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ABSTRACT

This dissertation examines the principles of two current theories of first language acquisition and from them synthesizes a second language methodology. As a background to the problem of second language methodology, it is stated that the basing of second language methodologies on first language learning is currently being questioned and that the difficulty is compounded by varying theories of the nature of first language acquisition. The nativist position is examined, and a foreign language methodology developed on the basis of that position is then criticized in terms of the concerns of second language teachers. Following this, a compromise position between nativism and empiricism is examined and used as a basis for a second methodology. This second methodology is then criticized according to the above-mentioned criteria. The paper concludes that the nativist approach to first language acquisition is not a good basis for second language methodology, whereas some principles of the nativist-empiricist approach are. The major question remains whether such a methodology can be made effective. A further question is whether children learn a foreign language more quickly or more effectively than do adults. (Author/AM)

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AN ASSESSMENT OF THE ATTEMPT TO BUILD SECOND LANGUAGE METHODOLOGIES ON TWO CURRENT THEORIES OF FIRST LANGUAGE ACQUISITION

BY

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To

Miriam G. Mcuradian

Physician, surgeon and benefactress

CONTENTS

CHAPTER I

INTRODUCTION

Background of the Problem

Throughout the centuries, second-language teachers have attempted to justify their practices by relying on one or another theory from psychology or linguistics (philology)--a fact documented by Kelley's recent volume.[1] The present century is no exception. One of the current controversies is whether a second-language methodology can be based on the principles which operate in a child's acquisition of his first language. What makes the controversy difficult to deal with is the fact that there are different interpretations of the nature of the principles of first language acquisition, if not different views concerning the process itself.

Thus, it will be the aim of this paper to set forth the principles of two current theories of first language acquisition, and to build a second language methodology based on each of them.

Review of the Literature

Empiricism vs. rationalism

Diller in a recent book on foreign language methodology,[2] sees the problem as being a controversy between the empiricist and rationalist positions:

To be effective in teaching language, we must first understand what happens when a person really learns a language. How do children learn languages? Why are some situations more conducive to language learning than others are? What is a language in the first place? These are questions of linguistic theory; the language teacher who understands what he is doing is by definition a linguistic theorist. [Here and throughout the paper, emphasis within a quotation is found in the source.]

Some language teachers try to avoid thinking through these basic questions for themselves, by accepting the authority of professional linguists. This is a dangerous attitude in any field, but it is especially dangerous in linguistic theory because there has never been general agreement on the questions of language acquisition. This has been a controversial matter throughout more than four centuries of the modern era, with analogues in the medieval and ancient worlds.

Most of the controversies have been centered on differences between empiricist and rationalist theories of language acquisition.* At present, an empiricist position is held by structural and descriptive linguists of the Bloomfield school. A rationalist position is held by generative grammarians, who, following Noam Chomsky, have brought about a radical transformation in linguistics since 1957.

Methods of language teaching are ways of carrying out the theoretical approaches, and the history of language teaching methodology is immensely simplified if we look for two separate developments of language teaching during the modern era: methods based on the empiricist approach and those based on the rationalist approach.

Briefly, the two approaches can be summed up as follows:

The basic empiricist position is that language acquisition is a kind of habit formation through conditioning and drill. Descriptive linguists affirm that the normal use of language is either mimicry or analogy; grammatical rules are merely descriptions of habits, and in normal fast speech, they say, a person has no time to apply rules as recipes for sentence formation. In its behaviorist extreme, as held by many descriptive linguists, the empiricist position holds that human beings use basically the same learning processes as other animals do--a stimulus-response model of conditioning. Leonard Bloomfield, the behaviorist father of twentieth-century American linguistics, maintains that vocal human language is not essentially different from gesture or animal language. (Bloomfield, p. 14) Some people in the empiricist tradition have maintained that the mind is a 'blank tablet' upon which the outside world imposes various sorts of knowledge; the behaviorists refuse to go so far as to talk of 'knowledge' or of 'mind' --for them the human being is essentially a machine with a collection of habits which have been molded by the outside world.

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*Diller is using the terms "empiricist" and "rationalist" in the sense defined by Noam Chomsky in Aspects of the Theory of Syntax, pp. 47-48. See also Chomsky's Cartesian Linguistics.

This approach has led to methods of mimicry, memorization, and pattern drill, advocated not only in the current audio-lingual method,* but also in the 'Army method' of World War II. In 1916, Harold E. Palmer published a book of pattern drills for English as a foreign language, and he recommended mimicry and memorization as well. (Palmer, 1916) Even before this, in the late nineteenth century, various European linguists had advocated similar procedures in their 'Reform method,' or 'imitative method.' (Haugen, 1955)

On the other side, the rationalist position holds that man is born with the ability to think. He equipped with a highly organized brain that permits certain kinds of mental activity that are impossible for other animals--for instance, man is the only animal that can learn human language (and virtually all human beings learn at least one language). The rationalist notes that on an abstract level, all languages work in the same way--they all have words and sentences and sound systems and grammatical relations--and he attributes these universals of language to the structure of the brain. Just as birds inherit the ability to fly, and fish to swim, men inherit the ability to think and to use language in a manner which is unique to their species. A given language, English, for example, has to be learned but the capacity to learn languages is inherited. The child is not a passive agent in language acquisition; he actively goes about learning the language of his environment. And what a person learns is more than a set of habits. If you read all the books in the English language, you will find very few sentences which are habitually used and are exact duplicates of each other--otherwise you would suspect quotation or plagiarism. Knowledge of a language allows a person to understand infinitely many new sentences, and to create grammatical sentences which no one else has ever pronounced but which will be understood at once by others who know the language.[3]

Closer examination of the first position will be made because of strong recent criticism. It is a theory of stimulus-response learning, particularly as developed in the operant conditioning model of Skinner, who considers all learning to be establishment of habits as the result of reinforcement or reward. According to his theory, the infant

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*Because the term "audiolingual" appears frequently in this paper, we will use as a working definition the one given by Valdman: (1) the emphasis on audiolingual skills, i.e., comprehension and speaking ability; (2) the assimilation of conversational-style target language texts through mimicry and memorization; (3) the presentation of authentic target language samples by the use of live native speakers in class or recordings in the language laboratory; (4) the learning of pronunciation and grammar through pattern drills; and (5) the claimed application of structural (or scientific) linguistics to language teaching problems.

acquires native-language habits in the following fashion. At some stage in his random babbling, the infant makes a sound which resembles the appropriate word for some person or object near him. For this he is rewarded by the approving noises or smiles of those about him and so the probability of his emitting the same grouping of sounds in a similar situation is increased. With repeated reinforcement a habit is established and he continues to name the person or object in this way. As he continues to imitate sounds around him, more combinations are reinforced. When he names something imperiously, it is brought to him and so he learns to use words as mands, and later to combine words to convey more complex meaning. As he acquires more syntactic and morphological variations, he creates new combinations by generalization or analogy, sometimes making mistakes by producing analogies which are not permissible in the language. Thus by a trial-and-error process, in which acceptable utterances are inhibited by lack of reward, he gradually learns to make finer and finer discriminations, until his utterances approximate more and more closely the speech of the community in which he is growing up.[4]

Even before Chomsky's lengthy review of Skinner's Verbal Behavior, there were many psychologists who were questioning a strict behaviorist approach to verbal behavior. In 1940, Fritz and Grace Heidu compared the sentence structure of deaf and hearing children, concluding that both types of children organized the world of their experience in much the same way, thus implying a sort of internal structure not dependant on conditioning.[5] Similarly, Miller and Dollard concluded that imitation helps the child only in providing new combinations of responses which have already been learned by other means.[6]

Lashley (1951) seems to have begun the trend towards crediting the child with some sort of internal language handling process, his version being a selective or scanning process related to the integrative functions of the cerebral cortex, which permits the child to generate novel utterances. Lashley thus concluded that language is more than external stimulus-response and intraverbal association.[7]

Another psychologist, Jenkins, (1954) summarized four of the then-current theories of learning, Guthrie's, Thoman's, Skinner's, and Hull's, indicating that none of them was comprehensive enough to explain all facets of language acquisition.[8] Osgood also indicated that all then-current theories of language acquisition were inadequate for the task.[9]

In 1959, Noam Chomsky became a focus of attention for many linguists and psychologists with his review of Skinner's Verbal Behavior. He stated:

> [Skinner] confidently and repeatedly voiced his claim to have demonstrated that the contribution of the speaker (in the language act) is quite trivial and elementary, and that precise prediction of verbal behavior involved only specification of the few external factors that he has isolated experimentally with lower organisms.
>
> Careful study of this book (and of the research on which it draws) reveals, however, that these astonishing claims are far from justified. It indicates, furthermore, that the insights that have been achieved in the laboratories of the reinforcement theorist, though quite genuine, can be applied to complex human behavior only in the most gross and superficial way, and that speculative attempts to discuss linguistic behavior in these terms alone omit from consideration factors of fundamental importance that are, no doubt, amenable to scientific study, although their specific character cannot at present be formulated. Since Skinner's work is the most extensive attempt to accommodate human behavior involving higher mental faculties within a strict behaviorist schema of the type that has attracted many linguists and philosophers, as well as psychologists, a detailed documentation is of independent interest. The magnitude of the failure of this attempt to account for verbal behavior serves as a kind of measure of the importance of the factors omitted from consideration and an indication of how little is really known about this remarkably complex phenomenon (pp. 27-28).[10]

Chomsky then shows the inadequacy of Skinner's terms in dealing with the real facts of verbal behavior, for example

> It is simply not true that children can learn language only through 'meticulous care' on the part of adults who shape their verbal repertoire through careful differential reinforcement . . . . It is also perfectly obvious that, at a later stage, a child will be able to construct and understand utterances which are quite new . . . . Talk of 'stimulus generalization' in such a case simply perpetuates the mystery under a new title. (p. 39)

At the same time, other scholars were questioning Skinner's formulations. Tikhomirov also reviewed Verbal Behavior, concluding that Skinner misread or misused Pavlov, who maintained that classical conditioning does not explain man's verbal behavior.[11] Another Russian, Luria, agreed that the active, directive role of speech shows it as being a different type of conditioning from that in animals.[12]

Lambert and Jakobovits found that constant repetition tends to weaken or actually cause a total lapse of meaning of the repeated word on the part of the subject.[13] George Miller and his colleagues maintained that speaking required "a motor plan [in the sense in which "plan" is used in connection with computers] to be constructed very quickly and efficiently, not by rote, but by the operation of a higher-level plan that has this motor plan as its object."[14] Murdock and Babich also found that repetition has no discernible effect on recall.[15]

Lenneberg worked with an eight-year old boy who had a congenital disability for the acquisition of motor speech skills" which, however, did not impair his ability to learn to understand language. The boy's crying and laughter sounded normal. He did not produce spontaneous words, but learned to imitate (repeat) a few words in a barely intelligible manner. However, he could obviously understand and follow tape-recorded instructions which were transmitted to him through

earphones while not being able to see the examiner. Some of the questions and instructions were quite complex. An organic defect prevented this patient, like many others, from acquiring the motor skills necessary for speaking the language, but evidence was presented for the acquisition of grammatical skills as required for a complete understanding of the language. Lenneberg concluded that babbling and imitation are not essential in language acquisition and that speaking a language is not crucial for the development of understanding, findings which run very much counter to the behaviorist position.[16]

Taba, from the field of educational curriculum development, questioned the value of practice without understanding underlying principles, a technique recommended by some of the audiolingual methodologists.[17]

In comparing a number of psychological approaches to the study of language, Lambert said of Skinner's position:

> Any theorizing about internal mental or neurological processes is scorned by him and his large host of followers. Meaning is considered as a mentalistic concept and he tries to explain language without reference to it. He is hampered in this attempt because his theory is limited . . . . It is difficult for those now aware of Skinner's desire to help psychology become a 'science' to understand his hard-headed position. However, in view of recent developments in cognitive and neurophysiological psychology, an imaginative person like Skinner must feel that being forced to be consistently the descriptive behaviorist is really being left with a very sticky wicket.[18]

Daniel Ausubel criticized the behaviorist method in these terms:

> The audio-lingual approach tends to assume that second-language learning, both in children and adults, is largely a process of rote verbal learning. Both in pattern practice drills and memorized dialogue practice, there is either no awareness of phrase meaning whatsoever, or, at very best, awareness of total phrase meaning. Thus the learner understands neither the syntactic functions of the component words nor the lexical and syntactic contributions of the individual words to the total meaning of the phrase. A purely

> arbitrary (rote) rather than lawful or meaningful relationship prevails between phrase meaning and component elements of the phrase.
>
> Under these circumstances it is hardly surprising that particular grammatical patterns can be imitated perfectly in a familiar and structurally limited context, or that simple substitutions, transformations and elaborations can be made, but that new words in a wider, unfamiliar context cannot be fitted into the learned patterns, or that the same words and syntactic categories cannot be recombined in different patterns to express different ideas.[19]

Briggs and Hamilton presented evidence that, for meaningful learning, the roles of overt responding, practice and reinforcement can be overemphasized to the neglect of subsumption and other cognitive processes.[20]

In The Psychologist and the Language Teacher, Wilga Rivers analyzed two main streams of psychology--behaviorism and neo-behaviorism--and the implications they have for foreign language instruction. Of the Skinnerian position she stated:

> . . . verbal behavior becomes quite unpredictable, and the relationship between stimulus and response cannot be shown to be lawful. Skinner is therefore forced into a use of the terms stimulus and response which is inconsistent with his own definitions of them in his experimental work.[21]

It must be pointed out, however, that although Rivers criticized Skinner in these terms, she nonetheless found other support for some of the practices of the audiolingual method.[22]

Diebold surveyed psycholinguistic research from 1954 to 1964 and concluded that the child acquires the sorts of linguistic competence which enables him to cope with (understand and produce) an infinitude of utterances, without the reinforcement Skinner finds necessary.[23]

It is during this period of time that David McNeill began to theorize about language acquisition. Chapter II of this study will explore his work in detail. Let us note here, however, that one of his early works began cautiously, stating that mature speakers are

continually creating new utterances, not merely repeating identical responses to previously met stimuli. McNeill felt that the use of language resembles more closely the writing of a play than performing in one, and that we can't really use the S-R process for explaining the acquisition of a child's grammar since it is much broader than imitation and reinforcement would produce.[24]

From the criticism of theory, we move to a criticism of specific practices. Saporta said of Lado's Language Teaching: A Scientific Approach, "The notion behind the 'linguistic method' does not follow directly from any theory of linguistics and probably not from any but the most superficial learning theory."[25] Even Nelson Brooks admitted some shortcomings in the method which he helped to pioneer, "The audio-lingual approach is largely an act of faith; research to prove the validity of its basic principles is scanty."[26]

While ostensibly criticizing programmed instruction, Spolsky had a fair amount to say about the audiolingual method. He noted that knowing a language involves more than the performance of language-like behavior, and suggested instead an underlying competence that makes such performance possible. He felt that by ignoring the latter, it had been easy to make exaggerated claims for the effectiveness of operant conditioning in second-language teaching.[27]

Valdman's characterization of the "New Key" methodology was noted above (p. 3 footnote). After discussing each of those points, he concluded: "If I have dealt at such length with the basic tenets of the Linguistic Method, it is only to underscore the fact that curiously enough they do not derive from any profound or adequate view of language but rather from a very primitive behavioristic concept of learning."[28]

Chastain analyzed the "audiolingual habit theory and the cognitive code learning theory" (his choice of words making his position evident), using copious references. His conclusion was that the cognitive code theory had more theoretical support.[29]

The final citation in this series puts the problem very succinctly. Pulgram noted that behaviorists (but not all structuralists) made automaticity the goal of second language teaching (with which he finds nothing wrong), but also made it the method (with which he finds much wrong). He blames much of this on the lag in scholarship between the theories of psychologists and linguists on the one hand, and methodologists like Brooks on the other.[30]

Thus, it should be clear that many psychologists, linguists and second-language teachers have rejected behaviorism, structuralism and the audio-lingual methodology. We would, therefore, expect that the newer theories of language and language acquisition would have produced a second-language methodology. We shall now explore that thesis.

New language teaching methods

As we move into this area, it is necessary to stipulate a definition of goals in a second-language methodology. Ritchie's statement seems to give a sufficiently wide, yet detailed explanation:

> The general goals of any course in a FL are:
> (1) the acquisition or formation by the learner of knowledge about the utterances of the FL that allows him to interpret those utterances phonologically, syntactically, and semantically,
> (2) the use of this knowledge in linguistic performance or behavior in communicating with native speakers of the language.
>
> A course which accomplishes (1) but fails to accomplish (2) will leave to the student the (often difficult) task of relating abstract knowledge to concrete application. On the other hand, if a course attempts to accomplish (2) without allowance for the accomplishment of (1) the students will be left to organize the data, make generalizations, etc., themselves. Under these circumstances they are quite

> likely to learn inefficiently and to miss altogether the deep and far-reaching generalizations which native speakers intuit and which make projection (i.e., the understanding of wholly novel utterances) possible.[31]

Working from this definition, Ritchie pointed out that the actual classroom activities which are designed to accomplish (1) and (2) seem to be incompatible and, therefore, should take place during different class periods. He then suggested the following order of activities:

a. the acquisition of knowledge (learning per se)

b. practice in bringing knowledge to bear in performance (performance per se)

c. use of knowledge in actual communication (performance as communication) (p. 114.)

Ritchie projected the following class schedule and techniques:

A. Oral grammar practice
B. Oral pronunciation practice
C. Aural comprehension laboratory
D. Conversation
E. Written or written-oral homework.

The first three periods are not related in any fixed way so that they may be interchanged. The place of conversation, however, is fixed for reasons that should be apparent below. The place of homework is fixed by its nature. Both oral practice hours and conversation are carried on in the classroom with live teachers. Aural comprehension laboratory is a mechanical language lab.

