THE APPLICATION OF PROGRAMMED INSTRUCTION

THE APPLICATION OF PROGRAMMED INSTRUCTION

TO A FRENCH LANGUAGE COURSE

by

MARCIA JANE GOUGH, B.A. (CHICAGO)

A Thesis

Submitted to the Faculty of Graduate Studies

in Partial Fulfilment. of the Requirements

for the Degree

Master of Arts

McMaster University

May 1968

MASTER OF ARTS (1968)   McMASTER UNIVERSITY
(Romance Languages)   Hamilton, Ontario

TITLE: The Application of Programmed Instruction to a
           French Language Course.

AUTHOR: Marcia Jane Gough, B.A. (Chicago)

SUPERVISOR: Professor W. N. Jeeves

NUMBER OF PAGES: iv, 187

SCOPE AND CONTENTS: The purpose of this paper is to study
various problems which arise in applying programming principles
to a French language course. While developmental reports of
various programmes will be considered, this is essentially
an investigation of internal aspects of programmes. Linguistic
pedagogical and programming problems will be discussed in
relation to specific French programmes.

ACKNOWLEDGMENTS

T A B L E   O F   C O N T E N T S

INTRODUCTION

In recent years there has been much emphasis on the
psychological foundations of foreign language teaching. New
insights into the acquisition of foreign language skills have
enabled educators to utilize more effectively the findings of
structural and descriptive linguists. The linguists' reliance
on authentic target language speech as the authority and
source of language, and research in the field of psychological
learning theories have necessitated revisions in traditional
foreign language teaching concepts. One particular
educational development based on behavioral science research
is programmed instruction, and its application to foreign
language teaching problems presents some interesting
theoretical and methodological departures from the traditional
grammar-translation method or the newer "linguistic method"
(sometimes referred to as New Key or Audio-Lingual method).

Programmed Instruction has often been associated
with the idea of "automation" and many "teaching machines"
do utilize programmed materials as a basic core of instruction.
There is a tendency among educators to react adversely to
new technological devices on the grounds that the educational
process is being dehumanized. Joseph S. Roucek begins
his book on programmed teaching "A specter is haunting the

United States - the Specter of automation."[1]

However, the use of technology for the advancement
of teaching and learning is not really new. One of the most
important steps in this process occurred five hundred years
ago, with the invention of the printing press and the
subsequent introduction of the printed book into the class-
room. We are so accustomed to using books in the educational
process that it is difficult to imagine a school that does
not have the benefits of the printed book. Five hundred
years from now it may be equally difficult to conceive of
schools that do not utilize mechanical and electronic devices
for communicating, storing and retrieving information in the
interests of achieving a more effective educational programme.

Marshall McLuhan has pointed out that a new technology
will gradually create a totally new human environment. In
the electric age, data classification will yield to pattern
recognition (key phrase at IBM), and to studies of
configurations:

> The young student today grows up in
> an electrically configured world. It is a
> world not of wheels but of integral patterns.
> The student today _lives_ mythically and in
> depth. At school, however, he encounters
> a situation organized by mean of classified
> information. The subjects are unrelated.

---

[1] J. S. Roucek, ed., _Programmed Teaching: A Symposium
on Automation in Education._ (New York: Philosophical Library,
1965), p. vii.

They are visually conceived in terms of a
blueprint. The student can find no possible
means of involvement for himself, nor can he
discover how the educational scene relates
to the "mythic" world of electronically
processed data and experience that he takes
for granted. As one IBM executive put it,
"My children have lived several lifetimes
compared to their grandparents when they
begin grade one".[2]

In another book McLuhan emphasizes the disparity

between the home and school environment:

There is a world of difference
between the modern home environment of
integrated electric information and the
classroom. Today's television child is
attuned to up-to-the-minute "adult"
news -- inflation, rioting, war, taxes,
crime, bathing beauties - and is
bewildered when he enters the nineteenth-
century environment that still characterizes
the educational establishment where
information is scarce but ordered and
structured by fragmented, classified
patterns, subjects, and schedules. It is
naturally an environment much like any
factory set-up with its inventories and
assembly lines.[3]

The utilization of technological devices is

especially important in the field of language instruction.

---

[2]Marshall McLuhan, Understanding Media: The Extensions
of Man (New York: Signet Books, 1964), p. viii.

[3]Marshall McLuhan and Q. Fiore, The Medium is the
Massage (New York: Bantam Books, 1964), p. 18.

Films can introduce the student to the culture of the country and allow him to experience the language in a natural and meaningful situation. Tapes and records facilitate the drill and practice necessary for the acquisition of new language habits, and the teacher is freed for more creative and individualized teaching. In the language laboratory the student is exposed to a variety of native speakers, and can intensify, individualize and internalize his practice of the spoken language. However, it must be emphasized that these devices are teaching tools and only in the hands of skillful teachers using appropriate instructional materials will they produce any appreciable results. It is evident that many language courses are taught with twentieth-century technological devices and nineteenth-century content.

With the passage of the National Defense Education Act in 1958 in the United States there was a dramatic increase in the number of language laboratories in educational institutions. From a few dozen language laboratories in the secondary schools the number grew to almost 10,000 in 1964 and from 250 in the universities and colleges to well over 1,000.[4] There are some indications, however, that through misunderstandings of its function and inappropriate

[4]Joseph C. Hutchinson, "The Language Laboratory: Equipment and Utilization", in Albert Valdman, ed., Trends in Language Teaching (New York: McGraw-Hill Book Company, 1966), p. 216.

instructional materials, the potential of the language

laboratory is not being realized. The introduction of

programmed instruction materials may hasten a more genuine

incorporation of the language laboratory in the foreign

language teaching process.

While recent technological devices are especially

useful in the field of foreign language instruction, it

should be emphasized that programmed instruction materials

are not limited to any particular medium of presentation.

A programme is a type of teaching based on a carefully

integrated psychological rationale and may be presented in

the form of textbook, tapes, records, television, filmstrips,

or materials for a language laboratory. What is important

in all these devices is the programme itself, for the most

complex machinery could be rendered ineffectual with a poorly

developed programme. Unfortunately the uncritical and too-

ready acceptance of programmed instruction materials has

resulted in the marketing of programmes that have not been

adequately evaluated.

Programmed instruction materials differ from standard

textbooks in several respects. A successful programme will

"shape" or modify the students' behavior in a specified

area. Sapon distinguishes between a programme and a text:

> A teaching program is. . .an aid
> to the teacher's goal, but the goals are
> somewhat different from those involved
> with the use of a textbook, and aid is

different, not only in magnitude, but in
kind. A program purports to do a stated
amount of actual teaching, and leaves the
student with a demonstrable degree of
control of either a skill or a body of
knowledge.[5]

The development of the programme tends to be

empirically guided, and in contrast to textbooks, emphasizes

the goal of maximum efficiency. Fernand Marty has described

the programming of a foreign language course as the following:

the process of organizing the material in
such a way that the student acquires the
desired linguistic skills (terminal
behavior) in a minimum of time. The
programmer's goal is maximum efficiency.
If we accept this definition of programming,
we must conclude that the present textbooks
are not programmed since their authors did
not make an avowed or consistent effort to
maximize efficiency.[6]

While a prospective purchaser of a programme may be

able to evaluate the contents of the programme in terms of

whether the proposed terminal objectives of the course are

congruent with his own and if the materials are at an

---

[5]S. M. Sapon and John B. Carroll, "Discriminative
Perception of Speech Sounds as a Function of Native Language",
General Linguistics, III. (Spring, 1958), 104.

[6]Fernand L. Marty, Programing a Basic Foreign Language
Course: Prospects for Self-Instruction (Roanoke, Virginia:
Audio-Visual Publications, 1962), p. 1.

appropriate level for the intended age-group, developmental research reports are necessary to determine the scientifically demonstrated effectiveness of a programme. The quality of programmes available in foreign languages varies greatly and it is the responsibility of the purchaser to collect from the publisher or other sources relevant data as to the actual effectiveness of the programme.

Dr. J. B. Carroll, Harvard University, a specialist in the psychology of language, has listed what he regards as the essential characteristics of programmed instruction materials:

(1) Programmed instruction must be based upon an adequately detailed specification of the "terminal behavior" (that is, new skills, knowledge, or response tendencies) which the programmer desires to produce in students taught by the programme.

(2) The material of instruction must be organized and presented in a carefully designed sequence of steps. As a corollary to this requirement, the steps must also be of an appropriate size for the student to master readily: a student may be ready to take a larger step if he has been properly prepared for it, and thus the programme can lead to more efficient learning if sequencing and step-size have been properly attended to in preparing the programme. In practice, it is found that the optimal size of step is considerably smaller than is usually assumed by inexperienced programmers.

(3) The student must have an opportunity to test his mastery of each critical step as he proceeds through the programme. The programme is so constructed that correct responses are promptly confirmed and the student is led to understand and correct wrong responses. When

the material is properly programmed, simply
exhibiting the correct answer will usually
enable the student to do this.[7]

Two optional characteristics are that the student
may proceed at his own rate (through individualized or self-
instruction), and the programme may be incorporated into some
type of presentation device.

There is nothing unusual or fundamentally new in
these principles. They have much in common with the Socratic
Dialogues, where learning was produced by making the students
respond actively to questions and by guiding their discovery
of the answers. However, this interaction of student and
teacher has been severely limited by the demands of mass
education. Even using his method, few teachers could rival
Socrates, and the conditions under which the Athenian taught
could hardly be produced in contemporary schools.

The breaking down of a complex body of knowledge into
its smallest components is at least as old as Descartes and
is implicit in his Discours de la Méthode:

> Mais je ne craindrai pas de dire
> que je pense avoir eu beaucoup d'heur,
> de n'être rencontré dès ma jeunesse en
> certains chemins, qui m'ont conduit à
> des considérations et des maximes, dont
> j'ai formé une méthode, par laquelle il

---

[7]John B. Carroll, "A Primer of Programmed Instruction
in Foreign Language Teaching", International Review of Applied
Linguistics, I (1963), 116.

me semble que j'ai moyen d'augmenter par
degrés ma connaissance, et de l'élever peu à
peu au plus haut point, auquel la médiocrité
de mon esprit et la courte durée de ma vie
lui pourront permettre d'atteindre. . .je
crus que j'aurais assez des quatre suivants,
(préceptes dont la logique est composée)
pourvu que je prisse une ferme et constante
résolution de ne manquer pas une seule fois
à les observer.
      Le premier était de ne recevoir
jamais aucune chose pour vraie, que je ne la
connusse évidemment être telle; c'est-à-dire,
d'éviter soigneusement la précipitation et
la prévention;. . .
      Le second, de diviser chacune des
difficultés que j'examinerais, en autant
de parcelles qu'il se pourrait, qu'il
serait requis pour les mieux résoudre.
      Le troisième, de conduire par ordre
mes pensées, en commençant par les objets
les plus simples et les plus aisés à
connaître, pour monter peu à peu, comme
par degrés, jusques à la connaissance des
plus composés; et supposant même de l'ordre
entre ceux qui ne se précèdent point
naturellement les uns les autres.
      Et le dernier, de faire partout
des dénombrements si entiers, et des revues
si générales, que je fusse assuré de ne rien
omettre.[8]

The central psychological concept of programmed

instruction, however, is not just a division of the subject

matter into small steps or questions, but a manipulation

and control of student behavior. As Valdman comments:

    . . .to equate programmed learning merely
with the division of the subject matter
into small steps and the immediate
confirmation of the learner's response

---

[8]René DesCartes, "Discours de la méthode pour bien
conduire sa raison et chercher la vérité dans les sciences",
in H. Clouard and R. Leggewie, eds., Anthologie de la
littérature française (New York: Oxford University Press,
1960), p. 123.

is to fail to recognize that the central
concept of that approach is the definition
of the teaching process in terms of control
of student behavior through proper
reinforcement.[9]

The fundamental psychological theory of programmed instruction

is that a description and classification of an individual's

behavior is possible, and that by a certain definite

procedure (contingency of reinforcement) consistent

modifications in that behavior can be developed. Whether

this theory is adequate for the complex process of foreign

language acquisition will be discussed later in this paper.

While some of the principles of programmed instruction

have been used intuitively by good teachers, programmed

materials differ from former methods in the scientific

rigour with which these principles are applied and tested

on a particular subject. Since a requirement of a programme

is frequent student response, a source of data is available

which can be useful for detailed revision of the programme.

The effects of a revised programme can be empirically tested

in terms of specified behavioral outcomes. There has been

little control, however, in the evaluation of various

programmes and their quality varies greatly. The Joint

Committee on Programed Instruction has issued the following

statement:

---

[9]Albert Valdman, "Programmed Instruction and Foreign
Language Teaching", in his <u>Trends in Language Teaching</u>
(New York: McGraw-Hill Book Company, 1966), p. 136.

> Experimentation conducted thus far supports the expectation that good programs, carefully developed, <u>can</u> significantly improve both the quality and the economy of instruction. Whether any particular program <u>will</u> do so is subject to question until established by adequate tests of that program. Unfortunately, programs may be offered for sale that will fall short of the potential value of programed instruction - for example, because they have not been carefully developed through procedures that include sufficient tryout and revision to assure their effectiveness.10

The construction of a foreign language programme has become an inter-disciplinary endeavor and often involves the co-operation of several experts. These would include the teacher, with experience in the problems encountered in teaching the foreign language to students of the appropriate level, an expert on the construction of programme sequences and programming techniques who is also well-acquainted with the foreign language, a subject matter expert such as a specialist in linguistic science (supplying contrastive, structural and transformational analysis of the language), and an expert in the newer discipline of psycholinguistics, who would have insights in the control of verbal behavior. While programming variables and techniques may be discussed, this study will be primarily concerned with the <u>linguistic</u> and <u>pedagogical</u> aspects of programming a foreign language. The particular difficulties involved in programming a French course will be discussed in relation to the specific

---

[10]Joint Committee on Programed Instruction and Teaching Machines, "Criteria for Assessing Programed Instructional Materials", <u>Audio-Visual Instruction</u>, VIII (1963), 85.

programmes that are examined. Various aspects of the French programmes will be discussed in the areas of phonology, morphology and syntax.

In examining these programmes, it is necessary to make a distinction between external and internal aspects of the programme. "Internal" characteristics refer to features of a programme which can be revealed through inspection of the programme itself. This might include subject matter content, technical construction (branching or linear, frames, prompts, etc.), organization and relative emphasis given to various topics, appropriateness of the programme in relation to the intended age group, and the terminal objective of the programme. "External" characteristics of a programme would include information which cannot be observed merely by inspecting the programme itself, such as the history of the development of the programme and its empirically validated effectiveness as a teaching instrument.

It is not within the scope of this paper to determine empirically the effectiveness of various programmes, but to examine their internal characteristics. These internal features will be viewed mainly in a descriptive sense and are not assumed to be predictive of the effectiveness of the programme. This emphasis on external criteria for assessing programme effectiveness is consistent with the position of the Joint Committee on Programed Instruction:

> External evidence is recommended
> as the main basis for the evaluation of
> program effectiveness - in particular, test
> data obtained from using a program under
> specified conditions which provide
> dependable measures of gains produced in
> student achievement and of the time
> students require to achieve these gains.[11]

The purpose of this thesis will be to investigate,

not to advocate. Whether programmed instruction is an

efficient and effective method of teaching foreign language

skills has yet to be conclusively proven. Controversy is

currently concerned with whether the psychological theory

of programmed instruction can adequately account for the

complex process of foreign language acquisition, and

experimental research on language acquisition will have

significant pedagogical implications. While there are

few proven theories in this field, the questions which arise

upon investigation of French programmed materials are

provocative and provide stimulus for further research.

---

[11] Joint Committee on Programed Instruction and Teaching Machines, _Audio Visual Instruction_, p. 87.

CHAPTER I

THE DEVELOPMENT OF PROGRAMMED INSTRUCTION

As early as 1912 the psychologist, Edward L. Thorndike, in his book Education, outlined a blueprint for a programmed learning device:

> A human being should not be wasted
> in doing what forty sheets of paper or two
> phonographs can do. . .If, by a miracle of
> mechanical ingenuity, a book could be so
> arranged that only to him who had done what
> was directed on page one would page two
> become visible, and so on, much that now
> requires personal instruction could be
> managed by print. . .The improvement of
> printed directions, statements of facts,
> exercise books and the like is as important
> as the improvement of the powers of teachers
> themselves to diagnose the condition of
> pupils and to guide their activities by
> personal means. . .Just because personal
> teaching is precious and can do what books
> and apparatus cannot, it should be saved
> for its peculiar work. The best teacher
> uses books and appliances as well as his
> own insight, sympathy and magnetism.[1]

With the experimental objective of studying the learning process, Thorndike was one of the first to introduce animals into psychological laboratories. His first laboratory experiments were performed with cats, fish, chickens, dogs

---

[1] E. L. Thorndike, Education (New York: Macmillan Company, 1912), p. 292.

and monkeys. However, he was concerned with all types of learning situations, and eventually moved to the study of human learning. An interesting series of experiments challenged the commonly held view that practice and repetition will "fix" or "stamp in" material. He found that simple practice and repetition does not necessarily strengthen behavior, increase efficiency, or eliminate errors, unless the responses are constantly reinforced. Repetition had little effect unless the "law of effect" were operable in the situation.[2] The "law of effect" stated that if an act was followed by some sort of satisfying consequence, the probability of its recurrence in a similar situation increased. These experiments have relevance in language learning today, where practice and repetition are stressed without adequate reinforcement. Reinforcement, any event that increases the probability of responses on which it is made dependent, could be a material satisfaction such as food or candy, or in a school situation approval, praise, or knowledge of the correctness of an answer usually have a reinforcing effect.

In the middle 1920's Dr. Sidney L. Pressey, of Ohio State University, designed the first mechanical teaching

---

[2]E. L. Thorndike, Language Learning: Summary of a Report to the International Auxiliary Language Association in the United States, Inc. (New York: Bureau of Publications, Teachers College, Columbia University, 1933).

machine, primarily for testing and scoring.[3] This instrument was first exhibited at the Washington, D.C., meeting of the American Psychological Association, December 1924, and an improved version in 1925. The early Pressey experimental device used multiple choice principle with scoring mechanism. Material was presented on a roller with a viewing slot, and a gum-drop reward fell from a slot in the center when the correct series of answers was made. Dr. Pressey's device was primarily used for testing, but he later discovered that the device also had definite instructional possibilities.

However, Dr. Pressey was too far ahead of his time and there was little enthusiasm or response to his experiments. It was not until thirty years later that these devices and programmed materials began to excite public interest. In 1954 Dr. B. F. Skinner, a Harvard psychologist, published a report on scientific investigations on the learning process.[4] He described techniques used in the laboratory to produce modifications in the behavior of experimental subjects, and the principles involved in such modifications. He also discussed the direct application of these principles to classroom learning and teaching.

---

[3]Sidney L. Pressey, "A Simple Apparatus Which Gives Test and Scores -- And Teaches", School and Society, XXIII, No. 586 (March 20, 1926), 373-376.

[4]B. F. Skinner, "The Science of Learning and the Art of Teaching", in W. I. Smith and J. W. Moore, eds., Programmed Learning (Princeton, New Jersey: D. Van Nostrand Company, Inc., 1962).

Dr. Skinner is a behaviorist in the tradition of John Watson and Ivan P. Pavlov. Behavior is explained as "a series of physiological responses to environmental stimuli". While Skinner studied overt, or observable behavior, he believed that the principles underlying this type of behavior were also applicable to forms of covert behavior such as ·"thinking", "understanding" or "imagining".

Skinner distinguished between two types of overt behavior: respondents and operants. Respondents are largely involuntary reflexes which are elicited by specific stimuli. These responses, which are subject to the laws of classical conditioning, were studied extensively by the Russian physiologist, Pavlov. In a classical experiment Pavlov conditioned a dog to salivate at the sound of a bell by ringing it every time the dog was about to be fed.

The second type of response, which is more important to Skinner, an operant response, actively operates on the environment which in turn affects the individual or animal. In respondent behavior, a known stimulus elicits a response, but in operant behavior, a spontaneous response is emitted for which the stimulus is either unknown or not under the control of the experimenter. If this response is rewarded or "reinforced" there is greater likelihood of its recurring. There is, then, in operant conditioning, a dependent relation- ship between the reinforcement and the response of the

organism. The relation which prevails between behavior on
the one hand, and the consequences of that behavior on the
other is known as the "contingencies of reinforcement". An
example is an animal in a cage who accidentally presses a
lever which releases food. The animal soon learns to press
the lever whenever he is hungry. The "reinforcing stimulus"
i.e. the appearance of food, is dependent on the action of
the animal, the "conditioned response".

Skinner describes some of the techniques used in
conditioning pigeons in the laboratory:

> Recent improvements in the conditions
> which control behavior in the field of learning
> are of two principal sorts. The Law of Effect
> has been taken seriously; we have made sure
> that effects do occur and that they occur
> under conditions which are optimal for
> producing the changes called learning. Once
> we have arranged the particular type of
> consequence called a reinforcement, our
> techniques permit us to shape up the behavior
> of an organism at will. It has become a
> routine exercise to demonstrate this in
> classes in elementary psychology by conditioning
> such an organism as a pigeon. Simply by
> presenting food to a hungry pigeon at the
> right time, it is possible to shape up three
> or four well-defined responses in a single
> demonstration period -- such responses as
> turning around, pacing the floor in the
> pattern of a figure - 8, standing still in a
> corner of the demonstration apparatus,
> stretching the neck, or stamping the foot.
> Extremely complex performances may be reached
> through successive stages in the shaping
> process, the contingencies of behavior. The
> results are often quite dramatic. In such
> a demonstration one can see learning take

place. A significant change in behavior
is often obvious as the result of a single
reinforcement.[5]

By the slow but sure accumulation of successive and

related motions a relatively complex performance was achieved.

Pigeons were taught to discriminate among playing cards, peck

out tunes on a toy piano, and play a kind of table tennis.

This process of rewarding responses that approximate the

desired repsonse and proceeding by successive approximations

to the desired terminal behavior is know as "shaping" behavior.

Skinner's most significant psychological work has been the

investigation of schedules of reinforcement. He has

experimented with different rates and intervals of reinforcement

and found that if you reinforce intermittently the behavior

is more stable and maintained for much longer periods once

reinforcement stops than is the case in continuous reinforcement.

He makes the following comment:

> A second important advance in technique
> permits us to maintain behavior in given states
> of strength for long periods of time. Rein-
> forcements continue to be important, of course,
> long after an organism has learned how to do some-
> thing, long after it has acquired behavior. They
> are necessary to maintain the behavior in strength.
> Of special interest is the effect of various schedules
> of intermittent reinforcement. Charles B. Ferster
> and the author are currently preparing an extensive
> report of a five-year research program, sponsored
> by the Office of Naval Research, in which most of
> the important types of schedules have been
> investigated and in which the effects of schedules
> in general have been reduced to a few principles.
> On the theoretical side we now have a fairly

---

[5]Skinner, _Programmed Learning_, p. 19.

good idea of why a given schedule produces
its appropriate performance. On the
practical side we have learned how to
maintain any given level of activity for
daily periods limited only by the
physical exhaustion of the organism and
from day to day without substantial change
throughout its life. Many of these effects
would be traditionally assigned to the field
of motivation, although the principal
operation is simply the arrangement of
contingencies of reinforcement.[6]

Although the principles of "operant conditioning"
were derived from laboratory observations of animals, Skinner
felt that they were also applicable to human verbal behavior.
It was not until he turned from training rats and pigeons
to teaching children that the teaching profession and the
public became seriously interested. Skinner's theoretical
position led him to the following teaching procedure:

1. Complex learning is broken down into very small
steps, each step building on the preceding one. 'For example,
in presenting the structures of a foreign language, a
monostructural approach would be used. Structures would be
presented only one at a time and each structure must be fully
mastered before the next one is introduced. The monostructural
approach could be contrasted with the polystructural approach
of the Glastonbury materials, now called A-LM, or the "New
Key" materials, where many completely different structures
are presented together in the same unit.

---

[6]Skinner, _Programmed Learning_, p. 19.

2. The student is led by questions that are equally constructed and arranged so he will make correct responses to incresingly complex questions.

3. In order to insure the students'active participation in the learning cycle and to have the student recall rather than just recognize the correct response, Skinner prefers the "constructed response" to the multiple-choice method. He makes the following comment:

> The student must compose his response rather than select if from a set of alternatives, as in a multiple-choice self-rater. One reason for this is that we want him to recall rather than recognize - to make a response as well as see that it is right. Another reason is that effective multiple-choice material must contain plausible wrong responses, which are out of place in the delicate process of "shaping" behavior because they strengthen unwanted forms. Although it is much easier to build a machine to score multiple-choice answers than to evaluate a composed response, the technical advantage is outweighed by these and other considerations.[7]

4. In an effective programme, there must be immediate reinforcement of student response, in this case consisting of the knowledge of the answer. Ideally, the student should know whether he is right or wrong within seconds. The usual quiz paper or exercises, even when corrected the next day, are far too slow. Since people learn at different rates of speed, only a tutor can give immediate satisfaction. In a normal classroom, the most skilled teacher cannot do it

---

[7] B. F. Skinner, "Teaching Machines", in A. A. Lumsdaine and Robert Glaser, eds., Teaching Machines and Programmed Learning: A Source Book (Washington, D. C.: Department of Audio-Visual Instruction, National Education Association, 1960), p. 140.

consistently, for forty or even for four students. While it
would be impossible to supply the millions of school-age
children with tutors, programmed instruction materials
attempt to approximate the tutorial process in the sense of
providing immediate reinforcement and forcing the student to
actively participate in the learning process. Skinner
comments on this aspect of programmes:

> This may suggest mass production, but the
> effect upon each student is surprisingly
> like that of a private tutor. The
> comparison holds in several respects:
> (a) There is a constant interchange
> between programme and student. Unlike
> lectures, textbooks, and usual audio-
> visual aids, the machine induces sustained
> activity. The student is always alert
> and busy. (b) Like a good tutor the
> machine insists that a given point be
> thoroughly understood, either frame by
> frame or set by set, before the student
> moves on. . . (c) Like a good tutor
> the machine presents just that material
> for which the student is ready. It asks
> him to take only that step which he is
> at the moment best equipped and most
> likely to take. (d) Like a skillful
> tutor the machine helps the student to
> come up with the right answer. . .
> (e) Lastly, of course, the machine,
> like the private tutor, reinforces the
> student for every correct response, using
> this immediate feedback not only to shape
> his behavior most efficiently but to
> maintain it in strength in a manner which
> the layman would describe as "holding the
> student's interest.[8]

---

[8]Skinner, _Teaching Machines and Programmed Learning:_
A Source Book, p. 143.

