by a vowel than when it is." Thus the fact that the -ed in rolled is a grammatical signal (written symbolically as rOl#d) constrains the rule. This rule can be seen operating in the speech of every adult and child we have studied, in Harlem, Chicago, Texas or Los Angeles. It is one aspect of a universal principle which governs such linguistic changes in progress

which may be stated as "If a language has a rule which variably deletes a word-final consonant, that rule operates more often when the consonant is an inseparable part of the word than when it is a distinct grammatical signal."

But how do children learn such a rule? They cannot tell from any given sentence if the rule is being followed or not. The implication is that speakers are sensitive to frequencies, something we have long been reluctant to consider. But we can speculate that when a person drops too many past tense /d/'s the listener may react "You're speaking a little too rough; you're not speaking English any more." In fact, foreigners frequently do reveal their foreignness in just this way--by turning a variable rule into an obligatory one. This may be seen most clearly in the rule which shifts the th- of these, them and those into a stop consonant [d]. No matter how often a native speaker of English says dese, dem and dose, he never reaches 100% on this rule; there is always enough of standard these, them and those to demonstrate that the speaker knows the class of th- words and does not confuse dose 'those' with doze 'to sleep'. When a person turns this into an invariant rule we hear his usage as foreign and un-English.

These remarks are based on inference and indirect evidence. Empirical investigations of such sensitivity to frequency remain to be done. The implications of the problem for education are strong: if children can function with such variable rules, then they need not be trained to reach 100% efficiency in production in order to have a firm knowledge of the form. They may use a linguistic form variably, and still possess enough knowledge for reading or interpreting the language of others. But on the other hand, they may not have grasped in any deep sense the fact that our spelling rules are today, by convention, invariant, and quite different from pronunciation in this respect.

A third problem to be faced is how social factors come to bear on the abstract, deep-seated linguistic rules that the linguist isolates. The items I have mentioned so far are well known social markers. But we also find social conditioning of rules that are well below the level of conscious awareness. The backing of /ay/ to [ɔɪ] in New York City shows clear class stratification, but very few people are aware of it. When they hear the sound [ɔɪ], they think it is "Cockney." Some linguistic

changes occur almost entirely without social notice. In our studies of Sound Changes in Progress in the United States (Labov 1970), we have been tracing the merger of short /ɔ/ and long open /o/ in cot and caught, God and gaud, Don and dawn. The merger of these two sets of words is expanding rapidly over half of the geographic United States, yet very few speakers are aware of it. Dictionaries and phonics readers fail to take notice of the fact that short open /ɔ/ and long open /o/ are the same sound for speakers in the West, the Pittsburgh area and in the Northeast. One of the general rules of sound change is that mergers do expand at the expense of distinctions, and we find accordingly that in the marginal areas, younger speakers are unconsciously adopting the system in which cot and caught are the same. Yet below the level of awareness, we see that the speakers' normative reactions are influenced by the change taking place around them. Thus an eighty-year-old man living north of Harrisburg read a word list with all of these pairs the same, although our spectrographic measurements showed an enormous difference in his natural speech between the word class of cot, hock, God and the class of caught, hawk, Maud, etc. He had unconsciously picked up the norms of the younger generation, and used them as the "correct" pattern. Furthermore, we find differences in social distribution of this merger. In Phoenix, for example, the merged pattern is most common among white Anglos, and least common among Blacks and Spanish-Americans.

Though most linguistic changes begin well below the level of conscious awareness, and rise to social notice only late in their career, we find that every change in progress seems to have begun in a special sub-group of the community and spread outward--and usually not in the highest status group. What is the mechanism of such transmission? The anthropologist Tarde argued that all borrowing takes place from the group with the higher prestige to the group with lower prestige, but if "prestige" has any meaning, linguistic changes are usually violations of this principle.

One of the most striking and curious problems in the social distribution of language forms is the difference between men and women. In a number of sociolinguistic studies it has been found that women are more sensitive to prestige forms than men--in formal style. Yet at the other end of the scale, in casual speech, women show the most advanced

forms of linguistic change in progress. This was first shown by Louis Gauchat in the Swiss French village of Charmey in 1899, and we find strong confirmation in New York, Detroit and Chicago. In Chicago, for example, women lead in the tendency to raise the vowel of that and at to a high vowel [dɛ^ət, e^ət] or [dɪ˙·ət, i˙·ət], and at the same time lower the short vowels of miss and mess toward [mɛs] and [mæs]. The fact that women show these two opposite tendencies fits in with the general sociolinguistic principle that those who show the most extreme forms of a stigmatized feature in their casual speech are quickest to correct it in their formal speech, and in the speech of others. Such a principle illustrates the importance of not focusing directly upon language with informants. It also raises the further, more puzzling question as to why women show this tendency, and what effect the differentiation of the sexes has on linguistic evolution. We realize of course that women have contact with young children as they learn the language, and teachers in the early grades are women, largely from the lower middle class. This is the group which shows the most extreme form of linguistic insecurity, with the sharpest slope of style shifting. The special role of women is not characteristic of any one community or any one variable, which must in some way play a role in the shaping of language.