The new material for a given lesson is presented to the student for the first time by simple repetition during the second half of the conversation class. The material will always be assigned to a lesson in such a way that it is possible to generate a set of reasonable conversations.

The material will be presented first sentence-by-sentence and then in the form of a dialog or two. No structural information is to be explicitly given at this point. It is to be acquired by the student through the written-spoken program that constitutes the homework. The reasons for this are two fold. First and most important, the student will have an opportunity during this initial contact with the new material to extend his previous knowledge to the utterances he is being called upon to repeat without benefit of explicit explanations; it is exceedingly important that the student get into the habit of projecting what he already knows onto new material and that he do this on his own since this is precisely what he must eventually be able to do in conversing with native speakers.

> Second, time in the class that is used for explanation is wasted if the written-spoken program is a successful one. Another function of this presentation is, hopefully, to provide a situational matrix for the syntax exercises to be done in the homework. Without a previously given situation these exercises are likely to become meaningless to the student (pp. 116-117).

Homework in Ritchie's system consists of the storage of information about utterances. The primary activity consists of "reading" in the sense of converting visually-represented abstract concepts into concrete speech utterances. He suggests, for example, that the student be given the following phonemic-syntactic representations:

hi + BE + hir (he + BE + here)

ðe + BE + hir (they + BE + here)

He is then asked to produce either in written or spoken form, or both, the utterances that these represent (He is here; they are here). Using the homework time as the concept-forming period allows the student to work at his own pace (p. 118).

Insofar as the entire grammar of a language is concerned, Ritchie stated:

> . . . granted that both Spanish and English have relative clauses and that one can compare native-speaker intuitions about relative clauses in Spanish with those in English--that is, compare the set of rules that generates Spanish relative clauses with that which generates English clauses--on what basis do we justify the statement that they are 'the same' or that they are 'different'? Each set of rules is a subset of a larger, intricately interrelated set of rules, and part of the identity of any rule or any set of rules consists of its relations with the other rules in whichever grammar it appears. It seems that the only way for a learner to gain a fruitful, simple, revealing intuition of the structure of a given foreign language is to rely on his innate knowledge of general linguistic structure (p. 129).

The remainder of the articles in this section draw on the Chomskian notions of competence and performance, summarized here by Muskat-Tabokowska:

First should come Chomsky's definition of performance: 'the actual use of language in concrete situations' (Chomsky, 1966, p. 4), that is, what the speaker actually produces on a particular occasion, without our considering the questions of how and why he does so.

The distinction in usage of competence seems more complex, due both to the abstractness of the notion of competence and to the fact that both Chomsky and some of his followers (Fodor and Garrett, 1966) attached to it a number of different meanings. Obviously, competence should not be used synonymously with grammar, which according to Chomsky's definition, is a model of competence. It should also be made clear that competence should not be taken to mean the same as what Chomsky calls a language-acquisition device (L.A.D.), that is, general competence ability. Comparison of Chomsky's definition of competence ('the speaker-hearer's knowledge of his language') and grammar ('a description of the ideal speaker-hearer's intuitive competence') allows us to make afurther important distinction. One should differentiate between the highly abstract notion of competence as it is assumed for the purposes of theoretical consideration, that is, the tacit knowledge of an underlying system of rules internalized by an idealized native speaker who knows his language perfectly and from whom performance is the exact reflection of competence and the less absolute notion of real competence as it is really possessed by speakers of a given language, whose internalized knowledge of their language may be far from absolute perfection and whose actual utterances include mistakes, false starts, redundant repetitions, and so on.[32]

Indicating that she was drawing on this distinction and other Chomskian concepts, Muskat-Tabakowska pointed out that the amount of primary linguistic data to which a child learning his native language is exposed is much greater than the amount of data that can practically be provided in the case of foreign-language learners. This, she felt, explains the considerable differences most often observed in the duration of the language acquisition process between native and foreign language learners. She also felt that the presentation of primary linguistic data in the case of a child learning his native language may "include also examples designated as non-sentences" (from Chomsky, 1965, p. 25), while in the case of foreign-language learners it should be carefully planned and controlled. She agreed with Dakin[33] that we do not know how pupils arrive at explanations or new hypotheses. We

can only set up conditions in which it would be both simple and necessary for them to do so. Thus, it is the function of the language teacher to present linguistic data. She suggested compensating for scarcity of exposure by systematizing the data:

1. Choosing primary linguistic data according to the accepted model of desired competence.
2. Grading the data according to the extent of complexity.
3. Ordering the data according to the interrelations which hold between them
4. Arranging the data from the point of view of 'significant generalizations . . . (which) . . . express underlying regularities in the language' (Chomsky, 1962).
5. Presenting them correctly (p. 53).

Muskat-Tabokowska hedged, however, when she indicated that the amount of grammar presented by rules should be determined by "the level of general mental development of pupils, relations between the aims and the duration of the course, and so on". She further suggested a cybernetic model of instruction, again based on the assumption that there would eventually be an accurate method of determining competence (p. 54).

Jakobovitz' suggestions for a foreign language methodology are quite scanty. He analyzed the old behaviorism and its related methodology as proceeding from surface to base, whereas he saw the newer ideas suggesting the opposite directions. Thus, he rejected imitation, practice, reinforcement, etc., in favor of "transformation exercises at the phonological, syntactic and semantic levels" (p. 24) Unfortunately, he was very vague about the exact nature of these exercises, and made no attempt to place them within a total methodology.[34]

Vivian Cook examined the relationship between first language acquisition as seen by the Chomskyites and second-language teaching. She concluded that

> . . . there seems to be little similarity, then, between the process of first language acquisition as it is understood today and the process of second language learning as implicit in present-day teaching. A method for teaching foreign language that could justifiably claim to be based on first language acquisition would have to meet at least the following requirements:
> 1. That it would allow the learner to progress by forming a series of increasingly complete hypotheses about the language.
> 2. That, consequently, it would permit, and indeed encourage, the learner to produce sentences that are ungrammatical in terms of full native competence, in order to test these hypotheses.
> 3. That it would emphasize the perception of patterns rather than the intensity of practice.
> 4. That its teaching techniques would include partial repetition of sentences, verbal play, and situationally appropriate expansions of the learner's sentences.[35]

The most recent suggestions for a foreign language methodology found in the literature are those of Georgia Fuller. In thirty-two pages of manuscript she attempted to trace the findings of psycholinguistics and also to prescribe a method. She succeeded in doing neither. An appendix to her work contains a few examples of rhythm drills based on a Spanish text in current use. Beyond this, her most cogent contribution was to indicate that "most teaching material used now could be reinterpreted or reshaped to have situational relevance. Perhaps the ideal would be one that gradually guides the student to talk about himself and express his own thoughts."[36]

Thus it seems clear that no coherent foreign language methodology based on Chomskian or post-Chomskian psycholinguistics now exists. What we have found, rather, are bits and pieces--a few techniques which attempt to draw from isolated aspects of psycholinguistic theory.

Design of the Study

The remainder of this paper will be devoted to the following:

A. Examining the works in psycholinguistics representing the nativist position;

B. Developing a foreign language methodology based on that position;

C. Criticizing that methodology in terms of the concerns of second language teachers, as represented by the Minnesota Guide to Foreign Language Programs (Appendix A) and the "Rivers criteria" (Appendix B). (These two formulations were chosen as being current instruments by which to evaluate foreign language programs. Few such instruments exist. These two are sufficiently different in nature to provide a rather wide basis for judgment.);

D. Examining the newer position in psycholinguistics, the compromise between nativism and empiricism;

E. Developing a foreign-language methodology based on that position;

F. Criticizing that methodology as in C above.

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CHAPTER II

THE NATIVIST APPROACH

A Caveat

As is often the case with opposing schools of thought, the leading exponents of each school tend to use the same data to support opposing points of view. The research in psycholinguistics is no exception. Many studies cited in this section on innateness will also appear supporting an empiricist position. While one could go into great detail questioning the interpretations of the various theorists, the approach here will be to present the two major theories without critical analysis initially, but to criticize the foreign language methodologies they produce. The weaknesses in the nativist position will become apparent in the methodology section.

Research Supporting the Nativist Position

According to at least one recent survey of the field, the work of David McNeill represents the purest (most extreme) of the nativist positions.[1] McNeill's view is seen as being based on the arguments of Chomsky[2] and Katz,[3] namely that "the specific content of a child's capacity for language is manifested in the form of linguistic universals"[4] and that "languages possess the universal properties contained in the theory of grammar because all languages are acquired. The renewed formulation of grammar by children automatically imposes features corresponding to the fundamental capacity for language."[5]

McNeill's own recent review starts out in a less polemic manner:

> All normal children, not impaired by deafness, brain damage, or other physical or psychic disorders, begin to babble at about 6 months, utter a first word at 10 to 12 months, combine words at 18 to 24 months and acquire syntax almost completely at 48 to 60 months. All children pass such a sequence of 'milestones', always at about the same ages (Lenneberg, 1967). They do so regardless of the language they acquire, or of the circumstances under which they acquire it. Such massive regularities of development remind one more of the maturation of a physical process, say, walking, than of a process of education, say, reading. One might even say that children cannot help learning a language, whereas they can easily avoid learning to read.
>
> The acquisition of language thus shows some of the characteristics of physical maturation. Yet, at the same time, it is obvious that language is learned . . . . Both learning and maturation are necessary conditions for the development of language, but neither is sufficient. To understand such a problem, clearly we must consider both the innate and the acquired aspects of linguistic competence, as well as the way in which they combine.[6]

Despite this broad-minded and conciliatory beginning, McNeill's development of the problem deals almost exclusively with the nativistic approach, as the following pages will indicate.

Syntax

This is the area in which the greatest number of studies have been done and, for most of us, the most easily understood phenomenon. Most of the studies have followed a general pattern. Typically, a small group of children is visited, at home, once or twice a month, where everything the child says and everything said to him is tape recorded. Once the data is thus compiled, there is often an attempt to write a transformational-generative grammar which describes the child's complete corpus. The hope is to capture his total linguistic system at the time the corpus was collected without distortion from adult grammar. It is often done by performing a distributional analysis of the child's speech. The procedure often followed is that described by Brown and Fraser. Essentially, an investigator searches for words that appear in

the same contexts, the assumption being that such words are members of the same grammatical class in the child's grammatical system. Words with different privileges of occurrence are assumed to belong to different grammatical classes.[7] Using McNeill's example, suppose that a corpus collected from a 2-year old, one "Adam" in this case, contains the following utterances:

my cap
that cap
a shoe
that horsie
other dog
a daddy
big shoe
red sweater[8]

Because the words on the left all seem to occur in the same relationship with the words on the right, that is, have identical privilege of occurrence, one can conclude that two different grammatical classes are present, and the child's grammar at this point considers a "sentence" to be any word from the first class followed by any word from the second class. Thus, nonoccurring combinations, for example that sweater or big daddy are allowed by the child's grammar but are not observed because of sampling limitation. More complex grammatical categories obviously demand more complex rules.

It is important to note, however, that none of this procedure necessarily comprises a statement of a child's linguistic competence, his knowledge of language. It is a summary of his performance, whereas a statement of competence is a theory about what a child knows. A distributional analysis, such as the one above, at best, provides a description of a child's grammatical classes, plus some hints as to his grammatical rules. Studies which have been set up along these lines are Braine's (1963), Brown and Frazer (1964), and Miller and Ervin (1964).

A second strategy has been used with some success. Rather than attempt to describe the total corpus collected from a child at some point in time, one examines the emergence of a particular grammatical system as it is manifested at different times. Thus Bellugi[9] studied the development of negation and Klima and Bellugi[10] studied the development of questions. The advantage of this strategy lies in the emphasis it places on observation arising from the very fact that it does what a distributional analysis typically strives to avoid--it exploits the fact that adult grammar is the endpoint of linguistic development. A distributional analysis attempts to discover parts of a grammar from a corpus. The second strategy begins with a part of adult grammar and judges if there is sufficient evidence in the corpus to justify ascribing it to a child. The demands on the second strategy are weaker than the demands on the first, for the second must only recognize the applicability of a known theory; it does not have to discover an unknown theory. The following quotation from Brown, Cazden and Bellugi summarizes many of the dangers and opportunities of following either strategy when interpreting a corpus of utterances collected from a child:

> We operate on the general assumption that the child's terminal state of knowledge is of the sort represented by current transformational grammars. However, we do not simply attribute to each sentence that the child produces the analysis that would be appropriate to that sentence if it were produced by an adult: if we were to do that the inquiry would be largely vacuous. Insofar as the child's particular sentence--and all related sentences--depart from adult forms the grammar is tailored to the departures. The most informative departures are analogical errors of commission such as goed . . . . Harder to interpret, but still important, are errors of omission such as the absence of the auxiliary did . . . . Omissions in a sentence are at least easy to detect but omissions in the distributional range of a form are harder to detect and harder to interpret since it is necessary to weigh the probability that an omission is simply a consequence of the size of the sample that has been taken. Finally all the errors that occur must be

> considered in comparison with conceivable errors that do not occur. Even this full procedure will not render the construction completely determinate in all respects. The indeterminacies are tentatively resolved by assigning the usual adult representation insofar as that representation does not depend on forms that have never appeared in the child's speech.[11]

Thus, with this background, we will begin with studies of the smallest "sentence" type, that speech referred to as holophrastic, the possibility that the first single-word utterances of young children express complex ideas--that ball means not simply a spherical object of appropriate size, but that a child wants such an object or that a child believes he has created such an object, or that someone is expected to look at such an object.

Several investigators of children's language (deLaguna, Stern and Stern, Leopold, McCarthy[12]) have said that the single words of holophrastic speech are equivalent to the full sentences of adult grammar. It is true, of course, that adults typically require a full sentence to express the content of children's holophrastic speech. But this is not what McNeill means by the term holophrastic. Rather, he uses it to mean that children are limited phonologically to uttering single words at the beginning of language acquisition, even though they are capable of conceiving of something like full sentences.

McNeill uses this supposition, along with evidence from Leopold, Neumann, and Stern and Stern[13] to make a case for the fact that holophrastic speech is expressive of children's emotional states, as well as being fused with action (imperatives) and thus he sees the simplest or earliest utterances as examples of predication, one of the concepts he sees as being primary in the development of communication.

We move next to the two-word utterances, the components of which on the basis of a distributional analysis, Braine coded into "pivot" and "open" classes.[14] The pivot class contains a small number of words, each of them frequently used, the words in the first column of the utterance list on p. 21 for example. Words from the pivot class always appear in combination with words from the open class, and the pivot class is slow to take in new members. The position of pivot-words in two-word sentences is fixed, first for some pivot classes and second for others. The open class contains the words not in the pivot class. There is typically a large number of open-words which are therefore used infrequently in two-word sentences. The open class is quick to take in new members and may stand alone in a child's speech. Given a two-word sentence, the position of open-words is fixed with respect to the position of pivot-words. Open-words also appear in combination with each other, although not necessarily in fixed relative position. The possibilities are thus P+O, O+P, O+O, and O.

McNeill compares the pivot and open classes from three studies, Brown and Bellugi's, Braine's and Miller and Ervin's.[15] In doing so, he poses the question of the significance of the pivot and open distinction, and bases its importance on the fact that it would be highly implausible for children to have learned by rote the 2500+ combinations possible in such a set of patterns. It is also impossible that children have imitated some of the patterns they came up with, such as allgone shoe. What is suggested is that children "juggle" sentences spoken by their parents and create the pivot-open distinction in their initial attempts to formulate their grammars. The most compelling reason, however, is that pivot words never occur alone or in combination with each

other. McNeill feels it impossible to think of such a development as not reflecting a restriction on the use of words--that is, as not reflecting a grammatical system of some kind.[16]

Braine, the initiator of the pivot-open distinction, maintained, however, that the distinction was learned through a process which he called "contextual generalization," very similar to a stimulus or response generalization, except that it takes place across temporal positions. Pivot words are so called because to Braine they are the only words for which a child knows the proper temporal locations in a sentence--that they occur first, last, etc. Because at first a child knows the location of few words, pivot words are used with high frequency. Membership in the pivot class increases more slowly than that of the open class presumably because it is more difficult to learn the positions of words than it is to learn new vocabulary regardless of position.[17]

McNeill and Bever, Fodor and Weksel have criticized this view of Braine's, pointing out that the restrictions on the use of pivot words (that they rarely appear alone or with other pivots) is not accounted for by Braine's theory. A second difficulty is that, as sentences increase from two to three words in length, the surface structure can be accounted for by Braine's theory, but not the underlying structure.[18]

There is yet another finding which supports the early categorization into the pivot and open categories: the further refinement of the pivot class. Adam, one of Brown and Bellugi's subjects, developed the grammatical classes of adult English through what the authors called "differentiation." The pivot class members in the list on p. 21 were further categorized over a five-month period, in three

states, each time by differentiating the pivot class then existing into one or more adult classes plus a new residual pivot class. At the first stage, there was the undifferentiated pivot class. At the second stage, there was distinction between articles, demonstratives, and the residual pivot class. The third stage was the differentiation of the residual pivot class into adjectives, possessive and a smaller residual class, in this case containing other, one, more, all, etc.[19] McNeill sees the crucial aspect of the process being the fact that entire adult classes are removed from an ancestral pivot class in one step--separate words do not straggle out at different times. Zheny, the son of the Russian linguist Gvozdev, developed a pivot class equivalent to Adam's and formed adult grammatical categories through a comparable process of differentiation.[20]

Thus the open-pivot distinction fits into a plan of generic distinction which the child makes. A generically appropriate pivot class is one that ignores but potentially admits all the relevant distinctions of the adult grammar. For example, Adam's pivot class contained every available member of several adult grammatical classes (articles, demonstratives, adjectives, possessives, etc.) even though none of the classes were themselves recognized in Adam's grammar. This implies that children classify words (as pivot or open) in a way consistent with more subtle distinctions they are yet to draw, a very real type of precognition.