Skinner's learning theory is essentially performance-oriented and to the criticisms that it is "mechanistic" or "positivistic" he answers:

> Contrary to frequent assertions, a behavioristic formulation of human behavior is not a crude positivism which rejects mental processes because they are not accessible to the scientific public. It does not emphasize the rote learning of verbal responses. It does not neglect the complex systems of verbal behavior which are said to show that a student has had an idea, or developed a concept, or entertained a proposition. It does not ignore the behavior involved in the intellectual and ethical problem solving called "thinking". It does not overlook the value judgements said to be invoked when one thing is taught rather than another or when the time and effort given to education is defended. It is merely an effective formulation of those activities of teacher and student which have always been the concern of educational specialists.
>
> Not all behavioristic theories of learning are relevant, however. A distinction is commonly drawn between learning and performance. Learning is said to be a change in some special part of the organism, possibly the nervous system, of which behavior is merely the external and and often erratic sign. Performance is the observed, and usually much less orderly, effect of learning on behavior. With modern techniques, however, behavior can be much more successfully studied and manipulated than any inner system, even when inferences about the latter are drawn from the behavior with the help of sophisticated statistics. An analysis of learning which concentrates on the behavior applies most directly to a technology, for the task of the teacher is to bring about changes in the student's behavior. His methods are equally conspicuous: he makes changes in the environment. A teaching method is simply a way

of arranging an environment which expedites learning.[9]

As a consequence of the first Soviet success with space flight in 1958, the American public became aware of the need for better, more efficient instruction. With the passage of the National Defense Education Act (1958), funds became available for educational research and for more complex educational apparatus. Sufficient interest was aroused to stimulate the development of machines and programmes and to experiment with traditional ideas of education. Within the last decade many variables involved in a programmed learning situation have been investigated and data is available for the programmer and for those interested in the general learning process.

There are two main schools of thought in programming. The first, most popular, is that of Dr. Skinner at Harvard. Dr. Skinner's programmes are constructed by atomizing a discipline into its smallest units to form incremental learning steps. The questions contain single-sentence statements with an integral word or words left out which the student must supply. One of the important features of this type of programme is the "constructed response". Skinner believes that the student is forced to think more

---

[9]B. F. Skinner, "Reflections on a Decade of Teaching Machines --", in Robert Glaser, ed., Teaching Machines and Programmed Learning, Volume II: Data and Directions, (Washington, D.C.: Department of Audio-Visual Instruction, National Education Association, 1965), p. 12.

and learn more rapidly, when he has to write in the responses
rather than choose from a series of alternative answers. In
other words, the programme does not test but rather teaches
by requiring a positive effort. Also, effective multiple-
choice material would contain plausible wrong responses,
which Skinner feels are out of place in the delicate process
of "shaping" behavior as they could strengthen unwanted forms.

The Skinner type programme is generally referred to as
the "linear style" because each student goes through the
entire programme in the same sequence as every other student.
Student behavior is molded or "shaped" with the aid of
"prompts" (some sort of visual, verbal or symbolic cue which
facilitates the desired response from the subject) until it
meets the specified goals of performance. The prompts are
gradually eliminated in a process called "fading" or
"vanishing". Active responding is required of the student
after very small amounts of information have been given and
reinforcement, or knowledge of results is immediate. One of
the assumptions of this type of programme is that students
do <u>not</u> learn through making mistakes. Through experimentation
Skinner arrived at the conclusion that the student learns
most efficiently by being correct, and a well-constructed
"linear programme" would decrease the probability of student
errors.

The second school of thought in programming is

represented by Norman Crowder, and Dr. Sidney L. Pressey.
This group believes that a programme need not be completely
broken down, but should be presented in larger logical units
of a paragraph or more, each of which would explain some
principle in its entirety. By this more classical method
of teaching, a rule could be stated followed by a series
of examples of this rule. The student would be tested by
a series of questions on the preceding materials.

In a Crowder programme, the response takes the form
of multiple-choice answers. Crowder also uses a technique
known as "branching". For the student who does not at first
understand a particular point, there is the backward branching
technique. The student who selects a series of incorrect
answers will be referred by the programme to a remedial
sequence of steps which will give him fresh approaches to the
explanations of the material he is trying to understand. The
brighter student is allowed to skip over additional steps
covering material that he has already mastered. Crowder's
plan is as follows:

> . . .the student is given the material to be
> learned in small logical units and tested on
> each unit immediately. The test result is
> used to automatically conduct the material
> that the student sees next. If the student
> passes the test question, he is automatically
> given the next unit of information and the
> next question. If he fails the test question,
> the preceding unit of information is reviewed,
> the nature of the error is explained to him,
> and he is retested. The test questions are
> multiple choice questions and there is a

separate set of correctional materials for
each wrong insert that is included in the
multiple choice alternative. The
technique. . .is called "intrinsic
programming".10

Crowder feels that linear and intrinsic programming

are basically different in approach:

In linear programming, the student's response
is considered an integral part of the learning
process; .the response is induced in order that
it may be rewarded and learning thus occur. . .
          In intrinsic programming the questions
serve primarily a diagnostic purpose, and the
basis of the technique is the fact that the
diagnosis so made can be promptly utilized
to furnish specific remedial material to the
student.11

Most foreign language programmes use the linear approach to

programming, though some language programmes do make some

sort of provision for a student who does not understand a

particular series of steps. The only way to distinguish

between these alternative positions is to consider relevant

experimental data; unfortunately there is none.

Skinner's principles on learning theory were mainly

derived from laboratory studies of animal behavior. However,

he asserts that these principles are applicable also to human

---

[10] N. A. Crowder, "Automatic Teaching by Intrinsic
Programming", in A. A. Lumsdaine and R. Glaser, eds.,
Teaching Machines and Programmed Learning: A Source Book.
(Washington, D.C.: Department of Audio-Visual Instruction,
National Education Association, 1960), p. 286.

[11] N. A. Crowder, "On the Differences Between Linear
and Intrinsic Programming", in John P. DeCecco, ed.,
Educational Technology: Readings in Programmed Instruction
(Holt, Rinehart & Winston, 1964). .

verbal learnings:

> The basic processes and relations which
> give verbal behavior its special characteristics
> are now fairly well understood. Much of the
> experimental work responsible for this advance
> has been aired out on other species, but the
> results have proved to be surprisingly free of
> species restrictions. Recent work has shown
> that the methods can be extended to human
> behavior without serious modifications.[12]

Serious criticism of this assumption has come from

psychologists who feel that Skinner has extrapolated too

liberally from behavioral experiments performed with rats

and pigeons to the uniquely human behavior of language. In

particular, a group of Soviet psychologists completely

disagree with Skinner's view that verbal behavior does not

differ in any significant way from other behavior.

O. K. Tikhomirov, of the Department of Psychology at the

University of Moscow, points out that Pavlov, himself, did

not believe that the results of his classical conditioning

experiments with dogs could be applied to the speech functions

of man:

> The impression may arise that Skinner's
> approach to the analysis of human behavior from
> the point of view of so called "conditioning"
> is analogical to I. P. Pavlov's doctrine of
> conditional reflexes. However, this is not
> the case. Pavlov, in passing to the investigation

---

[12]George A. C. Scherer and Michael Wertheimer,
A Psycholinguistic Experiment in Foreign-Language Teaching
(New York: McGraw-Hill Book Company, 1964), p. 3.

of the higher neutral activity of man,
repeatedly stressed its qualitative part-
icularity in comparison with the higher
neutral activity of animals. A concrete
manifestation of his qualitative distinction
was Pavlov's doctrine of the interrelation
of signal systems. In all the diversity of
stimuli acting on man, Pavlov distinguished
two systems of signals. The first system
includes all conditioned stimuli (the
objects of the surrounding world and their
features) which directly act on man. This
is the first signal system of reality, which
man shares with animals. Words, word groups,
and connections arising on the basis of them
constitute the second signal system, which
only man possesses. Pavlov called this
second signal system "an extra-ordinary
addition" to the mechanisms of higher neural
activity, and said that "it was the word
which has made men of us".[13]

For these Soviet psychologists, language behavior

not only differs from other forms of behavior, but the

acquisition of speech has a directive effect on other

behavior and qualitatively transforms it. Citing the work

of A. R. Luria, Tikhomirov concludes:

As this research has shown, speech
restructures the cognitive processes of man,
enabling him to get a profound orientation
in surrounding reality, to distinguish
essential features and relations, and to
systematize his accumulated experience. . .
speech activity does not follow the basic
regularities of conditioning, as Skinner
asserts, but quite the contrary; the
intervention of speech transforms these

---

[13]O. K. Tikhomirov, "Review of B. F. Skinner, Verbal
Behavior", Word, XV, No. 2 (August, 1959), 365.

regularities and makes them qualitatively different.[14]

Harlan Lane, a psychologist involved with problems of second language learning, feels that the techniques of operant conditioning are especially valid and suitable in second-language learning:

> . . .The techniques of the laboratory analysis and control of behavior, upon which programing is based, are more literally applicable to the conditioning of second-language behavior than to most of the other repertoires that programing has confronted. The objectives of most programs are restricted to changing the written, verbal behavior of a student in response to textual stimuli. The prerequisite motor responses and discriminations among orthographic stimuli already have been conditioned and are taken for granted. The behaviors involved in reading and understanding English and in writing at least a "reasonable" answer are also assumed. As Gilbert has put it: "Our student is not a master of the subject because he cannot make the mastery responses on the right occasions, not because he is unable to make those responses at all. . .The responses of mastery are there. . ." This type of verbal conditioning, involving a restructuring of the student's highly articulate first-language repertoires, has a limited resemblance to laboratory research on the control of behavior. Transitional behavior affected by shifting contingencies of reinforcement, patterns of discriminative stimuli, or both, is little studied and poorly understood in comparison with the shaping, maintenance, and extinction of behavior in initially naive organisms.
>   The programing task of restructuring an extant verbal repertoire may be contrasted to that of conditioning second-language fluency. .

---

[14]Tikhomirov, _Word_, p. 366.

In the latter case, there is nothing
extrapolative in the application of
laboratory techniques and nothing
metaphorical in the use of concepts gained
from a functional analysis of behavior in
the laboratory. New discriminations
(auditory, textual) must be conditioned,
new forms of response (vocal, written) must
be differentiated, concurrent responses of
differing topography each must be brought
under the control of appropriate
discriminative stimuli, novel chains of
topographically novel responses must be
established, and so forth.
These behaviors must be conditioned
largely "de novo", although it is never
possible, as this chapter will point out,
to overlook sources of interference and
enhancement from the first-language
repertoires.[15]

Other objections to Skinner's work on verbal behavior

have come from generative-transformational grammarians like

Noam Chomsky, who feel that Skinner's characterization of

language fails to give sufficient emphasis to the contribution

of the internal processes of the speaker:

One would naturally expect that
prediction of the behavior of a complex
organism (or machine) would require, in
addition to information about external
stimulation, knowledge of the internal
structure of the organism, the ways in
which it processes input information and
organizes its own behavior. These
characteristics of the organism are in
general a complicated product of inborn
structure, the genetically determined
course of maturation, and past experience.

---

[15]Harlan L. Lane, "Programmed Learning of a Second
Language", in Robert Glaser, ed., Teaching Machines and
Programed Learning, Volume II: Data and Directions (Washington,
D.C.: Department of Audio-Visual Instruction, National
Education Association, 1965), p. 585.

> Insofar as independent neurophysiological
> evidence is not available, it is obvious
> that inferences concerning the structure
> of the organism are based on observation
> of behavior and outside events. Never-
> theless, one's estimate of the relative
> importance of external factors and internal
> structure in the determination of behavior
> will have an important effect on the direction
> of research on linguistic (or any other)
> behavior, and on the kinds of analogies from
> animal behavior studies that will be
> considered relevant or suggestive.[16]

Chomsky has suggested that the ability to generate

novel utterances may indicate that there are internal

processes at work which are independent of environmental

feedback and conditioning. He comments that, "The fact that

all normal children acquire essentially comparable grammars

of great complexity with remarkable rapidity suggests that

human beings are somehow specially designed to do this, with

data-handling or 'hypothesis-formulating' ability of unkown

character and complexity". The child appears to be

functioning as an implicit inductive scientist; collecting

data (linguistic utterances), classifying this data into

different categories and constructing rules to account for

underlying regularities. These rules are then used to

produce novel utterances. The child seems to be endowed with

an innate mechanism for language analysis and Chomsky feels

---

[16]Noam Chomsky, "Review of: B. F. Skinner, Verbal Behavior", Language, XXXV (1959), 27.

that research should be directed towards discovering how this mechanism works.

One must always face the truism that an engineering technique of the sort that Skinner has proposed may work very well even though the theoretical justification that he has proposed for this technique is completely wrong. The ultimate justification for any practical method of this sort is whether it works or not. It would be, of course, anti-intellectual to be satisfied with a method for controlling behavior without attempting to understand how it works. Therefore, it is necessary to consider the theoretical basis of these programmed instruction techniques. However, it seems wiser to wait until more data on their efficacy and how they work is available before plunging into the treacherous waters of theory.

Another question of importance is whether current research on young children is relevant to adult second language learning since the ability to acquire a language seems to atrophy with adolescence and adulthood. Nelson Brooks has made a necessary distinction between the behaviors involved in a child learning his native language and an adult learning a foreign language:

Language learners divide themselves into two main classes, those who as infants are learning the mother tongue, or learning another as a second language or, in some cases, an additional one. There are many important comparisons and distinctions to be made between these two groups of learners.

In the case of the infant, there is a fascinating contrast between his inborn potential for the use of _parole_ and the community's highly systematized practice of _langue._ Of course, the latter always wins and imposes its will upon the loser almost completely. This outcome has long obscured the arresting significance of what the infant brings to this struggle. For within the newborn baby there is a vital force that finds delight in incessant verbal play, with the result that within a matter of months he "breaks the code" of the language being used about him, and within a few years he has completely mastered it in its spoken form. . . .

The individual who already possesses a mother tongue brings to the learning of a second language a very different set of physical and mental capactities. Partial, if not complete, command of one linguistic code has already been attained, and it can be both a help and a hindrance in learning the second. The conditions for learning, almost identical for all learners of the mother tongue, differ widely for the second-language learner. The greatest single difference is whether or not he finds himself in the "cultural field" of the language in question, by being either geographically within its borders or in direct contact with it in an authentic "cultural island" transplanted to a distant place. Another difference of great importance is the age of the learner, for this largely determines the extent to which he still retains the faculties that made it possible for him to learn his mother tongue.[17]

---

[17]Nelson Brooks, _Language and Language Learning_, 2nd ed. (New York: Harcourt, Brace & World, 1964), p. 21.

Programmed instruction material in foreign languages
may prove to be more valuable in the area of research than as
a pedagogical device. The emphasis placed on revision and
validation of programmes based on direct observation of
student behavior can provide empirical data as to how second
languages are acquired by adults and adolescents. A
programmer of a language is essentially interested in the
presentation and organization of materials in a manner which
will most effectively and efficiently facilitate learning, and
his experimental investigations may provide insights into
the process of adult second language acquisition.

CHAPTER II

TRENDS IN FOREIGN LANGUAGE TRAINING AND LINGUISTICS

While the application of programmed instruction to foreign language training presents some interesting conceptual and methodological problems, it is necessary to stress that this study was undertaken with an awareness that research in foreign language learning is in its initial stages. Programmed instruction may prove to facilitate certain aspects of foreign language instruction; however, there is as yet no proven theory which completely or adequately explains language behavior or the acquisition of foreign language competence. J. B. Carroll comments:

> . . .We are at such a really rudimentary
> stage in the development of theory in the
> behavioral sciences that there is enormous
> scope for theoretical developments. This
> is true not only for learning theory in
> general but also for the theory of foreign
> language learning. That is, we do not yet
> have either a good general theory concerning
> the conditions under which learning takes
> place or a general theory of language
> behavior that would enable us to select
> optimal components of a foreign language
> teaching system for any given case. This
> is not to say that we know nothing about
> learning - I would hold that we know a good
> deal about it on a descriptive, functional
> level, for we can state quite a number of
> generalizations and principles that, if
> followed, will help the teacher or learner
> improve the course of learning. My point
> is that no proved _theory_ now exists to
> account for all the phenomena we can observe
> or even the phenomena that we can predict

> and control. We are in the stage in the
> history of our science that chemistry was
> in before molecular theory was well
> developed. . .The lack of a proved theory
> becomes particularly acute when we try to
> understand the process of learning a second
> language.[1]

Since a foreign language programme will necessarily

reflect much of the programmer's conception of language and

the process of language acquisition, it is useful to review

the approaches to language which have been prevalent within

the last two decades. An examination of current grammars

in North America and teaching practices of foreign language

teachers would seem to indicate that there are two major

approaches to foreign language learning - the "traditional"

eclectic approach (or the more recent cognitive-code learning

theory) and the audio-lingual habit theory (sometimes referred

to as "New Key" or Linguistic Method).

During the nineteenth century the predominant mode of

foreign language instruction in American education was the

grammar-translation method, with an almost exclusive emphasis

on reading and writing skills. Modern foreign languages were

taught as classical languages had been, with the memorization

---

[1] John B. Carroll, "The Contributions of Psychological Theory and Educational Research to the Teaching of Foreign Languages", in Albert Valdman, ed., _Trends in Language Teaching_ (New York: McGraw-Hill Book Company, 1966), p. 101.

.of grammar rules and paradigms and the main emphasis on translation. There was some revolt against this method even in the early 1900's (for example, the "direct method" and the "phonetic method" of Paul Passy). However, after the First World War there was a decline in language study in America, probably due to the isolationist mood of the 1920's and '30's. The amount of school time spent on foreign language instruction was sharply curtailed by unsympathetic administrators, and a cursory reading ability became the objective of foreign language courses. It was not until the United States entrance into World War Two that a renewed interest was taken in foreign languages. The Intensive Language Programme of the 1940's was an attempt to apply the findings of linguistic science to foreign language teaching and the principles of this programme were used by the Army Specialized Training Programme of 1943-44 to produce the audio-lingual fluency required of language trainees.

The current cognitive-code learning theory or the "traditional" approach have certain similarities to the grammar-translation method. The structure of the foreign language, the phonological, lexical and grammatical patterns are studied and analyzed as a body of knowledge. The emphasis is placed on a conscious control and understanding of the structures of the foreign language rather than on the student's facility in using those structures. According to this theory,

if the student has a thorough conscious control of the
language's structure, he will automatically develop facility
when the language is used in a meaningful situation.

Most of the precepts and theories of the audio-lingual
habit method were formulated by the linguist, Leonard
Bloomfield, while working with the Intensive Language
Programme of the .40's. In an early work of Bloomfield,
The Study of Language (1914) he criticizes the "traditional"
approach to foreign language learning and though reflecting
the attitudes of that time (regarding the exclusive concern
of the 20's and 30's with reading objectives), he predicts
the change of emphasis to audio-lingual skills which is
realized in the 40's, 50's and 60's. He makes the
following observations:

> Our fundamental mistake has been to
> regard language-teaching as the imparting of
> a set of facts. The facts of a language,
> however, are, as we have seen, exceedingly
> complex. To explain to the student the
> morphology and syntax of a language, be it
> his own or a foreign one, would require a
> long time, and, - even if it were done
> correctly by linguistically trained teachers,
> - would be of little or no value. . . .Language
> is not a process of logical reference to a
> conscious set of rules; the process of
> understanding, speaking and writing is
> everywhere an associative one. Real language-
> teaching consists, therefore, of building
> up in the pupil those associative habits
> which constitute the language to be learned.
> Instead of this we try to expound to students
> the structure and vocabulary of the foreign
> language and, on the basis of this, let them
> translate foreign texts into English. Such
> translation is a performance of which only

people equipped with a complete knowledge
of both languages and with considerable
literary ability are ever capable. As a
method of study, moreover, it is worthless,
for it establishes associations in which the
foreign words play but a small part as symbols
(inexact symbols, of course) of English words.
    The excuse usually given for this
practice is that American conditions make only
a "reading knowledge" of the foreign language, -
especially, if ancient, - of importance, -
that it is not our purpose to enable pupils
to order a meal in the foreign language.
Reading, however, is no different from the
other phases of using a language: the
expressions of the language are not the given
members of mathematical equations or puzzles,
but must enter into a set of rapidly and easily
functioning associative habits. Correct
methods of language-teaching differ from
those which we are at present unsuccessfully
using not in aim, - any aim can here be
attained by good as surely as it missed by
bad teaching, - but in adaption to the
mental conditions underlying the activities
of speech. In what follows I shall naturally
speak of American conditions and assume that
the ability to read rather than to speak is
aimed at: needless to say that even here
the desired associations cannot be formed
without much oral and auditory practice. I
believe, moreover, that American conditions
are coming to make a "speaking knowledge"
more and more desirable and that the time is
not far off when here as well as abroad the
ability to converse in one or two foreign
languages will be looked upon as one of the
ordinary marks of education.[2]

---

[2]Leonard Bloomfield, The Study of Language (New York:
Henry Holt and Company, 1914), p. 294-295.

Almost thirty years later, after experience with the description of languages of preliterate American Indians, Bloomfield, in conjunction with the Intensive Language Programme postulated the primacy of speech as a language universal with the corollary of the separation of audio-lingual skills from reading and writing. In <u>Outline Guide for the Practical Study of Foreign Languages</u>, Bloomfield formulàted the ideas upon which most audio-lingual materials are based. Only relentless repetition would lead to audio-lingual fluency "Language learning is overlearning. Anything else is of no use".[3]

Though now challenged by the findings of generative-transformational grammarians, structural linguists today still conceive of language as an intricate system of habits. Robert Hall comments:

> Languages are systems of habits. The habitual nature of language is, in general, insufficiently realized in our normal thinking on the subject; especially philosophers and aestheticians tend to treat language as if it were wholly the product of conscious reflection and purposive behavior. In fact, we acquire very extensive linguistic patterns when we are children, and use them in adult life, without becoming aware of their almost wholly habitual nature.[4]

---

[3]Leonard Bloomfield, <u>Outline Guide for the Practical Study of Foreign Languages</u> (Baltimore: Linguistic Society of America, 1942), p. 12.

[4]Robert Hall, Jr., <u>Introductory Linguistics</u> (Philadelphia: Chilton Books, 1964), p. 17.

Charles Hockett, another linguist observes:

> 16.1   A language is a complex system
> of habits. . .
> 16.3   The summary of language design
> in 16.1 states that a language is a set of
> <u>habits</u>.   An act of speech, or utterance, is
> not a habit, but a <u>historical event</u>, though
> it partly conforms to, reflects, and is
> controlled by the habits.   Acts of speech,
> like other historical events, are directly
> observable.   Habits are not directly
> observable; they must be inferred from
> observed events, whether the inferring agent
> is a child learning a language or an analyst
> seeking to describe one.[5]

The Intensive Language Programme used in the Army
Language School and the Foreign Service Institute was
successful in producing students with high proficiency in
the use of a foreign language.   With the increasing emphasis
on audio-lingual skills in the next two decades, foreign
language teachers began utilizing the model of learning
associated with the Intensive Method.   Albert Valdman has
described the following characteristics for "New Key"
materials:

> (1)   an 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

---

[5]C. F. Hockett, <u>A Course in Modern Linguistics</u>
(New York: The Macmillan Company, 1958), p. 137 and 141.

grammar through pattern drills; and (5) a
claimed application of structural (or
scientific) linguistics to language
teaching problems.[6]

While the Intensive Language Programme did have

considerable success with the objective of producing

students fluent in a second language, there are indications

that this was more probably due to the conditions of

instruction than the model of learning or the instructional

materials used. Language teachers are currently using

audio-lingual materials developed for a context of instruction

radically different from the typical high school or university

situation. The classes of the Intensive Language programme

or the Foreign Service Institute were small enough (not

more than six students per class) to insure active participation

and practice of the target language, and the students were

provided with more than 450 hours of instruction. This

could be contrasted with a high school or college class of

twenty-five students (though many high schools operate

with thirty-five or forty students per class) who receive

fifty minutes of instruction five days a week. Half of that

time is usually reserved for the teacher's lecture or

instructions. If each student were allowed to participate

during each class period, his active participation would be

---

[6]Albert Valdman, _Trends in Language Teaching_ (New
York: McGraw-Hill Book Company, 1966), p. xv.

limited to one minute. Total participation time for each

student would be less than twelve hours in two years.

There is reason to believe that the linguists

associated with the Intensive Programmes produced effective

foreign language programmes through massive student exposure

to the target language rather than through the instructional

materials used. It is doubtful that a scientific, descriptive

analysis of a language will necessarily be the most effective

teaching device. While an efficient, effective method might

utilize the findings of linguistic field work, the materials

must be organized for pedagogical expediency. Sol Saporta

comments:

> A central question in the application of
> linguistics to the teaching of foreign
> languages involves the conversion of a
> scientific grammar into a pedagogical
> grammar. What form the pedagogical grammar
> takes, whether drills or rules or some
> combination of the two, is presumably
> determined by some assumptions about the
> nature of learning in general, that is,
> by principles which are not primarily
> linguistic. On the other hand, the content
> of the grammar, that is, a specification of
> what it is that is to be learned, is
> narrowly linguistic.[7]

The objection to current audio-lingual materials is

---

[7]Sol Saporta, "Applied Linguistics and Generative
Grammar", in Albert Valdman, ed., Trends in Language Teaching
(New York: McGraw-Hill Book Company, 1966), p. 81.

that the teacher is operating with a simplistic "sunburn"

method of learning without the concurrent expansion of

exposure time implicit in the Linguistic Method. Harlan

Lane, a Skinnerian psychologist involved in problems of

language acquisition, comments:

> The language teacher has operated frankly with
> a sunburn model of learning and his techniques
> are as inefficient as this characterization of
> learning is inappropriate. The teacher, prime
> source of knowledge and light (and occasionally,
> heat), "exposes" students to the language and
> its principles. He is aided in this endeavor
> by the language laboratory, now commonplace in
> secondary education, which also exposes the
> students to the material in limited doses;
> twenty minutes is generally considered the
> maximum safe exposure in one treatment. When
> classroom practice permits active participation
> by the student at all, it is usually in the
> form of repetitive drills which are presumed
> to "fix" or "stamp in" the material through
> repetition alone. The "brighter" students
> "soak up" the material and become "enlightened".
> Dull students, who fail to learn, are simply
> not "sensitive" or "receptive".
>   The remarkable plasticity of behavior
> is ignored by this model. Instead of
> acknowledging that the inadequacies of the
> students are the product of inadequate
> technique, and then spending all effort to
> improve technique, teachers often assign the
> key role in language learning to ability or
> endowment, and thus place the process beyond
> their control - and responsbility.[8]

The foreign language teacher was more influenced by

the linguists teaching materials, pattern-practice exercises,

---

[8]Lane, _Teaching Machines and Programed Learning,
Volume II: Data and Directions_, p. 586.

grammar by induction and basic conversational sentences for memorization, than by the realization of the necessity of intensive contact and active participation as essential to the acquisition of audio-lingual skills. Unfortunately, in the context of the traditional classroom, the emphasis on drills and mechanical manipulation of linguistic features tends to produce students fluent in producing rehearsed utterances, but unable to generate novel sentences. Storage of a large number of sentences cannot be equated with having learned a language, but the audio-lingual habit method maintains that by generalization and analogy a student will be led to generate novel sentences based on the stored material. However, the materials are not presented in a way which would facilitate the formation of analogies. Many utterly different structures are presented together within one lesson and no attempt is made to have the student understand how these structures operate.