The most puzzling problem which has arisen from this research is the existence of continuing differentiation among social groups in large cities, increasing despite the high level of inter-group communication. Classical views of linguistic change maintained, without too much empirical evidence, that linguistic divergence was always due to discontinuities in the networks of communication. Such discontinuities do exist, but not in every case. For example, the dialect boundaries which separate New York and the upper tier of Pennsylvania from the rest of Pennsylvania (Kurath 1949) coincide with one of the deepest and oldest discontinuities in the United States--for soil, crops, rainfall, population, and for travel. But the boundary which surrounds the New York City speech community, over 150 years old, shows no such discontinuity. Several million people cross this boundary every day. Yet the divergence of New York City from the surrounding area grows, and within New York City we find increasing linguistic stratification between social classes. We have the important task of accounting for such divergence, if simple mechanical factors of drift and isolation will not do so.

The larger problem posed by linguistic divergence appears when we compare linguistic evolution to biological evolution. As Greenberg notes earlier in this series, linguists actually preceded biologists in providing a model of differentiation and hierarchical radiation in the course of development. Darwin saw many parallels between linguistic and biological evolution, and made extensive use of them in The Descent of Man. Yet to complete his comparison, Darwin was forced to argue for natural selection in language--that somehow words became better as they were shortened and replaced. No one would support such a claim today. On the contrary, the regular forces of linguistic evolution are most often seen as blind and destructive: the wearing away and annihilation of words and inflections by sound change is occasionally patched by irregular applications of analogical restructuring. It would not be difficult to argue that linguistic evolution shows no adaptive tendencies at all--that it is dysfunctional. How do we benefit by not being able to understand the French or the Chinese? Yet the end result of linguistic evolution is the absence of communication between groups. This is an uncomfortable situation for those who feel that some kind of functional theory must eventually play a role in explaining language change.

We normally think of communication as the primary function of language, as a quantity to be maximized at all times. Yet there may be conditions under which it is advantageous for one group not to communicate readily with another. In this connection, several of us have noted an important paper by Fernando Nottebohm in Science on the songs of chaffinches (1970). Chaffinches are one of several species whose songs are learned from other birds of their species during a fixed developmental period. They have developed areal dialects, which like other territorial signals establish preferential patterns of mating, and so have differentiated into a number of subspecies under slightly different ecologies. There is no absolute speciation, because chaffinches do mate across dialect boundaries when population levels drop. Nottebohm suggests that such relative isolation allows subspecies to develop specialized adaptation to local environments without the danger of accidental extinction which absolute speciation brings. He suggests that human dialect diversity offers parallel advantages. We can extend his thinking to hypothesize that linguistic diversity allows cultural pluralism to flourish;

and if one believes as most linguists do that such pluralism is a good thing, there is an advantage in our not being able to understand the Russians which may be greater than we first realize. Exactly which empirical directions might approach such an hypothesis remains an open question.

2. The social implications of dialectology

The broad problems of linguistic diversity raise theoretical questions for American dialectology as a whole, including the traditional study of rural dialects. Insofar as the Linguistic Atlas work under Kurath and McDavid has been completed, (Kurath 1949, Kurath and McDavid 1961) we have a valuable resource which goes beyond the original historical interest of these findings. When dialect boundaries coincide with discontinuities in communication, the linguist has little more to say. Our sense of justice and explanation is satisfied. When they do not, we become alert to the possibility of internal, structural factors which impede or promote the expansion of linguistic forms.

As a small but striking example, we can consider English names for the fish called by the Wampanoag Indians skuppaug. This word was simplified to scup in New England, and porgie in New York. There is a boundary in Connecticut between the two forms; its location in the Atlas maps exactly coincides with another boundary between names for another fish called pogie in New England and menhaden in New York. Wherever one fish is called the scup, the other is the pogie; but if the first is porgie, the second is menhaden. Nowhere do we have two species of fish called pogie [pogi] and porgie [po'gi]. Thus we see that in this one area--minor to us but important enough to fishermen--the evolution of language is governed by the need for cognitive differentiation.

Another structural factor was mentioned above: the pressure for mergers to expand. Thus we find the merger of pin and pen, common in the Southern states, expanding northward as far as Gary, Indiana. The reason for such expansion is that a class of words with a given vowel is more or less an historical accident, with no inherent rhyme or reason. It can be lost and merged with another class much more easily than it can be learned. Obviously, information on these fast-moving changes should

be made available to educators writing texts which are intended to introduce students to the relation of the sound system to the alphabet.