This brings us to the very thorny problems of linguistic capabilities, linguistic universals and the problem of abstraction. As McNeill puts it:

According to one traditional view, language is a systematic relation between expression and content. In a transformational grammar such a view is embodied in the distinction between deep and surface structure; the deep structure of a sentence is associated with meaning and the surface structure with sound. Deep and surface structure are in general different from each other but stand in a specific relation, which is explicitly described for every possible sentence by the transformations of the language.

One inherent aspect of each sentence therefore is the existence of an abstract deep structure. It is the phenomenon of abstractions which all children face and overcome, that eliminates stimulus-response theory as a possible explanation of language acquisition . . . .

The phenomenon of linguistic abstraction presents a major theoretical challenge in the explanation of language acquisition. Fluent speakers somehow gain knowledge of the deep structure of sentences. They do so even though they never encounter such information in the form of examples, stimuli, or anything else. Moreover, children make use of information organized as deep structure very early in the acquisition of language. From the first moment of speech, indeed, children have the ability to communicate meaning and do so in a manner understandable to adults . . . . [this] seems to mean that the most abstract part of language, its propositional content, is the first to develop. Children present evidence of employing something related to the deep structure of sentences before grammar is acquired.[21]

This abstracting ability is what leads McNeill to the concept of a Language Acquisition Device, discussed by Chomsky, or the LAD as it has become known (alternatively, the Language Acquisition System, or LAS, the feminine form--McNeill, p. 1087). As it is seen by its proponents, the LAD receives a certain corpus of utterances. Some of these utterances are grammatical sentences in the language to which the LAD is exposed, but besides grammatical sentences, the corpus also contains blunders, false starts, interruptions, and a certain amount of nonsense. Given such a corpus, the LAD in a two-year-old, for example, is so constructed that it can develop a theory of the regularities that underlie the speech to which it has been exposed. It can exclude the nongrammaticality in the corpus by constructing a theory about the regularities of the language. This theory is the LAD's grammatical

competence, its knowledge of the language behind the corpus. After developing such a grammatical theory, the LAD becomes able to go far beyond the corpus with which it began. The LAD can distinguish the infinitely many grammatical sentences in its language from the infinitely many nongrammatical alternatives, and it can judge how far from full grammaticality each of the later deviates.[22]

It is important to specify the components of the LAD. One of these is a set of procedures for operating on a corpus--for example, conducting a distributional analysis, or looking for transformations of certain kinds. The other is a body of linguistic information--for example, that all sentences include noun and verb phrases, or that there are sentences, for that matter. McNeill maintains that the LAD contains only one of these components[23] (he cannot decide which) while Fodor suggests that it contains both.[24]

> Whatever LAD contains, however, must be universally applicable. For LAD must be able to acquire any language; it cannot be biased toward some language and away from others for reasons of internal structure. Thus LAD may contain information and procedures bearing on the general form of language but presumably contains nothing bearing on the form of any particular language to the exclusion of others.[25]

This argument is based on the theory of grammar--as opposed to the grammar of a single language--as being a description of the general form of natural language. Its purpose is to state the conditions that grammars describing individual languages must meet. For example, grammars must all be transformational, and the base component must include rules stating the relations that hold among such syntactic categories as NP and N. When the grammar of a particular language represents the linguistic knowledge of the speakers of the language,

and also conforms to the theory of grammar, one can claim to have explained the grammar of the language.[26]

Within this theory of grammar, McNeill further hypothesizes that, because the LAD and children accept the same types of data and deal with them in the same way, the theory of the LAD is ipso facto a theory about children, that they have the same "internal structure."[27]

What, then, are the universals in the theory of grammar, which the nativists presume to be a reflection of children's innate capacities? Some are phonological. Every language, for example, employs consonants and vowel types, syllabic structure, and not more than 15 distinctive features.[28] Other universals may be semantic--universals that are essentially constraints on possible concepts of what is thinkable.[29]

In the case of syntax, some universals describe the characteristics of the deep structure of sentences. Every language utilizes the same basic syntactic categories arranged in the same way--such categories as sentences, noun phrases, verb phrases, etc. Every language utilizes the same basic grammatical relations among these categories--such relations as subject and predicate of a sentence, verb and object of a verb and modification within a noun phrase. Every language can recursively include sentences within sentences. And every language distinguishes deep and surface structure and so is transformational.[30]

The transformations of a language are mostly, though not exclusively, idiosyncratic. However, the types of relations that exist between deep and surface structure are universals. For example, English relates the underlying and surface structure of auxiliary verbs by permuting the order of verbs and affixes. This transformation appears in English and French and is possible elsewhere, but is not universal.[31]

However, the relation of permutation is universal. The transformational idiosyncracy of each language arises from the way in which a few universal transformational types, such as permutation, are exploited.

Thus, using the concepts above, McNeill arrives at the formulation of the nativistic hypothesis about the acquisition of syntax:

> Much of the deep structure of sentences is described by various syntactic universals; most tranformations are idiosyncractic uses of universal types of relation. Making the assumption that such linguistic universals exist because of innate abilities, we can say that the abstractions of the deep structure are those universal categories and relations that reflect children's innate capacities, and that are made abstract when children discover the transformations of their language.
>
> A language is thus acquired through discovering the relations that exist between the surface structure of the sentence and the universal aspects of the deep structure, the latter being a manifestation of children's own capacities. The interaction between children's innate capacities and their linguistic experience occurs at this point, in the acquisition of transformations--and it is here that parental speech may make its contribution.
>
> If a language is acquired through discovering the transformations that relate surface structures to the universal aspects of the deep structure of sentences, then these universal aspects must be present in children's earliest speech, at least, they must logically be present before the transformations that depend on them are acquired. An aspect of children's capacities will not appear until it has 'matured' but everything in earliest speech that is not transformational should reflect an aspect of children's capacities. The early linguistic constructions of children should therefore be the universal parts of the deep structure of sentences, but, in effect, pronounced directly. It is for this reason that children are able to express meaning from the onset of language acquisition.[32]

McNeill then takes the phenomenon of holophrastic speech, noting that it has the conceptual content of full sentences, and uses this to substantiate the most primitive manifestation of a basic grammatical relation--predication.[33]

Adam's speech, above, is thus seen to contain many examples of predication, as well as other relations: direct and indirect objects, modification and possessives, the latter being a variety of modification, according to Chomsky's view.[34]

To quote from McNeill again,

> It is impossible to say from Adam's evidence whether or not these relations had equal tenure in his grammar at 28 months. All four conceivably existed at the holophrastic stage. But it is equally possible that originally Adam's utterances expressed only predication, to which was first added modification (including possession) then direct object of verbs, then subject, and finally indirect objects of verbs,--this being the order of the frequency of these relations in Adam's speech at 28 months.
>
> Whatever the order of emergence of such relations, however, it is difficult to imagine that they were, in any sense, discovered by Adam. For example, Adam apparently expressed the object of a preposition before he included prepositions in his speech, as in write paper and several other examples. It is difficult to see how he could have discovered such a relation from surface structure without also discovering the preposition; the preposition is the only feature on the surface that identifies the relation. It seems rather that Adam used the different basic grammatical relations, as they became available, to organize his other linguistic experiences--for example, acquisition of such prepositional phrases as write on the paper.[35]

Other evidence can be interpreted in this way. The two other children followed by Brown and his collaborators give this same type of evidence.[36] Evidence for Japanese children was discussed by McNeill and McNeill.[37] Slobin reviewed a number of diary studies and found evidence for the early emergence of the basic grammatical relations in Russian. Serbian, French, German, Georgian, Italian and Bulgarian.[38]

The problem of how the child accomplishes this categorization is also an interesting one. McNeill adopts Chomsky's notion of syntactic features to account for the phenomenon. Children are seen as being able to cross-classify various words, at least temporarily until further features can be employed in the classification. The resultant categories are thus predicate, subject, main verb, object, modifier and head.[39]

The distinction between pivot and open classes appears in a distributional analysis because a child's lexicon is derived from the basic grammatical relations of modification, predication and main verb, and

sentences constructed from this lexicon are limited to two and three words. Each of the observed relations yields N or NP as a contextual feature. Pivot words are either modifiers, predicates, or main verbs; open words appear with pivot words in the complementary relations. Open words appear without restriction because they are unmarked; pivot words appear with open words because they are marked. Modifiers, for example, cannot occur alone because they have the obligatory feature [+ _N] and cannot occur with each other because they have no contextual feature [+Det__]. Nouns appear alone because they have no contextual feature and appear with pivots because pivots have nouns as a contextual feature.

We are now ready to move from what McNeill sees as totally innate knowledge, to what he sees as "learned."

> The deep structures of sentences are largely a reflection of children's innate linguistic abilities. It is for this reason that such information can be totally abstract in sentences. Deep structures become abstract when children learn the transformations of their language. The interaction between linguistic experience and innate linguistic ability thus occurs here--in the acquisition of transformations. . . .
>
> [This interaction] can be viewed as a history of the way that children, beginning with a universal child grammar, diverge in the direction of the grammar of their local language.[40]

The emergence of inflections gives some indication of this interaction. Bellugi observed the order of noun and verb inflections of two children, and also noted the relative frequency of the same inflections in the speech of the children's mothers. The study underlined the fact that the order of emergence was the same for the two children, even though the children's rate of development was radically different, one child taking twice as long to acquire the six inflections in question as the other. A second point was that forms employing the same phonetic variants (the plural morpheme, for example) do not appear at the same

time, so it is not phonemic development that regulates the acquisition of inflections. Finally, the order in which inflections emerged in the speech of children was weakly correlated with the frequency of the forms in the speech of the mothers.[41]

The phenomenon of overgeneralization of inflections has also attracted a good deal of attention. Most parents notice that children regularize strong verbs (runned, goed, setted, etc.) and nouns (foots, mouses, toothes); Ervin, however, found that strong verbs appear in children's speech initially in the correct irregular forms. The explanation of the early appearance of such correct irregular verbs and nouns has to do with the frequency of these forms in adult speech. Strong verbs are by far the most frequent verbs, and strong nouns occur commonly also. Children are thus given many opportunities to discover the association of the underlying morphemes of the past and plurals of these words, and they must make many such discoveries. Thus the irregular forms and the small number of cases to which the varied inflections applied were learned early, then the simpler -ed or -s was noticed by the children who then generalized them to both regular and irregular cases.[42]

Slobin, who saw much the same phenomenon in children's acquisition of Russian inflections, refers to such encroachment of regularity as "inflectional imperialism." McNeill notes that there are no political connotations in the fact that inflectional imperialism is a major factor in the acquisition of Russian; the terms applies only to language. Gvozdev and Zakharova found the same type of "imperialism" in their studies of Russian children.[43]

McNeill sees this overgeneralization or imperialism in the acquisition of morphology as clearly showing that overt practice has little influence on linguistic performance. When one form imperialistically drives out another, it is a form which has received little or no overt practice which displaces another which has received a great deal of overt practice.[44]

The role of imitation has been examined by several studies. Brown found that only 10% of children's speech at 28 to 35 months is imitative, as for example in such exchanges as the following:

Adult	Child
Oh, that's a big one.	big one
But he was much bigger than Perro	Big as Perro
Salad Dressing	Salad dressing
That's not a screw	Dat not a screw
Are they all there?	All dere?[45]

However, McNeill feels the fact that children imitate the speech of adults does not mean that the process of acquisition is imitation. He cites the examples given earlier to indicate that not everything in child grammar originates in such a fashion. It runned, allgone shoes, for example, have no models in adult speech, but they are grammatical within a child's system.[46]

Ervin also looked into the possibility of imitation of "advanced" grammaticality (relative to spontaneous speech) being found in children's free speech. She found that the grammatical organization of the imitations was identical to the organization of the free speech. There was a strong tendency among children to include nothing in the surface structure of sentences that could not be related to deep structure--nothing for which the transformation derivation was not

known. The principle encompassed imitation as well as spontaneous speech. If a child did not yet include the progressive inflection -ing in his speech, he also did not imitate it in the speech of adults, particularly if the adult model was long relative to his memory span.[47]

The resistance of children to new forms sometimes goes to extravagant lengths. Consider, for example, the following exchange between one mother and her child:

> Child: Nobody don't like me.
> Mother: No, say 'nobody likes me.'
> Child: Nobody don't like me.
>
> (eight repetitions of this dialogue)
>
> Mother: No, now listen carefully; say 'nobody likes me.'
> Child: Oh,! Nobody don't likes me.[48]

A technique which children do use, however, is that of soliloquy. Weir found many examples of grammatical play in the pre-speech play of her 2 1/2 year-old son. The child selected a particular paradigm--sometimes grammatical, sometimes phonological--and then elaborated a stream of examples, the linguistic equivalent of repeatedly building up and knocking down a tower of blocks.[49]

Combining all this evidence, McNeill maintains:

> The role of parental speech in language acquisition is not to supply opportunities for children to practice. The practice of forms already in a child's grammar contributes nothing to the viability of the forms when they come into conflict with a child's changing system . . . . The practice of forms not yet in a child's grammar simply does not occur. The dominating factor is a child's own system of rules. The contributions of parental speech are always most severely filtered through this system.[50]

The notion of expansion has also been discussed fairly frequently in the literature. It is the process by which an adult, imitating a child's

telegraphic sentence, typically adds to the child's sentence the parts he judges the child to have omitted. For example, the child says big doggie, and the adult says Yes, that's a big dog. Cazden looked into the effectiveness of expanding child speech by deliberately increasing the number of expansions given to a group of children. The experiment consisted of having every child in a given nursery school spend 1/2 hour a day, 5 days a week, looking at picture books with an adult who systematically expanded everything the child said. At the beginning and end of the experiment, three months later, the children were given a specially devised test of linguistic performance. These "expansion" children were compared to two other groups of children, taken from the same nursery school, who received in one case what Cazden called "models" and in the other case no special treatment. "Modelling" was commenting on everything said by a child rather than improving it through expansions. If, for example, a child said doggie bite, the expansion might be yes, he's biting, whereas a model might be yes, he's very angry. Children in the modeling group likewise spend 1/2 hour a day, 5 days a week, looking at picture books with an adult. The results showed, relative to the group of children who received no special treatment, there was a modest gain in linguistic performance among children who received expansion, and a large gain among children who received models. Cazden interpreted her results by pointing to the fact that in expansion an adult is closely led by a child--he must use the child's words and something like the child's syntax. The opposite is typically true of modelling--he must avoid the child's word and often his syntax. Apparently, therefore, constraint by a child's own utterances is not beneficial to linguistic development.[51]

McNeill, however, dismisses this evidence, suggesting that perhaps inappropriate expansions were used, and therefore feels the question of the effectiveness of expansions remains open.[52]

Instead, McNeill sees a much narrower role for parental speech in the learning of transformations. He feels that in order for a child to observe a transormational relation not yet part of his linguistic competence, he must have in mind the deep structure of a sentence obtained from the speech of someone else; a structure that can only be in a child's mind must coexist with another structure that can only be in the speech of an adult. McNeill notes that expansions, prompts and imitation meet this demand, but echoes, talking to oneself, rote practice, and many utterances simply overheard by children do not. The effect is to reduce even further the effective size of the corpus on which all language acquisition is based.[53]

> Such situations as expansion or imitation, which potentially combine a child's deep structure and an adult's surface structure, may not, of course, result in the discovery of transformations. In the case of imitation, discovery is systematically blocked by a contradictory tendency to imitate in terms of a child's own grammar. The usefulness of expansions and prompts, while not systematically blocked, depends on a child actually noticing that both a deep and surface structure are available. Children may not always do this.[54]

The transformationalists have found that, just as languages differ greatly in their surface structures, they also differ greatly in the transformations that relate surface structure to deep structure. However, there is a small number of universal transformational relations. For example, permutation of the order of stems and affixes occurs only in certain languages, but the relation of permutation is universal. Besides permutation, the adjunction of elements (as in the English passive) and the deletion of elements (as in the English imperative) are universal

transformational relations. So is the requirement that deletions from the deep structure be recoverable. It is felt that there may be a few other relations universal in scope, but their total number is probably less than ten.[55]

The innateness concept must carry a great deal of theoretical weight in this area. McNeill tries to explain it:

> Universal transformations may play a crucial role in language acquisition, for it is possible that they describe relations to which young children are innately predisposed. Indeed, that would be at least one reason why they are universal.
>
> If indeed the acquisition of transformations proceeds through the formulation and refinement of hypotheses, the hypotheses apparently take the most general form possible. Children are not cautious theoreticians. They do not, for example, attempt to find an integrating principle that covers two or three local observations, to which they add the results of other small theories devised elsewhere . . . their goal is to find hypotheses with the largest possible exceptions. The consequences are visible through language acquisition--in inflectional imperialism, and in the differentiation of grammatical classes . . . .
>
> It is worth considering the possibility that children cannot avoid formulating hypotheses about language. Given any kind of linguistic experience, children very quickly develop rules that cover the experience . . . . The tremendous generality of children's first grammars suggest the existence of such a phenomenon throughout language acquisition. Generalizations appear immediately. What requires more time and further experience is the modification of these generalizations. Language acquisition thus appears to be the opposite of concept formation, where strategies for organizing formation lead to the discovery of rules. (Bruner, Goodnow, and Austin, 1956). Indeed it is different from most forms of learning studies by psychologists . . . .
>
> Being universal, child grammar is not the grammar of any language but is instead something that can become the grammar of language through a process of formulating and modifying linguistic hypotheses.
>
> In so evolving, language for a child moves from a maximally diffuse to a maximally articulated state. It starts with an intimate and extremely general relation between sound and meaning; it progresses from there to a less intimate and general relation mediated by deep structures; eventually it arrives at the complex and systematic relation between sound and meaning that comprises a transformational grammar . . . . These events take place for the most part before age 4 1/2.[56]

Phonology

As we move from syntax to phonology, we come to an area, easy to observe, but about which it has been difficult to theorize. Although Jakobson proposed an explicit theory of phonemic development in 1941, the theory for phonological development has not been so readily come by. Phonological development refers to the emergence of rules for combining sound into pronounceable sequences in a language and for relating such sequences to the surface structure of sentences.