Fernand Marty (1962) has listed eleven completely different structural types presented in the first unit of the Glastonbury materials (renamed A-LM). The failure to explain how these various structures operate leads the student into difficulties when he attempts to analyze or draw analogies from these memorized sentences. Marty comments:

1. If the student attempts, on his own, to compare and analyze the structures, he finds himself running into dead ends of this type:

<u>Sentences he has been taught</u>:

Je voudrais <u>te</u> présenter Paul Martin.
Présente-<u>nous</u>, veux-tu?

Il s'appelle Jean.   Elle s'appelle Marie.
C'est un ami.   C'est Marie Leblanc.

<u>Dead ends he is led into</u>:

Where do the French place the object pronoun?

When do you use il, elle, ce?
How would you say "She is a friend"?

2. If the student proceeds by analogy and tries to make up some sentences he runs into traps of this type:

<u>Verb forms he has been taught</u>:

Je fais
Tu fais   Tu vas
Il fait   Il va

<u>Wrong analogy he is liable to make</u>:

Since in je fais, tu fais, il fait, the verb forms sound alike, I can also say *Je vas, tu vas, il va, and I can answer je *vas bien, je *vas au cours de français.[9]

The most serious criticism of the audio-lingual habit method, then, is that the materials constitute a closed system. A student will, of necessity, only meet a

---

[9]Marty, <u>Programing a Basic Foreign Language Course: Prospects for Self-Instruction</u>, p. 8.

*Nonce or ungrammatical form.

finite number of sentences in a course. However, the
learning of a language is not just the mimicking of these
sentences, but rather, the ability to produce and understand
novel sentences. Therefore, the most important skill to
develop in a language programme would be the ability to
solve linguistic problems automatically as they arise.

The basic objection to the audio-lingual habit
method is that it often produces robot-like parroting of
the language where the students are able to use the dialogues
and patterns only in the context which they have been
memorized. This criticism has also been raised against the
programming method. However, as has been said earlier, a
programme will reflect the views of the programmer. If a
programmer relies too heavily on current textual materials
or methodology, he may produce a programme which is merely
an up-dated version of the grammar-translation method or
the audio-lingual habit method and which is susceptible to
their flaws. Too rigid adherence to Skinnerian psychology
or the structural linguists conception of language may
produce a programme which has little use as a pedagogical
device. Several programmes currently available in foreign
languages are mere translations of traditional textbooks
and as such, offer no real insight into course analysis or
the learning process.

Some Relevant Research

An area of particular controversy in foreign language teaching is the dispute between the adherents of the audio-lingual habit method and those of the more traditional grammar-translation (or cognitive-code learning) approach. Characteristic of this dispute is a lack of rigorous experimental research which would conclusively prove either method superior. Research in foreign language learning has generally been inadequate because much of the work of psychologists has little relevance to foreign language teaching, and experiments performed by linguists or foreign language teachers often lack necessary controls and scientific rigour.

Due to the climate of the times which enthusiastically and uncritically accepted any method which emphasized verbal skills, many aspects of the audio-lingual method have been accepted as valid without adequate investigation. In 1962 George Scherer and Michael Wertheimer summarized the problem:

> Inherent in the assumptions under-
> lying an audio-lingual approach to foreign
> language learning is that students trained
> only audio-lingually at the beginning will
> subsequently reach, and perhaps surpass, in
> reading and writing ability, students who
> have been trained in the more conventional
> manner, while exhibiting a far higher level
> of achievement in auditory comprehension
> and speaking; advocates of the traditional
> multiple approach, with its heavy emphasis
> on grammar and reading, are of a contrary
> opinion. Little evidence based on

controlled experimentation exists.[10]

Even when certain aspects of audio-lingual techniques are investigated the results of the studies are often equivocal. The audio-lingual method prescribes that a student should read only what he has spoken.[11] As Lane has pointed out, when an audio-lingual method was compared with a sight method producing speed and retention in reading, all four possible outcomes were reported.[12]

In a study by J. J. Asher it was found that "subjects who learned visually and relearned aurally achieved superior performances in comparison with performances of subjects who learned aurally and relearned visually".[13] However Pimsleur and Bonkowski report the opposite: "Aural learning facilitates visual relearning; this facilitation is greater than the facilitation of aural relearning by visual learning".[14] Carroll feels that reading and oral-aural skills are distinct

---

[10]George A. C. Scherer and Michael Wertheimer, "The German Teaching Experiment at the University of Colorado", German Quarterly, XXXV (May 1962), 298.

[11]Brooks, Language and Language Learning, p. 52.

[12]Harlan L. Lane, "Acquisition and Transfer in Auditory Discrimination", American Journal of Psychology, LXXVII (June 1964), 620.

[13]J. J. Asher, "Sensory Interrelationships in the Automated Teaching of Foreign Languages", Perceptual and Motor Skills, XIV (August-December 1958), 38.

[14]P. Pimsleur and R. J. Bonkowski, "Transfer of Verbal Material Across Sense Modalities", Journal of Educational Psychology, LII (April 1961), 107.

and their development is mutually exclusive: "Oral-aural and

reading proficiency constitute separate, independent skills

which do not develop one from the other".[15] In an experiment

comparing a traditional with an audio-lingual method, Scherer

and Wertheimer found that the students' reading and writing

ability were almost comparable. They concluded that "students

taught by the audio-lingual method. . .were almost on the

same level with students taught by the traditional method

in new-type reading and writing tests".[16]

A particularly interesting study is one conducted

by Scherer and Wertheimer and described in their book

published in 1964.[17] In a rigourous and highly controlled

experiment performed at the University of Colorado, they

compared a traditional and an audio-lingual approach to the

teaching of German. The audio-lingual group were not given

any reading material until the twelfth week of the experiment

while the "traditional" group received reading materials

immediately. By the end of the first year the audio-lingual

students were superior in listening and speaking, and almost

---

[15]John B. Carroll, Research on Teaching Foreign
Languages (Ann Arbor: University of Michigan, Publications
of Language Laboratory, Series Preprints and Reprints, Vol.
III B, 1961), 1,067.

[16]Scherer and Wertheimer, German Quarterly, 302.

[17]Scherer and Wertheimer, A Psycholinguistic
Experiment in Foreign-Language Teaching.

comparable to the "traditional" group in tests in reading

and writing. It was not possible to continue separate

training in the second year of the experiment and by the

end of the year the "traditional" group was still somewhat

better in writing skills and the audio-lingual group were

slightly better in speaking. However the groups were now

comparable in reading and listening.

While there are many variables which might govern

the results of this experiment (such as the quality of

teaching in each group, the specific formulation of each

method, etc.) it would seem to suggest that there is not a

tremendous difference in the amount of learning acquired

from either method. That audio-lingual methods do not

produce the dramatic superiority that their adherents claimed

could also be explained by the concept of language, not

primarily as a system of habits, but as rule-governed

behavior, and language learning as the internalization of

these rules. Sol Saporta summarizes the deficiencies of both

methods:

> We see that we have not come full
> circle. The impact of modern linguistic
> theory must be to improve the content of
> pedagogical grammars. In this sense the
> traditional grammarians were on the side of
> the angels. Postwar linguists focused on
> the fact that ability to verbalize even
> adequate rules did not ensure performance
> and argued for the importance of practice.
> But the practice which has been devised
> is of two kinds, one of which can be performed
> automatically and hence may have only a

> minimal effect on the learner's competence
> and another which presupposes precisely
> the competence to be learned. The drill
> which serves as input to a native student
> and which is somehow converted into command
> of precisely the appropriate rule is an
> illusion.[18]

While in the past there has been a dearth of research
in foreign language learning, recently quite a few
experiments have been undertaken in this area. The results
of these studies are often conflicting, but the very fact
that rigorous experimental data will be available is
promising for the future.

Since most of the programmed French courses have
utilized linguistic or frequency studies as an aid to subject
matter analysis, it is interesting to look briefly at the
trends influencing the linguistic studies of French. Certain
philosophical ideas were to play an important part in the
direction of thought in France during the second half of
the twentieth century. In particular the pre-eminence placed
on the "totality" or whole which manifested itself most
clearly in Gestalt psychology, led to the development of the
structural approach to linguistics. Another important
trend was modern phenomenology which had certain similarities
to pragmaticism and behaviorism and led to a more functional

---

[18]Saporta, _Trends in Language Teaching_, p. 91.

approach to linguistics. Kukenheim describes the philosophical

developments in France which were to have significant

influence on the direction of French linguistic studies:

> De nos jours, la langue est redevenue
> un des principaux sujets de reflexion
> philosophique. Deux grands principes dominent
> la pensée du second tiers de notre siècle:
> d'abord celui de la priorité et de la
> précellence de la totalité: "il faut voir
> le tout ou l'on ne voit rien". Ce ne sont
> pas les éléments, les parties qui font le
> "tout", mais c'est le "tout" qui est décomposable
> en parties. De même qu'une mélodie peut se
> décomposer en notes, mais n'est pas composée
> par elles, la langue peut être décomposée,
> mais n'est pas construite à l'aide de certains
> éléments qui la composeraient. La théorie
> de la "totalité" ne permet pas de séparer,
> elle admet tout au plus de distinguer et
> s'oppose nettement à l'atomisme, préconisé
> par exemple, par les sensualistes du XVIIIe
> et, en matière linguistique, par les
> néogrammairiens.
>
> Les philosophes néopositivistes font
> observer que certaines idées ont la vie dure
> seulement à cause des mots qui les propagent,
> par exemple les concepts "corps" et "âme":
> le "moi" est un "corps-âme". En médecine
> ce principe se retrouve dans la psychosomatique
> (ou psychosomatologie), qui considère le malade
> comme un tout et s'applique à guérir le corps
> en guérissant les psychoses: "Non pas guérir
> les corps, mais les malades!". Du même ordre
> sont, en matière linguistique, les considérations
> sur le signe linguistique: le mot est un
> "signifiant-signifié".
>
> La théorie de la totalité se manifeste
> en psychologie sous la forme de la "Gestalt-
> psychologie", "gestaltisme" ou "psychologie
> de la forme" et trouve en linguistique son
> application dans le structuralisme, qui
> souligne, lui aussi, la priorité des ensembles.
> Ainsi l'on revient à l'ancien adage: Totum
> est prius partibus".
>
> Le second courant important est celui
> de la phénoménologie moderne, qui, se tenant
> à l'écart de la marche de la pensée - celle-ci
> se soustrait à notre observation - s'intéresse

aux manifestations extérieures et revient
aux choses elles-mêmes, au solide, au concret.
De fait, les néopositivistes du "Wiener Kreis"
(cénacle philosophique né à Vienne en 1925)
et de la "Berliner Gruppe", qui comptent parmi
leurs membres Reichenbach, Rudolphe Carnap et
R. von Mises, admettent que la pensée n'a rien
d'intérieur, qu'elle est inexistante en dehors
des mots; niant l'opposition traditionnelle
des sciences de la nature et des sciences
humaines, ils ne reconnaissent que l'empirisme
en psychologie comme en linguistique. Leurs
conceptions sont voisines de celles du pragmatisme
et du behaviorisme, mais ce qui caractérise
surtout leur philosophie, c'est la critique
de la langue, dont les imperfections nous
induisent en erreur: ce qui est réel, ce sont
les sensations, non pas les abstractions:
"le rouge n'existe pas, ce qui existe ce sont
des objets rouges." Ce qui reviendrait à dire
qu'il faudrait abolir de nombreux termes qui
ne correspondent à rien du tout. . .
. . .La philosophie néopositiviste est
représentée aussi par E. Husserl (1859-1938),
mais il l'a approfondie en soulignant que
les objets sont toujours des objets de la
conscience; sa phénoménologie est la science
de la "conscience dans son rapport avec les
choses", de la "conscience intentionnelle";
la "relation" y est, par conséquent, la donnée
fondamentale. Des idées analogues ont été
exposées par Heidegger, H.-J. Pos, Merleau-
Ponty, auteur de la Structure du comportement
(1942) et de la Phénoménologie de la perception
(1945) et par Sartre. Au lieu de rechercher les
concepts de "causes finales", de buts ou
d'intentions, sur le plan linguistique, ces
conceptions amènent les idées de "relations"
et d'"échanges" (structurales), de "rendement",
d'"économie" du langage, d'"automatisme" et
d'"efficacité", par opposition à celles
de "causalité" ou d'"histoire". Ainsi l'objet
central de la linguistique devient le
fontionnement du langage. . .19

19Ch. Bruneau, Petite histoire de la langue française,
2 vols. (Paris: A. Colin, 1955-1958), pp. 111-112.

These philosophical trends were curiously paralleled
by similar attitudes in North America. They were to have a
profound influence on linguistic studies and language
training. Kukenheim comments:

> Ces courants a-historiques, sinon
> anti-historiques, coïncident avec l'état
> d'esprit des philosophes et linguistes
> américains: avec le pragmatisme de William
> James, avec le "behaviorisme" de Watson
> et avec l'oeuvre de Sapir, qui, dès 1921,
> proclame l'indépendance de la langue à
> l'égard de la psychologie: il analyse la
> langue en partant des éléments que celle-ci
> nous procure. En même temps, Leonard
> Bloomfield (1887-1949), après avoir débuté
> par une thèse d'indo-germanistique et une
> Introduction to the study of language (1914)
> tout imprégnée des idées de Wundt, se
> détourna, dans sa fameuse publication
> Language (1933), des "mentalistes", adhérents
> de spéculations psychologiques, pour défendre
> l'étude de la langue du point de vue
> "mécaniste". Prenant comme point de départ
> la théorie du comportement (behaviorisme),
> Bloomfield exposa dans Language, le mécanisme
> de la communication: négligeant à dessein
> la "conscience", domaine inaccessible, et
> évitant à tout prix de parler de "l'introspection",
> méthode impraticable, Bloomfield n'admet
> chez l'individu que des stimulus et des
> réactions: ceux-ci peuvent être de nature
> non-linguistique quand l'individu agit sans
> se servir de la langue, mais dès qu'une
> deuxième personne entre en jeu, la langue
> peut intervenir: la première personne peut
> éprouver un stimulus qui le fait parler, et
> la seconde personne pourra, à son tour, subir
> ce stimulus linguistique qui provoquera une
> réaction, parfois de nature linguistique.
> Les idées de Bloomfield devaient avoir un
> grand retentissement, surtout en Amérique,
> où les adhérents de l'"école de Yale", les
> "mécanistes" s'opposaient aux psychologues,
> les "mentalistes".[20]

---

[20]Bruneau, Petite histoire de la langue française,
p. 113.

In France, however, the main impact of these philosophical ideas was felt in literature and the theatre. E. Knight, in the introduction to his book, <u>Literature Considered as Philosophy: The French Example</u> makes the following comment:

> The fear of the traditionalist that
> the existentialist heresy may eventually lead
> to the disappearance of philosophy as a
> separate discipline is perhaps ill-founded,
> but the very essence of philosophy may well
> be transformed. For if truth is part of
> existence itself and not the distillation
> of some complex scientific or logical
> apparatus, then it is accessible to all of
> us; it becomes, par excellence, the domain
> of literature.
> We have said that existentialism
> is not an idea, but a movement. If this is
> true, there must be evidence of it everywhere
> in the thought and art most characteristic of
> our age, and as we shall see this is the case.
> In this matter of the present-day fusion of
> literature and philosophy, we are too often
> content to note simply that Sartre, Simone
> de Beauvoir, Gabriel Marcel; Brice Parain,
> etc., are novelists or playwrights as well
> as philosophers. It is more important to
> recognize that there exists a literature, of
> which no one speaks in connection with
> existentialism, which, nevertheless, is
> existentialist in that it is <u>literature as
> philosophy</u>, its authors being as much
> philosophers as the above-mentioned
> philosophers are novelists and playwrights.[21]

---

[21]Everett W. Knight, <u>Literature Considered as Philosophy: The French Example</u> (New York: Collier Books, 1962), pp. 14-15.

Knight examines the works of Gide, Malraux, Saint-Exupéry, and Sartre as examples of this fusion of philosophy and literature. The plays of Camus and Sartre and, to a lesser extent, the Theatre of the Absurd also exhibit this dual quality of being both works of art and philosophy.

In the United States the direction of linguistics and education was strongly affected by these philosophical ideas. Education has become increasingly goal-and performance-oriented and the emphasis in the universities is on description rather than prescription or participation. Knight notes the influence of the philosophical currents in France:

> The existentialist movement constitutes an unprecedented re-orientation of human thought in that it denies existence to everything of which we are not immediately and indubitably aware. To philosophize will no longer be to deduce or to analyse, but simply to describe what exists, and that not in view of establishing an eventual synthesis or hierarchy but to enable us to distinguish what really is from what through the centuries, human ingenuity has created to explain the nature of the universe and to justify man's presence in it. Existentialism reduces life from what we would like it to be, to what it is; and the instrument employed is not this or that method, but lucidity [emphasis mine]. The writer who refuses to allow a faith, a hope or a theory to interfere with his work, who has the courage to confront existence itself, is also a metaphysician, because existence is Reality and not merely its outward form.22

22Knight, Literature Considered as Philosophy: The French Example, p. 16.

Lucidity has been underlined in this quote because it is the quality which is most blatantly lacking in the educational system of North America. The emphasis on methodology in the universities, rather than any conception of "lucid choice" has led to a complacent conformity which results in the alienation of the "intellectual" from the rest of society.

While French linguists were eventually influenced by the "structural approach", they were not initially receptive. In 1928 the first Congrès International des Linguistes was held at La Haye, and despite the introduction of new approaches to language study, most French scholars continued the historical or psychological linguistic methods - methods which were in "la grande tradition française". Among some of the historical works were the monumental work of F. Brunot, L'Histoire de la langue française which was continued after his death in 1938 by Ch. Bruneau, the Petite histoire de la langue française, of Ch. Bruneau, the Histoire de la langue française of A. Dauzat (1930), A. François's Histoire de la langue française cultivée des origines à nos jours, and several works of W. von Wartburg.

Some publications with a psychological approach were Henri Frei, Grammaire des Fautes, Georges Galichet, Essai de Grammaire psychologique (1947), the works of Gustave Guillaume, and the works of Edouard Pichon.

Kukenheim comments on the various conceptions of the relation of thought and language and he compares several works which present divergent views:

> De la collaboration d'un linguiste, Jacques Damourette, et d'un médecin aliéniste, Edouard Pichon (1940), est née une oeuvre magistrale en sept volumes, inititulée Des mots à la pensée - Essai de Grammaire de la langue française, fondée sur des milliers d'exemples. . .
> Il est intéressant de comparer la méthode de cet "Essai" avec la conception de Brunot, dont La pensée et la langue se trouve être l'antipode de Des mots à la pensée; de fait, il convient de songer à la découverte récente qui a révélé que la marche ne va pas seulement de la pensée à l'expression linguistique, mais que ce sont aussi les mots qui font la pensée. Voilà une vérité dont n'ont tenu compte ni Felix Boillot, dans sa Pscyhologie de la construction dans la phrase française moderne (1930) ni G. et R. Le Bidois dans leur Syntaxe du français moderne (soustitre "Ses fondements historiques et psychologiques"; deux vol., 1935 et 1938) ni Georges Galichet dans son Essai de grammaire psychologique (1947). Le dernier distingue deux espèces grammaticales essentielles (le "nom" qui exprime l'être, et le "verbe" qui exprime le procès), des espèces adjointes (l'"adjectif" déterminant le nom, l'"adverbe" déterminant le verbe) et des espèces de relations (prépositions, conjonctions, qu'il appelle "mot-charnières"); ensuite il traite des "catégories grammaticales" (genre, nombre, temps, voix mode, etc.) pour finir par les "rapports ou fonctions grammaticales" (épithète, sujet, complément, etc.), s'efforçant de "faire crouler la fausse barrière traditionnelle entre analyse logique et analyse grammaticale". Convaincu que ce ne sont pas les mots qui gouvernent la langue mais que celle-ci est gouvernée par des valeurs psychologiques, Galichet nous présente en même temps qu'une

analyse du français, une espèce de "grammaire générale".23

The second half of the twentieth century in France was characterized in linguistics by specialization in the areas of phonology, morphology, syntaxe, lexicologie, etc. Examples of this trend towards specialization are the works of F. Saussure, M. Grammont or P. Fouché in phonetics and phonology. Despite frequent international contact, French scholars were slow to adopt a structural approach to linguistics. Among the first to do so were Georges Gougenheim, Système grammatical de la langue française (1938), and A. Martinet, Eléments de linguistique générale

Conclusion

An effective analysis of French programmes necessitates a study of the current trends in language teaching and linguistics. A programme does not prescribe any view of the subject matter but is only a reflection of the programmer's conception of the language. It will be seen in the following pages in an actual examination of French programmes that course objectives and the presentation of materials vary greatly. However, most programmers have been influenced by the audio-lingual method or the grammar-

---

23Louis Kukenheim, Esquisse historique de la linguistique française et de ses rapports avec la linguistique générale (Leiden: Universitaire Pers, 1962), p. 145.

translation method and have often used linguistic techniques for the presentation of materials. It is only very recently that any of the assumptions made about foreign language teaching have been tested, and many aspects of previous methods have been accepted without adequate evaluation.

What may prove to be the most important feature of the programming method is its emphasis on empirical evidence of course effectiveness as a basis for revisions and validation of the programmes. A rigorously constructed programme is tested and revisions are made on the basis of direct observation of student behavior. This will not only encourage a thorough course analysis and more effective organization of materials, but it will also provide research data on second language learning for future investigations.

CHAPTER III

THE APPLICATION OF PROGRAMMING PRINCIPLES TO FRENCH:

PRELIMINARY PROBLEMS

Two immediate problems arise in programming a foreign language and are evident from an initial review of French programmed materials:

(1) How are programming principles applied to the foreign language?
(2) How is the subject matter analyzed?

The first problem is especially important, for critics are now questioning whether, in fact, it is possible to programme a foreign language. Programming requires that an analysis be made of the students' initial behavior, followed by a specification of the terminal behavior expected upon completion of the programmed materials. At first, this would appear to be no more than what a competent teacher would do in preparing a lesson plan. After considering what the students can already do, the teacher outlines what new things he wants them to do. However, if these principles are applied with scientific rigour certain distinct difficulties arise. The difficulties will be examined with special attention given to the problem of determining the terminal objectives of a French course.

The second problem which is immediately apparent upon investigation of a French programme is the method by

63

which the language has been analyzed. If the materials are
well-programmed, the language will not only be analyzed in
terms of linguistic elements to be learned, but will also
present these elements in relation to different behaviors.
Vocabulary and grammar are only tools which enable one to
read, write, speak, and listen. If the materials are
thoroughly programmed, the emphasis will be placed on the
development of skills and the language will be analyzed in
terms of behaviors expected of the student.

It is necessary to look more closely at some of
the principles involved in programming and to see how these
can be applied to a French course. Robert Glaser, co-editor
of the first comprehensive compilation of research material
in programming, has analyzed the instructional system into
the following components:

> (a) Instructional Goals - the System
> Objective (b) Entering Behavior - the System
> Input, (c) Instructional Procedures - the
> System Operator, (d) Performance Assessment -
> the Output Monitor, and (e) Research and
> Development Logistics. . .
> The development of the system is
> initiated with the specification of the goals
> of instruction. These goals constitute the
> objective to be accomplished and the purpose
> for which the system is to be designed. The
> main input into the system, upon which it is
> designed to operate, consists of the entering
> behavior of the student. This consists of the
> initial repertoire, aptitudes, and prior
> educational background with which the
> instructional process begins. The next phase
> constitutes the actual instructional procedures
> and experiences which are employed to guide
> and modify behavior. The final phase in an
> instructional situation is some sort of

"quality control", that is, assessment of
the extent to which the end-of-course behavior
has been achieved by the student in the light
of the kind of performance required by the
specified instructional goals. These phases
are the main flow of the instructional system,
but it has many feedback loops and subsidiary
inputs. The information obtained in each phase
supplies data which are useful for monitoring
and correcting the output of the preceding
phase; for example, measurement of the kind
of performance achieved can provide information
for redesign of instructional procedures, and
information on instructional procedures can
interact with the characteristics of the
entering behavior. Feeding in to all phases
are the results of research and development.
The implementation of these results and the
fruitful interplay between research and
development, on the one hand, and the
operating aspects of the system, on the other,
involve important logistical considerations.[1]

The development, then, of a French programme involves

four steps:

(1)   an analysis of initial behavior;

(2)   the determination of the terminal objectives

of the course;

(3)   the procedure leading to the terminal objectives;

(4)   the revision and validation of the programme.

Each of these steps is influenced by current research in the

fields of psycholinguistics, programming, linguistic science

---

[1]Robert Glaser, "Components of the Instructional
Process" in John P. DeCecco, ed., _Educational Technology:
Readings in Programmed Instruction_ (Holt, Rinehart &
Winston, 1964).

and learning theory. Because language behavior is so complex,
programmers often have difficulty with the first two steps,
the analysis of initial behavior and the determination of
the terminal objectives of the course.

Analysis of Initial Behavior

In analyzing a student's initial behavior, language
programmers are ·confronted with theoretical questions as to
the nature of language and language acquisition. Is language
a set of habits amenable to operant conditioning techniques,
or is it the result of an internal "data-processing
mechanism" as Chomsky and others suggest? As has been seen
earlier in this paper, a major difficulty in determining the
initial or entering behavior of an individual is a lack of
basic knowledge and research on the process of language
acquisition. There is very little laboratory research as to
how a child acquires a first language and even less research
material in regard to second language learning. An important
distinction must also be drawn between the behaviors involved
in a child learning a native language and those of an adult
learning a second language. Current research involving
young children may not be relevant to adult second language
learning because there is some evidence that the mechanism
for language acquisition may atrophy as a person grows into
adolescence and adulthood. This seems to be suggested by
Masson's observations that pre-teen-age Anglo-Saxon children

learn French faster and better than teen-agers of similar background.[2]

Generative-transformational grammarians argue that language is an abstract system which only relates indirectly to observable behavior. If the internal language system can be modified without any observable manifestation, it is difficult to adequately measure or observe language acquisition. Valdman has raised doubts as to whether, in fact, it is possible to programme a foreign language.[3] If we are to accept, along with Chomsky, that there is only a partial relationship between observable responses and basic linguistic competence, then it would be difficult to specify the initial and terminal behaviors of a foreign language programme.

Specification of Terminal Objectives

Difficulties also arise in programming a French course in determining the objectives or instructional goals of the course and in the specification of terminal behaviors. It is necessary to distinguish between a content description

---

[2]L. I. Masson, "The Influence of Developmental Level on the Learning of a Second Language Among Children of Anglo-Saxon Origin", Canadian Education and Research Digest, IV (1964).