The general research strategy to be followed here is that the more we know, the more we can find out. Where the Linguistic Atlas has been completed, we can return a generation or two later to see where the language is going, as I did in New York City and Audrey Duckert did in Massachusetts. Knowledge breeds knowledge, and with it, respect and affection for the language being studied. For this reason, some developing nations, fearful of incipient tribalism, raise difficulties for linguists who want to study local languages. The very act of studying a language is equivalent to declaring it a vehicle of communication worthy of attention. We in this country may take the opposite view, and develop the notion that language teaching should be based on the resources that the child brings to the classroom. We want to promote interest in local dialects alongside the educated standard, rather than try vainly to extinguish them.

The major factors which support and maintain linguistic diversity appear to be cultural, even ideological. In formal contexts, most people apologize for their local terminology, even try to repress it. But when the teacher or the stranger is gone, the local terms break out, flourish and multiply. When some white investigators visited the Georgia Sea Islands to study the Creole known as Gullah, they found no African names remaining. But when the Black linguist Lorenzo Turner made his own study, he found that every child had an African name which he never told teachers or white strangers. School teachers at Julia Richman High School in New York are encouraged to call every student by his first name--but the strategy fails through ignorance. The names on the teachers' lists are the wrong ones, quite different from the names that the Black and Puerto Rican students actually use. (Gutwirth 1969).

One of the most important functions of dialect studies is to bring a note of realism into the classroom, and to create a healthy respect for the vernacular of the students by giving them knowledge of it. In this respect, the Dictionary of American English directed by Frederick Cassidy at Wisconsin is providing a valuable service to scholarship and to education. The same social values are being supported by descriptive studies of Black English in many cities and rural areas, and studies of the

English of Spanish-speaking, French-speaking and Indian children. The aims of such studies are not to ignore Standard English, or to teach the local dialect--the children already know them. The aim is to design rational methods in teaching the standard through contrastive analysis, and at the same time, increase the student's knowledge of himself.

Studies of the acquisition of language. When we begin to study the language of children, we enter a separate pre-literate culture, quite unknown to most adults and even concealed from them. Children are excellent language learners, and we are still faced with the problem of understanding how they do the job so well and we do it so badly. Our current studies of the acquisition of grammar are still quite limited in their social orientation: they are studies of middle-class, eldest children, isolated from any other social context than the mother and the child. (Brown and Bellugi 1966, Bloom 1970, Braine 1963). In her study of negation, Bellugi points out (1967) that at the age of four one child suddenly developed multiple negation in such sentences as Nobody don't know nothing. Was this indeed an internal development of the rule system, as they suggest? We know nothing of this child's life outside of the home. Who did he talk to and play with beside his mother? It is important to know if this was indeed a structural generalization and not the influence of other dialects, but we will not know this until we have further data to consider.

There are a number of unanswered questions which require the study of the social environment in which children are learning language. Here we can mention only a few:

(1) At what age do most children move outside of the linguistic influence of their parents and fall under the dominant influence of their peer group? We know that in the long run most children acquire the dialect of their friends, rather than their parents. But how early does this happen, and how completely? What traces, if any, remain of their parents' rules?

(2) Are the new rules added to the old ones, or do we actually have a re-structuring of the language as this process takes place?

(3) At what age do children begin to lose the ability to learn new rules with native-like control? Is this linguistic puberty biologically or culturally controlled? We have some evidence that favors

the notion that adults can retain this ability. In some multilingual areas of the world, like the Vaupes basin of the Amazon (Sorensen 1967), the average person learns three, four or more languages with little trouble and seems to go on improving his skills as he gets older.

3. Co-existent systems and bilingualism

So far we have been dealing with diversification within a single system. We can now consider the fact that our various speech communities do not merely show orderly differentiation within a single English system; as in most countries, we find several co-existent systems side by side or overlapping as superordinate and subordinate. This raises the question as to what our fundamental unit is: what is a system and how do we define it? Clearly Spanish, French, Navaho and English are different systems. But is Black English a different system from the surrounding white dialects? My answer would be yes, based on the following definition of a system: a set of rules or relations in equilibrium, which jointly carry out a given function. A system is said to be in equilibrium when it is not easily shifted in any one part. If you try to change one rule in such a system, you obtain very little result from your effort, because the set of rules resists change in any one member. Conversely, when change does take place in one element, correlated changes take place elsewhere. As one example of such correlated change, we may consider Hawaiian Creole in opposition to standard English. There is no optional rule for deleting -ed or -d in Hawaiian Creole--the rule became obligatory and so the -ed in rolled disappeared altogether. As in many Creoles, a new auxiliary developed in compensation. The new auxiliary, wen, was adapted from the past tense of go to serve as the mark of the past tense. Thus the present is He pick em up; the future, He gon pick em up; the past, He wen pick em up.