The direction of development during the first year of life has been documented as proceeding from the back to the front of the mouth for consonant-type sounds and from the front to the back of the mouth for vowel-like sounds. The direction of development during the second year of life is exactly opposite. First to appear as speech sounds are front consonants and back vowels. The back consonants and front vowels that were first uttered in the period of pre-speech are among the last organized into a linguistic system.[57]

The development of a phonemic system, according to Jakobson, is the result of filling the gap between two sounds, /a/ and /p/. The process of development is differentiation. /p/ is a consonant formed at the front of the mouth; it is a stop; it is unvoiced and it presents a nearly total lapse of acoustic energy. /a/ contrasts with /p/ in each of these respects. Each is an extreme example of its type, and the contrast between them is as large as possible. In order to establish a phonemic system, the space between /p/ and /a/ must be differentiated. The first such split occurs on the consonant side and results in a distinction between a labial stop /p/, and a nazalized labial /m/. There then appears

a division of oral consonant into labial and dental categories. After this there occurs the first division on the vocalic side. Narrow vowels are set off against wide vowels, as in /i/ versus /a/.[58]

Jakobson argues that the sequence of phonemic development is invariant and universal among children. All children pass through the same steps, although children may differ from one another in the rate of advancement. Moreover, the phonemic system created by the first two or three steps in phonemic development is universal among the languages of the world. The child possesses in the beginning only those sounds which are common to the world, while those phonemes which distinguish the mother tongue from the other language of the world appear only later.[59]

Thus we see the similarity between phonemic development, as traced by Jakobson, and syntactic development as traced by McNeill, Brown, et al. Both begin with a primitive form that is universal. In both, the starting point is not any particular language, but is so organized that it may become any language through a process of differentiation, and both are differentiated by sets of distinctive features.

Lateralization

There is a final issue treated by the innatists, which is important to foreign language learning--lateralization. Lenneberg noted that it has been known for more than a hundred years that the left side of the brain serves a special function in language. Lesions to the left side of the brain produce more damaging aphasia than do lesions to the right side, and they take longer to recover from, if indeed there is any recovery at all. The emergence of lateralization therefore seemed a

promising place to look for the physiological underpinnings of language acquisition. Lenneberg related lateralization to the existence of a critical period in linguistic development. The ability to recover from damage to the left side of the brain declines with age. A newborn with a damaged left hemisphere develops language normally with the right hemisphere. A two- or three-year old loses language in some degree after damage to the left hemisphere but then quickly recovers with the right. Beyond puberty recovery is always limited or nonexistent. The degree of recovery is thus correlated with the degree of lateralization before injury. Many language teachers have encountered parallel findings in the work of Penfield. Unfortunately, the development of the lateralization of speech functions has not really been studied, and thus this area needs more work if it is to fit neatly into the innatist position.[60]

Summary of the nativist position

1. The innate Language Acquisition Device of children contains strategies for differentiating words into ever more discrete categories. The device is seen as having a structure parallel to that found in a transformational grammar.
2. All children approach the learning of syntax and phonology in basically the same way, starting with universals, gradually differentiating and learning the transformations which are language specific.
3. In the earliest stages, children use one- and two-word sentences which correspond very directly to base structures.
4. Children tend to apply the most encompassing generalizations possible to cover inflections, word order, etc., rather than fitting the many variations they hear into a complex pattern.

5. Neither imitation of adult speech nor adult expansion of child speech is seen as a method of permitting children to acquire language; the underlying forms must have been developed by the child before he can assimilate new expressions.
6. Children often soliloquize--run through their repertoire of words and sounds--and these soliloquies are often unacceptable by adult language standards.
7. The brain seems to have a critical period for language development--the period prior to puberty.

Nativist Foreign Language Methodologies

FLES Methodology

In that FLES programs deal with students before the age of puberty, it would seem the process of learning a second language could proceed along the same lines. However, the 'program of instruction' would be much different from those typically found in FLES programs. Instead of the twenty minutes per day class schedule, with dialogue memorization, questions and answers, dramatization, mixed in with songs and games, the implication is for a much less structured situation. If expansions, prompts and imitation are not effective as teaching devices, then the child must be allowed to 'soak up' the language in a somewhat natural situation. The only type of program which would seem to fulfill these conditions is the type being used at St. Lambert's School in Montreal under the direction of Wallace Lambert et al., and which has given rise to some forty similar programs in Canada and at least two in this country.[61] The basic factor in the program is the fact that a foreign

language is used as the exclusive medium of instruction for most of the kindergarten-elementary school experience of the child. The child thus encounters a great deal of raw language data, and the LAD can operate upon it in the same way it operated upon his first language. There is, of course, none of the pattern drill type instruction found in most FLES classes.

The program consists of the child's encountering all his kindergarten and first grade experience through the medium of the foreign language (in this case, French). In first grade, he begins to read and write in French. From second grade on, the child receives approximately one-half hour a day of instruction in his native language, primarily to learn the graphic skills. This is the pattern up through the fourth grade, which is as far as the program has gone at this moment.

Post-adolescent Foreign Language Methodologies

As we move from the ideal language learning period, the issue becomes less clear. Does the theorist move in the direction of attempting to recapture the language ability of the earlier period, or does he attempt to compensate for the fact that the nature of the learner has changed? One answer to the question has been given by Leonard Newmark and David Reibel, who maintain that the adult language learner is perhaps quantitively, but not qualitatively different from the child learner. They recommend, therefore, the exposure of the adult to large amounts of raw language data in realistic language situations, rather than the sterile world of pattern drills. They further maintain that this method and only this method is both sufficient and necessary to produce second-language competence. Unfortunately, they offer little research to prove their claim. Because their answer ignores a basic tenet of

the nativist doctrine--a critical period of the brain, it will not be treated further here.[62]

The alternative, unless we are to admit that the two types of learning have little in common and can therefore draw no parallels, is to devise a methodology based on the principles of first language acquisition, realizing that the method must do for the post-adolescent learner much of what the LAD did for the child learner of a language. The resultant method would contain the following principles:

1. The first part of the course would be devoted to the examination of language universals, (in the native language) and the imparting of the knowledge of the relations to watch for in this specific second language.
2. The actual using of the language would begin with kernel sentences, simple transformation being then demonstrated and encouraged. Relatively poor phonology would be permitted at this point.
3. There would be a recurring pattern of exposure to additional, graded language data, preferably in an environmental(i.e., via audio and visual media) approach, guidance by the instructor toward the formulation of rules, imprecise at first, and then more encompassing.
4. Additional talk about the second language (in the native language) would point up the phonological features and phonology would be improved by referring to these features as errors were made.
5. Students would be encouraged to soliloquize on phonological or syntactic paradigms.

Evaluation of the Methodologies

FLES (Foreign Language in the Elementary School)

Although it was not intended as such, the St. Lambert French program could be considered a project in which nativist principles are permitted to operate. The results of that program have been most positive. By fourth grade, students are equally proficient in English and French, and also as proficient as monolingual control groups, not only in language, but also in disciplines such as math.[63] If we assume that the program will continue to provide experiences in two languages for the 13-year sequence, then the program, when evaluated by an instrument such as the Minnesota Guide to Modern Foreign Languages, (See Appendix A) would rate very high indeed.

It would seem that item A-1 would be well provided for: students would indeed be able to enroll in foreign language classes without sacrificing other worthwhile educational experiences, for the lion's share of the foreign language learning would take place in elementary school. If one assumes that at least part of the instruction in the secondary school is in French, then the students would sacrifice nothing while gaining a truly bilingual command of both languages.

Item A-3. There would be no artificial screening of students going into or staying in the sequence.[64] (Lambert indicates that there is no drop-out in his program, and that there even seems to be some increase in measured intelligence--possibly a result of greater intellectual stimulation.)[65]

Item A-4. Articulation would seem to pose little problem, for if the students are progressing as rapidly as their monolingual counterparts, the normal instruction given in each language should be suitable

for each grade level. One serious problem, however, would be that of providing for the child who transfers into the school district. This, and the fact that not all parents might want their child in a bilingual program, suggests that there should be at least some monolingual sections at each grade level.

Item A-5. So long as there is coordination of the various disciplines within the school district, one should be able to assume adequate coordination of the foreign language skills as part of the various disciplines.

Item A-6. The preparation of the teaching staff might pose the biggest problem, in that it might be difficult to find sufficiently well-prepared teachers to staff such a program.

Items A-12, B-2, 8. The language-switch program might well have an edge on other foreign language programs in that it would provide language experiences for all children. It has been shown that children of varying ability can profit from the program, and if the language is merely the medium, many fields of interest can provide stimulation for children.

Item A-13. Finding adequate texts would also seem to pose little problem, for normal instructional texts in various disciplines could be imported directly from the culture area being studied.

Item B-7. Another strong point of the language switch would be its integration into the total school curriculum. There should be no conflict between the goals of the language program and the other instructional goals.

Item C-1. The evaluation of such a program would definitely be that of a real-life situation, one of the most realistic for school-age children: the measure of being able to communicate in the classroom.

Items C-2, 5. Beginning in the first grade, there would be the opportunity to evaluate all four language skills. Standardized testing could easily be used, and in both languages, so long as the tests reflected adquately the content of the disciplines being taught.

In applying the Rivers Criterion #1, we can note that there should be no difference between the objectives of the foreign-language program and those of the other disciplines. The objectives would be multifaceted. Put in traditional FL terms, there would be functional mastery, reading knowledge, cultural knowledge, even informal linguistic analysis, all included in the one program.

Criterion #2. When compared with traditional FLES programs, the language-switch program has been shown to be more economical, for it does not require additional staff or additional material. When compared with the typical secondary-school programs, it seems to produce far greater proficiency with a much broader range of student ability.

Criterion #3. Whether or not the techniques maintain the interest and the enthusiasm of the learners would depend on the techniques used in the school as a whole. There is no reason for the FL techniques being different from the techniques used in other classes.

Criterion #4. As in #2, it has been shown that a wide range of student abilities can profit from this type of instruction.

Criterion #5. The demands of this method should not be greater on the teacher than those on any elementary classroom teacher, provided the teacher has near-native fluency in both languages. In fact, the load

would be less than that on an American elementary school teacher who must prepare a separate lesson plan if she is teaching her own FLES program. In comparison with the FLES specialist, the language-switch teacher should again have less demand on her. There would not be the need to contact 200-500 different students per week, and to attempt to entertain them in 20-minute episodes at the rate of 10-13 per day. In comparison with secondary teachers of French, the language-switch teacher would not be obligated to provide the tremendous expenditure of energy audio-lingual and direct method teachers typically do, especially in first-year classes. In addition, the teacher in this program would have at her disposal the wide range of activities typically found in elementary schools, including large group and small group activities, individual work, quiet work at seats, plus the opportunity for "diversionary" activities like physical education, art and music.

Post-adolescent Methodology

Since there is no extant model of an instructional system built upon nativist principles for the post-adolescent learner, the evaluation of the methodology is a difficult problem. The standard evaluatory guides cannot be brought to bear. Several points should be mentioned, however. This methodology would impose a double burden on the learner, the learning of the fundamentals of transformational grammar (a task not all that easy for university students) plus the language itself. In order to understand universal relations and features, a fairly sophisticated knowledge of linguistics would seem necessary. Another difficulty would be the large amount of time devoted to talk about the language, rather than the use of the language itself. Given the fact

that there is usually only a set amount of time available for the language course, one can well question the quantity of time devoted to the non-language activity. The environmental approach would be a costly one, if we assume that it would require multi-media presentations--tapes, and at least filmstrips, if not moving picture format. A final objection would be the well-known reluctance of adults to soliloquize, thus negating some of the supposed benefit of the method. (However, one might encourage sub-vocal soliloquy.)

Thus the attempt to formulate a second-language methodology upon nativist principles of first language acquisition is largely abortive, except for the FLES sequence. In the next chapter, we will attempt to describe a less monolithic approach to first language acquisition and a more fruitful attempt at extracting a second-language methodology from it.

NOTES

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CHAPTER III

THE COMPOSITE APPROACH

Research Supporting the Composite Position

As Tucker and d'Anglejan pointed out in their recent article in the Britannica Review of Foreign Language Education,

> The language learning process involves an interaction between various environmental and hereditary factors. As a starting point for the discussion to follow, consider the implications of two facts: (1) nearly all children, from diverse backgrounds, with different IQ's and with various psychological limitations, do become fluent speakers of some code, and (2) nearly all children who first acquire one code but then move to a location where another is used very quickly become fluent speakers of the second. Observations such as these, together with recent developments in psycholinguistic research and theorizing, have led investigators to examine critically once again the nature of the relationship between the process of acquiring a native language and the process of second-language learning.[1]

One of the teams of examiners consisted of Hebb, Lambert and Tucker at McGill University. They characterized the current approach in this manner:

> The dominant view in psycholinguistics seems to be that learning is not involved in the acquisition of grammatical competence; it is argued instead that the essential principles of grammar are unlearned and somehow transmitted by heredity. We say 'somehow' because this literature is more concerned with criticism of learning theory than with explicating a nativistic mechanism. The argument rests on two bases: a primitive view of the child's learning, drawn from experiments with rat or pigeon, and an equally primitive view of heredity and environment as alternatives in the explanation of behavior. Is a given attribute innate, or is it learned? And it seems to be thought, by these writers, that if it is learned it must be learned by conditioning and the reinforcement of overt response. With such ideas, with no awareness of the nature and extent of cognitive learning in which there may be no response to reinforce at the time learning occurs, and no recognition of the large class of behavior

> that is not learned but is dependent on prior learning (Hebb, 1953), it is inevitable that a psycholinguist will have difficulty seeing the place of learning in the mastery of grammar. Obviously the more superficial features of language (vocabulary, idiom, accent) are learned, but the mastery of what Chomsky (1965) has called 'deep structure' cannot be learned because--for one with such views--it is not a matter of conditioning and reinforcement.[2]

This article goes on to point out the nativist psycholinguist's stress on the regularity of development in children, even from different cultures, and their implication that the development must be based exclusively on genetic factors. Hebb et al. note that this argument overlooks the great elements of identity in the early environment of children everywhere, and a uniform early experience can contribute as much to uniform development as a common human heredity. (p. 218).

Thus, how learning occurs and what learning is, in the position of Hebb et al., is as much determined by the learner's environment as by his heredity. They believe that experience has an essential part in the development of any cognitive process, including those processes that control language, but that this in no way decreases the over-riding importance of heredity predispositions. They see man as born to talk, innately provided with both the capacity and with a motivation, a need to learn, at least in the case of the native language. (p. 219)

Part of the difficulty in reconciling the views of psychologists with those of linguists has been the sometimes willful ignoring of learning theories which suggest anything other than S-R relationships, and the ignoring of man's enormous capacity for latent learning, including perceptual learning and association of ideas. Hebb et al. cited Brogden's works of 1933[3] and 1947[4] in which a dog or cat was exposed to a stimulus combination--sound followed by light--with several repetitions.

This was enough to establish learning--the animal's association of the two events--but the learning was latent. To demonstrate it, a further step was necessary. The light was conditioned to an avoidance response, and then the crucial test was made; the animal was exposed to the sound and again made the avoidance response, which showed that sound and light were in fact associated.

Perceptual learning was first demonstrated by Leeper, who showed that undergraduates' perceptions of an ambiguous figure were modified by the prior examination of a related figure; the learning was latent with no discernible primary or secondary reinforcement.[5] Latent perceptual learning, without response reinforcement, has also been shown to occur in the behavioral development of a mammal as primitive as the rat. The rat was reared in a wire mesh cage, too small to permit any locomotion but permitting visual inspection of the experimental room. That visual-perceptual learning occurred was shown by the fact that at maturity the rat was decisively superior in solving maze problems to one reared with a similar degree of physical restriction, with light, but without being permitted a view of his immediate environment.[6] Here the perceptual learning of infancy had a lasting effect. Hebb et al. concluded that it can hardly be less so in man, in view of the far more extensive learning that is characteristic of the human species. As they noted:

> The S-R (stimulus-response) conception of learning with its emphasis on the development of connections between point of stimulation and motor organ of response was a fundamental advance in psychological thought because it freed us from the shackles of 19th-century subjectivism. No doubt Watson's doctrinaire narrowness was an aid in winning that fight, but the fight has been won and the current narrowness of 'learning theory' (NeoBehaviorism) is no longer a strength. With a broader view of learning as a modification of

> transmission in the CNS (central nervous system), we can include change or elaboration within a transmission route, or potential route (paradigm of perceptual learning); and cross-connection between such routes (paradigm of S-S learning) . . . . In addition to perceptual learning and sensory preconditioning, both repeatedly demonstrated in the laboratory, there is a form of transient one-trial learning without reinforcement that can be called simply the acquisition of information. It occurs in animals, in the delayed-response procedure in which a monkey is shown the place of food and only later allowed to go find it. At the adult human level it is possibly the commonest, easiest and most typical form of learning, occurring constantly during waking hours. When we hear or see or feel something and remember it, even for a short time and even if we make no response at the time, that is learning . . . . Latent learning without reinforcement is one of the facts of human behavior, a normal consequence of perception. (p. 216-217.)