[3]Albert Valdman, Problems in the Definition of Learning Steps in Programmed Foreign Language Materials, paper delivered at the Kentucky Foreign Language Conference, April 29, 1967.

and a <u>description of the behaviors</u> expected of a student

who has completed the course. A thorough and rigorous

specification of terminal objectives would include both

types of description. Valdman criticizes a phonetics

programme written by Elaine Burroughs because it lacks a

behavioral description of the objectives of the course:

> The course has presumably been tested as
> auxiliary materials for first year and
> "review" French courses and is suggested
> as syllabus for a First Course in French
> phonetics but the terminal behavior of the
> subject who completes the 1000 frames is
> nowhere stated in the objective terms Marty
> and this reviewer would require. Is the
> subject merely expected to transcribe French
> in the International Phonetics alphabet –
> a dubious achievement per se – to convert
> IPA symbols to the conventional orthography,
> to hear and produce French sounds well enough
> to meet Marty's minimum requirement, or to
> approximate the native model?[4]

From a careful linguistic analysis of the language,

a programmer would select those phonological, syntactical

and lexical aspects which were most important for a command

of the language. A behavioral description might specify

whether the student was expected to have both written and

oral command of a particular structure, whether he was

expected to passively comprehend or to actively produce this

---

[4]Albert Valdman, "Reviews of: Fernand Marty, <u>Programming a Basic Foreign Language Course; Prospects for Self-Instruction</u>; and Elaine Burroughs, <u>A Programmed Course in French Phonetics</u>", <u>French Review</u>, XXXVI (1963), p. 421.

structure and under what conditions. An even more rigorous

description might specify the time allowed for response

reaction and rate of phonation.

Different types of behavior might be required of a

student in relation to different styles of speech. While

a student might be expected to <u>understand</u> a variety of

styles of speech in French, he would only be expected to

<u>produce</u> the speech of the educated Parisian. Pierre Léon

suggests that different models of speech might be used in

teaching pronunciation and conversation - one for

recognition and one for production:

> Most languages, at least the so-called
> "languages of culture", are spoken in
> several levels of style. This raises
> the thorny problem of the selection of a
> suitable model for student imitation: the
> uninhibited pronunciation of the man in
> the street or that of the careful diction
> teacher? The final objective would probably
> be the former for audio-comprehension and
> the latter for sound production. In French
> a group of words like <u>je ne sais pas</u> would
> have to be taught for audio-comprehension as:
>
> 1. žən se pɑ
>
> 2. š se pɑ
>
> 3. se pɑ
>
> 4. pɑ
>
> but only the first form would be taught for
> the students' oral use. Even now, however,
> too many phonograph records present slow,
> emphatic models instead of natural speech.[5]

---

[5]Pierre Léon, "Teaching Pronunciation", in Albert
Valdman, ed., <u>Trends in Language Teaching</u> (New York:
McGraw-Hill Book Company, 1966), p. 61.

The preparation of a programme would entail a
detailed analysis of the language to be learned (the target
language) and also a contrastive analysis between the target
and native language which would identify those areas that
would interfere with learning. The programmer would also
need to locate those areas within the language which might
cause difficulties to the student (such as in French, the
sound contrasts in minimal pairs: roue/rue, chou/chaud or
different verb forms such as fut/fût which might be confused).

Within the last two decades the objectives of foreign
language study have changed from exclusive concern with
reading-translation to emphasis on audio-lingual skills.
However, a language programme will reflect the programmer's
view of the language and is not inherently an audio-lingual
method. Some programmes will have as a basic objective the
teaching of the spoken language while others will adhere
to a more traditional teaching of reading, translation and
vocabulary. A programme may include all materials necessary
to a first or second year course or it may cover a specific
skill such as spelling, phonetics or review materials.

Once the general instructional goals of a programme
are determined, a programme should specify in behavioral
terms (observable and quantifiable behaviors) what the student
will do as a result of completing the programmed sequences.
As Albert Valdman has pointed out problems arise in programming

a French course in finding practical, principle and

consistent bases for the specification of terminal behavior.[6]

Several different approaches have been used in audio-lingually

oriented courses.

Fernand Marty gives a detailed description of the

terminal objectives desired in the area of pronunciation.

In general, the goal is sufficient speed and fluency to be

acceptable to a French listener. In oral production and

listening comprehension fluency is stated as a function of

length of utterances and time needed to produce them and

decoding defined in syllables per second with a reaction

speed of less than three seconds.

> 8. Pronunciation. The pronunciation
> is taught within the morphological and
> syntactical frameworks of the language. The
> voices heard by the students are native French
> voices and the training in the programme is,
> indeed, aimed at giving a native pronunciation,
> but we cannot reasonably expect that all the
> students will acquire it. It is a pronunciation
> which is sufficiently accurate to handle
> effectively the morphological and syntactical
> contrasts of the language. A few of these
> essential contrasts are:
>
> /y/ – /u/ inability to make this contrast leads
> to gross semantic errors (ils se disent
> tout / ils se disent tu).
>
> /ɛ̃/ – /ɛn/ inability to make this contrast renders
> the speaker unable to express
> satisfactorily some of the masculine/
> feminine oppositions (italien/italienne)
> or some of the singular/plural oppositions
> (il vient/ils viennent).

---

[6]Valdman, _Problems in the Definition of Learning
Steps in Programmed Foreign Language Materials_, p. 7.

/r/ - /rr/   inability to make this contrast
             leads to misunderstanding
             (vous courez / vous courrez).

Determining whether the student has acquired the required accuracy is done by having him select and read one sentence from sets of two contrasting sentence (such as ilvjẽdine / ilvjẽddine) and having the teacher write the one he understands. By comparing what the student intended to say and what was understood by the teacher, we know whether the required minimum has been met.

9. Oral expression. The natives vary considerably in the rate at which they express themselves. We ask that our students be able to express themselves at a rate which is found acceptable by natives. We consider that a student has acquired a given structure only when he can use this structure correctly at a rate not under 150 syllables per minute.

10. Audio comprehension. Native facility includes the ability to understand a high number of syllables per minute and also the ability to understand the language spoken in unfavorable conditions such as against background noise (street noises, other conversations going on at the same time, not being able to see the speaker's face, and loss of fidelity (telephone conversations, movies, radio and T.V. programs). During the recorded practice drills (not the presentation), we speak at a rate oscillating between 200 and 240 syllables per minute. We require that our students achieve a minimum comprehension ability of 200 syllables per minute.

11. Reaction speed. When a native is asked a question, his reaction speed is usually very rapid (less than one second), provided - of course - that he knows the answer and is willing to give it. We require our students' reaction speed be less than three seconds.[7]

---

[7] Marty, _Programing a Basic Foreign Language Course: Prospects for Self-Instruction_, pp. 2-3.

Valdman objects to this definition of terminal behavior in terms of rate of phonation and speed of identification of phonic signals because these aspects of language performance are often dependent on nonlinguistic factors, such as the emotional state of the speaker and listener, the context of the situation and individual differences among speakers. He maintains that speed of phonation is a meaningless criterion unless it is specified that the utterances meet certain standards of well-formedness and appropriateness at higher levels of language behavior.[8]

Some programmes approach the problem of the definition of terminal behavior by the establishment of a repertoire of responses to specific stimuli. This is apparent in the courses which emphasize the conversational aspect of the language. The content of a course by Paul Pimsleur, Speak and Read Essential French is informal, conversational French and he describes the terminal objectives of the programme:

> You will have at your command a 200-word
> vocabulary. . .In addition you will know
> how to pronounce written French. Your
> knowledge of the spoken language will
> enable you to cope with situations of
> travel, restaurant ordering, directions,

---

[8]Marty, Programing a Basic Foreign Language Course: Prospects for Self-Instruction, p. 6. See Marty for discussion of terminal behavior.

hotel accomodations, and simple social
encounter. You will also be able to
give information about yourself, your
family, your home and friends. . .you
will be able to extend your knowledge
of the language on the basis of what you
have already learned.9

The learning of a finite stock of utterances which
can be produced as the response to specific stimuli is
feasible in a short (the completion time for Pimsleur's
programme is estimated at about 15 hours), specialized
programme, but might have the same shortcoming as the "New
Key" materials if the course were more extensive.

Another approach to the definition of terminal
objectives is the discrimination and production of French
sounds with an emphasis on intonation patterns. Timothy
F. Regan and Juan Estarellas describe the objectives of
their courses:

> The student will achieve 80% of the following,
> Given: 1) an aural stimulus of twenty French
> words, the student will be able to fill in the
> blanks with the correct vowel or consonant
> grapheme, 2) the aural stimulus of twenty
> French words, the student will be able to
> circle the stressed syllable, 3) the aural
> stimulus of twenty French sentences, the
> student will be able to demonstrate
> recognition of the intonation pattern of each
> sentence by checking the appropriate symbol,
> and 4) the written stimulus of twenty French

9Paul Pimsleur, Speak and Read Essential French
(Columbus, Ohio: Tapeway, 1964), Introduction.

sentences, the student will be able to
pronounce them in a manner in which the
meaning would be understood by a native.[10]

Subject Matter Analysis

In a subject matter oriented analysis of a language

such terms as "content" and "subtopic repertoire" would be

relevant and the subject matter expert would divide his

subject on the basis of the logic and interrelationships of

content. Programmes which are only based on a subject

matter analysis of the language appear to be adaptations

of textbooks rather than presenting any new insights into

an effective organization of language facts. A course by

M. J. Collett[11] is designed to review French grammar learned

in the first two years of a secondary school. Part I of

the course covers the present tense of regular verbs,

preceding direct object pronouns, and a review of pronouns,

while Part II contains the perfect tense and some irregular

verbs. Both books include vocabulary sections. A programme

produced by Universal Electronics Laboratories Corporation,

has the course description: "This Course includes: Articles,

present indicative of first conjugation verbs, interrogative

---

[10]T. F. Regan and J. Estarella, From Sound to Letter:
Programmed Self-Instruction in French Pronunciation and Writing
(Wilton, Connecticut: Instructional Materials Division of
Continuous Progress Education, Inc., 1966), Introduction.

[11]M. J. Collet, Middle School French, Part I and II
(London, England: Methuen & Co. Ltd., 1966), Introduction.

and negative forms, ajectives, partitives, irregular verbs".[12]

A more extensive programme by Elaine Burroughs is also organized according to various topics of content:

> The three books of the course are divided into 25 chapters, each dealing with specific new structural patterns, vocabulary, and cultural items. . .Early chapters familiarize the student with the geography of France and the way of life in French cities, towns and villages; later units deal with French history and literature. . .
> Objectives of Book I - The student learns to read and write simple French prose. At the end of the first book, he has an active vocabulary of 550 words which he can recall and spell. He has a passive vocabulary of 250 additional words. He is familiar with basic French structural patterns.[13]

Each of these courses is organized around a content analysis of the language. A Skinnerian psychologist, however, would be less interested in the content-orientation of the subject matter and more concerned with the behavior expected of the learner and the stimulus-response situations involved. In a behavioral analysis of language such terms as "component behavioral repertoire" or more simply "component repertoire" would be used. From a pedagogical

---

[12]Universal Electronics Laboratories Corporation, French 4010 (New York: Institute for Programmed Teaching, Inc., 1963), Introduction.

[13]Elaine Burroughs, Modern French (French A & B) (Behavioral Research Laboratories, Palo Alto, California, 1966), Introduction.

point of view, the practical requirement of a behavioral

analysis of language would be to identify the type of

behavior involved in different component repertoires so that

the student can be provided with environmental conditions

and teaching methods which best facilitate the acquisition

of that type of behavior.

The assumption that is made in a component repertoire

analysis of language is that the learning of different kinds

of behavioral repertoires requires different kinds of

instructional procedures. Harlan Lane, following Skinner's

formulations, distinguishes between formal repertoires (in

which the stimulus and response are directly related in a

one-to-one fashion) and thematic repertoires (corresponding

more closely to the ability to form meaningful utterances).[14]

Formal repertoires would involve such behavior as

imitating, copying, and reading, and have been categorized

as echoic behavior - when both the stimulus and response are

spoken; textual behavior, - when a spoken response is

controlled by a written stimulus; transcription - when both

stimulus and response are written; and dictation - when the

stimulus is spoken and the response is written. Most

---

[14]Lane, _Teaching Machines and Programed Learning,_
Volume II: Data and Directions, p. 589.

research and experimentation have been on formal repertoires as they are less complex and it is easier to control the variables. However, purely formal repertoires are of minimal value. It is the combination of thematic and formal sources of strength which determine whether a response can be considered meaningful.

A thematic repertoire would involve such behavior as responding appropriately to a question with a meaningful answer and the ability to manipulate the grammatical structures and syntactic sequences in an appropriate and meaningful way. There is very little applicable research on thematic repertoires, though some research and experimentation in this direction is currently in progress. Since one of the most important aspects of language behavior is the ability to respond appropriately to the nature of the environmental conditions, this research will have important implications for language instruction.

In developing echoic behavior and the ability to pronounce French sounds most audio-lingual programmes use discrimination and differentiation training. The student would be taught to discriminate between a French sound and a similar English sound (such as English _day_ contrasted with French _des_). Mueller describes the discrimination portion of his programme:

In the discrimination portion the student
learns to differentiate automatically between
the French phonetic features and those of
the English counterpart. This ability to
discriminate is taught in individual
syllables and in sequences of up to five
syllables. The student is taught the
discrimination skill to enable him to
monitor his own speech for purposes of
self-correction.15

In the following section of his programme (which

Mueller calls transformation) the student is required to

transform initial, internal, and terminal sounds such as

chou-chaud, and basse-base, to emphasize the phonetic

contrasts within the language. Fernand Marty also begins

his programme with discrimination training, but he has not

separated various aspects of the language as rigidly as

Mueller and many phonological problems are taught along with

structural and morphological aspects of the language.

Marty emphasizes the following contrasts within

the French language:

a. The student must be made aware
of the contrasts which are essential for
effective communication. These contrasts
can be of a morphological, structural, or
semantic nature. They should be taught
along with the structure, the morphology,
and the vocabulary. Examples:

15Theodore H. Mueller, Trial Use of the ALLP French
Program at the University of Akron, 1963-64 (Akron:
University of Akron, 1964), p. 4.

Il vient.	Il est brun	These morphological contrasts require a satisfactory pronunciation of the oppositions
Il viennent.	Elle est brune.	
		$/\tilde{\epsilon}$-ɛɳ$/$, $/\tilde{œ}$-yɳ$/$.
Il vient dîner.	Il a dit.	These structural contrasts require a satisfactory pronunciation of the oppositions
Il vient de dîner.	Il l'a dit.	
		$/d$-dd$/$, $/\ell$-$\ell\ell/$.
Il me dit tu.	Il sent bon.	These semantic contrasts require a satisfactory pronunciation of the oppositions
Il me dit tout.	Ils sont bons.	
		$/y$-u$/$, $/\tilde{a}$-ɔ̃$/$, $/e$-ə$/$, $/s$-z$/$.
J'écris	Vous savez	
Je crie	Vous avez.16	

Albert Valdman teaches discrimination and differen-
tiation of phonological features in meaningful utterances and
does not favor the formal separation of components:

> In SEF French the presentation of the
> phonology is gradual, and the order of
> presentation of phonological features
> determines the introduction of grammatical
> structures and lexical items. . .After the
> student has been presented with a complete
> base sentence, he is led to discriminate

---

[16] Fernand L. Marty, Linguistics Applied to the
Beginning French Course (Roanoke, Virginia: Audio-Visual
Publications, 1960), p. xiv.

and differentiate a small number of French
phonemes and to produce them with accurate
control of secondary articulatory features,
particularly those that differ markedly from
features of American English. Criterion
frames require the student to produce the
phonemes under consideration within complete
sentences used in meaningful situations; in
other words, new pronunciation habits must
be so thoroughly acquired as to resist
deterioration under the interference of
higher levels of language structure.17

Much research in the psychological laboratory has

been conducted in the area of discrimination training and

several studies are relevant to second language teaching.18

Since much language training takes place in the language

laboratory, it is often necessary for the student to judge

the accuracy of his pronunciation by comparing it with a

tape-recorded native speaker. Paul Pimsleur points out:

The popular notion is that the student who is
able to compare his pronunciation with that of
a native speaker will acquire native-like
speech. Many teachers have already realized
that this hope is far too optimistic. It is

17Valdman, _Trends in Language Teaching_, p. 149.

18Lane, _American Journal of Psychology_; Harlan M.
Lane, and B. A. Schneider, "Methods for Self-Shaping Echoic
Behavior", _Modern Language Journal_, XXXXVII (April 1963);
P. Pimsleur, et al, _Preliminary Discrimination Training in
the Teaching of French Pronunciation_, Contract SAE 8950
(Washington, D.C.: U.S. Office of Education, 1961);
S. M. Sapon and John B. Carroll, "Discriminative Perception
of Speech Sounds as a Function of Native Language", _General
Linguistics_, III (Spring, 1958); P. Suppes, et al, _Some
Quantitative Studies of Russian Consonant Phoneme
Discrimination_ (Stanford, California: Stanford University
Istitute for Mathematical Studies in the Social Sciences,
September, 1962).

evident that students are rather poor judges
of their own pronunciation. They are prone
to think their pronunciation is "good enough"
when actually it is not acceptable. They
are unable to note which features are relevant
and which are not.[19]

The research and experiments study such questions

as whether, in fact, students are capable of judging their

own pronunciation and whether discrimination and different-

iation training are effective in producing accurate echoic

behavior.

---

[19]P. Pimsleur, "Discrimination Training in the Teaching
of French Pronunciation", Modern Language Journal, XLVII
(May 1963), 199.

CHAPTER IV

PHONOLOGY

The two most important problems that emerge from a study of the pronunciation section of French programmes are in the area of behavior and content. In the area of content, a programmer must decide <u>what</u> a student is to learn and in the area of behavior, he must decide <u>how</u> he is to learn it. In describing the terminal behaviors desired of a student in the area of pronunciation, most programmers expect the student to be able to discriminate and differentiate a certain finite number of phonemic contrasts. It was seen in the preceding section of this paper that in most French programmes the student is taught <u>how</u> to pronounce French sounds by a process of discrimination and differentiation training.

An important requirement in shaping behavior is the reinforcement of correct responses and the correction of wrong responses. In the standard conditions of a university or high school classes are so large that a teacher cannot possibly hear and correct student pronunciation, and there is no practical, mechanical device which can do this. Therefore, the student must learn to evaluate his own response. This, however, implicitly assumes that a student <u>can</u>, in fact, successfully compare and judge his own

pronunciation. Several programmers who have developed audio-lingual programmes have found that a student is often not automatically a good evaluator of his own response. One of the terminal behaviors of an audio-lingual programme, then, must be to explicitly teach the students how to correctly evaluate his response because this is necessary for effective reinforcement.

Pronunciation behavior has been analyzed into two components. Discrimination between French sounds and English near equivalents or distinction within the French language itself are essentially a sensory (auditory) component, while the motor component, (the vocalization of sounds) involves differentiation of a particular response or sound out of all the sounds it is possible for the student to make. For example, a student would discriminate between the French c'est and the English say and then he would learn to discriminate sounds within the French language such as c'est /se/ from se /sə/. The student would then attempt to imitate and produce this sound and compare his own pronunciation with that of the speaker on the tape. It must be pointed out that most New Key materials do not explicitly train the student to discriminate sounds, but seem to assume that this ability will develop as the by-product of a great deal of practice and imitation. However, this assumption is contradictory because if the ability to discriminate is

developed as a by-product of training, then self-evaluation
is impossible except at a stage when it is no longer needed.
Programmers seem to doubt that the cumulative effect of
practice and repetition is the ability to make relevant
discriminations and they feel that it is inefficient for the
student to learn to evaluate his responses as an <u>end</u> result
of training. If a student first learns to discriminate
French sounds at the <u>beginning</u> of the programme, he can
<u>continuously</u> evaluate his responses, and repetition becomes
more meaningful. Various studies regarding the success of
this type of training have been listed in the preceding
section of this paper.

The second problem, that of content selection,
would at first appear to be common to all authors of a
language course, programmed or otherwise. However, because
of the emphasis on scientific rigour in programming, the
problem is given new significance. The French language is
a living, evolving system, and as such, does not always
lend itself to rigorous scientific regimentation. Most
programmers expect a student to be able to discriminate
and differentiate a <u>finite</u> number of phonemic contrasts.
However, depending on the geographical region and the style
of speech, French exhibits from seven to sixteen vowel
phonemes. Even limiting the language model to that of a
cultivated Parisian, it is sometimes difficult to apply
programming principles to the French language. A programmer

must attempt to be logical and consistent, yet, French is often inconsistent (verbs that have the highest frequency such as être and avoir are quite irregular) and illogical. (If we can say d'aujourd'hui en huit or Qui Jean regarde-t-il par la fenêtre? why can't we analogize *d'aujourd'hui en cinq or *Que Jean regarde-t-il par la fenêtre? If we can translate The money was given to the boss as L'argent a été donné au patron why can't we translate The boss was given the money as *Le patron a été donné l'argent?) Also, even in Paris, French speakers are not always consistent in the liaisons they will make or their treatment of the unstable /ə/. Sounds are not always constant and certain sound distinctions such as /œ̃/ seem to be disappearing. This section will not treat the programmers' selection of linguistic elements extensively, but will point out some areas which might exemplify the nature of the problem.

In an amusing introduction to a book sponsored by the Association Phonétique Internationale, Paul Passy comments on the difficulties in pronunciation which a foreigner encounters when trying to master French. In particular he mentions instances where the foreigner's native tongue produces areas of interference with French, or where a characteristic distinction does not occur in the native tongue:

---

*Unacceptable grammatical constructions, or nonce forms.

Tout le monde a pu entendre des Anglais, qui
connaissent très bien notre langue, et sont
incapables d'articuler d'une manière
intelligible un petit mot comme vu ou été.
Un Allemand du Nord dira: Il faut mettre
du zèle dans les aliments (du sel). Un
Allemand du Sud ne manque pas de dire,
quand il commence à pleuvoir: Il pleut
des chats (déjà), ou encore: Il tombe
des petits couteaux (des petites gouttes
d'eau). Un Italien nous apprend qu'il a
été un âne en France et un âne en Angleterre
(un an). . . .Ces sortes de bévues, enjolivées
par une imagination railleuse, prêtent à
des plaisanteries sans fin; ainsi on fait
dire à un Espagnol: Depuis que ma femme
est morue, j'ai fait un vœu, de rester
toujours bœuf et andouille (morte, vœu,
veuf, en deuil); - un Allemand: Tous mes
brochets sont des truites (projets, détruits).
    Du reste, nous n'avons guère le
droit de nous moquer des étrangers sous ce
rapport, car nous écorchons leurs langues
d'une manière tout aussi ridicule. . .
    Le professeur répète à un jeune
Anglais: "Il faut dire une rue, comme moi";
et son élève impatiente s'écrie: "Mais je
dis comme vous; je dis youne roue". . . .
    Or, si nous essayons de prononcer
un son qui n'existe pas dans notre langue,
il est très rare que nous y arrivions du
premier coup; généralement nous le remplaçons
par un son qui nous est familier et qui lui
ressemble plus ou moins. C'est ainsi que
l'Anglais, qui n'a pas notre voyelle u, la
remplace généralement par le groupe you;
et que l'Italien prononce âne pour an. Le
plus souvent, ils n'entendent même pas la
différence, ou l'entendent en tout cas fort
mal: Les Allemands du Sud sont incapables
de savoir si vous dites pain ou bain, et
Les Espagnols, de savoir si vous dites bœuf
ou veuf.1

1Paul Passy, Les sons du français (Paris: Didier,
1932), pp. 5-6.

In each of these examples that Passy gives, it is not just a case of phonetic distortions, (an "accent"), but of phonemic errors which lead to a distortion in meaning.

The necessity of a functional approach to linguistic description in the teaching of a language is, especially evident in the area of pronunciation, and is discussed by Pierre Léon:

> Auditory considerations are found everywhere in classical handbooks of pronunciation, but they are not utilized from a pedagogical point of view. On the contrary, they are generally approached scientifically, using the same procedure as phoneticians did when noting all possible realizations of sounds in dialectal studies. As a result, Jones (1937) gives for English a system of twenty-one vowels and dipthongs; and Navarro Tomás (1932) proposes for Spanish a twenty-vowel system, including four i, three e, five a, three o, four u and one nasal a. (Indeed he could also have added other nasal vowels like [õ] in corazon, etc.) Fouché (1952, p. 77) quotes R. de Souza as finding five different colors for the French E: acute e in poupée, grave e in péril, middle e in pélerin, acute-open e in belle, and open grave e in père. All these variations are indeed attested, but they are determined by the phonetic environment. Thus before r a vowel is likely to be more open than before k, in French père, as in Spanish pero or in German gern. These variations may also be individual or regional. Going further in more precise phonetic description would lead us to posit about fifty vowels for French, whereas from a functional point of view French dialects show a basic system of ten vowels expanded to a larger system of fifteen in standard speech.2

---

[2]Léon, _Trends in Language Teaching_, p. 59.

Utilizing the findings of structural and descriptive linguistics, a programmer must isolate the more important language facts from secondary ones. However, special problems arise in programming a French course even if phonetic considerations are placed secondary to phonemic distinctions. French speakers vary in the number of phonemic contrasts they maintain, according to style or region. Thus in 1932 Paul Passy describes the existence of four nasal vowels in French but remarks that these distinctions are not always maintained:

> 163. - Le français nasale quatre voyelles, toutes ouvertes: (ɔ), (a), (ε), (œ), ou plus exactment (ɔ¹), (a¹), (εᵀ) (œᵀ).3
>
> Nous représentons ces voyelles nasalées par (ɔ̃), (ã), (ε̃), (œ̃); on les entend dans bon, banc, bain, un.
>
> -- Nos habitudes d'orthographe nous font facilement croire que les voyelles des mots pin, un, sont (i) et (y) nasales. Mais si on s'exerce a prononcer (a-ã), (ε-ε̃), (œ-œ̃), (ɔ-ɔ̃), on se rendra bientôt compte du mécanisme de la nasalation: dès lors on pourra facilement former toutes les autres voyelles nasalées, et on reconnaîtra que (i), (y) n'existent pas en français. On les trouve dans d'autres langues, notamment dans certains dialectes de l'Est de la France.
>
> 164. - A Paris, on confond souvent les voyelles (ã) et (ɔ̃); alors il n'y a plus de différence entre les cheveux blancs et les cheveux blonds. Dans la prononciation populaire, on confond aussi (ε̃) et (œ̃).4

3Paul Passy, Les sons du français (Paris: Didier, 1932), p. 13.
1 = bouche plus fermée, ᵀ = bouche plus ouverte.

4Ibid., p. 84.

In preparing a French audio-lingual course, the programmer would have to specify which phonemic contrasts the student would be expected to discriminate and differentiate upon completion of the course because as Valdman points out:

> Depending on the speaker's geographical and social provenience, the style used, and position in the phonological phrase, French exhibits from seven to sixteen vowel phonemes (Table I).

Table I

i	ü	u
è: ｜é̠	œ̠	ó̠
｜è̠	œ	ð
	a ｜ â	

ẽ ｜ õ
œ̃ ｜ ã

> Vowels separated by solid lines constitute the minimum inventory; the nasal vowels separated by -.- broken lines do not occur in Southern French; vowels separated --- broken lines are in free alternation or complementary distribution in many dialects; vowels to the left of dots (;...) occur only in formal style.5

In selecting phonemic distinctions most programmers use the speech of the educated Parisian as their model. Fernand Marty bases his selection of phonemic elements for a

---

5Valdman, <u>Trends in Language Teaching</u>, p. 138.