As a more complex example of a systematic difference between Hawaiian Creole and English, we can consider the forms of questions. There is no "flip flop" anywhere in Hawaiian Creole which exchanges the position of subject and tense marker. A question never takes the form, Can he swim over to the reef? But instead questions are signalled by a special intonation contour: He^{3} can^{3} swim^{3} over to the^{3} reef^{1}? This sounds like a

statement to outsiders but it is clearly different from Creole statements. The difference in question form between the Creole and English is illuminated when we consider another feature of the Creole: that subjects can be optionally deleted--a possibility which does not exist in English. Instead of the statement He no can swim, we may have No can swim; in place of He can swim, Can swim. But in standard English, we must have a formal subject except with imperatives (excluding Can swim entirely, which cannot be an imperative). We even supply dummy subjects, as in There's a dog over there, to fit this rule, while Hawaiian Creole has no such need. The Creole equivalent is Get one dog over there (Past tense, Had one dog...). Now if Hawaiian Creole signalled questions by reversing the order of subject and tense marker, as in English, and not by intonation, this optional deletion of the subject would wipe out any evidence that the rule had applied, winding up with Can swim for both statement and question. In other words, the two Creole rules function together, but the Creole subject deletion rule would be inconsistent with the English question rule. This fitting together of two very different rules is the mark of a separate system.

Contrasting two systems. The basic activity of applied linguistics in relation to the teaching of foreign languages is contrastive analysis. The fundamental procedure is to lay out the inventories of the two systems, map the differences, and point out which of these are apt to be overlooked or are known by experience to cause trouble to students. This trouble is usually the result of systematic interference--bringing into one language a persistent element of the other. The basic theoretical work on such interference was done by Weinreich in Languages in Contact (1959). Yet the considerations set forth above should make it clear that there is much to be done in uncovering the systematic interconnections within each system which may interfere in moving to another system. If we focus on the shift of individual rules or elements, we may be fighting against deeper interconnections we do not see. Furthermore, the pattern of interference may be quite complex and involve an asymmetry between production and perception.

Consider the term that many Puerto Ricans use for themselves in English: Porerikan [pɔrərikən]. Spanish has [pweɾtorikeno], with a flapped [ɾ] -the same sound that most English speakers use for the -tt-

in matter or -dd-in ladder. New Yorkers pronounce this word [pɔɾərikɔn], with no [r] before the /t/, and the /t/ itself realized as a flapped [ɾ]. Where does the first [r] in the Puerto Ricans [pɔrərikən] come from? It seems to be the result of a complex process. In their Spanish system, the sound [ɾ] represents /r/. New Yorkers use it for intervocalic /t/ or /d/. When the Spanish speakers hear this in New Yorkers' [pɔɾərɪkən], they use their Spanish perceptual system to identify it as an /r/. They then produce it as an /r/, but now using their newly learned English production system with a constricted central [r]. This is one plausible explanation. Yet we must also consider the fact that Puerto Ricans do not follow the same rules of consonant cluster simplification as native English speakers: they often consider -rd a cluster to be simplified in words like card, and pronounce it as car'--something English speakers never do. It is therefore also possible that there is some confusion as to which of the two consonants in Puerto- is to be dropped--the first or the second. Whatever the actual mechanism is, we can be sure that contrastive analysis must dig deeply into perceptual and productive processes to account for and predict interference.

Even more puzzling is the capacity of bilinguals to switch rapidly and fluently from one system to another in the middle of a conversation, or in the middle of a sentence. For example, from our current studies of the Puerto Rican speech community:

> Por eso cada, you know it's nothing to be proud of,
> Porque yo no estoy proud of it, as a matter of fact
> I hate it, pero viene Vierne y Sabado yo estoy, tu
> me ve haci a mi, sola with a, aqui solita, a veces que
> Frankie me deja, you know a stick or something, y yo
> equi solita, queces Judy no sabe y yo estoy haci, viendo
> television, but I rather, y cuando estoy con gente yo
> me . . . borracha porque me siento mas, happy, mas free,
> you know, pero si yo estoy com mucha gente yo no estoy,
> you know, high, more or less, I couldn't get along with
> anybody.

Observations of Spanish-English bilinguals in any area can easily document this process, but it is seemingly very difficult to predict when a person will switch. What factors trigger the switching in the passage just given? We can point to a few--the need to use an English word, television, for example. But what kind of underlying semantic system is being used? It seems unlikely that systems can be mixed together at

random, like tossed salad. Spanish and English are not very distant from each other, and current research on traditionally bilingual societies suggests that in the course of time two co-existent languages become even more similar. Their semantic systems and phonetic systems become identical (Gumperz, to appear). On the other hand, one could not expect two languages as dissimilar as Japanese and English to approximate each other in this way. For example, English verbs usually occur in second position, Japanese verbs at the end of the sentence. Yet we have observed speakers in Hawaii who mix Japanese and English half-and-half in every sentence. From an analysis of one such speaker done by Hamilton van Buren of the University of Hawaii, consider the sentence This one boy, boy no boy, no?:

Japanese:	Kono otoko wa,	musuko no musuko,		no?
Speaker:	This one boy,	boy	no boy,	no?
English:	This	boy	is my grandson,	no?