To account for these various types of learning, and as a basis for the composite nativist-empiricist language acquisition theory, the Hebb team resurrected Hebb's cell assembly theory[7] to which the similarities of Braine's storage bank concept and Herriot's schema and strategy will be shown later. Hebb had postulated

> . . . . assemblies of the first order (directly related to a specific stimulus), second order (excited by first-order assemblies), third order and so on. The notion . . . is that there is a hierarchy of representative (or cognitive or mediating) processes. At one extreme is an activity characteristic of actual perception, a primary level cognition or mediating process, vivid and specific but narrow gauge, for example the perception of a line or particular shape, or a vowel sound, or a pressure on a particular point on the skin. At the secondary level is the awareness or perception of larger aspects of the object or event, lacking some of the vividness of actual perception; at a tertiary or higher level, an abstract idea of a class of such objects, or if the same object as seen or heard or felt in its different aspects. How far one must go, in this description of successive levels of abstraction, is not clear; but it is quite clear that the different levels exist, psychologically, and clear also that there is an intelligible physiological basis for such a progression. For one thing, it closely parallels the progression of simple cell, complex cell and hypercomplex cell demonstrated physiologically by Hubel and Wiesel (1968). The simple cell is directly excited by sensory input, the complex cell by simple cells, and the hypercomplex by complex cells.[8]

Phonology

As we move to the specifics of the nativist-empiricist theory, we begin with the work of Martin Braine, who stated that "the available information indicates that phonological developments take the form of a progressively developing system of contrasts."[9] This conclusion is based primarily on the study of Velten[10] with corroboration in the works of Leopold,[11] Grégoire[12] and Govzdev.[13] Between 11 and 16 months of age Velten's daughter, Joan, developed as follows: her first two words /ap/ 'up' and /ba/ 'bottle', 'bang', indicated a distinction between a a vowel and a stop consonant. It was characteristic of Joan's early development, as of Leopold's daughter and Braine's son, that consonants tended to be voiced initially and unvoiced terminally, so that the voiced and unvoiced realizations of consonant phonemes were in complementary distribution. Joan next developed a stop-continuant distinction and a contrast between initial voiced phonemes, and so forth.[14]

Braine concluded that the data on phonological development confirmed the general lines of Jakobson's thinking (as noted in Chapter II) as being, not a gradual approximation of the adult phonemes one by one, but the acquisition of successive contrasts between distinctive features of maximum differences and generality, e.g. vowel vs. consonant, stop vs. non-stop, voiced vs. unvoiced, etc. (pp. 22-23).

Braine saw the literature as suggesting that for the acquisition of phonemes, distinctive features are learned. He found this concept generally consistent with the Gibsonian concept[15] that perceptual learning takes the form of a progressive differentiation of stimuli impinging on the sense organs, in this case auditory stimuli, and that receptive control is primarily a perceptual process, the newly learned auditory

distinction guiding production by providing the child with a criterion for monitoring his own motor output.[16]

Reviewing different literature,[17] Herriot came to a similar conclusion: first, the child appears to have an internally consistent set of principles complete at any given time, and secondly, he depends for his acquisition of these principles upon hearing his own and other utterances.[17]

> It is supposed that the learning of distinctive features is necessary for the learning of phonemes, and therefore it is reasonable to suggest that it is these features that are being acquired during the pre-language stages of development. They vary in the ease with which they may be perceived and articulated. A basic distinction, that between an open vowel and a closed stop consonant, has been distinguished by linguists in the cooing stage, which precedes the babbling stage (Leopold, 1953); other distinctive features, e.g. low versus high vowels, also occur early in the child's articulatory development; but still others, e.g. voiced versus voiceless in stop consonant, may not occur til much later (age two).
>
> [Given the difficulty of substantiating innate distinctive features, the alternative is] to postulate a set of experiential distinctive features. These features will be the cues which the child utilizes himself, and will differ in the early stages from child to child. The essential aspect of the distinctive features is that sound may be compared according to several criteria on which only one need be different for the sound to be considered to be of different categories. This essential aspect may be a feature of many different systems, which approximate more and more the adult system as crude perceptual and articulatory distinctions become refined.[18]

Thus the Chomskian claim that there are language universals (vowel vs. consonant, etc.) is not negated by nor does it negate the above account, if one realizes that early similarity in the phonological development of all children may well be the result of language universals, rather than genetic characteristics. The acquired distinctive features concept makes it much easier to explain why there is general sameness in development across cultures for a period, then a divergence based on the characteristics of the individual languages.

Grammar

Since Braine was the scholar who originated the open-pivot distinction in referring to the distributions of words in a child's early grammar,[19] it seems fitting that we look further at his argument. He and others[20] noted that the early word combinations of children tend to follow a certain pattern: a few individual words are singled out and used in a particular utterance position in combination with a variety of other words. The words singled out he named pivot words. They tend to appear sequentially in the very early development; one or two may first be singled out and used in a variety of word combinations; a week or two later, another pivot may appear, and a third or fourth after a further short time interval. Braine indicated that several other observers noted that the characteristic nature of the construction and the oddness of many of the combinations make it clear that a productive pattern is involved, not mere imitations of adult phrases.[21]

In Braine's analysis of the construction, he observed that the words that are combined with the pivots also occur as single-word utterances, whereas the pivot words themselves may not occur alone, a position also taken by McNeill, as we have seen in Chapter II. Thus, Braine said the construction consists of the three utterances forms X, P_1X and XP_2, where X is the class of single-word utterances, and P_1 and P_2 are the pivot words of first and second position respectively. He proposed that the basis of the construction is the learning of the position of the pivot words; the child begins to combine words by learning that a few words belong first and some others second. In the absence of other learning which might restrict generalization, the position

complementary to that of the pivot is occupied by any single-word utterance in the child's vocabulary.[22]

In Braine's analysis the period of time during which the pivotal construction appeared to be the only productive construction is of short duration. It lasted about four months in the three children described in his earlier work.[23] He stated that it is clear from other work that the period is variable and can be considerably shorter than four months, the transition to a more complex grammar not being sharp. He also noted that, from the beginning, a small number of utterances do not fall into the categories X, PX and XP; these consist, apart from some stereotyped expressions, of sequences of X-words, or of longer utterances one of whose components may be a pivotal construction. As development proceeds, the proportion of these more complicated utterances increases; often there is a relatively sudden and dramatic increase at some point, and it becomes clear that a construction more powerful than the pivotal construction has developed, which will generate more complicated strings that often turn out to have a kind of subject-predicate structure. The increased output of word combinations is presumably a consequence of a more powerful grammar becoming productive.[24] Admitting that the pivot construction lasts for only a short period does much to answer the criticism of the theory by Bever, Fodor and Weksel noted in Chapter II.

Braine also cited a number of studies which trace the development from two-word utterances to multi-word utterances. Although they show many similarities in development, there are also many slight divergences.[25] This observation corroborates Bloom's recent work in

which she noted that the process of grammatical acquisition seems unique for each child, although generally similar for all children.[26]

Transformations

The learning of transformations is a popular subject for all language acquisition theorists. Braine's analysis of the English patterns of negation, inversion in yes-no questions, verbal elipsis, and wh- questions concluded that the child first learns the position of the auxiliary components independently in each sentence type, often with a different group of auxiliaries for each structure. As the same auxiliaries develop in each sentence type, the child presumably learns to perceive the correspondences between them (can-can't, will-won't, the absence of auxiliary in the affirmative, etc.) and the transform relation is acquired. For the wh- questions, Braine felt that the data he cited provides good evidence for the learning of an inversion rule, or for the carrying over of an inversion rule in the yes-no questions. He further noted that at the time when the transformations are presumably acquired, the auxiliary system is substantially simpler than in the adult language; have ...-en is lacking, forms of be do not occur with a modal (e.g., subjunctive, imperative), and the progressive forms with past participle and adjectives (be being, be getting) also appear to be absent. Braine cited the developmental point as being that the locations of the various types of auxiliary elements in each sentence type are learned before the relationships between sentences are learned.[27]

The active-passive paradigm can be explained by bringing together the work from four sources: Bever et al,[28] Hebb et al,[29] Braine[30] and Herriot.[31] The statement of the first group reads, "[we] had to assume

that the underlying form from which the passive derives is not a corresponding active but rather an abstract structure never realized in speech" (p. 219). This accords precisely with the idea Hebb et al. arrived at independently, as follows:

> The perception of an event, first, is a sequence of ideas or part-perceptions. Secondly, this sequence may differ from one observer to another or for the same observer on different occasions, when perceiving the same event; and finally, it seems that the sequence of ideas, in perception, is what determines the sequence of verbal conceptual processes and thus the subject-predicate relation. Suppose A acts on B. If we are attending to A at the time, the order of events, in mental content, is (percept of A) (of A's activity) (impingement on B); but if at the time of the event we are attending to B instead of A, the order is (percept of B) (disturbance of B) (arising from A). In the first case the verbal report that results might be A hit B, in the second B was hit by A.
>
> All this may be obvious, but it suggests something less so; that is, the basis of transformation from active to passive and vice versa. It suggests that the basis is not grammatical, as such, but depends on the intermediary of the perception or the recall or imagery of the event. The recall may take either of the two orders (actor) (acted-on), and (acted-on) (actor), and determine active or passive voice accordingly . . . . Instead of elaborate formal rules of transformation to encompass all the complexities of sentence structure that even the four-year-old is capable of, the relation of active to passsive may depend on a non-verbal parallel mechanism (as Bever et al. suggest), and we propose that this is inherent in the normal mechanisms of imagery of a complex event. (pp. 219-220)

Although Braine admitted he did not have a thorough explanation for the passive acquisition, he did conclude a speculative section on the issue:

> Thus for the passive as for the adjective transform, the learning of the derived phrase structure probably precedes the learning of the transformation, the passive resulting from learning so. sort of correspondence between sentences of the form Subject + verb + object and Subject + G_{intr} + Agentitive-instrumental, where G_{intr} is a past participle. (p. 44).

Herriot's account is an interesting one in that it refers to Braine's work and incorporates it:

> Braine's (1953) theory of contextual generalization (for which there is little support among generative linguists) hypothesized that the position of an item relative to surrounding items was learned at every level of the hierarchy of the phrase marker tree of adult speech. For example, the position of a certain phrase in a sentence, or a certain word in a phrase, could be learned and the item used in the same position but with different content in a novel utterance. (pp. 108-109)

Herriot took the early Braine theory a step further and suggested that the theory can be made much more inclusive by bringing non-linguistic contexts into the explanation, e.g. the child might notice that a word appeared in a certain position in a certain situation. This reasoning and that of Hebb et al. above bear a striking resemblance. Herriot continued:

> It is possible, for example, that the child comes to learn that when a noun follows a passive verb form in an actor-action-object situation that noun is the actor. The child can see that the dog's biting Jane, that the dog is the actor and Jane the object; however he hears the sentence 'Jane's being bitten by the dog'. He recognizes that the usual sentence order of actor first and object last is reversed in this case, since the evidence in front of his eyes assures him that Jane isn't doing the biting. After experience with other such instances, he comes to realise that this reversal only occurs when the verb has certain passive grammatical features about it. As a result of this learning, he can comprehend the passive construction in the absence of the situation to which it refers. The perception of position in the sentence, of grammatical inflexions, and of the non-linguistic context of utterance is therefore necessary for such learning to take place. (p. 109)

The learning of negation is treated similarily by Braine and Herriot. Braine's treatment is based on his analysis of two other studies, those of Bellugi[32] and W. Miller[33]. He and they saw the primitive negative first appearing at between 21 and 30 months. It consisted of adding no or not to a sentence, and this particle usually preceding, but sometimes following the remainder of the sentence. There was no productive question pattern noted at this stage apart from a rising intonation.[34]

While this simple negation was still sometimes found in the next stage of development, about three months later, most negations were made at that point by placing a negation item before the verb phrase. The item was can't or don't in predicative sentences, don't in imperatives, and no or not otherwise. The affirmative forms can and do were not in the children's vocabulary at this time, indicating that the usual transformation was not yet present and that can't and don't were monomorphemic.[35] A very similar negative formed with a negative modal "prefix" to the verb phrase was reported by W. Miller for his 1964 subject.[36] At this stage, as in the previous one, the negative seems to be expressed through phrase structure rules. After this stage the negatives appear to be produced by "pure" transformations.

Herriot's account suggested that the child's rules may be derived from an inductive process. For example, just as the past tense "ed" morpheme is overgeneralized for a period to all verbs, so the negatives no and not are always placed at the beginning of the sentences (and he noted that this is where they often appear in adult utterances to the child). However, exceptions have to be allowed for. Why also appears at the beginning of sentences, probably more frequently than no and not, so the child has to make an exception to his first rule and say "why not?" By the time the adult degree of skill has been attained, the position of the auxiliaires and the negative and interrogative morphemes will have been mastered.[37] Herriot continued:

> A series of transformational operations performed on deep structure does not need to be inferred. Once again, the child's early utterances appear to be explicable in terms of Braine's theory concerning position of an item within a linguistic context; also, the child will have had to learn the non-linguistic contexts in which each transformation is appropriate. Therefore, the [nativist] inference

> that surface structure is not available to the child until these transformational types have been mastered is to be rejected. (pp. 112-113)

The development of plurals and past tense morphemes was also treated by these theorists, as they dealt with data from Berko[38] and others. Braine used Ervin's 1964 work[39] to substantiate his theory of this line of development. In the 24 children Ervin tested longitudinally for English noun plural inflection, the inflection had two main allomorphs: /z/ following stridents; and /z/ following other nouns (the /z/ being automatically devoiced to /s/ following unvoiced stops, according to general English phonological rules). The /z/ allomorph developed first, as it did in Berko's study, and the devoicing took place after unvoiced stops from the outset. The allomorph appeared first with familiar words, and then after an interval of a few weeks, it generalized to newly introduced nonsense words; words already ending in stridents in the singular were not inflected. Some time after the above system was established, the /iz/ allomorph made its appearance. At this point the previously well-established plural quite often underwent changes, such as foot-footses temporarily competing with or replacing the pre-existing foot-foots. (Pp. 16-27)

Braine summarized the developmental sequence for plurals and for the past tense morpheme as follows:

> First, appearance of an allomorph--not necessarily the predominant allomorph--in familiar words; second, productivity of the predominant allomorph; third, appearance of a second allomorph which replaces or varies freely with the previous one; finally, conditioned variation of the allomorphs. Wherever successive changes in an inflection have been followed in the child an essentially similar developmental sequence has appeared, with minor differences reflecting the phenomenon of the adult language. (p. 52)

The Hebb et al. explanation specified the experiential component:

> With a visual stimulus of one finger the child learns to say finger, and with the stimulation of two fingers he learns to add /z/; with stimulus of one toe, to say toe, and with the stimulus of two to add /z/; but how can this learning generalize to qualitatively different stimuli? Having learned to say doggie on sight of one dog--a new stimulus--he says doggies on sight of two of the animals. This is also a new stimulus, and how can it give rise to that response? But let us look at the problem from another point of view. Seeing a dog the child has cognitions at different levels: part-perceptions, perceptions of the animal as a distinctive whole, but also perception of the animal as a something, a thing. The latter would have occurred with fingers and toes as well, so that the /z/ sound would have had a chance to be associated with the sight of two fingers--and two things; with the specific perception of two toes, which are also two things, and so on. When another set of things (two dogs) is encountered, an already established association of things with /z/ would permit him to spontaneously pluralize the form. (Pp. 218-219)

Herriot was in general agreement with this analysis as he noted:

> Such inflections as plural 's', past tense 'ed', and participial 'ing' are used regularly in certain types of situations (where there is more than one item, where the event being referred to is past, and where something is going on) . . . . Comprehension may well precede production . . . Brown and Berko (1960) showed that older children could use a nonsense word as a form class in a sentence after they had heard it so used in another sentence. This illustrates the combined effects of sentence position and inflections on comprehension and, as a result, on production. (p. 114)

Braine attempted to pull the work together into a coherent theory in the following manner:

> It seems clear to common sense that the developmental sequence described results from step-by-step learning of the allomorphs and of their conditions of usage. It is of interest that this learning sequence bears some similarity to the behavior observed in the studies of the learning of 'paired associates' in experimental psychology. Learning an inflection and learning a set of paired associates both involve the acquisition of a mapping; for an inflection, the mapping is of a set of allomorphs on a set of lexical items; in paired-associate experiments, subjects have to learn a mapping of a set of 'responses' on a set of stimuli. It is well known (Underwood and Schults, 1960) that in learning a set of paired associates, a subject learns two things relatively independently: (a) what the response items are and (b) which responses go with which stimuli. Errors indicating knowledge of a response item but a lack of knowledge of which stimulus it belongs with are frequent and are obviously analogous to such

> errors as footiz by children. Indeed, for the experimental psychologist used to seeing simple mappings learned in a few minutes in the laboratory, the child's learning of the allomorphs of an inflectional morpheme provides an interesting slow-motion example of the acquisition of a large many-one paired-associate mapping. (p. 53)

Grammatical Categories

Another aspect of this composite theory of language acquisition deals with the learning of grammatical categories. Braine found that, as in phonology, the predominant order of development is from broad to fine distinctions. (p. 54) This general trend has been noted often, e.g. Braine[40], Menyuk[41] and Slobin[42]. An undifferentiated lexicon is the first stage. NPs and nouns separate off very early, whether or not they are always the first class to be distinguished. The successive subdivision of a generalized class of noun modifiers into articles, adjectives, possessives, is described for American subjects in the works noted above, and a similar subdivision was reported by Gvozdev for his son[43].

Hebb et al. felt that the child may have functional criteria by the way he is built, his brain activities being such as to process certain classes of words in a way special for each class.

> The result may be the same as if the child reported, 'I use this word as a qualifier, that word as representing an activity,' but he need no more have such ideas than a dog that chews a bone knows he needs calcium in his diet. The brain produces those results as nonlogically and nonformally as the sieve, in a cement-mixing establishment, sorts out gravel into small, medium and large. We believe that the child finds empirical criteria for nounness. Also we believe it is possible to indicate what they are in general terms. They differ at two stages of mastering language. In the first stage it would be repeated coincidence of the vocalization of the mother with the appearance or attention-getting activity of a striking or noticeable object, a space-occupying perceptible and imageable thing. Brown (1957) observes that the first nouns mastered refer to 'concrete, tangible objects,' verbs to 'observable physical actions.' The idea here is that many neurons are excited

when a child's attention is drawn to some visual object and the mother at the same time makes a particular vocalization; different groupings of neurons are involved from one such occasion to the next, but a small sub-group which is excited by the vocalization every time this occurs will organize, and their organized activity subsequently will be the abstract idea of a name; in this situation, then, the child will perceive a particular word (lower-order cognition) but also perceive it as a name (higher-order, abstract activity accompanying the lower order). In the same way, action-words will become perceived as such.