French programme on a linguistic study he has made of the
French language (this study was designed for pedagogical
purposes and was not intended to be comprehensive).[6] He
distinguishes sixteen vowel phonemes and emphasizes the vowels
/i/, /y/, /u/, /ɛ̃/, /ã/, /ɔ̃/ because no matter where these
phonemes appear (final or non-final, checked or open syllable)
a Frenchman's ear is very sensitive to them and any
variation is non-standard. He also discusses the vowels
/ø/, /œ/, /o/, /ɔ/ in final or non-final positions and checked
or open syllables, the unstable vowel /ə/, the vowels
/e/ - /ɛ/, /a/ - /ɑ/ and the nasal vowel /œ̃/ which some
Frenchmen have replaced with /ɛ̃/.

However, in actually selecting elements for his
French course, Marty does not present a comprehensive
description of French vowel phonemes in paradigm form, but
choses to emphasize the areas which are essential for
a mastery of the language. While certain areas of student
difficulty in pronunciation are taught at the same time as
the morphology, the structures, and the vocabulary, Marty
begins his programme by conditioning a core of phonemic
distinctions:

---

[6]Marty, <u>Linguistics Applied to the Beginning French
Course</u>, pp. 1-4.

> Our experiments have shown that
> students have difficulty in distinguishing
> between /e/ and /ɛ/; /ø/, /ə/, and /œ/;
> /o/ and /ɔ/; /a/ and /ɑ/; /ɛ̃/ and /œ̃/.
> Since these contrasts are not phonemically
> important enough to justify long drills,
> we have decided to teach only /i/, /y/,
> /u/, /e/, /o/, /ɛ̃/, /ɑ̃/, /ɔ̃/ in this unit
> and to postpone the study of the other
> vowels.[7]

For example, in his French programme Marty does not

teach the French nasal vowel /œ̃/ until unit five, page 78,

and then it is to emphasize the contrast in the quantity

articles un and une.[8]

Marty bases his selection of phonemic contrasts for a

French course on the areas where difficulties are likely

to occur and where these difficulties will cause serious

problems in communication.

> Some errors of pronunciation lead to gross
> difficulties of communication; for example,
> a student who does not know how to make a
> clear contrast between /y/ and /u/, /ɔ̃/ and
> /ɑ̃/, etc. might be understood as saying
> Mettez-le dessous and Il sent mauvais when
> actually he is trying to say Mettez-le
> dessus and Ils sont mauvais. Contrasts
> such as these are therefore essential since
> meaning depends on them. They are called
> phonemic contrasts; the vowel sounds /ɔ̃/,
> /ɑ̃/, /y/, /u/ represent different phonemes.

---

[7] Marty, Linguistics Applied to the Beginning French Course, p. 4.

[8] Fernand Marty, Active French: Foundation Course, Book One and Two (Roanoke, Virginia: Audio-Visual Publications, 1965), p. 78.

> On the other hand, a student who
> speaks French with an American /r/ may
> experience no difficulty in communication.
> The contrast between French /r/ and American
> /r/ is of a phonetic nature. From the
> communication point of view, phonetic
> contrasts are less important than phonemic
> contrasts.9

The student is not presented with phonetic or

phonemic symbols in the belief that the use of such

transcription would confuse him when conventional spelling

is introduced. The phonemic symbols are only presented in

the discussions for the teacher.

A course which attempts to programme a limited,

specialized area is that of Elaine Burroughs, _A Programmed

Course in French Phonetics_.[10] With the consideration of

integrating the course into the general framework of a

school curriculum, the programming of specialized skills

such as spelling or phonetics may prove to be more expedient

than the programming of an entire course. However, this

particular course was one of the first attempts at

programming and Valdman has raised some valid criticisms

as to an artificiality of language - slow, monosyllabic

---

[9]Marty, _Linguistics Applied to the Beginning French Course_, p. 3.

[10]Elaine Burroughs, _A Programmed Course in French Phonetics_ (Palo Alto, California: Behavioral Research Laboratories, 1961), p. 138.

utterances, and the lack of a thorough specification of desired terminal behaviors.

The general content and goals of the course are:

> To perfect a native or near native
> pronunciation of French sounds. . .and to
> achieve a firm grasp of (a) syllabication,
> (b) elision, (c) liaison, (d) the loss of
> the weak vowel in rapid speech.11

The model of speech used in the programme is that which is characteristic of a cultivated Parisian (the author). Nowhere are the terminal objectives of the programme stated in the rigorous, objective method which characterizes Fernand Marty's course. While the description of the specific behavior expected of a student upon completion of the course is vague, a more important objection raised by Valdman concerns the linguistic content of the course.

> A course in French phonetics should
> be based on an up-to-date model of language
> design and contain accurate facts about the
> structure of the language. While the material
> contains such terms as "graphemes", i.e.
> letters, and claims to present a brief
> introduction to the "linguistic approach"
> the author does not seem to be aware of the
> now widely accepted notion of the phoneme,
> nor does he make significant use of contrasts
> both French/French and French/English in the
> teaching of sound perception and imitation.
> French linguists and phoneticians would find
> objection to such statements as: "the vowel

---

[11]Burroughs, A Programmed Course in French Phonetics, Introduction.

sound [ɛ] is always followed by a consonant
sound. Thus, it never appears at the end of
a syllable" (p. 25). How then do Frenchmen
realize the contrasts imperfect/past definite,
e.g., <u>je donnais</u> versus <u>je donnai</u> or conditional/
future, e.g., <u>j'irais</u> versus <u>j'irai</u>? It would
indeed be neat if the opposition /e/ versus /ɛ/
were neutralized everywhere by everyone and the
above rule applied, but the fact that /ɛ/ does
occur in items like <u>met</u>, <u>baie</u>, is precisely
what characterizes "le parler des Parisiens
cultivés". The following excerpts are not
only grossly inaccurate but constitute poor
pedagogy to boot: (1) French [u] is similar
to the vowel in the English word FLUTE, but
again, it is shorter (How about tension and
non-gliding?) (2) [ə] is formed in the front
of the mouth with the lips rounded and tense. . .
In rapid speech it is barely audible. (When
mute - E is retained it is a full vowel,
when it is deleted it is zero.) (3) [o] is
similar to the vowel sound in the English
word "tote" but shorter. Remember that all
French vowels are short. (How about <u>peur</u>,
<u>pause</u>, <u>pèse</u>, <u>rage</u>?).12

Since a phonetics course would probably be used in a

more advanced class, one that had already mastered the

minimal sound elements, it <u>is</u> <u>phonetic</u> <u>considerations</u> which

would be important. A course which presents only those

sound elements which are necessary for a basic comprehension

of the language might be justified on an elementary level,

but in a programme which deals with phonetic elements of the

language, this is an oversimplification. It is unfortunate

that this programme has not presented a more careful and

accurate linguistic description of the phonological aspects

of the language. It is currently the only programme dealing

with French phonetics commercially available.

12Valdman, <u>French Review</u>, p. 421.

The development of an audio-lingual programme by
Mueller and Niedzielski has been particularly interesting.
The programme was first constructed under Project ALLP II,
directed by F. Rand Morton, and the first trial test for
feasibility and revisions was conducted at the University
of Akron in 1963-64.[13] Mueller had analysed the language
into four subsystems: phonemic, intonational, morphemic and
syntactic, and the student was to acquire automatic control
over these systems - "acoustic-mechanical" linguistic habits.
The emphasis was placed on habit-forming responses and operant
conditioning schedules.

The original ALLP French programme consisted of four
parts: phonology, basic vocabulary, syntactic structures
and conversations. Mueller describes the section on phonology:

> Part I consists of 500 frames, totalling
> 30 hours of recorded materials, and subdivided
> into 25 problems. Each problem centering around
> a sound or a group of sounds is subdivided into
> discrimination frames, vocalization frames,
> phonemic symbol frames and syntax frames. . .14

The traditional method of teaching pronunciation was
to present an utterance in which the meaning was the

---

[13]Mueller, _Trial Use of the ALLP French Program at
the University of Akron, 1963-64._

[14]_Ibid._, p. 4.

essential factor. Mueller, however, in this early version

of the programme felt that the student should not have to

contend with both lexical meaning and sound patterns. He

separated the two and in the first part of the programme

which deals with phonology, lexical meaning is reduced to

an absolute minimum:

> During the entire Part I lexical meaning
> is withheld from the student. The student
> learns to discriminate and to mimic without
> knowing the meaning of what he is saying. . .[15]

Based on the results of the trial testing of the

French programme, various revisions are suggested by Mueller

in Part I in the areas of length, discrimination, and the

sequencing of sounds. In the separation of lexical meaning

from sound patterns, Mueller found that student attitude

might necessitate changes in the programme. He comments:

> Merits of withholding lexical meaning:
> During Part I lexical meaning is withheld.
> This total absence of meaning contributes
> largely to the feeling of discouragement
> on the part of the students. On the other
> hand it does permit total concentration on
> pronunciation and probably speeds the formation
> of the new speech habits. Whether a very
> small amount of meaningful utterances added

---

[15] Mueller, Trial Use of the ALLP French Program at _____ of Akron, 1963-64, p. 4.

to each problem, particularly useful
phrases, would tend to deteriorate their
pronunciation has been questioned. It
is suggested that the addition of a
moderate amount of lexical meaning will
serve to motivate the student.16

In the second trial use of the ALLP French Programme

in 1964-65 Part I has been completely rewritten and

vocabulary frames have been added. Lexical meaning of

whole utterances is introduced, rather than of individual

words. Mueller summarizes the revisions:

The changes and additions alter Part I of
the original program and provide some major
additions to Parts III and IV. One of the
basic concepts according to which the original
Program was constructed, namely the total
separation of the various elements constituting
the ability to speak (Tasks I through V) is
affected. The distinctions between the original
"tasks" are further reduced and a much more
tightly organized program results from it.
In the original proposal for the ALLP II
Program in French, 1962, the term "spiral
construction" was used to describe the
grouping of the original tasks. In the
Revised French Program, this concept is
further expanded to include vocabulary with
its lexical meaning in Part I and further
reduces the distinction between the original
"tasks". Reading is introduced at the end
of Part I and is maintained throughout the
rest of the Program. Writing is introduced
at the end of each problem in Part III and
maintained through the necessary exercises.
There are a number of apparent
adjustments made to the student's preferences:

16. Mueller, _Trial Use of the ALLP French Program at the University of Akron, 1963-4_, p. 26.

explanations, earlier inclusion of lexical
meaning, grammatical charts, and more formal
testing. Such adjustments do not compromise
the basic programming principles. They secure
the student's cooperation and good will. The
student's preconceived notions of language
learning,which are deeply ingrained, cannot
be changed overnight through a new learning
concept.
Furthermore, some of the programming
principles followed in the Revised French
Program such as withholding explanations and
lexical meaning for a major portion of the
learning process, are still the subject of
debate among several experts in the field.
(See the work of Professor Stanley Sapon in
his Spanish program).17

Most French programmes introduce lexical meaning

from the beginning but Mueller initially chose to teach

sounds without any reference to meaning. While theoretically

he found it desirable to have the student master the

phonological system of French before proceeding to

vocabulary, syntax and conversation, in actual practice

this first part of his programme was so long and dull that

student motivation was low. Revisions in this area of the

programme were based on student attitude. It remains to be

shown by controlled experiments whether the introduction of

lexical meaning does, in fact, impair the acquisition of

phonetic habits.

In his books, Marshall McLuhan explores the implications

of the spoken versus the written word. He emphasizes

17Theodore H. Mueller, Revisions of the ALLP French
Program and Second Trial Use at the University of Akron,
1964-65 (August 1965), pp. 10-11.

the change from a "visual" world - the world of the printed

or written word - to a sensory or "acoustic" world of

electrical technology. He feels that this change will have

definite significance on man's orientation to the world and

his relations to other men. He comments on these changes:

> The dominant organ of sensory and social
> orientation in pre-alphabet societies was
> the ear - "hearing was believing". The
> phonetic alphabet forced the magic world
> of the ear to yield to the neutral world
> of the eye. Man was given an eye for an
> ear.
> Western history was shaped for
> some three thousand years by the introduction
> of the phonetic alphabet, a medium that
> depends solely on the eye for comprehension.
> The alphabet is a construct of fragmented
> bits and parts which must be strung together
> in a line, bead-like, and in a prescribed
> order. Its use fostered and encouraged the
> habit of perceiving all environment in
> visual and spatial terms - particularly
> in terms of space and of a time that are
> uniform,
> c,o,n,t,i,n,u,o,u,s
> and
> c-o-n-n-e-c-t-e-d.
> The line, the continuum - this sentence is a
> prime example - became the organizing
> principle of life. "As we begin, so shall
> we go". "Rationality" and logic came to
> depend on the presentation of connected and
> sequential facts or concepts.
> For many people rationality has the
> connotation of uniformity and connectiveness.
> "I don't follow you" means "I don't think
> what you're saying is 'rational'".
> Visual space is uniform, continuous,
> and connected. The rational man in our
> Western culture is a visual man. The fact
> that most conscious experience has little
> "visuality" in it is lost on him.
> Rationality and visuality have long
> been interchangeable terms, but we do not
> live in a primarily visual world any more. . .

> Ours is a brand-new world of
> allatonceness. "Time" has ceased, "space"
> has banished. We now live in a <u>global</u>
> village. . .a simultaneous happening. We
> are back in acoustic space. We have
> begun again to structure the primordial
> feeling, the tribal emotions from which a
> few centuries of literacy divorced us. . .
> At the high speeds of electric communication,
> purely visual means of apprehending the
> world are no longer possible; they are just
> too slow to be relevant or effective. . .
> Electric circuitry profoundly
> involves men with one another. Information
> pours upon us, instantaneously and continuously.
> As soon as information is acquired, it is very
> rapidly replaced by still newer information.
> Our electrically-configured world has forced
> us to move from the habit of data classification
> to the mode of pattern recognition. We can
> no longer build serially, block-by-block,
> step-by-step, because instant communication
> insures that all factors of the environment
> and of experience co-exist in a state of
> active interplay.[18]

What, then, does this have to do with foreign

language teaching? In studying the recent trends in language

teaching, it can be seen that there has been an increasing

emphasis on the spoken language. Many linguists and language

teachers consider the written language as a secondary form

and feel that the primacy of speech should be emphasized.

This does not mean that the literature of the language is

placed on an inferior scale, but that the study of literature

should be based on a firm knowledge of command of the spoken

---

[18]McLuhan and Fiore, <u>The Medium is the Message</u>,
pp. 44-45 and 63.

language. Literary problems of language instruction have not been discussed in this paper, but there seems to be validity in this viewpoint. Much of the beauty of French literature is lost if a student does not have an adequate knowledge of the sounds of the language. This is true for French poetry as well as prose.

In order to give equal importance to audio-oral and spelling-reading skills of the spoken and written language, it is necessary to re-analyze the language. Most language textbooks have based their analysis of the language on the written form of the language. As McLuhan notes:

> Most people find it difficult to understand purely verbal concepts. They suspect the ear; they don't trust it. In general we feel more secure when things are visible, when we can "see for ourselves". We admonish children, for instance, to "believe only half of what they see, and nothing of what they hear. All kinds of "shorthand" systems of notation have been developed to help us see what we hear.19

Since the analysis of the language in most textbooks is based on the written form of the language, the grammar which is presented is based on visual signs - e is the most usual sign for the feminine, nt is usually the sign for the third person plural, s is generally the sign for the plural. However, there is actually quite a difference between the grammar of spoken and the grammar of written French.

19McLuhan and Fiore, The Medium is the Massage, p. 117.

For example, the number and type of structural marks[20] or "signifiers" will vary greatly in the spoken versus the written language. In the contrast between the singular and plural form there will be many _visual_ clues but only a few _acoustic_ differences. In the following sentence there are four _visual_ signs which indicate the change from singular to plural:

Leur train principal marche bien. - Leur<u>s</u>

trai<u>ns</u> principa<u>ux</u> march<u>ent</u> bien.

However, in the spoken form there is only one acoustic change between the singular and the plural form; the adjective is modified:

<u>singular</u> - /lœ rtrẽprẽsipalmarʃəbjẽ/.

<u>plural</u> - /lœ rtrẽprẽsip<u>o</u>marʃəbjẽ/.

In another example, Ma fille travaille - M<u>es</u> fille<u>s</u> travaill<u>ent</u>, there are three written changes from singular to plural, but only one acoustic change; the vowel sound of the determinative is modified. In the following sentences, Leur bateau est neuf - Leur<u>s</u> bateau<u>x</u> <u>sont</u> neuf<u>s</u> there are four written changes, but only one audio change; the verb is modified.

There are many other examples of this type, while such languages as English or Spanish have many spoken

---

[20] See page 149.

indications as to whether the sentence is singular or plural, _spoken_ French will often indicate the plural by only one sound change. This means that Mueller's technique of training the student to recognize "acoustic signifiers"[21] - sounds or groups of sounds which carry grammatical meaning and can differentiate utterances from each other - has special relevance in teaching French. Before the student even knows the semantic meaning of the words in a sentence, Mueller trains him to recognize key sounds in the utterance which will distinguish one sentence from another. While the eye looks for visual signs, _s_, _x_, or _nt_ endings, the ear must be trained to listen for audio, vocalic changes taking place in articles, adjectives, verbs, or liaisons between adjectives and nouns or nouns and verbs, etc.

It might be interesting, now, to compare the analysis and presentation of verbs in a more traditional programme such as Elaine Burroughs _Programmed French: Reading and and Writing_ and a programme which emphasizes the spoken language, such as Fernand Marty's _Active French: Foundation Course_. Burroughs has used the traditional written French classification which divides the verbs into the following three categories in the present indicative:

1. _er_ verbs such as _chanter_

je chante	Nous chantons
Tu chante	Vous chantez
Il chante	Ils chantent

---

[21]See page 149.

2. <u>ir</u> verbs such as <u>finir</u>

Je finis	Nous finissons
Tu finis	Vous finissez
Il finit	Ils finissent

3. <u>re</u> verbs such as <u>vendre</u>

Je vends	Nous vendons
Tu vends	Vous vendez
Il vend	Ils vendent

However, verbs of frequent use such as mettre, venir, partir, sortir, vivre, dormir, écrire, sentir, lire, prendre and others, cannot be included in this classification and must be taught as irregular forms.

Burroughs does not present verbs in a paradigm, but introduces the student gradually to the different forms (one objection to the programme is that the student learns these forms much too gradually). In the first book of the programme (400 pages) the student only learns the third person singular and plural of the present indicative and the infinitive. In the second book he is presented with the first person singular of the present indicative in Chapter II (page 43), and the first person plural in Chapter III (page 84). The second person singular of the present indicative is given in Chapter IV (page 133) and the second person plural is presented in Chapter V (page 184). The student must complete at least 600 pages before he knows the conjugation of verbs in the present indicative tense. This appears to be impractical, though the completion time has been averaged as only about thirty hours for each book.

Marty has classified verbs according to their spoken form and he feels his classification offers the advantage of including most of the frequently used verbs mentioned above, which the traditional written classification must exclude. Marty divides the verbs into three types in the present indicative tense. In Type I verbs, the third person singular and plural are identical:

/ildãs/   /ildãs/   <u>il danse</u>   <u>ils dansent</u>

/ilʃãt/   /ilʃãt/   <u>il chante</u>   <u>ils chantent</u>

Verbs of this type have only three spoken forms, but five written forms. Included in Type I verbs are chanter, manger, arriver, aimer, acheter and others.

In Type II verbs the difference between the third person singular and the third person plural is made by the addition of a consonant sound:

/ilfini/   /ilfinis/   <u>il finit</u>   <u>ils finissent</u>

/ildɔr/   /ildɔrm/   <u>il dort</u>   <u>ils dorment</u>

The verb has four spoken forms and five written forms. Some Type II verbs are finir, partir, dormir, lire, servir, écrire, devoir, vendre, vaincre and others.

Type III verbs form the third person plural by modifying the final vowel sound of the third person singular and adding a consonant sound:

/ilse/   /ilsav/   <u>il sait</u>   <u>ils savent</u>

/ilvø/   /ilvœl/   <u>il veut</u>   <u>ils veulent</u>

Some Type III verbs are savoir, prendre, craindre, joindre, apprendre, pouvoir, venir, vouloir, comprendre, and others. The written conjugation has five different forms while the spoken conjugation has only four. Marty also describes various vowel shifts which occur in verbs in each type. For example a Type III verb such as <u>savoir</u> has a vowel shift in its root from /e/ to /a/: /ʒə se/ <u>je sais</u> /nusavõ/ <u>nous savons</u>.

Marty makes the following comments on the presentation of his materials:

> In most textbooks today, the "grammar" is presented either without any apparent logical order or in an order which is dictated by the cultural material on which each chapter is based. The result is that some important linguistic facts are omitted, some are presented in the wrong place, some are repeated uselessly, and some are separated when they should be grouped.
> In a basic course, the system of classification must include only the most important structures and it must classify them in such a way that only one difficulty appears at a time; the easiest step is taught first, then it is used as a base for the second, and so on until all the basic structures have been taught.
> Our forthcoming first-year text will use the order of presentation which we have developed after several years of experimentation. The easiest structure in spoken French is the type:
> Chantez/Chantons/Chante   Dormez/Dormons/Dors
> . . .The student then proceed to sentences of the structural type:
> Ne chantez pas, Ne dormez pas, N'entrez pas, etc., where the only morphological difficulty is the rule concerning the fall of /ə/. The next few chapters are concerned with structures based only on verbs, adverbs, and interrogative combinations. Articles and nouns do not appear

until the seventh chapter. . .

This need for an orderly presentation
of the structures can be expressed in a simpler
- if somewhat naïve - manner. When building a
house, it is not sufficient to know how to
construct the walls, install the doors and
windows, place the wiring, connect the plumbing,
paint the walls, etc. These various operations
have to be performed in an order which permits
maximum efficiency. If this logical order is
not respected, a brand-new wall may have to
be demolished in order to do some work which
should have been done before the wall was
built.

We have to realize that the teaching
of a foreign language is a complex under-
taking which must be thoroughly planned.
We have to achieve in a few hundred hours
what the native child has achieved in over
50,000 hours of trial-and-error practice.
Again we must state that our goal is TIME;
every time he has to backtrack and group
the linguistic facts differently, the
students are confused and time is wasted.[22]

It can be seen by Marty's treatment of verbs that

an analysis based on the spoken form differs significantly

from the traditional written classification. While he has

re-classified the verbs according to their spoken form,

Marty still presents the conjugation of the present indicative

tense in a paradigm. In the second unit he introduces the

student to the imperative form, the simplest French sentence,

and he proceeds in Unit three to present the paradigm of a

Type I and Type II verb. For example, on page nineteen he

---

[22]Fernand L. Marty, _Language Laboratory Learning_
(Wellesley, Massachusetts: Audio-Visual Publications, 1960),
p. 14.

presents the paradigm of a Type I verb, manger:

Je mange	Nous mangeons
Tu manges	Vous mangez
Il mange	Ils mangent
Elle mange	Elles mangent [23]

On page twenty-three he presents the paradigm of a Type II

verb, lire:

Je lis	The letter s does not	Nous lisons
Tu lis	represent any sound.	Vous lisez
Il lit	The letter t does not	Ils lisent
Elle lit	represent any sound.	Elles lisent [24]

Throughout the rest of the programme verb forms are

presented in a paradigm. In Book One Marty presents the

conjugation of the present indicative tense, the imperative,

the immediate future (aller + infinitive), the immediate

past (venir de + infinitive) and the emphatic present (être

en train de). Completion time for Book One (409 pages) has

been averaged by the author to be one hundred and twenty

hours.

Conclusion

The construction of a French programme necessistates

a rigorous linguistic and behavioral analysis of the terminal

objectives of the programme. Various problems arise in

French programmes in determining which elements and style

[23] Marty, _Active French: Foundation Course, Book One and Two_, p. 19.

[24] _Ibid._, p. 23.

of the language should be taught. While many of the difficulties are not common only to programmes, the insistence in programming on a rigorous specification of terminal objectives emphasizes them.

In the area of phonology it would be necessary to select those sound features which are essential for an elementary understanding of the language. However, depending on the locality and style, French speakers will vary in the phonemic distinctions they maintain. For example, not all speakers will distinguish the four nasal voyels (ã), (ɔ̃), (œ̃), (ɛ̃). Passy has noted that even in Paris there is a tendency to confound (ã) and (ɔ̃) and (ɛ̃) and (œ̃), resulting in a confusion between such words as (blanc/blond), or (brin/brun), (emprunte/empreinte). Valdman also discusses some of the reasons for the tendency toward the loss of (œ̃).[25]

Different programmers have approached this problem in different ways. A majority of audio-lingual programmes will begin with distinctions of three nasals (ɔ̃), (ã), (ɛ̃) and much later in the programme introduce the fourth nasal (œ̃). The distinction between (ã), (ɔ̃), (ɛ̃) are emphasized throughout the programme but the late introduction and small amount of space devoted to (œ̃) minimizes its importance.

---

[25]Albert Valdman, "Phonological Structure and Social Factors in French, the Vowel 'un'", <u>French Review</u>, XXXIII (1959), 153-161.

Some programmes appear to have eliminated the distinction
(ɛ̃ - œ̃) completely and present only (ɛ̃).

Studies and experiments in the area of discrimination
and differentiation training will be crucial in the field of
language programming. A basic principle of programmed
instruction is that student responses must be reinforced
for effective learning. In the area of pronunciation, this
reinforcement could be given by a teacher, by some
mechanical device or by the student himself. In a typical
language class in a high school or university, interaction
between teacher and student is minimal, and it is unlikely
that much active student participation or confirmation of
responses could be expected in the classroom. Most of the
students active responses will take place in the language
laboratory and since a mechanical device for analyzing
responses has not yet been sufficiently developed (at least
one that is practical in a language laboratory) the student
must compare and evaluate his own responses with that of a
recorded native voice.

In a French programme the student would learn to
discriminate between French sounds and English near
equivalents, (bow/beau), (do/doux), to emphasize the necessity
of vowel tension, lip-rounding and non-diphthongization in
French sounds. He would also learn to differentiate between
different French sounds (vu/vous), (chou/chaud).

The problem which arises is whether this type of
training will enable a student to judge his own pronunciation.
Numerous studies are now being conducted in this area. This
is an essential question for the programming of audio-lingual
language courses because if a student is unable to adequately
compare and evaluate his pronunciation with that of the
taped material his responses are not being reinforced and
effective learning is not taking place.

CHAPTER V

STRUCTURE AND MORPHOLOGY

This section will be concerned with problems which
arise in the programming of structural and morphological
elements of French. In particular, difficulties in the
selection and presentation of these elements will be discussed.
Most programmers are aided in their selection of structure
and vocabulary by linguistic and scientific studies of the
frequency of linguistic elements. Current studies of the
spoken language by such people as Georges Gougenheim enable
a programmer of an audio-lingual course to select language
elements which are essential to spoken French. The structures
and vocabulary included in an audio-lingual course which
has been based on an analysis of the spoken language will
vary considerably from more traditional texts which have a
literary emphasis.