This seems on the surface to be a case of English words with Japanese syntax. But we must consider that Japanese does not usually use the analytical expression musuko no musuko, 'son of son'; more common is the single lexical item mago used for 'grandson'. This is not merely a case of word-for-word translation. There are other cases where English and Japanese syntax are even more inextricably intertwined. The capacity of speakers to perform such bilingual gymnastics is impressive, and even more so the ability of non-Japanese listeners to understand it.

Within the United States, we find that bilingual situations are normally unstable; the first native generation rarely retains active command of the parents' language. The stable examples of such co-existent systems are found where underprivileged groups are isolated with limited social mobility: Blacks and Puerto Ricans in the inner cities, Spanish-Americans in the Southwest, and the mixed non-white population of Hawaii. The stability of such co-existent systems symbolizes the sharp social stratification involved. In this respect, the United States differs radically from many other societies where cultural pluralism is accepted for fully participating members. The American educational system is now under considerable pressure from Blacks, Indians, and Spanish speakers to bend towards that cultural pluralism and find a place for the vernacular in the classroom. How this can be

done is a difficult problem, and research on the experience of other nations can be brought to bear by those involved in sociolinguistics in the broadest sense fo the term.

4. The social evaluation of language

From all that I have said so far, it should be evident that cognitive and structural factors play a role in the evolution of language and the difficulties that people have in holding on to their older language or acquiring new ones. But these factors are not sufficient to account for the major social problems of communication and for linguistic divergence. In particular, success or failure in communicating across social groups, between Black and white, is controlled primarily by the social values ascribed to language. Success in learning to read or speak a foreign language may be fostered by analyzing carefully the cognitive and structural processes involved. . .and yet research generally points to the fact that the massive reading failure we observe in the inner cities is primarily the result of cultural and political conflict. Language differences are important as the conscious or unconscious symbols of that conflict. It is increasingly evident that we can explore and understand such value systems.

The choice of different languages, and of different varieties within a language, carries a heavy load of social evaluation for members of that society. Psychologists Lambert and Tucker in Montreal have developed a "matched guise" technique for studying the underlying value systems attached to language (Lambert 1967). Some sociolinguistic research has carreid the technique farther by studies of the values attached to particular sounds or grammatical forms. The subjects of such experiments listen to a series of tape-recorded voices and make judgments on the intelligence, honesty, reliability, job suitability and other qualities of the speakers. Unknown to them, the same speakers recur in the series, speaking different dialects, languages, or using different forms of a linguistic variable. As long as the listener does not know that the speakers are the same, the differences in the ratings given to the same speaker reflect the subjects' unconscious attitudes towards the linguistic differences.

Such attitudes show extraordinary uniformity. Both English and French-Canadian subjects agree in rating speakers who used French as less intelligent, less honest, less reliable than the same persons using English. In Mississippi or New York City, speakers using working-class Black English are rated lower than the same speaker using network English, by speakers of all social classes.

This general agreement brings us back to the original question on the causes of linguistic diversification with an even more puzzling problem. In the light of these findings on subjective norms, why doesn't the social stratification and diversification of English disappear? From the speaker's viewpoint, the problem is that of one New Yorker who said, "Why do I say [ɒɪ] when I don't want to?" The teacher puts it differently: after twelve years of instruction in standard English, why do so many Black students still say and write He work over there?

The conventional explanation of this persistance is that it is due to the ignorance and laziness of the speakers, or to a breakdown in communications. Any survival of socially stigmatized forms is seen as a kind of pathology. But observations of verbal skills in rural cultures, or in the inner cities, indicate that there is no match at all between basic linguistic capacity and performance in schools. There seems to be some permanent source of support for the non-standard forms which leads many gifted speakers to prefer them. We are led to suspect the existence of covert values which do not normally appear in formal test situations. Some progress has been made in isolating such values. For instance, it has been shown (Labov et al. 1968) that there is a complementary relation in the listener's mind between job suitability ("What is the highest job the speaker could hold, speaking as he does?") and toughness ("If the speaker was in a street fight, what are the chances of his coming out on top?") Up on one scale is down on the other. This is true for teachers even more than students; the message that seems to be coming across to students can be paraphrased in this way: "Don't talk like those big boys in the back of the room who beat up on kids and take their lunch money away; you should talk instead like the kids who sit in the front of the room, get beat up, and have their lunch money taken away."