In a second stage, however, another basis of detecting nounness and verbness will be operative. It will be that of the relation of a vocalization to already-established nouns and verbs. Thus to take the example of Braine (1968), modified a bit, the child hears 'People kivil,' 'The dog kivils,' 'Bobby kivils,' and categorizes kivil as referring to an action, because it is put in the place of action words. Here we propose that the sequence of a repeatable vocalization following a word perceived as a name (i.e., a noun) excites both the lower-order cognitions of that vocalization, and also (by association with the higher-order cognition of the noun preceding) the higher-order cognition normally accompanying a familiar verb. The theoretical proposal is very like that of Braine (1963), but we believe that the additional element of the higher-order cognition removes those difficulties encountered by his explanation that were pointed out by Bever et al. (1965)

> . . . Once a higher-order cognition such as nounness becomes established, it can have a pervasive influence on the processing and assimilation of new verbal inputs. For example, the sequencing of nouns and adjectives plays a substantial role in memorization and recall; the noun-adjective order is a much more useful and efficient schema than the adjective-noun sequence (even for English speakers who are more habituated to the latter) apparently because the noun serves as a 'conceptual peg' on which a long and complex series of succeeding adjectives can be 'hung' or stored in memory. (p. 221)

Imitation

Braine stated that "the common idea that language is learned through imitation has been shared by few serious students of language learning."[44] However, the role of imitation must be explained. It is clear that many children's utterances contain materials which could not be mere imitations, e.g., allgone shoe. Young children's imitations are often defective.[45] At least in part, such imitations must be the result of a reconstruction of the model sentence as it was understood. On the

other hand, to some extent the child can imitate sentences whose structure he does not understand. Ervin has concluded that overt imitations cannot be a major factor in the development of grammar.[46] They can however, be grammatically progressive, as the adult clarifies the child's sentence and repeats again.[47] Thus the adult's imitation of the child's utterance contributes to grammatical development, but seems not to be necessary to it. The discussions of Slobin[48], Bellugi[49] and Cazden[50] seem to suggest that, at any given stage of development, there is probably some optimal level of richness in the verbal environment which would maximize grammatical progress. Imitations and expansions are part of a matrix of interactions in which child and adult understand each other more or less and which partically controls the complexity and variety of the input to the child.

The phenomenon of pre-sleep monologues of her 2 1/2 year-old son described by Weir (cited in Chapter II) is interpreted by G. Miller as playing a role in grammar acquisition by bringing constructions that the child already commands up to the level of complete automaticity.[51] Braine concluded his section on imitation: regardless of whether or not it plays a direct role in grammar acquisitions, this phenomenon is revealing about the child's motivations; he obviously finds linguistic structure sufficiently interesting to play with it.[52]

Hebb et al. noted that imitation does play some role in language acquisition, for the child ends up with the vocabulary, accent and other speech mannerisms of his social group. They felt that the imitation itself, the overt motor speech, depends on the prior perceptual learning.[52] In this sense, the child can imitate only what is already

within his competence; in the early stages at least the imitation is more a product of learning than a mechanism of learning. Imitation of course occurs in other fields than language, and this fact should be kept in mind as we consider the acquisition of language as an essential part of the socialization process, rather than an isolated, idiosyncratic aspect of intellectual development.

Herriot, too, saw imitation as having an important role in language acquisition:

> The part played by imitation now becomes apparent, since the mother's utterances (or rather, salient phonological features of them) can provide the model to which the child may approximate more and more closely . . . . The extent and specificity of imitation is evident from the degree to which a child copies mother's regional accent . . . . In addition to the phonemes, it may well be that various distinctive features of phonemes are learned. (p. 121)

And thus we come back to the concept of experiential distinctive features. Herriot does not speak to the question of imitation in grammar acquisition, but rather in the acquisition of phonemes.

What about the omissions children make in either imitation or spontaneous utterances? The explanation consistent with the nativist-empiricist approach was suggested by Braine, namely that the child learns the most fundamental syntactic distinctions (e.g., between subject and predicate, between primary and adjunct predicate positions, between transitive and intransitive predicates) before he has learned some of the more detailed rules for expanding the components of the major syntactic positions. The higher nodes of the phrase-structure tree are acquired before the intermediate and some of the lower nodes.[54] This explanation seems consistent with the data and reflects a psychologically simple and very natural view of development, namely, that development consists in

the successive mastery of linguistic distinctions. This explanation thus speaks to the question of telegraphic speech raised in Chapter II.

Language Capacity and Lateralization

Braine characterized the claim that preadolescent children are specially equipped for language learning, that the learning process available to children becomes unavailable at some age, as a common lay view which has been casually advanced as a self-evident truth on a number of occasions by generative grammarians, e.g., Bever, Fodor and Weksel[55] and Bellugi and Brown[56]. Braine, however, found no discussion of the supporting evidence in the literature. He did admit that the knowledge of one language may interfere with the acquisition of parts of the structure of a second language.[57] Such interference effects occur at all ages. Interference would be expected on the general grounds that all new learning tends to be affected by past learning.[58] Thus, interference effects of this sort have nothing to do with the theoretical issue, which concerns the existence of a supposed genetically based ability which disappears or is diminished.

The evidence for age-specific ability seems to be contained in two observations:

(a) Children who acquire a second language normally learn to speak it without an accent, whereas an adult normally retains an accent long after he reaches fluency. While this difference may indicate some special facility at the phonological level, it provides no evidence that the facility extends to the acquisition of syntactic or semantic structure of vocabulary. It is not even known whether the child's phonological facility has a receptive component (e.g., an ability to

identify sounds of the new language at lower signal-to-noise ratios than the fluent adult with an accent).

(b) Some adults spend long periods in foreign countries without picking up the language. As evidence for special capacities in children, this particular observation seems to be of little value. An adult whose source of income does not depend on knowledge of the new language and who lives in a subculture where his native language is known, need not be motivated to learn. Similarly, there are American children in foreign countries who go to English-speaking schools and play with English-speaking peers and live for years without acquiring the language of the country in which they were living. The child who is sent to a local school or nursery in a foreign country is subject to what must be very effective conditions for language learning: massive exposure to the language combined with overwhelming pressure to learn. There is no evidence that an adult receiving concentrated exposure of this sort over a long period will fail to learn.[59]

In comparing child and adult achievement in language learning, it is important to remember that the natural standard of attainment--ability to communicate with peers--is biased in favor of the child, who needs know only a small part of the vocabulary that an adult need know for satisfactory communication.

Braine provided some indirect information on age as a factor in language acquisition by using Israeli census figures on the spread of the Hebrew language, concluding that if there is a decline in language learning ability with age, it is probably a slow decline associated with middle and old age, not with adolescence. (p. 71)

There seems to be only one experiment which compared children and adults. Using Russian, Asher and Price gave the same controlled exposure to 8-, 10- and 14-year old children and to college students. In three short sessions over a four-day period, the subjects heard Russian commands uttered on tape and learned the meanings of the commands just by watching an adult model obey them. Half of each age group simply watched the model act out the command; the other half copied the model, acting out the command. There was no other teaching of Russian of any sort. In the retention tests that came later, the subjects were tested by seeing if they could act out Russian commands without the adult model. Several of the tests used combinations of words which were not identical to those used in the training. The results were that the adults obtained nearly perfect scores on all tests; they were superior to all the children, doing about twice as well as the 8-year olds, with the intermediate age groups in between.[60]

It should also have occurred to most foreign language teachers that the post-adolescent students do not need an inordinate amount of time to learn things they see immediate use for; e.g., they quickly learn to say and respond to short greetings or to utter curses and dirty words in the new language, though from the linguistic analyst's point of view, these may be quite complex structurally.

Observed from the total cognitive viewpoint, the child is developing his intellect simultaneously with his language and can 'want to say' only what he is learning to say. The adult, on the other hand, can want to say what he does not yet know how to say, and he uses whatever means he has at his disposal. It is easy to see how the phenomenon of interference

referred to above can result from his attempt to do more than he has yet learned to do in the new language, and thus he fills in the gaps in his training with what he already knows from his native language. As Newmark and Reibel pointed out, if already learned habits exerted force against learning a new language (as implied by active metaphorical extension of the term "interference") one would expect the strongest habits to exert the greatest force; specifically, if a person knows imperfectly another foreign language in addition to the one he is trying to learn, we should expect his second language to be unable to compete with the native one in interfering with the third one. But in fact, it is commonly observed that the two imperfectly learned languages may infect each other to a greater degree than the native language will infect either one. Also, if learning a new language followed the psychological laboratory model of learning a new set of "habits", we should expect interference in both directions: any reduction of interference (which in the view often proposed is held to be proportional to the increase in the skill in the new language) should be accompanied by a weakening of the habits in the native language. But in fact one observes no direct ill effects on native habits as a result of increased learning of a second language. Newmark and Reibel indicate that there may be indirect ones; if, as a person learns a second language, he abandons the situations in which he speaks his native one, he may actually forget the latter. But such loss of native habits is like any other loss of skills which are not exercised: the proper learning of new skills--in contexts sharply set off from those appropriate for the old ones--does not interfere with the old ones.[61]

It is important, however, to distinguish the question of whether children have special abilities for language learning from the question

of whether children and adults typically learn second languages in the "same way." The adult can rarely afford the time the child supposedly spends (although even the time factor is questioned by Newmark and Reibel, as they point out that the child is extremely busy with many activities besides language [p. 155]), and the educated adult can have access to other resources, in the form of written materials and formal instruction in the language. However, illiterate adults learn new languages when they have to. They presumably face essentially the same tasks that children do, that of discovering the structure of the language on the basis of spoken text materials. There is no evidence that they solve this task in a substantially different way than do children.[62]

The issue of age-specific ability was also treated by Jakobovitz who reviewed the Penfield speech[63] with which many foreign-language teachers, especially FLES teachers, have become familiar. Jakobovitz noted that while Penfield is clearly a specialist in neurophysiology, he does not claim any special expertise in foreign-language teaching. One must therefore clearly separate what he said as an expert in neurophysiology from what he said as a concerned Canadian citizen interested in promoting bilingualism in his country.[64] Even while maintaining that unless the child is exposed to human speech before the age of puberty he will most likely never speak a human language,[65] Lenneberg seemed to be unable to make substantiated claims about second language acquisition.

Stern's 1963 UNESCO report on the teaching of foreign languages to younger children indicated that one of the advantages of beginning language learning in adulthood is that it provides the greatest amount

of learning in the least amount of time. This was in direct contradiction to an earlier statement in the same report indicating that pre-adolescent second language learning was easiest and most effective.[66]

The question of age-specific language ability is tied to the question of lateralization, also treated by several researchers and scholars. Herriot indicated that localization of language functions in particular parts of the brain is a hazardous pursuit, that a strict and detailed localization of function is untenable given the research on brain injury and aphasia. Even the linguistic theory of Jakobson and Halle, that the order of aphasic degeneration was the mirror image of the order of acquisition, has not been supported. Herriot concluded that a highly specific innate content might require a specific locus, and this is precisely what is absent even in adult language users.[67] On the contrary, the facts lead to a hypothesis of psychological functions involving interactions of many parts of the brain, as in Miller, Galanter and Pribram.[68] On the other hand, it might be argued that it is not a specific locus which is required for an innate component, but rather a specific system which could depend for its adequate function on many different parts of the brain. However, in this case, injury to any one part of the brain which serves the system should irretrievably disrupt language behavior in childhood; and the extraordinary capacity for recovery in children is well documented.[69]

To Herriot, it seemed necessary to suppose that during childhood, physiological function is sufficiently plastic to relearn language; this implies that there are no specific mechanisms located in particular parts of the brain which are responsible for language acquisition. (p. 130)

The Composite Theory of Language Acquisition

Before specifying the composite acquisition theory based on the foregoing studies, it might be well to indicate what the theory is not.

1. It is not the innatist theory of hypothesis testing. Chomsky seems to have given impetus to this line of thinking, and Katz summarized it succinctly:

> [Language acquisition] is a process of implicit theory construction similar in character to theory construction in science but without the explicit intellectual operation of the latter. The child formulates hypotheses about the rules of the linguistic description of the language whose sentences he is hearing, derives predictions from such hypotheses about the linguistic structure of sentences he will hear in the future, checks these predictions against the new sentences he encounters, eliminates those hypotheses that are contrary to the evidence, and evaluates those that are not eliminated by a simplicity principle which selects the simplest as the best hypothesis concerning the rules underlying the sentences he has heard and will hear. This process of hypothesis construction, verification and evaluation repeats itself until the child matures past the point where the language acquisition device operates.[70]

The difficulty with this theory is that the acquisition device must somehow be furnished with examples of what is not grammatical as well as what is grammatical. Braine found that there was little in the literature to suggest either that young children are typically given much information about what is not a sentence, or that they are able to profit from such information if they are given it. Those corrections which do seem to occur with reasonable frequency have to do with relatively trivial rules, e.g., special allomorphs of already acquired morphemes (bought for buyed) and presuppose a child whose grammatical development is well advanced. Moreover, the universality with which language is acquired at about the same age despite large cultural variation in child-rearing practices (Lenneberg, 1967) makes it hardly conceivable the corrections should be a necessary condition for learning.

since the care with which adults correct children's speech must be assumed to vary widely, both within and among cultures.[71]

As noted in Chapter I, Chomsky has himself pointed out the degenerate nature of the input to the child, noting that much of the actual speech to which it is exposed consists of fragments of sentences. He has used this as an argument for an important innate component in language acquisition.[72] According to Braine, it provides an equally powerful argument against a hypothesis-testing mechanism, since it is hard to see how a useful test of a hypothetical grammar could be made against this kind of input.[73]

From laboratory work on the learning of simple artifical semantically empty systems, it is clear that human subjects rather readily acquire at least a limited class of grammatical structures merely as a consequence of exposure to sentences, i.e., with no other input than a sample of the sentences of the system.[74] A recent experiment[75] indicated that the learning mechanism in such experiments robustly resists the inclusion in the input of some ungrammatical sentences along with the grammatical sentences to which they had not been exposed and rejected ungrammatical strings to which only some of the subjects had been exposed. These experiments imply that humans have a learning mechanism which is adequate for the discovery of at least some simple grammars and which cannot consist of generating and testing hypothetical grammars because the input information is insufficient for such a test. Moreover, to some extent this mechanism apparently provides for the forgetting of strings which contain unsystematic departures from the predominant patterns of formation of the input, an important consideration in the development of the theory which follows shortly.

2. It is not mediation theory. Mediation theory is a development out of stimulus-response association theory, i.e., out of the notion that in all learning "what is learned" is reducible to associations between events, primarily between "reponses" and "stimuli". In association theory, an organism's own responses can themselves serve as stimuli for further responses, leading to the formation of association"chains". (This is the direction of much of Skinner's work.) Mediation theory adds the assumption that some of the parts of an associative chain can be covert, unobservable, the covert steps being said to "mediate" between the observable steps. Mediation theory represents one of the ways in which association theory explains the fact that organisms can respond to stimuli in ways that are neither innate nor directly learned. However, adding the mediation assumption, that part of the chain need not be overt, seems formally equivalent to allowing that some of the transitions in a finite state diagram can be empty. Empty transitions do not increase the generative powers of finite state systems. Hence, mediation theory as presently constituted cannot provide the answer to criticism of associative chain and finite state models.[76]

Criteria for an Adequate Theory

The most comprehensive statement to date comes from Bloom:

> An ideal account of language development must specify at least three interrelated components: linguistic experience, nonlinguistic experience and cognitive perceptual organization, with the three components interacting to affect the development of linguistic competence. The three components are represented schematically in Figure A.

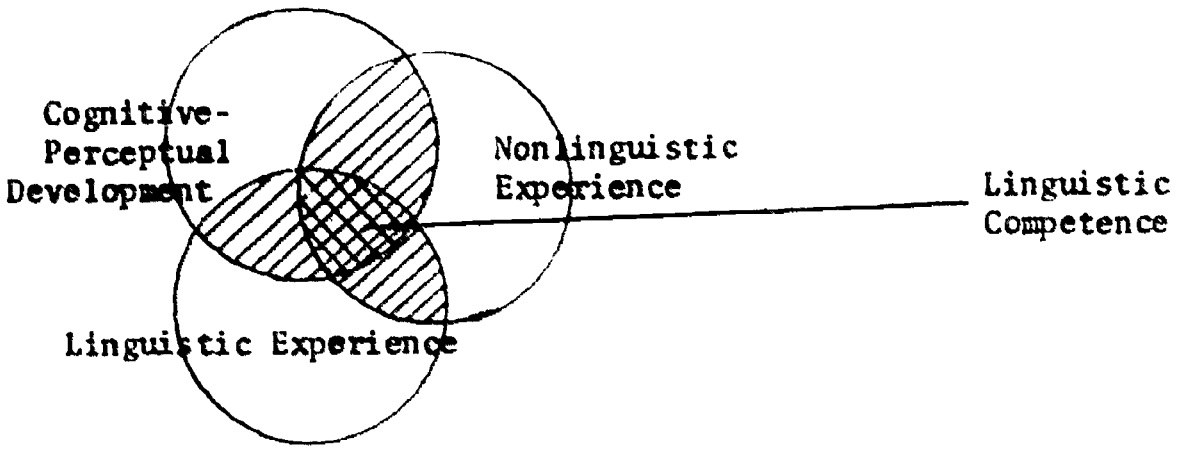

Figure A. Interrelationships of hypothetical components in language development

In the course of development, the three components presumably move, at varying speeds, in the direction of concentricity. Overlap of all three (the cross-hatched area) would schematically represent what the child knows about language. But there is also overlap between each of the three components and one other component (lined areas) with immediate effect on linguistic competence. That is, there are interrelationships--between development of cognition and nonlinguistic experience, between development of cognition and linguistic experience, and between linguistic experience and nonlinguistic experience--that do not result, by themselves, in language competence. With movement toward concentricity of the three components, these areas of overlap are progressively superimposed. They appear to represent, in some way, the mismatch between linguistic expression and cognitive awareness observed in the course of development.[77]

A Theory of Acquisition

Coming from three slightly different perspectives, the theories of Herriot, Braine and Hebb et al. can be combined into a single theory of language acquisition. The work of other scholars can be added to support this composite position. Herriot's contribution is of schema and strategy; Braine's is the model for the acquisition device; the Hebb team provides an explanation of the neurological mechanism.