Though most programmers depend on linguistic studies
for their subject matter analysis, the presentation of
linguistic elements is ultimately determined by student
response. Programmes are continuously tested and revised
and it is this empirical approach which makes programming
research so valuable to the foreign language teacher. This
aspect of programming is quite important because much New
Key material has been accepted by teachers without adequate

evaluation. By their emphasis on testing and validation of language materials, programmers exhibit a healthy reaction to the previous attitudes of uncritical acceptance. However, a majority of the French programmes investigated in this paper do not go far enough in this direction. Most French programmes appear to be adaptations of traditional texts, or New Key materials, and only a few programmers (such as F. Marty, Th. Mueller, or A. Valdman) have undertaken serious research into the most effective and efficient presentation of language materials.

While much laboratory experimentation has been conducted in the area of phonology, programmers are hampered by the dearth of pertinent scientific data in syntax and morphology. Several experiments have been cited in this paper, and Berko's experiment in the child's acquisition of English morphology is particularly interesting because it emphasizes the importance of analogy in language learning. However, most scientific research has been in the area of the child's acquisition of a _first_ language, and this may have only limited relevance to adult second language learning.

Lexical problems have not been treated under a separate heading because they generally occur in relation to phonological or structural difficulties. Mueller has been investigating the problem, as has been seen in the section on phonology, of whether the presentation of meaning and sound

patterns _together_ impedes the acquisition of correct
pronunciation habits. He feels that in the early stages,
attention to lexical meaning is a hindrance in establishing
the desired structural automaticity. Lexical and structural
problems are also often inter-related. Certain French
adjectives modifying particular nouns will change meaning
according to their structural position in the sentence.
These adjectives present the student with both lexical and
structural difficulties simultaneously.

While actual classroom testing of a programme will
determine its final form, programmers often turn to
linguistic science to gain greater insight into the
systematic structure of language. In constructing a
programme and in determining learning steps, programmers
often use linguistic techniques such as formal contrast,
structural marking, transformation grammar and tagmemics.
Each of these techniques will be investigated in relation
to their application to French programmes.

Presentation of Language Materials

Foreign language teachers have in the past turned
to linguistics for the specification of terminal behaviors.
While the linguist might assume the role of subject matter
expert in the construction of a programme, a scientific
description and analysis of a language is not necessarily
the most effective pedagogical presentation of materials.

In a conference of language programmers at Ann Arbor,

Michigan, D. M. Brethower comments on the interdisciplinary

nature of programming:

> The participants in the present
> conference include linguists and psychologists
> --- objective evidence that members of the
> two disciplines have come together in the
> study of a common problem. Both linguists
> and psychologists can make, and have made
> definite contributions to the programming
> of language. To idealize for a moment, the
> contribution of the linguist is in the
> specification of what to teach, that of the
> psychologist is in the specification of how
> to teach it. To return to reality, linguists
> are not in complete agreement as to what to
> teach nor are psychologists in agreement as
> to how to teach it. Partly as a consequence
> of the interdisciplinary disagreement the
> language programmer -- be he linguist or
> psychologist finds himself concerned with
> problems in both areas. The linguist is
> wary of accepting what the psychologist
> tells him and the psychologist is wary of
> accepting the pronouncements of the linguist.[1]

Harlan Lane, a Skinnerian psychologist involved in

problems of second language learning, has commented on

"The good fortune of the language programmer because in

the field of linguistics he finds an entire discipline

devoted to the systematic specification of terminal behaviors".[2]

---

[1] D. M. Brethower, "On Linguists and Psychologists in Second Language Learning, Or the Necessity of Strange Bedfellows", in F. Rand Morton, ed., _Programming of Audio-Lingual Language Skills for Self-Instructional Presentation_ (Ann Arbor: University of Michigan, Publications of the Language Laboratory, Series Preprints and Reprints, 1960), Vol. 6, p. 6.

[2] Lane, _Teaching Machines and Programed Learning, Volume II: Data and Directions_, p. 584.

This statement implies a confusion between the objectives
of linguistic science and those of language teaching, between
a scientific description and analysis and a pedagogical
presentation of language materials. (Sol Saporta has made
the distinction between a scientific grammar and a pedagogical
grammar, p. 44). While studies of linguistic structure
(contrastive, transformational, descriptive etc.) and phonetic
descriptions will undoubtedly be essential to a programmer,
the basic process in the development of a foreign language
programme is the selection, organization and presentation
of these materials in a pedagogically <u>effective</u> and <u>efficient</u>
manner.

Linguistic descriptions often provide the programmer
and teacher with insights into the structure of the language,
but they may only serve to confuse the beginning language
student. Valdman has given a generative-transformational
characterization of the French <u>est-ce que</u> yes-no interrogative
sentence by the following series of transformations: The
question <u>Est-ce qu'il est là?</u> is shown to be derived ultimately
from the declarative sentence <u>Il est là</u>. Beginning with
<u>Il est là</u>, the "emphatic" transformation is applied which
embeds this sentence in a <u>C'est que</u> main clause giving us -
<u>C'est qu'il est là</u>. After applying the inversion series of
transformations we obtain the nonce form <u>*Ce est ce qu'il</u>

---

*Nonce or grammatically unacceptable form.

est là, and finally <u>Est-ce qu'il est là.?</u>[3]

Valdman feels that this series of transformations is necessary to adequately and sufficiently characterize the French <u>est-ce que</u> yes-no interrogative sentences. From a linguistic point of view this may be true, but it would be pedagogically inexpedient and confusing to present this series of transformations to an elementary French student. Most programmes will simply have the student prefix the <u>est-ce que</u> structure to the declarative base sentence – <u>Il·va là</u> which gives – <u>Est-ce qu'il va là?</u> It would be a mistake to think that linguistic science has provided the specification of the terminal behavior of a language course. Linguistics will aid the programmer in presenting only correct models of speech and in determining areas of interference, but the programmer's main problem is the selection and presentation of these materials.

Selection of Linguistic Elements

In the selection of which lexical and structural elements are to be included in a French course, studies by Georges Gougenheim are especially useful. The studies were sponsored by the Ministère de l'Education Nationale Supérieure de Saint-Cloud in order to scientifically determine the linguistic elements necessary for a basic

---

[3]Valdman, <u>Problems in the Definition of Learning Steps in Programmed Foreign Language Materials</u>, p. 16.

understanding of French. Using recordings and tapes

Gougenheim made a statistical study of the frequency of

words and structures used in spoken, Parisian French, with

the objective of composing a French course based on those

elements of the language which were most frequent and

important to communication. He comments on his studies:

> Il n'en est pas moins vrai que, si
> l'on veut établir sur des bases scientifiques
> un vocabulaire d'usage, il faut commencer par
> dresser une échelle des fréquences. En cette
> matière mon collègue et ami M. Aurélien
> Sauvageot, professeur à L'Ecole des Langues
> Orientales, et moi-même nous avons, croyons-
> nous, apporté une innovation fructueuse en
> prenant comme base de nos dépouillements non
> la langue littéraire ou la langue écrite
> comme avaient fait nos prédécesseurs américains
> et belges, mais la langue parlée. L'utilisation
> de la langue parlée, qui aurait paru chimérique
> il y a moins de cinquante ans, est devenue
> possible et même aisée grâce aux progrès des
> magnétophones.4

Central to most modern scientific work of language

is the concept that human linguistic activity is first and

foremost, spoken, and only secondarily written. Programmed

instruction, however, does not prescribe any view of the

language and the programmer's selection of linguistic

elements will be determined by the aims of his course. If

his goal is primarily audio-lingual control of the language,

his selection of elements should be based on frequency studies

---

4G. Gougenheim, "Le français élémentaire", French
Review, XXVII (1954), 217.

of the spoken, rather than, literary language. Gougenheim

demonstrates the disparity between literary studies of

frequency and those in his study of the spoken language:

> I. - Entre plusieurs mots synonymes
> ou quasi-synonymes, celui qui est le plus
> employé dans la langue parlée ressort avec
> vigueur, tandis que dans la langue littéraire
> les fréquences tendent à se rapprocher, d'une
> part en raison d'un maniement plus raffiné
> de la langue, d'autre part parce que les
> écrivians cherchent à introduire dans leurs
> écrits une variété dont la langue parlée
> se soucie peu.
> Voici quelques exemples:

	Enquête du français fondamental (1er degré)	Vander Beke
quand	143/964	79/1.116
lorsque	23/43	74/395
maintenant	125/391	74/509
à présent	5/5	22/42 5

In the literary study of frequencies, then, the

range of <u>quand</u> is close to that of <u>lorsque</u>, while the

frequency study of the spoken language shows it to have

a range six times greater. While the difference between

<u>à present</u> and <u>maintenant</u> is considerable in Vander Beke's

study, 1 to 3.5 in range and 1 to 12 in frequency, this

difference is even greater in Gougenheim's study where it

is 1 to 25 in range and 1 to 78 in frequency.

---

[5]G. Gougenheim, et. al, <u>L'Elaboration du français
fondamental (1er degré)</u> (Paris: Didier, 1964), p. 118.

Gougenheim also finds important differences in
frequency for common verbs:

> . . .il existe des divergences importantes, en
> particulier en ce qui concerne des verbes à
> fréquence très élevée, comme le montre le
> tableau suivant où les données de notre liste
> sont confrontées avec celles d'Henmon:

	Fréquence fondamentale (1er degré)		Henmon	
	Fréquence totale	Fréquence sur 10.000	Fréquence totale	Fréquence sur 10.000
être	14.083	451,18	8.242	206,05
avoir	11.529	369,36	5.488	137,20
faire	3.174	101,69	1.818	45,45
dire	2.391	76,60	1.664	41,10
aller	1.876	60,10	843	21,07

> Le rapport de la fréquence de ces
> cinq verbes sur 10.000 mots dans l'enquête
> du français élémentaire à leur fréquence
> chez Henmon varie entre 1,8 (dire) at 2,7
> (aller). Ces chiffres montrent que certains
> verbes très usuels ont une fréquence beaucoup
> plus grande dans la langue parlée que dans
> la langue écrite, celle-ci étant beaucoup
> soucieuse de la variété et de la propriété
> des mots.[6]

With certain words of an abstract or literary nature
the variations are even more striking. In Gougenheim's study
the following words have a very low range and frequency:
larme = 4/6, pensée = 4/4, silence = 9/11, souffrir = 14/25.[7]

---

[6]Gougenheim, et al, L'Elaboration du français
fondamental (1er degré), p. 120.

[7]Ibid., p. 121.

Vander Beke's list based on literary works presents quite a different range and frequency for the same words: larme = 48/108, pensée = 49/123, silence = 51/220, souffrir = 53/168.[8]

From the numerous comparisons that Gougenheim gives, it is possible to see that there are great differences in the range and frequency of words between the literary and the spoken language. The selection of linguistic elements should not be an arbitrary task controlled by the whim of the programmer. If the course is audio-lingual, words and structures should not be selected from frequency studies of literary works or by the programmer's vague notion of what an educated Parisian might include in his vocabulary.

Gougenheim studied the frequency of structures as well as words and an example is his discussion of which interrogative structures to include in a basic French course:

> I. – INTERROGATION PORTANT SUR L'ACTION
>   VERBALE.
> A) Le sujet est un nom:
> Type avec est-ce que (Est-ce que votre ami
> vient?): 33 exemples.
> Type avec reprise du nom par un pronom
> personel (Votre ami vient-il?): 5 exemples.
>   La Commission a donc adopté sans
> hésiter comme type unique: Est-ce que votre
> ami vient?

---

[8]Gougenheim, et al, L'Elaboration du français fondamental (1er degré), p. 121.

B) Le sujet est un pronom personnel
(y compris <u>on</u>) ou le pronom <u>ce</u>.
Type avec <u>est-ce que</u> (<u>Est-ce que tu viens?</u>):
59 exemples.
Type avec inversion (Viens-tu?): 120 exemples.
Ici .les chiffres sont beaucoup plus rapprochés.
Dans la première édition, seul le type avec
<u>est-ce que</u> était enseigné.
Il a paru opportun d'y ajouter le type avec
inversion.9

Besides the frequency of words, Gougenheim has found

it necessary to form another category of word dependent on

their "disponibilité". A word such as "fourchette" is known

by any four year old French child, but though a fork is used

three times a day, the word rarely occurs in everyday speech.

In order to determine the "degré de disponibilité" of words,

Gougenheim has had recourse to the method of "centre d'intérêt"

such as clothing, parts of the body, food and drink at meals,

and others. By testing and investigating the vocabularies

of French school children he was able to determine which

concrete nouns in each center of interest were most common

and important to know.

With the current emphasis on the primacy of the oral

language, ordinary everyday speech is considered fundamental.

This does not mean that literature is neglected but it is

felt that the student will develop a keener appreciation

of literary works if they are presented against a background

9Gougenheim, et al, <u>L'Elaboration du français</u>
<u>fondamental (1er degré)</u>, p. 226.

of ordinary speech. Programmers have used different criteria in their selection of linguistic elements to include in an audio-lingual course. Mueller and Niedzielski[10] have based their selection of structural elements on those listed in Gougenheim's "Le Français fondamental (1er degré)", and "Le Français élémentaire", also by Gougenheim.

Fernand Marty has made his own linguistic study of French, "Linguistics Applied to the Beginning French Course",[11] and his selection of structural and morphological elements for his programme is largely determined by this study. The structural progression, size of steps, and the wording of the descriptive statements have been determined by testing student groups over a period of fourteen years:

> The structures are so complex and so numerous that we cannot hope to teach them all in a basic course. By experimentation, we have eliminated the least important ones, and we now have a body of structures which are essential to basic communication and which can be acquired within the time limits of a basic course.[12]

While a detailed discussion of each structural, morphological and phonological item can be found in Marty's linguistic study of French, it is interesting to see the

---

[10]Th. Mueller and H. Niedzielski, _Basic French: A Programmed Course_ (New York: Appleton-Centry Crofts, 1967).

[11]Marty, _Linguistics Applied to the Beginning French Course_.

[12]_Ibid._, pp. 20-21.

general considerations which determined the inclusion of various items in his French course. In the selection of structures Marty comments:

>   This is where the greatest amount
> of selection can be made. For example, there
> is no need to teach our beginners all the
> different ways to ask a question; there are
> nine common ways to express How long have you
> been here?, but Depuis quand êtes-vous ici?
> will serve our basic needs. Qui parle?, Qui
> connaissez-vous?, A qui pensez-vous? are
> easier to learn than Qui est-ce QUI parle?,
> Qui est-ce QUE vous connaissez?, A qui est-ce
> QUE vous pensez?. Thus our students can be
> taught to express a maximum number of concepts
> while learning a minimum of structures. They
> will express themselves more rapidly and more
> readily if they do not have to choose. SPEECH
> AUTOMATISMS ARE ACQUIRED MORE RAPIDLY IF NO
> CHOICE HAS TO BE MADE.
>   Later, when the students meet Combien
> de temps y a-t-il que vous êtes ici? or other
> synonymous structures of what they have learned,
> it will be simple to refer them to the
> structures they already know. It would be wise
> then to advise them to keep using the structures
> they are familiar with (Depuis quand êtes-vous
> ici?) and to store the synonymous structures
> in their passive knowledge of the language.13

In his selection of morphological elements for his course, Marty has eliminated certain forms which were generally included in a grammar-translation course:

13Marty, Language Laboratory Learning, p. 19.

> We should teach only the forms that
> are frequently used in cultured speech. The
> following forms can be eliminated in the
> basic course:
>> - simple past
>> - imperfect and pluperfect subjunctive
>> - most optional liaisons. . .[Here Marty
>>   has included, however, all compulsory
>>   liaisons and the optional liaisons
>>   which are generally made in natural
>>   cultured speech (such as: Il est
>>   espagnol).]
>> - most difficulties created by hiatus
>>   words
>
> Many rules about irregular feminine and
> plural forms can be simplified if rare words
> (landau, pou, joujou, etc.) are eliminated.14

In his selection of vocabulary words, Marty again

avoids redundant elements:

> 1. The principle of no-choice is also
> applied here and synonyms are eliminated; the
> students must be able to express a maximum
> number of ideas while learning a minimum
> number of words; for example, there is no need
> to teach lorsque, de bonne heure, environ,
> aussitôt que, davantage, à côté de, etc.
> since quand, tôt, à peu près, dès que, plus,
> près de are words generally preferred in
> cultured natural conversation.15

The difficulties that Marty experiences in his choice

of vocabulary for his programme are similar to those of

Georges Gougenheim. Gougenheim found it necessary to

supplement his frequency study with words grouped according

to their "disponibilité", in various centres of interest.

14Marty, Language Laboratory Learning, p. 20.

15Ibid., pp. 20-21.

Marty comments on the problems of selecting
vocabulary:

> 2. It is agreed that the selection of
> vocabulary should be made according to the
> frequency of use in cultured conversation, but
> this principle is extremely difficult to apply.
> There are some 500 words (for example, le, la,
> les, faire, être, avoir, mon, ton, son, etc.)
> which without doubt belong to this list, but
> our choice becomes increasingly difficult after
> that. Frequency depends on age, sex, occupation,
> social level, marital status, number of children,
> hobbies and friends, the seasons (mal de gorge
> is hardly ever used in the summer), the
> geographic location (mer is hardly ever heard
> among the inhabitants of Lyon, neige is rarely
> used in Bordeaux), etc.
> Therefore, our basic vocabulary list
> should not be based only on a frequency count;
> it should be tempered with common sense and
> adapted to the needs of the American student
> (to him, vitrail is more important than cave,
> even though a Frenchman goes down to the
> cellar more often than he goes to look at
> stained-glass windows).16

Marty also points out that while his list of words is short,

it is not an oversimplification of grammar because most of

the words presenting morphological difficulties (irregular

verbs, irregular feminines and plurals, etc.) are high-

frequency words which will appear even in a 1,000 word list.

He emphasizes the necessity of teaching the student structures

and forms, rather than vocabulary lists.

An important aspect of programming which has already

been noted, is the emphasis placed on a description of the

behaviors expected of a student. The distinction between

active and passive knowledge has been discussed by Pierre

---

[16]Marty, Language Laboratory Learning, pp. 20-21.

Léon in relation to various styles of speech. While a
student might be expected to recognize T'as compris
/takɔ̃pri/ as well as Tu as compris /tyakɔ̃pri/ and /isepaskidi/
as well as /ilnəsepaskildi/ Il ne sait pas ce qu'il dit, he
would only be expected to produce the longer forms. Marty
has applied the notion of active and passive behaviors to
his selection of structural elements. He has found, through
experimentation with student groups, that speech automatisms
are best facilitated by the elimination of redundant structures.
The students learn a core of material for active production
and they later acquire the redundant structures as passive
knowledge, for recognition.

Programmes which only teach reading and writing have
also used the concept of active and passive behavior. Elaine
Burroughs describes the following objectives for Book I:

> The student learns to read and write
> simple French prose. At the end of the first
> book, he has an active vocabulary of 550 words
> which he can recall and spell. He has a
> passive vocabulary of 250 additional words.
> He is familiar with basic French structural
> patterns.17

It might be argued that this is not an especially thorough
description of the terminal objectives of the course. The
reader is referred to the Table des Matières for a more
detailed breakdown of the contents but nowhere does he learn

17Elaine Burroughs, Programmed French: Reading and
Writing (Palo Alto, California: Behavioral Research
Laboratories, 1964), Introduction.

what "familiarity with basic French structural patterns"
means. Is the student merely supposed to recognize these
patterns, or is he supposed to actively use them?

Current Research in Syntax and Morphology

Unfortunately, in the most important area of language
instruction, the conditioning of syntactic responses, there
is very little pertinent scientific data. The effect of the
structure of the language on learning has been studied by
Horowitz in 1955.[18] He has shown that consistent language
structures are easier to learn than inconsistent ones and
that learners will tend to make errors by following analogic
patterns. Thorndike also demonstrated in 1933 that a
constructed language such as Esperanto, which showed great
regularity, was easier to learn than a natural one.[19]
Experiments by Miller and Selfridge[20] have described the
powerful effects of patterning in recall, and Miller[21]
has investigated some psychological aspects of transformational
grammar, and reports several experiments on the effects of

---

[18]A. E. Horowitz, The Effects of Variation in
Linguistic Structure on the Learning of Miniature Linguistic
Systems (Ph.D. thesis, Harvard University, 1955).

[19]Thorndike, Language Learning: Summary of a Report
to the International Auxiliary Language Association in the
United States, Inc.

[20]G. A. Miller and J. A. Selfridge, "Verbal Context
and the Recall of Meaningful Material", American Journal of
Psychology, LXIII (April 1950), 176-85.

[21]G. A. Miller, "Some Psychological Studies of Grammar",

patterning on speech perception. Brown and Berko[22] and

Brown and Fraser[23] have described the patterning of linguistic

elements in the language of children.

Laboratory experimentation in the field of syntax

has been meager, and the most important area for a foreign

language programmer, the technique for conditioning and

maintaining syntactic sequences in a foreign language, has

only recently begun to be examined experimentally. Studies

undertaken by Saporta on the evaluation of three grammatical

models in the teaching of foreign languages will be of

special interest to the programmer and language teacher.[24]

A series of experiments by Scherer and Wertheimer comparing

an audio-lingual course to a grammar-translation method have

tested various assumptions implicit in the audio-lingual

habit method.[25] This investigation has been more thorough

and controlled than most classroom experimentation.

American Psychologist, XVII (November 1962), 748-62.

[22]R. Brown and J. Berko, "Word Association and the Acquisition of Grammar", Child Development, XXXI (March 1960), 1-14.

[23]R. Brown and C. Fraser, "The Acquisition of Syntax", in C. N. Cofer and B. S. Musgrave, eds., Verbal Behavior and Learning: Problems and Processes (New York: McGraw-Hill Book Company, 1964).

[24]A. Saporta, Evaluation of Three Grammatical Models in the Teaching of Foreign Languages (Washington, D. C.: Government Printing Office, 1963).

[25]Scherer and Wertheimer, A Psycholinguistic

While structural and descriptive linguists and
Skinnerian psychologists have conceived of language as sets
of habits, experts in psycholinguistics have further divided
language behavior into specific habits and general rules.
They characterize language as rule-governed behavior and
the mastery of a language implies the internalization of
grammatical rules. In his paper, "Psycholinguistic
Perspective on Language Learning", Anisfeld has turned to
the transformational grammarians for an explanation of how
these rules are acquired:

> The answer that emerges from the
> writings of Chomsky (e.g., 1962) and others
> is that the child is functioning as an
> implicit inductive scientist. The child
> collects data from his environment in the
> form of linguistic utterances he hears,
> classifies them into various grammatical
> categories, and constructs rules to account
> for the regularities he discovers. He then
> uses these rules in producing new utterances.
> The system the child develops is not static
> but subject to revision as new linguistic
> data become available in the course of
> development. Apparently, human beings are
> endowed with a program for analyzing
> linguistic input to discover a system of
> underlying regularities. The amazing thing
> about language acquisition is that out of
> a collection of random, unorganized, and
> often ungrammatical linguistic utterances
> the child manages to form a well-structured
> system of rules. Because such a phenomenal
> system is mastered in a relatively short

Experiment in Foreign-Language Teaching.

time, it is suspected (e.g., Lenneberg, 1964) that the language analyzer is largely innate and that it makes a substantial contribution to the shape of the product of its analysis, i.e., to grammar. In other words, the acquisition of language depends not only on exposure to environmental stimulation but also on specific innate propensities of the organism.[26]

It has often been described in the language of children that grammatical errors are made by the use of an analogical pattern which happens to lead to an incorrect form. French children sometimes analogize *vous faisez for vous faites *prendu instead of pris, *les chevals instead of les chevaux, *vous disez for vous dites, or *nous boivons for nous buvons.[27]

Berko has studied the language of American preschool children and found that they can extend morphological rules to nonsense material with a high degree of accuracy. He describes some of the areas he wished to investigate:

> To test for knowledge of morphological rules, we use nonsense materials. We know that if the subject can supply the correct plural ending, for instance, to a noun we have made up, he has internalized a working system of the plural allomorphs in English, and is able to generalise to new cases and select the right form. If a child knows that the plural of witch is witches, he may simply have memorized the plural form. If, however, he tells us that the plural of *gutch is *gutches

---

[26]Moshe Anisfeld, "Psycholinguistic Perspectives on Language Learning", in Albert Valdman, ed., Trends in Language Teaching (New York: McGraw-Hill Book Company, 1966), p. 115.

[27]Antoine Grégoire, L'apprentissage du language. (Paris: Droz, 1937-1947).

*Nonce or grammatically unacceptable form.

we have evidence that he actually knows,
albeit unconsciously, one of those rules
which the descriptive linguist, too, would
set forth in his grammar. And if children
do have knowledge of morphological rules,
how does this knowledge evolve? Is there
a progression from simple, regular rules to
the more irregular and qualified rules that
are adequate fully to describe English?
In very general terms, we undertake to
discover the psychological status of a certain
kind of linguistic description. It is
evident that the acquisition of language is
more than the storing up of rehearsed utterances,
since we are all able to say what we have not
practiced and what we have never before heard.
In bringing descriptive linguistics to the
study of language acquisition, we hope to
gain knowledge of the systems and patterns
used by the speaker.28

The children were presented with a number of nonsense

words and were asked to supply English plurals, verb tenses,

possessives, and derivations and compounds of those words.

Berko concluded that children do, in fact, possess

morphological rules which can be extended to enable them

to deal with new or nonsense words. This experiment emphasizes

the importance of _analogy_ rather than mimicry and

memorization in language learning.

Use of Linguistic Techniques

In recent years language teachers have frequently

turned to linguistic science to gain greater insight into

28Jean Berko, "The Child's Learning of English
Morphology", Word, XIV (August-December 1958), pp. 150-151.

the systematic structure of language. Programmers also use linguistic techniques as an aid in constructing programmes and determining learning steps. These techniques are evident in almost all programmes, and while they are useful, programmers are unanimous that the final criteria for determining learning steps should be student response. After describing some linguistic techniques applied to programming Valdman comments:

> One should, however, caution against too literal an application of linguistic theory in the determination of optimum learning steps and in the ordering of steps into pedagogically efficient sequences. Ultimately, learning steps are determined on the basis of student response, and one should not expect necessarily a close correlation between the results of linguistic and behavioral analysis.[29]

Belasco describes four systematic techniques evolving from linguistic science which can be adapted to the language teaching situation.[30] He stresses the fact that a teacher should be more concerned with the results or findings of these analysis than with the methods represented by each of these procedures. The four techniques are formal contrast, structural marking, tranformation grammar, and tagmemics.

In a formal contrast of two languages, a linguistic analyst will describe the structures of the languages and compare them. By contrasting the significant units, phonemes,

---

[29]Valdman, Trends in Language Teaching, p. 142.

[30]Albert Valdman, Applied Linguistics: French,

morphemes, tagmemes and graphemes, etc., of the first language with those of the second, he will isolate precisely the points at which the two languages differ. Language teachers and programmers often use a contrastive analysis of the native and target language (the foreign language to be learned) in order to identify areas which might cause interference in learning. This analysis will often influence the amount of time spent on various linguistic items and these contrasts can also be brought to the attention of the student in order to make him consciously aware of problem areas.