The stability of evaluative norms in the face of social revolutions is remarkable. In the Soviet Union or Czechoslovakia, for example, we

find that the movement of working-class speakers into government positions has not led to any change in the norms for public speaking and writing. On the contrary, the standards of literary language have been reinforced and strengthened in the editorial policies of the state. In recent years, a great deal of public attention has been given to apparent changes of norms in regard to the use of language in the United States and Canada. The use of taboo words in public protest is the most striking example: an attack on linguistic restrictions symbolizes the attack on the social system as a whole. The strength of the norms which are being challenged here is hard to overestimate. The reactions of the Kent State grand jury to the language of the students provides some evidence. It must be remembered that the violation of a norm does not destroy the norm: in fact, this behavior would lose its significance if the social sanction did not exist.

There is general agreement on the need for norms for public speech different from norms for private and casual speech. The writings and speeches of most leaders of Black militant groups are cast in standard English grammar, with a certain number of quotations from the vernacular inserted. The social construct "speaks ghetto English" is quite different from the objective linguistic pattern used by peer group members in the ghetto, and it is worthy of study in its own right. A small number of gestures towards the vernacular, added to a standard English grammar, can produce in listeners the belief that the speaker is using that vernacular.

The use of taboo words raises the whole issue of ritual behavior and the difficulties of interpreting differences in the use of language by different subcultures. If both parties are members of the same subculture, then the surface dispute can be a symbol of a real conflict of interest rather than a communicative disorder. When a Southerner insists on calling an older Negro man boy, he is using a common cultural symbol to define the status relations once again. Here Negro and White understand one another, even if they are in conflict. But speakers from different sub-cultures may find themselves at odds through ignorance.

Recent studies of speech events within the Black community have begun to isolate some cultural differences of considerable significance. The institution of ritual insults is one of the forms most highly

developed in the Black community. A ritual insult may be distinguished from a personal insult by its presuppositions: both parties share the knowledge that the statement made is not literally true. The proper response to a ritual insult is another ritual insult:

--Your mother sells crackerjacks.

--Your mother looks like a crackerjack!

On the other hand, the proper response to a personal insult is a denial, since a personal insult is not known to be false and may even be true.

--I went to Junior house and sat in a chair that caved in.

--You's a damn liar. 'N you was eatin' in my house, right?

If we were to apply the sequencing rule for a personal insult to a ritual insult, we would obtain the absurd and ungrammatical

--Your mother the Abominable Snowman.

*--Tha's a lie!

The development of formal rules of discourse is a necessary ingredient in the analysis of sub-cultural differences (Labov et al. 1968: 4.3). The Black institution of ritual insult will not be clearly understood by white society, neither in its playful or in its aggressive use. At present, some judges will sentence a Black man to six months for breach of the peace for calling a policeman a motherfucker; in their sentences, judges have asserted that any redblooded man would react violently to being accused of committing incest with his mother. It is hard to say if this represents a disorder of communication or not. Would any amount of discussion of the ritual nature of the insult change the behavior of the policemen or the decision of the judge in such cases? To what extent did the Kent State jury literally believe that the use of taboo words by the students was sufficient justification for shooting them? This is a difficult question that cannot be solved by examining or discussing particular cases; it involves the general problem of identifying the "key" or level of seriousness of any given utterance.

Some of the most important work in this area is being carried out by sociologists in their studies of conversational sequencing (Sacks 1969, Schegloff 1968). Most of their work concerns the invariant rules which govern the behavior of all members of our society. But where subcultures differ in such rules, the consequences for personal interaction can be strong. Though native speakers of a given dialect show an

extraordinary ability to interpret the grammatical rules of another dialect, they do not necessarily show the same ability in dealing with the broader aspects of communicative competence. The rules of discourse tend to differ not in the obligatory sequencing rules, but in the interpretation of the social significance of actions--differences in the forms of politeness, ways of mitigating or expressing anger, or of displaying sincerity and trust. This is an area where ethnographic and linguistic description has an important role to play.

Linguistic investigation of behavior in the classroom may also contribute a great deal to our understanding of educational failure. The inferences we have drawn about causal factors from our work outside the classroom are being checked by observations within the schools (Lewis 1970). Such direct observations give support to Rosenthal's conclusion that social judgments in the form of self-fulfilling prophecies dominate cognitive and rational procedures in the classroom. We do not know exactly how pre-formed judgments are put into effect to differentiate students' performance, but we are now beginning to find out.