Given the difficulties with both the purely behaviorist approach and the nativist approach, it is the theory of schema and strategy which seems best able to account for all the findings, including deep

structure. It can also account for behavior in general. The schema has a long history as a concept in British[78] and European[79] psychology. The strategy is the result of evidence of the hierarchical structure of behavior derived from diverse fields, owing its inspiration perhaps to Lashley[80] and its popularity to Miller, Galanter and Pribram, who call it a plan.[81]

According to Lunzer, schema and strategy are to be distinguished as follows:

> The difference is mainly one of emphasis; it is the difference between structure and function. So long as we are describing the actual sequence of events involved in the regulation of behavior, the language of strategies is quite adequate by itself. However, when we want to describe the connectivity of the various centres which are involved in such strategies, it is more advantageous to use the term schema. The strategy corresponds to the actual operation of the organism at any given time; the schema to its potential for regulated behavior. The strategy may be likened to the 'flow' of current in any phase of the operation of the machine; the schema is the wiring diagram itself.
>
> Strategies and schemata are hierarchial in nature, and may themselves be sub-strategies or sub-schemata in a hierarchy of strategies or schemata. Schemata may overlap with each other. Sub-strategies may be controlled by an initiating super-strategy, which may exercise different degrees of control over the transition from one strategy to another. Some transitions may be very highly determined, others free-wheeling. As a result of much less determined transitions, schemata associated with the strategies which succeed such a transition will be activated. Transitions may occur from one strategy to another at different levels in the hierarchy of strategies. Different levels of schema may therefore be activated as a result of such transitions. Thus schemata are not to be considered as super-strategies, but rather as on the same level as strategies, though fulfilling a different function. Strategies control the organization of present behavior at every level, while schemata correspond to the functional implication between the possible lines of behavior at every level.[82]

Such a theoretical system seems to be flexible enough to deal with the psycholinguists' findings. Strategies are implied by the psychological reality of the phrase-structure analysis of sentences. These are hierarchial in nature, as are strategies. They contain sub-units

for the construction of which the sub-strategies are required. The units of a sentence are produced sequentially in time, and the transition from one unit to another may be determined to a greater or lesser degree. For example, transition at a high level in the hierarchy, from subject to predicate, may be almost obligatory; but there is considerable choice at lower levels of the hierarchy (e.g., whether one qualifies a noun with an adjective or not.). Both top-to-bottom and left-to-right dependencies are therefore accommodated within the concept of the strategy.[83]

The development of language skills follows the same course as that described by Piaget for the development of schemata.[84] Take, for example, the learning of inflections. Schemata are formed as a result of continuous interaction between organism and environment. The schema is accommodated to certain salient features in the environment which strike the attention as being inconsistent with one's existing schema. In the case of inflection, the child may start with an over-simple rule (schema) whereby he produces "s" or "es" for all plurals. This has to be modified to copy with exceptions which cannot be ignored. The same may well apply to all syntactic rules, for example, transformations. When too many positional exceptions to the rule negative morpheme first are perceived, the rule has to be changed and more flexible procedures adopted.[85]

Deep structure is represented in schemata which mediate between non-linguistic schemata. It can be supposed that deep-structure schemata are activated by non-linguistic schemata and in turn activate more specifically grammatical and linguistic schemata.[86]

The schema and strategy concepts can also accommodate the model of the learning mechanism suggested by Braine. In his early work, Braine proposed (a) that what is learned of verbal structure are the temporal positions of units in verbal arrays and contingencies between morphemes; (b) that the position learned is the position of a unit within the next larger unit in a hierarchy of units; and (c) that position within a unit may be defined, either absolutely (e.g., first, last) or relative to a reference (e.g., before X, first after X, second after X, where X is some frequently occurring morpheme or "marker").[87]

The learning mechanism described by Braine consists of two principal components: (a) a scanner which receives the input sentences (one schema) and (b) an ordered series of intermediate memory stores (schemata within a higher-order schema), the last of which is the permanent memory store which contains the rules or pattern properties that are finally learned. The function (strategy) of the scanner is to scan each input sentence, observe its pattern properties, and cause these to be registered in an intermediate store. At the beginning of learning, the intermediate stores are empty, and the characteristics of the first input string are listed in the first intermediate store. Once there is some information in the intermediate stores, the properties observed in an input string are compared with the properties then listed in the intermediate stores, one order in the hierarchy of schemata triggering the next higher order. Those properties not already listed are recorded in the first intermediate store. When a property noted by the scanner is the same as one listed in an intermediate store, this property moves to the next intermediate store. As properties recur in the input, they

move progressively through the series of intermediate stores and eventually reach the permanent store.[88]

In order to fit the requirements noted earlier, the intermediate stores all have a built-in decay characteristic, i.e., the information stored is lost after a period of time. This forgetting affects the learning in important ways. First, it means that unsystematic "error" in the input will have little or no effect on learning: random deviation from grammaticalness may indeed be registered by the scanner, but since such errors are by definition dissimilar one from another, they quickly disappear without trace. Second, broad and abstract properties of the input corpus will tend to be more readily learned than specific properties. This tendency follows from the fact that the properties learned fastest are those that are shared by many sentences and thus recur frequently. In general, the intermediate stores act as a kind of sieve (similar to that referred to by the Hebb team earlier) which retains what is systematic in the input. Specific properties will be subject to repeated forgetting and restorage, although those that recur often enough will of course be learned--among them, the exceptions and special cases which are so common in natural languages.[89]

It should be noted that this mechanism is consistent with the Hebb et al. cell assembly theory in which assemblies of the first order (directly related to a specific stimulus) excite second order assemblies, which in turn excite third order assemblies, etc.

Braine further postulates that the scanner has access to the information in the permanent store (a relationship of the different schemata). Thus, once some learning has taken place so that the permanent store is no longer empty, the scanner is in a position to attempt

a preliminary analysis of incoming strings on the basis of its partial knowledge of the structure of the input corpus. That is, the first scanning step incorporates a recognition routine, as stimulation of the first-order assemblies, a strategy involving lower-level schema. Already-learned information about the structure of the short string is used to group the elements of longer strings, so that these may be recorded as being composed of shorter strings. Also, pattern properties registered may be recorded as deviations from already learned properties or as special cases of them.[90] (Perhaps this version of a hypothesis-testing theory will appeal to those who wish so strongly for that type of theory.)

It can be seen that the most complicated part of the model is the scanning mechanism. The properties of sentences that the scanner is sensitive to, at least initially, are taken for granted; i.e., the model does not account for their coming into existence. Moreover, since it has to be assumed that only a few properties of any particular sentence get registered at any one time, there is probably an unlearned order among the properties determining which are preferentially registered. In general, therefore, the scanner is "preset" to notice certain features of the input and to ignore others. Thus, this model shares one feature of the Chomsky-Miller model, in that universal properties of natural language are for the most part built into the acquisition model. However, the present model represents a different hypothesis as to how these properties are built in. Put into the schema and strategy paradigm, this is to say that there is a biological predisposition for certain schema to be formed and activated.

One weakness of the theory presented above is that is has little to say about the development of transformations. While the nativists maintain that it is impossible to develop a theory of the learning of transformations within traditional psychological frames of reference,[91] approaching the problem as the learning of changes of form does seem to present a possibility. It is well established that organisms are often sensitive to stimuli which are identifiable only as alternations of other already familiar stimuli.[92] Morphology provides many examples of signals manifested primarily as alternations in already familiar items, e.g., to understand sang one must presumably perceive the "underlying" signal sing, in addition to the past tense morpheme expressed as a change in the form of sing. Many transformations can be regarded as instances of such alternation, in which one signal (e.g., "negative" or "question") is recognizable through the changes made in the already familiar form of another signal (the underlying sentence). Thus, if S is a sentence converted into S' by the singular transformation T, S' can be analyzed as containing two components, S + T.

To see a thing as a hanged form of something else, the latter must of course be already familiar. Thus, to regard the learning of transformations as the learning of changes in form, it would have to be assumed that the learner is familiar with the kernel structure before he learns the transformation; i.e., to a substantial extent, the kernel structure must be acquired before transformations are learned. The evidence[93] indicates that this is the case, and the development of negatives and questions seems quite consistent with the notion that what is learned is an alternation in a familiar structure. For example, the negative morpheme is first realized directly as no, not

—or don't (or their equivalents in other languages), the negative item being simply appended to the sentence or placed before the predicate phrase. No transformation is apparent until after the kernel sentence structure is fairly well developed, and the changes in form are learned in steps, the change from some to any, for instance, being learned after the change in the auxiliary (I want some--I don't want some--I don't want any). Thus, the negative sentence has the structure Neg + Sentence from the start; the development lies in the step-by-step learning of the manifestations of the negative morphemes.[94]

To show the application of the general composite theory to other aspects of linguistic behavior, we will look briefly at its application to the production of language by adults. Herriot's experiments showed that when a sentence contained strong cues based on expectation, those cues were employed in preference to grammatical cues. He thus concluded that there was a close connection between specifically linguistic and non-linguistic schemata.[95] Osgood supposed that the same was true of production. He stressed the importance of content before structure; one decides what one wants to say before how one is going to say it. In particular, there are features of the non-linguistic situation which act as cues to utterance. For example, there might be a situation when a woman bather was rescued on a crowded beach by a boy. The utterance might be "The tall boy saved the drowning woman." Take the subject of this sentence, "the tall boy". The grammatical construction Article + Adjective + Noun is required because the construction Article + noun would not distinguish the rescuer from all the other boys on the beach. The physical situation has constrained the grammar but so too has the requirement of

communication. For it is assumed by the speaker of this sentence that the hearer wishes to be able to distinguish the rescuer from other boys. It may thus be inferred that different non-linguistic cues may activate non-linguistic schemata and thence language schemata and language behavior. These non-linguistic schemata may be expectations about the outside world; perhaps the violation of an expectation is more likely to lead to activation of language schemata: one is apt to mention something unusual. The non-linguistic schemata may also be expectations about the communication situation. These expectation schemata may be activated by, for example, visual cues which suggest that one's auditors want information; or are in a position to give one information themselves.[96]

This account is concerned with the regulation of behavior by means of language and of language by means of behavior. The latter process is supposed to occur first in development, since it does not demand complex feedback processes. But it should be stressed that the very early connections between non-linguistic and linguistic schemata postulated here are not contradictory to the theories of Bruner[97] or Piaget[98] concerning the connection of language with cognitive development. Bruner wonders why the power-house of language is not harnessed sooner to aid cognition. Piaget replies that cognitive development is according to stages, and that only when a certain stage has been attained can language be used to help. The crucial stage which both are concerned with is, in fact, that of operational thinking. This requires the representation to oneself of the criteria of one's behavior; in other words it requires the representation of

alternative schemata. This representation of schemata must be distinguished from the regulation of behavior by non-linguistic and linguistic schemata.

Thus we come round to the criterion for an adequate theory of language stipulated by Bloom above, the interaction between linguistic, non-linguistic and cognitive experience. This theory has one other important advantage; it brings language behavior back into a general behavior theory.

Summary of the nativist-empiricist theory

1. Human language is a result of the interaction of linguistic, non-linguistic and cognitive development. Although the human seems innately predisposed to learn language, the actual learning depends heavily on his environment, linguistic and non-linguistic.
2. The psychological theory which seems to best account for these phenomena is that of schema and strategy, while the cell-assembly theory gives insight into the physiological and neurological workings. This theory bridges the gap between the extremes of behaviorism on the one hand and nativism on the other.
3. The language learning mechanism is seen as consisting of a scanner and a series of storage banks with built-in decay characteristics.
4. The acquisition takes place as the raw language data is analyzed into an increasingly refined series of feature contrasts, the scanner being "preset" to notice certain features.
5. It is important for the child to have concrete experiences with the linguistic and non-linguistic environment in order for him to extract the necessary linguistic data.

6. The earliest grammar recognizes open and pivot classes of words, but rapidly changes to a more productive grammar, functions still being learned, however, primarily by position.
7. Although imitation is definitely a part of language acquisition, it is not the major process involved. The child seems to use imitation and verbal play primarily to bring his motor skills up to his conceptual level (to make his performance more closely approximate his competence, to use Chomskian terminology).
8. Inflections are explained as being the gradual development of generalizations (often over-extended at first) from a rough add-a-segment process to the fine distinctions involving several allomorphs. They are learned as changes of known forms, in the fact of linguistic and non-linguistic experience.
9. Telegraphic speech and omissions (in contrast with adult speech) are seen as reflecting the phrase structure tree diagram, with the lowest elements most subject to omission, the major contrasts occurring at the higher nodes.
10. The process involves a great deal of perceptual learning, characterized by lack of overt response.
11. Although the general pattern of development is similar for children within and among cultures, there are many individual differences in the routes taken to arrive at the same goal: adult command of the language.
12. Language learning capacity does not seem limited to any particular period of life. Lateralization itself is not sufficient to explain language acquisition.

Nativist-Empiricist Foreign Language Methodologies

Since the nativist-empiricist theory maintains no distinction between pre-adolescent and post-adolescent language-learning ability, a common set of principles can be shared. However, it must be recognized that, although children and adults can learn in the same way, they often do not, for the adult frequently takes short cuts via reading and rule summaries.

The principles which could be used with learners of all ages include:

1. Furnishing examples of "whole speech" perhaps graded (rendered increasingly complex) situationally, as the child experiences graded real-life situations, but not graded grammatically.
2. Permitting the student to approximate standard language gradually, allowing him to develop his system of contrasts both in phonology and in syntax. That is, the instructor will not insist on perfection in pronounciation nor in syntax in the early stages of the course, but will rather let the student "come close" to the standard usage gradually, just as he gradually perceives, then makes distinctive contrasts in the language.
3. Providing ample opportunity for the student to try his version of the language against the teacher's version, as the teacher expands, corrects, or just comments on the student's use--an attempt to utilize the optimal mixture of expansions, corrections, and commentary found in first-language acquisition.
4. Giving the student the opportunity to practice (soliloquize on) syntactic and phonological paradigms. For example, in French he can be exposed to and allowed to practice the phonological set balle, bille, bulle, boule and bol (with visuals or the actual objects).

5. Giving corrections and expansions as the student over-generalizes inflectional or transformational rules.
6. Teaching inflections and transformations within concrete situations (e.g., for negation, interrogation, etc.)
7. Permitting the student, in the early weeks of instruction, to omit parts of sentences which are far down on the phrase-structure tree.

There seems to be no one method currently in wide-spread use which employs all these principles. What seems essential to the method is that whole segments of the language be presented, either as actual situations, or via an audio-visual simulation, and the student have the opportunity to witness the episode several times, each time attempting to reproduce the language involved. The teacher's role is that of encouraging, occasionally correcting, expanding his attempts and just talking generally in the foreign language about the student's response. There would be considerable class time devoted to activities which allow the student to marshall his linguistic repertoire, the teacher asking questions like, "In the course of the day, what does Bill do?" so that the verb portion of the phrase structure can be repeatedly filled, its position learned. This type of activity would also permit a certain amount of creativity on the part of the student, a factor which is seen as being fundamental to his acquisition of his first language.

In keeping with the concept of providing a mixture of linguistic, non-linguistic and cognitive experiences, gestures should be used in the classroom. Green's recent volume[99] should be useful, at least in Spanish classes.

Allowing the student to observe the new language situation several times without expecting him to immediately use the material would allow

him to use his perceptual learning abilities more than our present teaching techniques usually do. The student can be permitted to take what he wishes from the language situation he has observed, and the teacher should not be disturbed if either phonology or syntax or both are not "correct." The important aspect of this methodology would be that the student is exposed to authentic language, and that he takes from it what he wants to say--a technique and approach which is being highly touted in other disciplines, but which finds acceptance difficult in foreign language classrooms.

In contrast with the nativist method, instead of talking about the language (presumably in English), there would be a maximum of talk in the foreign language, and much of it would be student-initiated. In this way we can encourage creativity and student selectivity in the initial stages of language learning, rather than telling the student that after he is proficient he will be permitted to be creative.

Evaluation of the Methodologies

Before proceeding to an evaluation of the methodology outlined above, it is important to mention that the home-school language switch described and evaluated in Chapter II is also permitted under a nativist-empiricist theory. Its evaluation would be identical to what was noted earlier.

Because there is no extant model of this methodology, it is difficult to use the criteria of the Minnesota Guide (See Appendix A) for evaluation.

However, one could assume that many of the administrative criteria could be fulfilled, except for items 6, 7 and 13. Item 6--the preparation of the teaching staff--would have to take into consideration a different

type of training for this type of instruction, but since the methodology seems to bear more relationship to language arts methodology than to speech correction (as extreme examples), it would seem that colleges of education might be in a better position to train teachers for this foreign language methodology than they are for inculcating a methodology which seems to be at cross-currents with the rest of secondary education at the moment.

Item A-7. It would be important that much "supplementary" or supportive material be provided, especially in the area of audio-visual technology. This could be an item of great expense.

It is in the area of the instructional considerations of the Minnesota Guide where this methodology might be considered strongest. For example, in Items B-2 and 8--suitability of instructional method--if we assume that the method is sound because of the way in which it parallels first-language acquisition, there is a good chance that it would be appropriate for the various language skills and various student abilities, at least as appropriate as current methodologies. In addition, given the techniques of permitting and encouraging student creativity, this methodology should appeal, especially to today's students.