In certain areas, such as phonology, the contrasts are presented directly to the student in the form of discimination training. The student might be given information about the formation of a French sound and this sound would be contrasted with the English equivalent. The student also learns those phonological distinctions important to the foreign language which might be absent from his native lange. However, whether the contrasts

---

edited by Simon Belasco: introduction by Simon Belasco (Boston: D. C. Heath and Company, 1961).

are presented directly to the student, as in discrimination
training, or whether they are used by the programmer
in the construction of the programme and the determination
of the amount of time spent in various areas, most
programmes utilize some form of contrastive data.

In Marty's programme, "Active French: Foundation
Course",[31] the student is made aware of the areas of
interference and the amount of practice time spent on
various structural and morphological elements is
determined according to the degree of interference. In
his analysis of the structural interference which exists
between French and English, he has found that this
interference is most severe in the structures which are
normally reserved for literary expression, and rather
small in the structures which might be selected for a
basic course, he comments:

> In fact, this amount of structural inter-
> ference is small enough to have the
> students assume that the structural order
> will be the same (Je resterai ici jusqu'à
> midi si vous voulez/ I will stay here until
> noon if you want) unless they are told to
> the contrary (I want you to stay here/ Je
> veux que vous restiez ici).[32]

---

[31]Marty, Active French: Foundation Course, Book
One and Two.

[32]Marty, Linguistics Applied to the Beginning French
Course, p. vi.

Though most student difficulties in an elementary course occur in French morphology, it is wondered whether this is a valid assumption for the student to make in regard to French structure. Even in a basic French course one of the more difficult areas for a student is the positioning in French of indirect and direct object pronouns. Numerous pattern drills have been created in this area, yet even advanced students experience difficulty in handling these structures, especially when they occur simultaneously in a sentence. The student of a beginning course would also experience structural interference in the placement of adverbs and adjectives. This is especially true of adjectives, where the position of French adjectives often differs from that of English, and where positioning can also determine lexical meaning.

Georges Gougenheim has noted two types of adjectives, those with a _fixed position_, either always before, or always after a noun, and those adjectives with a _mobile position_ which can come either before or after the noun with a corresponding change of meaning. He comments on the adjectives with a mobile position:

> Pour certains adjectifs, en particulier dans des locutions, il y a une différence de sens très nette entre les deux constructions; l'adjectif postposé a sa valeur propre, l'adjectif antéposé une valeur uniquement appréciative: _un enfant pauvre_ est un enfant dépourvu de biens, _un pauvre enfant_, un enfant digne de pitié;

> un personnage triste est un personnage
> chagrin ou affligé, un triste personnage,
> un personnage sans moralité; un repas maigre
> est un repas qui ne comporte pas de viande,
> un maigre repas, un repas peu abondant.
> Un homme jeune et un jeune homme ne sont pas
> du même âge. . .33

A word such a grand in French has a very high
frequency and would probably be included in a beginning
course, yet the structural difficulties related to this word
would present a large area of interference for the student.
Gougenheim has described some of the difficulties and comments
that the usual place for grand is before the noun: une
grande maison. However, this will vary according to the
noun and the intended meaning:

> Mais cette place habituelle lui
> vaut d'avoir souvent une valeur appréciative
> qui varie avec le substantif: un grand homme
> est un homme illustre, une grande dame, une
> dame de haute naissance ou de belle tenue;
> avec des substantifs qui désignent des
> personnes exerçant une profession artistique,
> littéraire ou scientifique, il a le sens
> d'"illustre": un grand peintre, un grand
> poète, un grand chimiste; avec des substantifs
> désignant des malfaiteurs il a le même sens
> avec une valeur non plus laudative, mais
> péjorative: un grand criminel. Avec d'autres
> mots encore il peut avoir un sens analogue:
> un grand soldat; Victor Hugo dit les grands
> paysans en parlant des Vendéens (Contemplations,
> V, III). Enfin avec les substantifs impliquant
> l'exercice d'une qualité, il marque l'intensité

33G. Gougenheim et al, L'Elaboration du français
fondamental (1er degré), p. 108.

de cette qualité: un grand mangeur, un
grand bavard. Quand, qualifiant des
personnes, grand a-t-il donc son sens
propre, physique? Il l'a avec femme (une
grande femme n'est pas une grande dame),
il l'a eu avec homme: dans les Fausses
Confidences de Marivaux, Mathon cherchant
à savoir à qui est adressé un paquet, suggère au
garçon: Un grand homme qui s'appelle
Monsieur Dorante (II, 7); mais ce sens
n'existe plus que si homme est suivi d'un
autre adjectif descriptif (un grand homme
brun). Pour exprimer qu'un homme, un peintre,
un poète est grand (physiquement), on dit
quelquefois un homme grand, en postposant
l'adjectif. Cf.: On sait que Mme Mary Marquet,
qui est peut-être une grande comédienne, est
à coup sûr une comédienne grande (Marianne,
6 mars 1935); mais c'est une construction que
le sujet parlant lui-même sent exceptionnelle
et anormale. En somme on est réduit à
employer d'autres mots (par exemple un homme
de haute taille) ou à dire un homme grand et
maigre, grand et fort, etc. . . .La valeur
spéciale de l'antéposition des adjectifs
épithètes a donc amené une gêne pour la
langue dans l'emploi de grand.[34]

While Marty has said in his book Linguistics Applied

to the Beginning French Course that the structural interference

between English and French is small enough to have the

student assume that the structural order will be the same

unless they are told to the contrary, he devotes more time

in his own programme, on these interrelated problems of

structure and meaning than most other programmes, which

will often tend to avoid the semantic problem. He first

presents most adjectives which usually come after the noun

---

[34]Gougenheim et al, L'Elaboration du français
fondamental (1er degré), pp. 108-109.

and then describes those that precede the noun. He then
presents those adjectives which are placed either before or
after the noun depending on their meaning:

L'école est une ancienne église.	The school is a former church.
Voici une église ancienne.	Here is an old/ancient church.
Jean est un brave homme.	John is a fine man (friendly, helpful).
Jean est un homme brave.	John is a brave man.
Parlez de la dernière semaine des vacances.	Speak about the final week of vacation.
Parlez de la semaine dernière.	Speak about the last week.
Paul est un pauvre homme.	Paul is a poor man (to be pitied).
Paul est un homme pauvre.	Paul is a poor man (no money).
Vous êtes un sale homme.	You are a nasty/wicked man.
Vous êtes un homme sale.	You are a dirty/(not clean) man.
Nous habitions dans la même ville.	We live in the same town.
Nous habitions dans la ville même.	We live in the town itself.35

Marty describes the adjective <u>grand</u> as normally
place before the noun, with its meaning (tall, great, big,
spacious) dependent on the noun and the context:

35Marty, <u>Active French: Foundation Course, Book
One and Two</u>, p. 310.

Marie est un grande femme.	Mary is a tall woman.
Pierre est un grand homme brun.	Peter is a tall man with dark hair.
J'ai un grand ami à Paris.	I have a great friend in Paris.
Nous avons une grande maison.	We have a big house.

However, with the noun <u>homme</u>, <u>grand</u> makes this distinction

if no other adjectives are used:

De Gaulle est un grand homme.	De Gaulle is a great man.
De Gaulle est un homme grand.	De Gaulle is a tall man. 36

While it is probably true that students will

encounter most difficulties with adjectives in the area

of morphology (the concept of gender and agreement of

adjectives with nouns is difficult for most English-speaking

students), nevertheless, structural problems of interference

are apparent even at the elementary level.

In a monograph on the programming of a foreign

language course, Marty stresses the idea that practice of

various linguistic elements must be dosed according to areas

of interference:

> The comparative linguists have
> mapped out the areas of interference between
> English and the second language. We know
> what the areas are where interference from
> English is greatest and where it is very
> small.
> When there is no interference from

36Marty, <u>Active French: Foundation Course, Book One and Two</u>, p. 311.

English, the foreign structure can be
learned rapidly: when there is inter-
ference, intensive practice is needed in
order to eradicate the native habits.
Examples:

No Inter-
ference

I	let	my	children	do	their	work.
Je	laisse	mes	enfants	faire	leur	travail.

Strong
Inter-
ference

I	want		my	children	to do (infinitive)	their	work.
Je	veux	que	mes	enfants	fassent (subjunc-tive)	leur	travail.

37

Interference is also found by Marty in pronunciation

and spelling. He has found that partial audio and visual

cognates (French words which are pronounced or spelled nearly

like their English equivalents) are harder to acquire than

words which are entirely different. A word such as ressembler

is misspelled more often than doigt. R. J. Sweet also finds

similar areas of interference, "The Toronto experiment showed

that pupils mispronounced those words which were nearly

approximated in English; e.g. "papier" and paper; "brosse" and

brush; "serviette" and serviette; "personne" and person.

Evidently, to avoid confusion, the verbal stimulus in the

37
     Marty, Programing a Basic Foreign Language Course:
Prospects for Self-Instruction, p. 12.

early stages should not include these near-approximations".[38]

Valdman has pointed out that the process of shaping behavior, a principle which is implicit in all programming, actually emphasizes a difference between a _contrastive_ and _behavioral_ analysis:

> One of the most important techniques of programmed instruction is shaping new responses from responses the student already emits. In conventional pronunciation drills the student is expected to acquire new sounds by simple mimicry or, in more refined methodologies, by contrast drills, either target language oppositions (French, russe/ rousse; Spanish sera/seda; German, kennen/ konnen) or target-native language pairs (French, tout/English too). But veteran teachers know that most students can be guided to the acquisition of sounds not present in the inventory of their native language. Most teachers scorn tricks that lead to intermediate sounds which are neither native language sounds nor accurate renditions of the target language sound; these are precisely the trick the programmer seeks.
>
> In devising shaping sequences the programmer must examine the passive as well as the active inventory of the learner. For example, in the teaching of English /θ/ to French speakers it is customary to instruct a student to place his tongue between the upper and lower front teeth to produce a friction noise. This procedure requires him to produce a new voiceless fricative distinct from the French fricative /f/ and /s/ as well

---

[38] R. J. Sweet, "Programming Control to Elicit Maximum Effectiveness in Pronunciation", in F. Rand Morton, ed., _Programming of Audio-Lingual Language Skills for Self-Instructional Presentation_, VI (Ann Arbor: University of Michigan, 1960), p. 12.

as the dental stop /t/ in a single step.
Many French children and some adults lisp
(French zézayer), as such tongue twisters
as combien sont ces six saucissons-ci,
Monsieur Sans-souci? attest. French lisped
/s/ ·is acoustically similar to English /θ/
and is within the passive and - for purposes
of mock imitation - within the active inventory
of all French speakers. This suggests a
pedagogical sequence that starts with the
shaping of English /θ/ from a lisped French
/s/ and ends with contrasting the newly
acquired sound class to English /f/, /s/,
and /t/ in minimal pairs like thin/fin,
thin/sin, thin/tin. Shaping underscores
an important difference between behavioral
and contrastive analysis. In classical
contrastive analysis the analyst focuses
on the points of difference between two
languages or, in other words, on probable
negative transfer from the native to the
target language. The programmer, on the
contrary, seizes upon positive transfer.
In programmed as in conventional instruction
thorough and expert linguistic analysis
must precede the preparation of materials.[39]

A. S. Hayes and others have also used this technique

of shaping a new phonemic response by utilizing the students

first-language repertoire. They have conditioned a German

sound by pointing to a nearly equivalent English sound.[40]

Harlan Lane, however, cautions that this process of shaping

---

[39] Valdman, _Trends in Language Teaching_, p. 140.

[40] Working Committee on Programmed Learning of the
1962 Northeast Conference on the Teaching of Foreign
Languages, "Programmed Learning: 'A New Look at Learning'",
in W. F. Bottiglia, ed., _Reports of the Working Committees_
(Oxford, Ohio: American Classical League Service Bureau,
1963).

pronunciation by using the students' first language

repertoire may impede rather than facilitate eventual

mastery of accurate phonology:

> Several writers, among them Sweet
> and Hayes and others, have suggested that
> the shaping of new response topographies
> may be accelerated by employing those in the
> first-language repertoire. For example,
> the student may be led to a correct
> pronunciation of the German ich via the
> following steps: (a) "fish", (b) "fish"
> said through spread lips, (c) "fish" said
> through spread lips while opening the
> teeth slowly. The danger of such techniques
> is, of course, that they evoke the very
> responses in the first language which are
> sources of interference and must be weakened.
> Here the language programmer faces a choice,
> unguided as yet by research findings, which
> recurs in programming other repertoires as
> well (. . .) By calling into play first-
> language discriminations and patterns of
> responding an approximation to the desired
> terminal behavior is more quickly attained
> but it may then be more difficult to move
> precisely onto target.41

While there is still no specific research in this

area, both F. Marty and R. J. Sweet have noted that French

cognates (French words which are nearly approximated in

English) present areas of strong interference for the

student. R. J. Sweet describes the control of pronunciation

as involving "the sequencing of phonemic elements and their

combinations so as to minimize the possibility of confusing

41Lane, Teaching Machines and Programed Learning,
Volume II: Data and Directions, p. 608.

phonemes and their combinations in the new language with others already acquired in the native tongue".[42] Since students seem to have such difficulties with near equivalent sounds of cognates, it is possible that the advantage of calling into play first-language discriminations is outweighed by the subsequent detrimental effects.

Structural Markers

An important aspect of language which has been studied extensively in linguistic science is the structural meaning of a sentence. Whereas the number of lexical items that can fit in a basic frame of a sentence are almost limitless, there is a definite limit to the structural devices used in a sentence. Simon Belasco describes the linguistic technique of structural markers:

> Structural marking involves words or parts of words functioning as signs which indicated the grammatical relationship of words having lexical meaning. Let us examine the following sentence: The nomely zuggs unzacked the koaler steffnessly. We can read the sentence with just the right stress and intonation so that it sounds like a statement in the English language. Except for the word "the", which occurs twice, none of the words appear to have any meaning. At most, the sentence sounds like double-talk or jabberwocky. However, repeating the sentence several times will reveal a good deal about the structural

---

[42]Sweet, Programming of Audio-Lingual Skills for Self-Instructional Presentation, p. 48.

meaning of the "words", if not their lexical meaning. The word order as well as the "sound" of the word endings appear to identify several parts of speech: two nouns, one verb, one adjective, and endings appear to identify several parts of speech: two nouns, one verb, one adjective, and one adverb. The words zuggs and koaler are nouns because they are both "marked" by the definite article. Even though the word nomely immediately follows the article, its ending -ly /liy/ and position in the sentence -- unlike the ending -s /z/ of zuggs and its position -- indicates that the former is most likely an adjective and the latter a noun. The ending -ed /t/ and position of unzacked, among other markers, reveals it to be a verb. Although steffnessly like nomely ends in -ly /liy/, its position "after" koaler, rather than before it, reveals it to be an adverb.

Other features are signaled by the endings. The -s /z/ of zuggs reveals that it is plural; the -ed /t/ of unzacked that it is past tense. The -er /ir/ of koaler helps to identify it as a noun (cf. boarder, manger, etc.), and absence of -s /z/ makes it singular. On a different level, moreover, the position of zuggs and koaler with respect to unzacked shows the one to be "subject" and the other "object". We can compare this sentence word for word with an actual sentence in English having the same structural features "The nomely zuggs unzacked the koaler steffnessly" versus the homely thugs ransacked the larder selfishly. The position of the words and their markers are identical. Only the lexical meaning of the stems differ. In fact the stems in our sentence have no meaning since they represent "nonce forms"; that is, they occur only in this one instance. Such a comparison can easily be extended to other languages. The same nonce words can be "translated" from one language into another. The structural features for the respective languages must be "real", however: English, The narpish galsts morted the fleens statiously; French, Les galats narpeux mourtaient statieusement les flenes; Spanish, Los galastos narposos mortaben estasiosamente las flanas; Italian, I galasti narposi mortabano stasiosamente

le flane; German, _Die narpischen Galasten_
morteten die Flane statzlichweise; Russian,
наρπьϧ галасτϧ Мορταли φланϧ сталодно₀ Except that
the stems represent nonce forms, each
sentence is a basic frame in the languages
mentioned of the type: Nouns Subject--Verb--
Noun Complement (NVN).43

It is important to note that in an analysis of this
type, the important features are structural markers and
ordering -- _meaning_ has been kept to a minimum. Among
psychologists, however, there appears to be two schools of
thought on the nature of language. The behaviorists,
represented by Skinner, are interested in observable behavior,
i.e. the physical manifestations of language, while a newer
school, represented by C. Osgood and O. Hobart Mowrer, feel
that _meaning_ and _emotion_ play key roles in characterizing
the nature of language.

In most current studies in linguistics, the abstract
approach is taken in language analysis, and meaning is
considered minimal. Chomsky comments:

> Meaning is a notoriously difficult
> notion to pin down. If it can be shown
> that meaning and related notions do play a
> central role in linguistic analysis, then
> its results and conclusions become subject
> to all of the doubts and obscurities that

43Valdman, _Applied Linguistics: French_, p. iv.

plague the study of meaning, and a serious
blow is struck at the foundations of
linguistic theory.44

T. Mueller and F. Rand Morton have made extensive
use of the concept of structural markers in their language
programmes. However, since their programs are audio-lingual,
they use the term "acoustic signifier". An acoustic
signifier is a sound or group of sounds which carry grammatical
meaning and are capable of differentiating utterances from
each other. An example could be the sounds in French, /mɔ̃/
(mon) and /me/ (mes) which differentiate plural from singular
nouns and also indicate possession. In Spanish the phoneme
/o/ indicates the first person singular (that is, it is the
acoustic signifier for the first person singular - hablo
versus habla) and /n/ is the acoustic signifier for the
third person plural (hablan versus habla).

The syntax frames of Mueller's French programme are
not intended to teach systematically the structure of the
language. Mueller comments:

> They are intended to make the student aware
> that the grammatical structure of the language
> consists in sound shifts, that sounds are
> used as syntactical signifiers or acoustic
> morphemes and have meaning in specified
> environment.
>   During the entire Part I lexical
> meaning is withheld from the student. The

44Noam Chomsky, Report on the Sixth Annual Round
Table Meeting on Linguistics and Language Teaching
(Georgetown University, 1955).

student learns to discriminate and to mimic
without knowing the meaning of what he is
saying. In the syntax frames only is he
taught the meaning of the grammatical
structures but not the lexical meaning.45

The student is taught to manipulate the acoustic

signifier, an abstract phonic signal carrying grammatical

meaning, in an utterance, but the semantic meaning of the

utterance is withheld from him. The student is first taught

to discriminate and vocalize a particular sound, and he is

then introduced to the various acoustic signifiers that use

that sound. The first two tasks of Mueller's programme are

the discrimination and vocalization of a French phoneme (in

this case, closed /e/). The student is then taught particular

acoustic signifiers which use this phoneme:

> Task 3: Acoustic Signifiers. Acoustic
> signifiers using the closed /e/-sound are:
> the determiners les, des, mes, tes, ses, ces,
> and these verb forms: passez, passer, passé,
> passerai, passerez. In order to acquire the
> grammatical habits of the language, the student
> manipulates utterances containing the closed
> /e/-sound used in these ways.
> Not all the signifiers using the closed
> /e/-sound can be introduced at this point. . .
> since the sounds needed have not all been
> taught. Such is the case for the future and
> the determiners ses, tes, des, and les.
> The determiner mes: The student adds

45Mueller, _Trial Use of the ALLP French Program at
the University of Akron, 1963-64_, p. 4.

mes to a noun stimulus given orally. He changes
the stimulus ma + noun or à ma + noun to mes +
noun or à mes + noun, in two-word utterances at
first, in short sentences later.
Second person plural: The student
changes the verb, presented in the present stem
form, into the required form, and later adds
vous as the prefix with which this particular
form is to be associated. There is a progression
from a single word to a short sentence.
Passé composé: The student transforms
the verb stem into the first person singular
of the perfect tense. The utterance length
increases to a short sentence.46

The above example is taken from an early stage in

the development of Mueller's French programme. However, it

resembles the final programmes that he has just published

in 1967. In teaching the /o/ sound Mueller begins with a

sound identification phase (discrimination) in which the

student learns to distinguish the French phoneme from English

near-equivalents, and from other French phonemes. The

programme then has a vocalization phase where the student

learns to pronounce the sounds he has heard in the previous

section. The section which follows, syntax, requires the

student to listen to a syntactical pattern and repeat it.

Confirmation of the student response follows. For example,

the student may read and hear a noun marker, an appropriate

noun, and then be required to respond by repeating both,

incorporating liaisons when appropriate. Mueller gives

the following example from his programme, Basic French:

46Working Committe on Programmed Learning of the 1962
Northeast Conference on the Teaching of Foreign Languages,
Reports of the Working Committees, p. 36.

<u>Syntax</u>
5-70 Plural noun markers: <u>nos</u>, <u>vos</u>,
<u>tes</u>. <u>Nos bébés</u> pronounced /no bebe/, means
<u>our oogles</u>. <u>Nos</u>, pronounced /no/, is a noun
marker meaning <u>our</u>. It is a plural noun marker
indicating that the noun following it is plural
and is spelled with an <u>s</u> which is not pronounced.

<u>Vos bébés</u>, pronounced /vo bebe/ means <u>your oogles</u>,
that is, oogles belonging to several people, not
an individual <u>you</u>. <u>Vos</u>, pronounced /vo/ is a
noun marker meaning <u>your</u>. It is a plural noun
marker indicating that the noun following it is
plural and is spelled with an <u>s</u> which is not
pronounced.

<u>Tes bébés</u>, pronounced /te bebe/, means <u>your oogles</u>
also, but oogles that belong to an individual
person, not several people. <u>Tes</u>, pronounced /te/
is a noun marker meaning <u>your</u>. It is a plural
noun marker indicating that the noun following
it is plural and is spelled with an <u>s</u> which is
not pronounced.

Remember the liaison factor which also applies in
the above examples when the noun following the
noun marker begins with a vowel sound. . .
<u>Nos amis</u> is pronounced /no zami/, <u>vos amis</u>
is pronounced /vo zami/ and <u>tes amis</u> is
pronounced /te zami/. Remember, it is not the
noun marker but the noun which gives evidence of
this liaison factor in speech. The noun begins
with a /z/ sound. The noun marker remains
unchanged.[47]

The only semantic information that the student is

given is that <u>nos</u> means <u>our</u> and <u>vos</u> and <u>tes</u> mean <u>your</u>. The

student is not given the <u>semantic</u> meaning of the nouns until

many lessons later, when he has internalized the <u>grammatical</u>

meaning of the acoustic signifiers. In this section, then,

---

[47]Mueller and Niedzielski, <u>Basic French: A Programmed
Course</u>, Introduction.

lexical meaning is kept to an absolute minimum. The technique of the acoustic signifier is used by Mueller for teaching basic syntax such as singular and plural noun markers (articles and most possessives), the present tense of one- and two-stem verbs and the subject pronouns. However, as the French structures become more complex, Mueller uses standard pattern exercises and conversation drills to condition structural responses.

Transformation Grammar

The generative transformational theorists are interested in the formal syntactic properties of sentences, intuitive judgements of speakers concerning utterances in their language, and explanations or interpretations of ambiguous sentences. The most important work in this field has been done by Noam Chomsky. He has criticized the traditional view of a sentence consisting of lexical items placed in a grammatical frame (structural marking and ordering). As an example he gives the utterances (1) _furiously sleep ideas green colorless_, and (2) _friendly young dogs seem harmless_. The sequences have the same frames (-ly, -s, -less) but only utterance two is a grammatically acceptable English sentence. Similarly in the following utterances, (3) _colorless green ideas sleep furiously_, and (4) _harmless seem dogs young friendly_ the order of the structural markers is the same, (-less, -s, -ly) but only utterance three could

be accepted in English and utterance four would not be
considered grammatically well formed.[48]   Chomsky feels that
the comprehension of language, therefore, relies on a
deeper level of analysis than structural marking, and he
attempts to make this explicit in his studies.

Transformational grammarians view any sentence as
being ultimately derived from certain basic or "kernel"
sentences (unless the sentence is already in its "kernel"
form).   Belasco has applied the transformational theory to
three French sentences:

> Differences among sentence types are
> represented by the relation between source
> kernel sentences and their transforms. For
> example, in French the three sentences,
> 1. Le garçon embrasse la femme, 2. Le
> garçon obeit à la femme, and 3. Le garçon
> parle à la femme, are all sentences of the
> type NVN in the active voice. It will be
> observed that the noun complement in
> sentence 1 is a direct object, whereas the
> noun complements in sentences 2 and 3 are
> indirect objects. However, only sentences
> 1 and 2 but not 3 can occur as transform
> in the passive voice; that is, one can say
> 1. La femme est embrassé par le garçon
> and 2. La femme est obeié par le garçon
> but not 3. *La femme est parlée par le
> garçon (nonce form). By certain restrictive
> and obligatory rules, transformation grammar
> can convert kernel sentences into types of
> constructions which show one or more of the
> relationships traditionally termed active-
> passive, assertion-question, main clause
> -- dependent clause, etc. Moreover, certain
> peculiarities of structure between the source
> and target languages can be isolated and
> proper drills devised to prevent impossible

---

[48]Noam Chomsky, "Degress of Grammaticalness", in
J. A. Fodor and J. J. Katz, eds., The Structure of Language
(Englewood Cliffs, New Jersey: Prenctice-Hall, Inc., 1964).

sentence types from creeping into language
texts, e.g., *<u>Que</u> <u>Jean</u> <u>voit-il</u>? *<u>Le</u> <u>garçon</u>
<u>fut</u> <u>donné</u> <u>l'argent</u>, etc.49

It is difficult to see how transformation grammar

will affect programming. Current <u>French</u> programmes show

little or no influence from these theories. However, a

Latin programme by Waldo B. Sweet has been developed according

to kernel sentences and their transformations.50 Sweet

has utilized all four techniques of linguistic science,

formal contrast, structural marking, tagmemics, and

transformational grammar, very effectively. By consciously

pointing out to the student the various methods he is using,

Sweet has succeeded in maintaining a vitality and stimulation

which is singularly lacking in most Latin textbooks.

Valdman has experimented with transformation grammar

for determining learning steps in a programme:

> Should one prefer to follow the
> currently fashionable generative model,
> one might be tempted to define a step
> increment as equivalent to the application
> of an individual rewrite or transformational
> rule. For example, with regard to the
> derivation of the appropriate form of French
> adjectives such as petite/petit that exhibt
> contrasting feminine and masucline forms,
> one would start from the feminine singular
> form and account for all others by rewrite
> rules as follows:
>
> 1. /pEtit/   ---   masculine, prevowel ⟶ /pEtit/
>   (no change)
>
> 2. /pEtit/   ---   masculine, general
>   (loss of final consonant) ⟶ /pEti/

49Valdman, <u>Applied Linguistics: French</u>, p. v.