5. The relation of language and thought

In all of the areas discussed so far, I have been emphasizing a common theme: that the most important applications of linguistic method in education do not lie in the area of grammatical research but rather in the formal study of verbal interaction and the value systems inherent in this behavior. This is a new field. Yet in many ways, the knowledge that linguists already have of English structure and the nature of language has the most important implications for public policy. Government intervention programs like Headstart have until recently relied heavily on the notion of cultural and verbal deprivation put forward by educational psychologists. Some such psychologists have interpreted the speech of Black children as fundamentally incoherent and useless for the expression of logical thought. Linguists here find themselves in extraordinary agreement. Without a single dissenting voice, they concur that this is a superficial and erroneous interpretation of the very data presented in support of it. For example, the absence of the copula in Black English expressions such as <u>They nine</u> is often cited as an indica-

tion of the absence of essential logical elements. But linguists know that many languages do not use a present tense copula, with no loss of logical power: Russian, Hebrew, Hungarian, etc. Secondly, linguists have rich data on the rules governing Black English such as that cited above which show that the absence of the copula in Black English is comparable to contraction in other dialects. It is interesting to note that the complex data on the copula converges with the general analysis of the stress rules of English developed by Chomsky and Halle, part of which is presented by Halle in this series. Given the stress rules of English, we can predict in which positions the copula can be contracted or deleted.

As a result of their knowledge of the rule-governed character of non-standard dialects, and Black English in particular, linguists argue for the view of cultural difference rather than cultural deprivation. They do not see Black children as speaking an impoverished dialect, but using a different rule system. In this respect, linguistic research offers a powerful counter-current to the ethnocentric model which is common enough in American education--the notion that our own habits of speaking and arguing are the only rational ones.

For many decades, linguists have been interested in the relations of language and thought--in particular the problem of translating concepts across languages. The Sapir-Whorf hypothesis in its strong form asserts that different grammatical systems stand as screens between the observer and the objective world, producing different conceptual systems for speakers of different languages. One can sum up the efforts of three decades by the verdict: not proven. On the other hand, many linguists have now developed a strong interest in the opposite aspect--linguistic universals, as outlined by Greenberg at the beginning of this series. Some go so far as to assert that all languages have the same "deep" or logical structure. This area of investigation has assumed great importance in the light of recent efforts of Piaget and other cognitive psychologists to analyze the development of logic in the child. It is obvious that cross-cultural studies of the conservation of various quantities require close linguistic scrutiny to be sure that the experimenter is asking the same question everywhere.

The relation of language to thought has become an even more immediate issue in the light of Jensen's argument (1969) that the population of the United States is divided into two levels of intelligence--those who have the inherited ability to form concepts and those who do not. This notion appears strange to most linguists, since it seems that all children who learn to speak a human language necessarily form concepts such as animate vs. inanimate, concrete vs. abstract, or proximate vs. obviate. The claim being made by Jensen is equivalent to saying that what people do unconsciously and efficiently at three they cannot do at four on a direct request from the teacher or tester. That is equivalent to asserting that the linguist's rich analysis of the semantic concepts and categories are irrelevant to any other measure of mental activity. It is true that there is a great deal we do not know about the relation of cognition to formal structures, but it is not likely that the use of language has no *relation to concept formation*.

In any case, linguists interested in the most abstract level of semantic analysis suddenly find that their work has an immediate and important place in the argument as to whether Black lower class children are fully qualified human beings.

In this discussion, I have argued that linguistics could be expanded in its scope, and anchored more firmly in the world of every-day speech. There does not seem to be any immediate value in defining the limits of linguistics. I would agree with Professor Halle that it offers us the best window into the operation of the mind, and as such it would qualify as a branch of psychology. Linguistics can also be defined as one of the most advanced studies of human behavior. I do not think we are premature in applying our formal procedures to the data of everyday behavior, although here I am sometimes in conflict with my sociological and anthropological colleagues. This is a matter of strategy. The only colleagues that I would seriously disagree with here are those who feel that linguistic knowledge is irrelevant to social questions. I have tried to show here that even those working in the most remote areas of semantic and logical analysis will suddenly find that their work has an important place in American society.

6. Prospects for research

The current outlook for research on language in its social context depends upon the development of a tradition which combines field work with abstract and formal analysis of linguistic data. It is an open question as to whether the field can generate enough students with abilities in both of these areas. It may be necessary to construct research projects in which field work is carried out by one set of investigators and analysis by others, although this is a dangerous tactic at our present state of development. The role of intuitions plays too strong a part in grammatical data and analysis to safely introduce personnel who never acquire a feeling for what can be said and what cannot be said. Another possibility, perhaps the most promising, is the interdisciplinary training of young anthropologists, sociologists, and psychologists. A reasonable estimate is two years of study to acquire the formal techniques of linguistics for writing invariant rules of behavior. The interdisciplinary training of linguists may in turn help them to expand their empirical techniques and formal modes of analysis through acquaintance with broader academic fields, as well as to deal with wider ranges of data. This may be an essential step if linguists want to be sure that their analyses of linguistic structures are not artifacts, but direct reflections of the language used in the societies around them.