Under evaluative considerations, one could assume that many of the better evaluative instruments now in use could be used, so long as it was remembered that the student will be approaching mastery gradually, which is in contrast to the current usual practice of working on a phonological or syntactic point for a period of time, then assuming that the student has mastered it, then testing him on it. In this regard, it

should be pointed out that this methodology would seem to be in sharp contrast to the current stress on performance criteria, particularly in the early stages of instruction.

In attempting to evaluate this methodology by means of the Rivers Criteria (See Appendix B), one can compare it with the Direct Method, which Rivers evaluates in her recent text.[100]

Item 1--objectives--could well be the same in this methodology as for other contemporary methods. We would assume here functional mastery of the four language skills, knowledge of the target culture, and informal skills of linguistic analysis.

Item 2--economy of techniques--might well give precedence to the nativist-empiricist methodology, if indeed, attempting to duplicate the process of first-language acquisition produces better results than current methods. On the face of it, one could question the time spent allowing the student to "be creative" and to "gradually approximate standard language." On the other hand, one can point to many instances in learning where the interest of the student and his desire to pick his own way through the discipline produce better results than a highly structured program. While Rivers criticizes the Direct Method for its heavy use of unplanned discourse and the slowness of pace this sometimes produces, especially with less-than-average students (p. 20), the present methodology might permit the student to move at his own pace, or at least through his own series of stages. The teacher, however, would probably present a structured sequence of material.

Items 3-4. The heavy use of audio-visual material would probably help all students, particularly the less-than-average student.

Item 5--demands on the teacher--would produce a mixed evaluation. The actual presentational devices would be highly structured, as noted above, and this would reduce the amount of planning and preparation time for the teacher, at least in comparison with the Direct Method. However, compared with recent audio-lingual materials which tend to be highly structured, the teacher would spend at least as much time in preparation. Since there would be alternative ways for students to approach mastery, and perhaps alternative rates of speed, the teacher would probably not have to rely so much on being a "ring-master" in the classroom, with the constant obligation to keep the foreign-language stream flowing.

There is only one aspect of the method which has had the benefit of empirical study. The situational approach, as contrasted with a structural approach, was studied by Hauptman.[101] American children learning Japanese were treated in two ways: one group used material sequenced in order of increasing difficulty of grammatical and lexical forms while the other group was presented the same material in the form of meaningful dialogues. The principal findings were (1) that the situational approach produced results equal to or better than those of the structural approach, (2) that the situational approach produced significantly better results among students of high language aptitude and intelligence; and (3) that there was no significant difference between approaches among students of lower aptitude and intelligence. (p. 235). Hauptman also cited theoretical backing for the situational

approach in the form of Bauer's suggestion of turning to Gestalt psychology,[102] Brown's demonstration of support in the principles of cognitive psychology,[103] and from Bandura and Walters.[104] Hauptman also cited Upshur's four experiments, the results of which indicated that sequential mastery of foreign language materials is almost certainly unnecessary and perhaps even impossible.[105] The other aspects of the method seem to have no empirical support (nor rebuttal, for that matter).

Although one might attempt to find empirical data for the various facets of this method, such an attempt seems outside the realm of this paper. The task here has been to find a defensible theoretical position.

NOTES

[1]G. Richard Tucker and Alison d'Anglejan, "Language Learning Processes," in The Britannica Review of Foreign Language Education Vol. 3 (1971), p. 166.

[2]D. O. Hebb, W. E. Lambert and G. R. Tucker, "Language, Thought and Experience," Modern Language Journal, LV (1971), pp. 212-213.

[3]W. J. Brogden, "Sensory Preconditioning," Journal of Experimental Psychology, XXV (1939), pp. 323-332.

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CHAPTER IV

CONCLUSION

Summary of Findings

Scott characterized the current period in foreign language education as a search for a substitute trinity--transformational-generative grammar, non-behaviorist psychology and a yet-unspecified methodological component to replace structural grammar, behaviorist psychology and the audio-lingual methodology.[1] The hybrid of psychology and linguistics--psycholinguistics--is often looked to to provide some valid basis for a methodology, particularly from the study of first-language acquisition.

In this paper, we have attempted to explore the possible applications of psycholinguistics to second-language acquisition, this attempt being unique in the following ways:

1. Heretofore, there has been no attempt in the literature to distinguish clearly between the two major positions on first-language acquisition--nativist and nativist-empiricist (composite). In fact, this paper takes three separate accounts of the composite theory and interweaves them in what is hopefully a coherent manner.
2. The previous attempts to extract a second-language methodology from first-language acquisition theory (See Chapter I) have tended to reflect a given author's own prejudices in terms of second-language method. There has been a tendency to pick and choose principles which have suited the author's own methodological ends.

3. Even where there have been attempts to extract methodological principles, there has been no attempt to measure them against any sort of evaluative yardstick.

By contrast, this paper presents two distinct theories of first-language acquisition, extracts second-language teaching principles from each of them, then attempts to evaluate these rudiments of methodology by means of two representative evaluative instruments--the Minnesota Guide to Foreign Language Programs and the Rivers Criteria.

We shall now summarize the findings of each of those stages.

The Nativist Position

Both theoretical and empirical work in the area of first-language acquisition have undergone major changes in direction in the past two decades, motivated primarily by the work of Noam Chomsky. One direction has been that which is entitled "nativist" and whose strongest exponent is David McNeill.

According to McNeill's theory, the acquisition of the mother tongue proceeds in basically the same manner in children everywhere, for children are born with language universals and a Language Acquisition Device (LAD). The LAD contains strategies (content and/or processes) for assigning words in a corpus to ever more discreet categories. The child's LAD is thus seen as having a structure parallel to that of a transformational-generative grammer.

Armed with the LAD, all children approach the learning of syntax and phonology in the same manner, beginning by making the unversal contrasts which occur in all languages, then gradually learning the contrasts and transformations which are language specific. In their earliest "sentences" children use one- and two-word utterances which correspond

very directly to base structures (kernel sentences). The errors we hear children make in their mother tongue are usually the result of the child's attempt to apply simple, encompassing generalization to a concept like inflections or word order, before he has had sufficient contact with the language to see that the many variations can be fit into an interwoven set of generalizations.

Neither the child's imitation of adult speech nor an adult's expansion of the child's speech is seen as a method of helping children to acquire language; the underlying forms must have been developed by the child's own LAD before he can assimilate new expressions. However, children often soliloquize--run through their repertoire of words and sound--but these soliloquies are often unacceptable by adult language standards.

One crucial facet of this theory is that of lateralization--that the brain seems to have a critical period for language development--the period prior to puberty. After the onset of puberty, language acquisition is seen as being increasingly difficult.

Attempting to extrapolate from this theory to a theory of second language methodology is a difficult business, perhaps an impossible one as Rivers has recently suggested.[2] However, the second-language methodology which would seem to have the closet relationship to the nativist theory would include the following principles:

1. The early part of the course would be devoted to the examination of language universals--the features all languages share--and then an examination of the various specific features and relations which will be found in the language to be studied.

2. The student's actual use of the language would begin with kernel sentences, the teacher then demonstrating simple transformations and encouraging the students to use them. Poor phonology would be permitted at this point, since the students would still be developing their own system of feature contrasts.
3. The cycle of instruction would be (a) exposure to a graded language situation, preferably in an environmental (i.e., via audio and visual media) approach; (b) guidance by the instructor toward the formulation of rules, general and imprecise at first, and then more refined.
4. The teacher would present additional information about the phonological features which the students may or may not have discovered at any given point, and the teacher would subsequently attempt to correct phonology by referring to the feature contrasts.
5. Students would be encouraged to soliloquize on phonological or syntactic paradigms.

Because the nativist theory of first-language acquisition puts such a heavy emphasis on the mental equipment the child is born with (the LAD), it is almost as if the child needs hear only a small amount of language data, then sit back and wait for his LAD to fit this data into the scheme of language universals and thus produce a full-blown transformational-generative grammar for the child. Thus the methodological principles which can be extracted are few in number and hardly produce anything approaching a true second-language methodology.

Even using the principles listed above, we immediately see a major problem--the fact that the learner would have a double burden (a) learning the fundamentals of transformational grammar (a task not all that easy for university students) plus (b) learning the language itself. In

order to understand language universals--features and relations--a rather sophisticated knowledge of linguistics would have to be provided.

However, there is one strategy which would permit the nativist theory to be applied to second-language acquisition--the strategy of home-school language switch described in Chapter I. In that program, children are given the major part of their schooling from kindergarten on in a second language, and, being under the age of puberty, the child presumably still has access to his LAD which will produce proficiency in the second language as it did in the first.

Evaluating a post-adolescent methodology based on the nativist position is a virtually impossible task because of the sketchiness of the "method," but the language-switch program would rate very high on the Minnesota and Rivers scales, if the assumptions of a well-coordinated program are made.

The Composite (Empiricist-Nativist) Position

The second major direction in new thinking about first-language acquisition has taken can be found in the work from three sources, Martin Braine, Peter Herriot, and a team at McGill University, consisting of W. Lambert, D. Hebb, and G. R. Tucker. Interwoven in Chapter III, the theories from these three sources provide the theory of first-language acquisition which can be summarized as follows:

Human language is a result of the interaction of linguistic, non-linguistic and cognitive development. Although the human seems innately predisposed to learn language, the actual learning depends heavily on his environment, linguistic and non-linguistic. The psychological theory which seems to best account for the language learning phenomenon

is that of schema and strategy, while the cell-assembly theory gives insight into the psychological and neurological workings. This composite theory seems more adequate in explaining all the facts of language acquisition than does either the nativist or the behaviorist theories, yet takes essential parts from both these theories.

The language learning mechanism is seen as consisting of a scanner and a series of storage banks with built-in decay characteristics. The actual acquisition takes place as the raw language data is analyzed into an increasingly refined series of feature contrasts, the scanner being "preset" by heredity to notice the contrast in certain features. Without concrete experience with the linguistic and non-linguistic environment, however, the child cannot extract the necessary linguistic facts. The first step in the process is the categorization of words into open and pivot classes, subsequent steps being the increasing refinement of classes, based primarily on the position of the word or element in the utterance.

Imitation is seen as being a part of language acquisition, but not the major process involved. The child seems to use imitation and verbal play primarily to bring his motor skills up to his conceptual level. The entire process of language acquisition involves a great deal of perceptual learning in which there is little or no overt response.

The child's acquisition of inflections is explained as being the gradual development of a generalization (often over-extended initially), from an add-a-segment concept to the fine adult language distinctions involving several allomorphs. Inflections are learned as changes of known forms as the child experiences greater numbers of varied linguistic

and non-linguistic situations. Telegraphic speech and omissions (omissions insofar as adult speech is concerned) are seen as reflecting the phrase structure tree diagram, with the lowest elements of the tree most subject to omission (the major contrasts occurring at the higher nodes of the tree).

In contrast to the nativist position, this theory sees language-learning capacity as not being limited to any particular period of life (such as pre-puberty). Although the general pattern of development is similar for children within and among cultures, there are many individual differences in the routes taken to arrive at the same goal: adult command of the language.

Extrapolating from this composite theory to a second-language methodology is somewhat easier than from the nativist position, but the following methodological indications are far from complete. The "method" might well begin with the presentation of examples of "whole speech," that is, authentic chunks of language. The chunks would be graded in terms of increasingly complex situations (as life itself is) but there would be no grammatical grading. The student would attempt to use the language soon after experiencing it, the instructor not being concerned about poor phonology or structure, at least in the early weeks of instruction, for the child would be developing his own system of feature contrasts. The teacher would expand, or just comment on what the child said ("modelling"), gradually increasing the corrective portion of the commentary so that the child can develop sophisticated inflectional and transformational rules.

The instruction would require heavy use of audio-visual equipment, as the language situations should be concrete ones, as should be the

situations which teach inflections and transformations as changes of known forms. This also suggests the use of gestures.

There would be heavy emphasis on student creativity--from permitting the student to omit parts of sentences which are far down on the phrase structure tree to encouraging him to soliloquize on syntactic or phonological paradigms.

Before evaluating this methodology, one should note that the home-school language switch program could also operate under this theory of first-language acquisition and receive the same positive evaluation as under the nativist theory.

Evaluating the nativist-empiricist methodology in terms of the Minnesota Guide and Rivers Criteria is only slightly easier than evaluating the nativisit "methodology" for there are only slightly more indications as to how to proceed with the actual instruction. However, in comparing the composite methodology with the Direct Method, as Rivers did, we can assume that the composite methodology might be more effective, since there would be less use of unplanned discourse, and a more structured teaching situation. It might well meet the needs and interests of more of the students, particularly if creativity were included in teacher as well as student activity. This method might also be more effective in that it would more closely parallel the type of instruction found in other disciplines, with less stress on habit-formation than, for example, the audio-lingual methodology.

One aspect of the method which has received empirical study is the situational (as contrasted with grammatical) gradation. That procedure has been found to produce good results.

Conclusions

The conclusions of this paper may be summarized as follows:

1. The Nativist approach to first-language acquisition does not lend itself to producing a methodology for second-language instruction.
2. The Composite (Nativist-Empiricist) approach to first-language acquisition produces some principles on which a second-language methodology can be based. Despite the limitation of having no elaborated methodology in practice, the methodological theory, by extension, can be favorably compared with the Direct Method, and to a certain extent, with the audio-lingual method, when evaluated by the Minnesota Guide to Foreign Language Programs and the Rivers Criteria.
3. The home-school switch program could operate under either of these theories, and this program rates high on the evaluative instruments.

Implications for Further Study

1. The major question which needs further study is, of course, the empirical question of whether an elaborated second-language methodology based on the nativist-empiricist first-language acquisition theory can be made to operate effectively--and this is indeed a major question. From the theoretical construct provided in these pages, one needs to progress to the elaborated methodology, including materials and techniques for a given language or for several languages. Then the students taught by means of such a methodology must be compared with those taught by other methodologies and their proficiencies compared.

2. A second issue of interest to this writer is the question of whether children or adults learn a foreign language more quickly or more effectively. Adherence to the nativist-empiricist theory would lead one to believe that adults would be just as efficient. The single piece of research we currently have on this point hardly seems adequate in view of the major effort expended over the past two decades to implant foreign language in this nation's elementary schools.

NOTES

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APPENDIX A

EVALUATION OF A FL PROGRAM

from Guide to Modern Foreign Languages
Minnesota State Dept. of Education,
1966

Evaluation of a total educational program considers the amount and quality of effort expended on a program and the observable results in terms of student learning. Specifically, the following questions may be asked regarding a school's foreign language program.

A: Administrative Considerations.

1. Is the school schedule flexible enough so that students may enroll in foreign language classes without sacrificing other worthwhile educational experiences.

2. Does the school provide a foreign language sequence long enough so that students may develop a real proficiency in the language?

3. Have provisions been made for continuity of instruction from its beginning through grade 12?

4. Have procedures been established to articulate the instruction program between levels in any given school and/or between elementary school, junior high school and senior high school when programs exist at lower levels?

5. Have adequate provisions been made to coordinate the program within a building and within the school district?

6. Is the preparation of the teaching staff adequate to meet the stated objectives?

7. Does the school system promote participation in in-service training, night courses, summer institutes, and travel abroad?

8. Are teachers compensated for engaging in such further activity?

9. Is the staff utilization appropriate and effective?

10. Is adequate supervision provided for the program?

11. Is the community involved in planning and developing the program?

12. Are foreign language experiences available for all children?

APPENDIX A (Continued)

13. Has sufficient space, materials and equipment been provided for teachers to create a varied and stimulating program and to deal with individual differences? (Are there tape recorders, record players, slides, FL periodicals and books, realia, tape recordings, etc. available?)

B: Instructional Considerations.

1. Have the objectives of the program been clearly defined?

2. Are the instructional methods used suitable for learning all foreign language skills?

3. Is there emphasis on language as communication?

4. Is the student taught spoken language appropriate for conversational use as well as literary language?

5. Are there opportunities to compare the native with the foreign culture?

6. Has the course been planned in sufficient detail to provide appropriate guidelines?

7. Has the program been planned in accordance with the total curriculum?

8. Are materials used in instruction appropriate to the ability, maturity, and interests of the learner?

C: Evaluative Considerations.

1. Do evaluation activities measure command of a language in situations approximating those in life?

2. Are all four skills evaluated?

3. Is there evidence of student progress in all skills?

4. Have the instructional materials and equipment used proved efficient and adequate?

5. Is standardized testing used?

6. Is the material learned enjoyed and used widely in and out of school?

7. Is there increased interest in foreign peoples and cultures?

APPENDIX A (Continued)

8. Is there evidence of increased international understanding as shown by activities such as:

   a. Use of supplementary materials (books, films)?

   b. Contact with speakers of the language?

   c. Trips?

   d. Civic activities?

   e. Foreign language camps?

   f. Pen pals, tape pals?

9. At the advanced levels in the longer sequences is use made of modern literary materials interesting to students at that particular age level?

10. Is there participation in special foreign language and related activities in school and community?

11. How well do teachers use testing and other forms of evaluation in analyzing the effectiveness of their teaching?

APPENDIX B

CRITERIA FOR EVALUATING FOREIGN LANGUAGE METHODOLOGIES

from Teaching Foreign Language Skills by Wilga Rivers (Chicago: Univ. of Chicago Press, 1968) pp. 13-14.

1. What are the objectives of the method under discussion and are these objectives appropriate for the teaching situation in which the teacher finds himself?

2. Do the techniques advocated by the proponents of the method achieve the stated objectives in the most economical way?

3. Do these techniques maintain the interest and the enthusiasm of the learners, and at what levels of instruction?

4. Are these techniques appropriate for all types of students?

5. Are the demands these techniques make on the teacher such that he can carry a full day's teaching load?

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