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Center for Applied Linguistics

The Center for Applied Linguistics is an independent, nonprofit institution concerned with language and linguistics. Its principal aims are: (1) to apply the results of linguistic research to practical language problems in the areas of teaching English to speakers of other languages, teaching standard English to speakers of nonstandard varieties, and teaching foreign languages in the United States; (2) to encourage the inclusion of linguistic studies in the school curricula; (3) to collect and disseminate linguistic information through bibliographies, state-of-the-art papers and surveys, and to investigate linguistic documentation; (4) to promote interdisciplinary cooperation and understanding between linguistics and other disciplines interested in language; and (5) to further linguistic studies in general.

The Center seeks to achieve these objectives by serving as a clearinghouse for linguistic information; by acting as an informal and impartial coordinating body among government agencies, schools and universities, foundations, professional organizations, and the public; by conducting surveys and issuing publications; by maintaining a reference library; by preparing educational materials; and by conducting basic research. In its aims and objectives, the Center has served as a model for the establishment of similar institutions in Europe, Africa, and Latin America.

Linguistic Society of America

The Linguistic Society of America, founded in 1924, is a learned organization whose membership comprises a majority of professional linguists in the United States, and many abroad. It is devoted to the furtherance of research and publication in the scientific analysis of language and languages.

The Society pursues its objectives through its journal, Language, and associated publications. The Linguistic Institute, held each summer, is a unique effort by linguists to bring together on one university campus (in rotation) leading figures in the discipline. Two meetings, at which papers are presented, are held each year.

There are now over 4,400 members in addition to 2,000 subscribing libraries in the United States, Canada, Latin America, Europe, Asia, Africa, and Oceania.

The LSA is a constituent of the American Council of Learned Societies, and is affiliated with the Philological Society of England, the Linguistic Society of India, the Société de Linguistique de Paris, and the Indogermanische Gesellschaft in Switzerland.

The Smithsonian Institution

The Smithsonian Institution has supported linguistics by maintaining linguists on its scientific staff, by publishing technical works by them and by others, and by collecting and preserving linguistic manuscripts. This interest has been focussed on (but not limited to) North American Indian languages. Work by Smithsonian scholers in the late 19th century set the comparative linguistics of North America on a firm footing. Existing published and manuscript materials were collected (the massive bibliographies compiled in this connection by J.C. Pilling are still fundamental), standardized check lists and orthographic recommendations were prepared, and new data were recorded in the field by Smithsonian anthropologists and by correspondents. Comparative work based on these materials resulted in the list of "Indian linguistic families of America North of Mexico," published in 1892 under J.W. Powell's name, a study which still serves as a base line, as it was the first attempt to establish the relationships among all the languages of the continent by means of a comparative method which is still acceptable. The linguistic manuscripts collected both before and after this are preserved, indexed, and much used in the Smithsonian's National Anthropological Archives. In addition to this comparative work, the Smithsonian has published a great deal on various North American Indian languages--especially dictionaries and texts--written by members of its staff and by others. Most Smithsonian linguistic work was supported by the Bureau of American Ethnology, during its existence from 1879 to 1965. Over the last five years, responsibility for linguistic research and publication has been assumed by the Department of Anthropology of the National Museum of Natural History.

Linguists employed by the Smithsonian for extended periods include,

among the earlier, less-specialized scholars, J.W. Powell (employed from 1879 to 1902), H.W. Henshaw (1880-1892), J.C. Pilling (1879-1896), J.O. Dorsey (1879-1895), A.S. Gatschet (1879-1905), C. Thomas (1882-1910), and J.N.B. Hewitt (1885-1937). In more recent times, the Smithsonian staff linguists trained in the Boasian and subsequent traditions are: J.R. Swanton (1900-1944), T. Michelson (1910-1938), J.P. Harrington (1915-1954), W.L. Chafe (1959-1962), and P. Voorhis (1967-1970).

Linguistics in the 1970's

National Museum of History and Technology
Constitution Avenue between Twelfth and Fourteenth Streets, N.W.
Washington, D.C.
November 12, 1970

A briefing co-sponsored by the
Linguistic Society of America and the Center for Applied Linguistics
under the auspices of the
Smithsonian Institution and its Center for the Study of Man

9:00 a.m. Welcoming remarks

Charles Blitzer
Assistant Secretary for History and Art
The Smithsonian Institution

9:15 a.m. Linguistics as a Pilot Science

Joseph H. Greenberg
Professor of Anthropology
Stanford University

10:30 a.m. Applied Linguistics in a Broad Context

Norman A. McQuown
Professor of Anthropology and Linguistics
University of Chicago

12:00 noon Luncheon, Carrousel Hall

2:15 p.m. Frontiers of Linguistic Theory

Morris Halle
Professor of Modern Languages
Massachusetts Institute of Technology

3:30 p.m. The Place of Linguistic Research in American Society

William Labov
Professor of Linguistics
University of Pennsylvania