50Waldo E. Sweet, "The Choice of Syntactical and

3. /pEtit/ ⟩
    /pEti/ ⟩ -- plural, general   /pEtit/
                   (no change)   /pEti/

4. /pEtit/ ⟩
    /pEti/ ⟩ -- plural, prevowel   /pEtitz/
                                        /pEtiz/

Mastering adjectives like grande/grand or
fraîche/frais, whose masculine prevowel
forms differ from the feminine base form
(e.g., /grãd/ versus /grã/ and /frèš/
versus /frèz/) or those with nonpredictable
generalized masculine forms (belle/bel/
beau/bèl/ versus /bó/) would require
additional learning steps.51

While transformatioanl grammar may provide the
teacher with new insight into structural analysis, it does
not appear to be the most efficient or economical method
of presenting structures to the student. While some
programmers are experimenting with transformation techniques,
no French programs which are commercially available have
incorporated them for presentation to the student.

Tagmemic Analysis

The fourth technique used by linguists, tagmemic
analysis, is quite important because it is related to the
concept of substitution drills in pattern practice. Belasco
describes this technique as follows:

Morphological Discriminations in an Elementary Latin
Program", in F. Rand Morton, ed., Programming of Audio-
Lingual Language Skills for Self-Instructional Presentation
(Ann Arbor: University of Michigan, Publications of the
Language Laboratory, Series Preprints and Reprints, 1960),
XI.

[51]Valdman, Trends in Language Teaching, p. 141.

> the relationship between a 'slot' in a
> grammatical structure and units of
> speech which 'fill' the slot. The
> technique is referred to as slot-class
> correlation. By a slot in grammar is
> meant a position in the structure at
> which substitution of one element for
> another may take place, and a point at which
> new words may be introduced to the system.[52]

Thus in the sentence _Jean va partir demain_ there is a slot

where _Jean_ may be replaced by _Marie_, _Paul_ etc. Since the

use of pattern drills is so prevalent, and since much of

programmed material is based on these drills, it is

necessary to take a closer look at their relation to

programming techniques.

Most programmes appear to use adaptations of "New

Key" pattern drill material for conditioning syntactic

responses. Programmers have attempted to fit "pattern

practice drills" within the framework of programmed

instruction. Various types of pattern drills - substitution,

transformation, mutation, fixed increment, analogy, etc.

have been adequately described by Stack,[58] Valdman,[54]

Pimsleur,[55] Delattre[56] and others. Since these drills have

---

[52]Valdman, _Applied Linguistics: French_, p. iv.

[53]E. M. Stack, _The Language Laboratory and Modern Language Teaching_ (New York: Oxford University Press, 1960).

[54]Albert Valdman, "From Structural Analysis to Pattern Drill", _French Review_, XXXIV (May 1960).

[55]P. Pimsleur, "Pattern Drills in French", _French Review_, XXXIV (May 1960).

[56]P. Delattre, "Un Cours d'exercices structuraux et

been treated extensively elsewhere, this discussion will be
limited to describing their adaptation for programming
purposes.

Though Marty describes the techniques he used for
programming as "constructed response, memory responses, and
multiple choice response", they are basically "New Key"
pattern drills and testing devices. The "constructed
responses" correspond to transformation or substitution
drills. For example in No. 3 - <u>Je me pèse.</u> $\xrightarrow{nous}$ <u>Nous nous</u>
<u>pesons.</u> or No. 4 - <u>Il veut du pain.</u> $\xrightarrow{negative}$ <u>Il ne veut pas</u>
de pain., No. 6 - <u>Je crois Marie</u> $\xrightarrow{pronoun}$ <u>Je la crois.</u>
Marty also uses chain substitution - No. 9 <u>Jean va parler</u>
(<u>travailler</u>), <u>Jean va travailler</u> (<u>venir</u>), <u>Jean va venir</u>, etc.
In his description, then, of techniques used for programming
a French course, Marty has described most pattern drills
developed for New Key materials.[57]

Mueller also uses pattern drills in his programmes,
though he tends to use mainly question and answer drills
rather than the variety of drills used by Marty. An example
is taken from Part Two, lesson 3, which deals with feminine-
masculine forms of the adjective.[58] The lesson begins with

---

de linguistique appliquée", <u>French Review</u>, XXXIV (May 1960).

[57]Marty, <u>Programing a Basic Foreign Language Course:</u>
<u>Prospects for Self-Instruction</u>, p. 42.

[58]Mueller and Niedzielski, <u>Basic French: A Programmed</u>
<u>Course.</u>

grammatical explanations and sample frames and continues

with question and answer drills:

<div align="center">question</div>   <div align="right">answer</div>

Frame 26 - La robe est grise. Et le manteau? | Il est gris.

   - La blouse est blanche. Et le | Il est blanc.

        chapeau?

   - La viande est fraîche. Et le pain? | Il est frais.

   In lesson 34 of Part Two, the lesson is concerned

with word order of two object pronouns. Explanations and

patterns are shown to the student followed by drill material:

Frame 359   listen   reply

Est-ce qu'elle donne le livre à Jean? | Oui, elle le lui
                 donne.

Est-ce que vous donnez la robe à Marie? | Oui, Je la lui donne.

Est-ce que vous apportez le livre à Jean? | Oui, Je le lui apporte.

   Valdman has also described his attempts at

presenting a programmed French course at Indiana University.

Since no programmed materials for spoken French were available

when the course was first instituted, it was necessary for

him to devise his own. These materials essentially followed

the New Key closely, with a variety of pattern drills and

and an emphasis on mimicry and memorization. However,

Valdman felt that the pedagogical efficiency of these

materials left much to be desired, and they were revised

for the second run of the course:

The revised version departed from the New Key by a more thorough linguistic and pedagogical analysis of the structural elements presented: a distinction was made consistently between discrimination/comprehension and differentiation/production phases; the material was carefully graded and presented in minimal steps at all levels - phonology, spelling, grammar; structure was presented in terms of grammatical categories and generative processes rather than in terms of paradigms; for instance, the presentation of phonology was spread over thirty units, instead of eight, simultaneously with the introduction of vocabulary and grammar. . .

Drill material was also made more natural and progressive: correlation and transformation drills were replaced by response drills which allowed the student to assimilate grammatical features by responding to a series of related questions posed by the voice on the tape and usually referring back to situations and using vocabulary presented in dialogues recently learned. . .

[Valdman then compares the earlier drills with the revised materials. For the sake of brevity only the revised material will be presented here:]

Step one
      Answer the questions in the past tense.
Model: Est-ce qu'il est parti ce matin?
Student: Oui, il est parti ce matin.
Conf.:   Oui, il est parti ce matin.

Step two
      Answer the questions in the past tense.
Model: Il est allé au cinéma. Et vous, est-ce
        que vous êtes allé au cinéma?
Student: Oui, moi aussi, je suis allé au cinéma.
Conf.:   Oui, moi aussi, je suis allé au cinéma.

Step four
      Answer in the negative.
Model: Est-ce qu'ils sont arrivés?
Student: Non, ils ne sont pas arrivés.
Conf.:   Non, ils ne sont pas arrivés.

```
Step five
        Answer the questions.
Model:      A quelle heure est-ce que vous êtes
            allés au bureau?
Student:    Nous somme allés au bureau à deux heures.
Conf.:      Nous sommes allés au bureau à deux heures.


Step seven
Model:      Ma soeur arrive ce soir.  Et ta soeur?
Student:    Ma soeur est arrivée ce matin.
Conf.:      Ma soeur est arrivée ce matin.


Step ten
        Respond to the command.
Model:      Dites que vous êtes descendu au laboratoire.
Student:    Je suis descendu au laboratoire.
Conf.:      Je suis descendu au laboratoire.59
```

The materials that Valdman used for the third trial

programme comprised a set of programmed units consisting

of material presented in frames as well as drill sets. The

programme was linear and only those features presented in the

frames were formally programmed in chained sequences using

standard prompting and vanishing techniques.

Conclusion

As can be seen by these examples of audio-lingual

programmes, most foreign language programmes have incorporated

some form of New Key pattern drills into the format of the

programme. While such devices as pattern drills and testing

---

[59] Albert Valdman, "Toward Self-Instruction in Foreign
Language Learning", in G. Mathieu, ed., Advances in the
Teaching of Modern languages, Volume II (Oxford: Pergamon
Press, 1966), pp. 93-94.

procedures may be effective teaching techniques, there is little experimental research in this area. Since much of the value of programming lies in its empirical approach, it would be expected that a foreign language programmer would rigorously test all materials and techniques that are to be included in a programme. However, most programmers appear to be as negligent in this respect as their New Key predecessors. There has recently been criticism of pattern exercises, and the question has arisen as to whether the mastery of pattern drills actually results in any significant language behavior. While this is a complex issue, involving questions about the acquisition of first language behaviors, transfer conditions, and theories of syntax, there is very little experimental research data. Most programmes have accepted and adapted pattern drills without questioning their validity as a teaching tool (Valdman appears to be the only one to raise doubts as to the effectiveness of New Key drill materials). This uncritical acceptance of current techniques is inconsistent with an empirical approach. The most difficult area of foreign language teaching is the conditioning of syntactic responses and if programmed instruction is to make any significant contribution to language training, programmers must begin investigations in this area.

One important difference between New Key and programmed materials is that most programmes have

monostructural approach. This is contrasted with the polystructural approach implicit in the memorization of New Key dialogues. In a majority of programmes, structures are presented one at a time and each structure must be fully mastered before the next is introduced. There is also an emphasis on presenting productive structures which encourage a student to analogize correctly. Programmers have often criticized the memorization of dialogues because the student is often led to make faulty analogies and does not gain experience in solving linguistic problems automatically.

In an attempt to make drills more meaningful and less boring, most New Key materials relate the pattern drills to actual situations that the student might encounter in the country where the language is spoken. The structural patterns, therefore, are determined through the medium of the dialogue. However, as programmers point out, there is reason to believe that the dialogue is not necessarily the best medium in which to develop real linguistic competence, i.e., the ability to generate novel utterances determined by the conditions of the situation. Much of conversation, idioms and clichés, occurs within a formal repertoire. For a certain stimulus there is a certain set response or responses which are relatively unchanging - How are you? Fine thanks, and you? etc. These clichés and idioms of the

language allow the student to acquire a certain superficial knowledge of the language, (which is undoubtedly useful when travelling), however, they cannot be equated with a real ability to express a novel idea or to adequately handle a new situation.

In departing from New Key dialogues and encouraging the solving of linguistic problems automatically, programmers appear to be going in the right direction. By emphasizing productive language patterns rather than clichés or idioms, the student may develop the ability to analogize in the foreign language. It is hoped that future foreign language programmers will make more careful investigations as to the value of pattern drills.

CONCLUSION

Within the last decade there has been an increasing

emphasis on psychological aspects of foreign language

training. Programmed instruction materials represent an

attempt to apply the results of laboratory research to the

practical problems of a classroom situation. In one respect,

programming has marked a new era in language teaching. For

the first time teaching materials are being produced

according to their <u>tested</u> effectiveness. Perhaps the most

stimulating material that has been recently written on

foreign language training is the reports of those psychologists,

linguists and foreign language teachers involved in

programming. A vital part of the construction of a

programme is continuous testing while still under development,

and field trials in actual classroom situations. By this

process of testing and revision, a programmer is able to

determine which presentation is, in fact, most efficient

and effective. Those programmers who have remained flexible

and open-minded, rather than rigidly adhering to preconceived

theories and methods of language instruction have produced

research materials which will be of value to all foreign

language teachers in the future. However, not all

programmes have been rigorously developed or evaluated and

it is the responsibility of the prospective purchaser to

obtain research reports from the editor or author of a

programme from the Centre for Applied Linguistics in

Washington.[1]

The construction of a foreign language programme is

a complex process and a programmer will necessarily be

concerned with questions in programming, linguistics,

psycholinguistics, psychology, and language teaching. This

study has been primarily concerned with the application of

programming principles to a French course, and has

concentrated on problems in this area. However, in order

to fully understand the implications of programming a French

language course, it has been necessary to review the

historical development of programmed instruction and to

summarize the current trends in language teaching and

linguistic studies of French.

There has been much controversy as to whether the

theoretical basis of programmed instruction is adequate

for the complex process of language learning. Research

in language acquisition is at such an elementary stage

than an examination of programming efforts must take into

consideration the objections of psychologists and linguists

such as Noam Chomsky and others. While it is necessary

for those involved in language training to be aware of

theoretical considerations, the ultimate criterion must be

the demonstrated effectiveness of programmes as a teaching

_____

[1]Center for Applied Linguistics, 1717 Massachusetts
Avenue, N. W., Washington, D. C., 20036.

technique. A programme proposes to do a stated amount of teaching and the final judgement must be based on whether, in fact, it does so. The ultimate test is empirical.

A programmer of a foreign language will also attempt to organize the linguistic material in such a way that the student acquires the desired language skills (the terminal behaviors of the course) with maximum efficiency. The programme proposes to teach more material in less time. While the goal of most programmes is effective and efficient teaching, it is extremely difficult to perform experiments comparing programmed learning with conventional learning. The problems arise in trying to control the variables which would otherwise influence the results. Important variables which would have to be controlled are the quality of the programme, the quality of the teacher in the conventional instruction, time available, the novelty (Hawthorne) effect, and the relevance of the criterion tests.

Another important aspect of programming is that it has resulted in a more rigorous analysis of a foreign language. With its emphasis on the specification of terminal behaviors, programming has necessitated not only a detailed examination of linguistic elements, but also a description of the behaviors expected of a student in relation to those linguistic elements. A thorough programme will state in quantifiable and observable terms what behaviors will be

expected of a student who has completed the programme.

As John B. Carroll has noted in specifying the terminal

objectives of a programme:

> One would list the phonological, grammatical,
> and lexical items which the student is
> expected to master. But there is more to
> the task than this. It is also necessary
> to specify the language _behaviors_ desired
> in the student, that is, to state what
> mastery means in terms of behavior. 'Mastery'
> of a phonological item might mean anything
> from 'a technical knowledge of the phonetic
> classification of a phoneme' to 'habitual
> and consistent use of the phoneme, with
> pronunciation like that of a native speaker,
> in free conversation as well as in formal
> speech', one must decide what kind of
> mastery one seeks. Some items might be
> listed only for recognition rather than
> active use (e.g., the forms of the past
> definite in French).[2]

A traditional textbook would merely list those

linguistic items to be included in the book, but programming

calls for a detailed specification of skills, behaviors and

knowledge desired of a student who has completed the

programme. Different behaviors may also be conditioned in

relation to different language elements. For example, while

a student might be expected to _recognize_ and _understand_

a variety of styles of speech, he might be trained to

produce the speech of a cultivated Parisian.

---

[2]John B. Carroll, "A Primer of Programmed Instruction
in Foreign Language Teaching", _International Review of
Applied Linguistics_, I (1963), 131.

In comparing French programmes, a difficulty arises
because of the great variation in programme organization and
course objectives. Some programmes will be organized
according to chapters or lesson units while others will be
continuous, with no indicated stopping point. This means
that a chapter by chapter comparison is impossible. It is
also difficult to isolate and compare specific linguistic
elements. In a programme, the language is atomatized into
its smallest element and each new frame builds on the
preceding one. Thus there is a constant interplay on new
and old material; elements previously learned in the programme
are continuously reviewed and interwoven into newer material.
Sounds and structures learned in earlier sections continue
to be used in more complicated utterances.

The comparison of programmes is also complicated
by the variety of course objectives which programmes exhibit.
While some courses have an audio-lingual orientation and
have large sections devoted to teaching pronunciation, other
programmes only teach reading and writing skills and give
no instructions on pronunciation. Among the audio-lingual
courses some resemble New Key materials and present dialogues
to be memorized while others are more comprehensive and
attempt to develop linguistic competence through a variety
of techniques. Because of the difficulties of directly
comparing various programmes, it was found that the most
productive method of examination was to discuss the

problems and techniques of programming a French course in the areas of phonology, syntax, and morphology.

One particular problem that a French programmer encounters is the difficulty of applying rigid scientific principles to the complex, open system of the French language. French is a living, changing system and the variations of the language do not always lend themselves to scientific regimentation. For example, in the area of phonology, French speakers vary in the number of phonemic distinctions they maintain. Depending on region and style, the French language may exhibit from seven to sixteen vowel phonemes. Most programmers base their choice of phonemic contrasts on the speech of the cultivated Parisian. However, even among Parisians, there may be variations in the number of phonemic contrasts maintained. Thus the nasal vowel /œ̃/ is not always distinguished from the nasal vowel /ɛ̃/, or the contrasts imperfect/past definite, e.g. je parlais versus je parlai or the contrasts between the conditional/future, e.g. j'irais versus j'irai are not always realized because /ɛ/ is not always distinguished from /e/. While there is a great deal of regularity in the language, it is still not always possible to predict what distinctions a speaker will make.

In examining phonological, morphological and syntactical aspects of French programmes, two important problems become apparent. These involve the method of

selecting linguistic elements to be included in a programme

and the presentation of these elements in an effective and

efficient manner. Most programmers are aided in both these

areas by techniques and studies of linguistic science.

Frequency and linguistic studies are used to determine which

elements are essential to a mastery of the language, and the

programmer uses linguistic techniques such as structural

markers (or "acoustic signifiers") formal contrast and

tagmemics for presenting aspects of the language. In the

presentation of structures to be learned, most programmers

follow a monostructural approach. Structures are presented

one at a time and each structure must be thoroughly mastered

before the next one is presented. This could be contrasted

with the New Key method where many different structures

are presented simultaneously.

Since programming prescribes no view of the

course content, the objectives of a programme may be the

development of audio-lingual skills or only reading and

writing skills. If the course is to emphasize the spoken

language, it is important that a programmer base his

selection and presentation of language elements on linguistic

and frequency studies of the spoken language. An analysis

of the spoken language will differ significantly from that

of the literary language. Certain techniques, such as

Mueller's "acoustic signifiers" will have special relevance

if an audio-lingual mastery of the language is desired.

Central to the principle of programming is the
concept that for learning to take place, responses must be
immediately reinforced. The reinforcement of responses is
not particularly difficult in the area of syntax and
morphology where most programmers have adopted the use of
pattern and structure drills. Most pattern drills used in
the language laboratory will follow the sequence - model,
pause for student repetition, and repetition of the model.
The sequence for structure drills is - cue, pause for student
answer, model of the correct answer. In structure drills
the student response would require a change in word order or
a change in form and a student could compare his response
with that of the model. If the student's response is
incorrect, the difference between his wrong answer and the
correct repetition is fairly obvious, and it can be assumed
that on this level the student response is being adequately
reinforced.

However, in the area of pronunciation, programmers
have found that it is not valid to assume that a student can
automatically compare and evaluate his own response. The
student must be specifically taught the skill of evaluating
his pronunciation. Most audio-lingual programmes develop
this skill by a process of discrimination training - the
student is taught to discriminate between French and non-

French sounds so that he will eventually be able to evaluate his own imitation of the recorded model. If the discrimination training has been adequate, the recorded repetition of the model will act as reinforcement to the student's response.

At this point it is necessary to point out some of the difficulties encountered in doing research in programmed instruction. Since programming is a relatively new field, considerable effort must be expended in gathering and assimilating research materials. Bibliographies listing programmed materials are scarce (two or three at most) often inaccurate and out-of-date (an examination of two of these bibliographies has revealed that many institutions and programmes listed no longer exist). Research materials and reports (both published and unpublished) must be gathered from journals, institutions and individuals involved in programming French language courses, and much private correspondence is involved because many programmes are still in the developmental stage.

An empirical approach to the construction of language materials has been basic to the programming technique. While there is great variation in the quality of French language programmes, there are several which have been rigorously developed and tested over a period of years and these programmes promise to provide stimulating information about student reaction to various aspects of language training.

This study of the application of programming principles to French language courses has been exploratory in nature. It does not pretend to give definitive answers because the field of programming is still in an elementary stage. However, the problems which arise in programming French materials will be of interest to those attempting to improve the effectiveness of foreign language teaching.

BIBLIOGRAPHY

Books and Pamphlets

Bloomfield, Leonard. Outline Guide for the Practical Study of Foreign Languages. Baltimore: Linguistic Society of America, 1942.

————. The Study of Language. New York: Henry Holt and Company, 1914.

Brooks, Nelson. Language and Language Learning. 2nd ed. New York: Harcourt, Brace & World, 1964.

Bruneau, Ch. Petite histoire de la langue française. 2 vols. Paris: A. Colin, 1955-1958.

Brunot, F. Histoire de la langue française des origines à 1900. Vol. 1-10, 12, 13. Vol. 12 – Ch. Bruneau. Paris: A. Colin, 1905-1953.

————. La Pensee et la langue. 3rd ed. rev. Paris: Masson, 1936.

Carroll, John B. Research on Teaching Foreign Languages. Ann Arbor: University of Michigan, Publications of the Language Laboratory, Series Preprints and Reprints, Vol. III B, 1961.

Center for Programed Instruction. Programs, '63; A Guide to Programed Instructional Materials Available to Educators by September 1963. Washington, D.C.: Office of Education, OE-34015-63, 1963.

Chomsky, Noam. Aspects of the Theory of Syntax. Cambridge, Mass.: The M.I.T. Press, 1965.

————. Report on the Sixth Annual Round Table Meeting on Linguistics and Language Teaching. Georgetown University, 1955.

————. Syntactic Structures. The Hague: Mouton, 1957.

Clearinghouse for Linguistics. Selected Bibliography in Programmed Instruction. Washington, D.C.: Center for Applied Linguistics, 1966.

Clearinghouse for Self-Instructional Language Materials. *Program Information Sheets*. Washington, D.C.: Center for Applied Linguistics, 1967.

————————. *Clearinghouse Report: Results of the Survey of the Use of Programmed Foreign Language Instruction in School Systems*. Washington, D.C.: Center for Applied Linguistics, 1966.

Damourette, M. M. and E. Pichon. *Des mots à la pensée – Essai de grammaire de la langue française*. 8 vols. Paris: d'Artrey, 1911-1927.

Dauzat, Albert. *Histoire de la langue française*. Paris: Payot, 1930.

————————. *Où en sont les études de français?* Paris: d'Artrey, 1935.

DeCecco, John P., ed. *Educational Technology: Readings in Programmed Instruction*. Holt, Rinehart & Winston, 1964.

Delattre, Pierre. *Principes de phonétique française à l'usage des étudiants anglo-américains*. Middlebury, Vt.: Ecole Française d'Eté, Middlebury College, 1951.

————————. *Principes de prononciation française à l'usage des étudiants anglo-américains*. Middlebury, Vt.: Vermont Books, 1946.

Fouché, Pierre. *Phonétique historique du français: Introduction*. Paris: Klincksieck, 1952.

François, Alexis. *Histoire de la langue française cultivée des origines à nos jours*. Genève: A. Jullien [1959].

Frei, Henri. *Le livre des deux mille phrases*. Genève: Droz, 1953.

Fry, Edward B. *Teaching Machines and Programmed Instruction*. New York: McGraw-Hill, 1963.

Fund for the Advancement of Education. *Four Case Studies of Programed Instruction*. New York: The Fund for the Advancement of Education, June, 1964.

Galichet, G. *Essai de grammaire psychologique*. Paris: Presses Universitaires de France, 1950.

————. Méthodologie grammaticale: Etude psychologique des structures. Paris: Presses Universitaires de France, 1953.

————. Physiologie de la langue francaise. Coll. Que sais-je? Paris: Presses Universitaires de France, 1949.

Gee, R. D. Teaching Machines and Programmed Learning, A Guide to the Literature and Other Sources of Information. Hatfield, Hertfordshire: Hertfordshire County Council Technical Library and Information Service, Hatfield College of Technology, 1965.

Glaser, Robert, ed. Teaching Machines and Programed Learning, Vol. II: Data and Directions. Washington, D.C.: Department of Audio-Visual Instruction, National Education Association, 1965.

Goodman, Edith Harwith, ed. Automated Education Handbook. Detroit, Michigan: Automated Education Center, 1965.

Gougenheim, G. Le Français Fondamental (1er degré). Paris: Publication de l'Institut Pédagogique National, 1959.

———— et al. L'Elaboration du français fondamental (1er degré). Paris: Didier, 1964.

———— et al. Méthode progressive du français parlé. Paris: Hachette, 1955.

————. Systeme grammatical de la langue française. Paris: d'Artrey, 1962.

Gregg, R. J. A Student's Manual of French Pronunciation. Toronto: Macmillan Company of Canada, Ltd., 1960.

Grégoire, Antoine. L'apprentissage du langage. Liège: Faculté de philosophie et lettres; Paris: Droz, 1937-1947.

Grevisse, Maurice. Le bon usage. 5th ed. rev. Paris: Duculot-Geuthner, 1953.

Guiraud, P. La syntaxe du français. Coll. Que sais-je? Presses Universitaires de France, 1962.

Hall, Robert, Jr. Introductory Linguistics. Philadelphia: Chilton Books, 1964.

Hayes, Walter M. _An Experiment in Multi-Language Programming_.
Paper presented at NSPI convention on May 5, 1965,
Philadelphia, Pennsylvania.

Hendershot, Carl H. _Programmed Learning: A Bibliography
of Programs and Presentation Devices_. Bay City, Michigan:
Carl H. Hendershot, 4114 Ridgewood Drive, 1964.

Hockett, C. F. _A Course in Modern Linguistics_. New York:
The Macmillan Company, 1958.

Horowitz, A. E. _The Effects of Variation in Linguistic
Structure on the Learning of Miniature Linguistic
Systems_. Ph.D. thesis, Harvard University, 1955.

Hoy, Eileen M. _Select Bibliography of Recent Material on
Teaching Machines and Programmed Learning_. Toronto:
Ontario Educational Research Council, 1963.

Joint Publications Research Service. _Teaching Machines
and Programmed Learning in the Soviet Bloc_. Washington,
D.C.: U. S. Department of Commerce, February 18, 1964.

Knight, Everett W. _Literature Considered as Philosophy:
The French Example_. New York: Collier Books, 1962.

Kukenheim, Louis. _Esquisse historique de la linguistique
française et de ses rapports avec la linguistique
générale_. Leiden: Universitaire Pers, 1962.

Léon Pierre. _Laboratoire de langues et correction phonétique_.
Paris: Didier, 1962.

Léon, Pierre, and Monique Léon. _Introduction à la phonétique
corrective_. Paris: Librairie Hachette, 1964.

Lumsdaine, A. A. and Robert Glaser, eds. _Teaching Machines
and Programmed Learning: A Source Book_. Washington,
D.C.: Department of Audio-Visual Instruction, National
Education Association, 1960.

Lysaught, Jerome, and C. M. Williams. _A Guide to Programmed
Instruction_. New York: John Wiley & Sons, 1964.

Mathieu, G., ed. _Advances in the Teaching of Modern Languages_,
Volume II. Oxford: Pergamon Press, 1966.

Martinet, André. _Eléments de linguistique générale_. Paris:
Colin, 1960.

--------. *La prononciation du français contemporain, témoignages recueillies en 1941 dans un camp d'officiers prisonniers*. Paris: Droz, 1945.

Martinon, Ph. *Comment on prononce la français*. Paris: Larousse, 1913.

Marty, Fernand L. *Language Laboratory Learning*. Wellesley, Massachusetts: Audio-Visual Publications, 1960.

--------. *Linguistics Applied to the Beginning French Course*. Roanoke, Virginia: Audio-Visual Publications, 1963.

--------. *Programing a Basic Foreign Language Course: Prospects for Self-Instruction*. Roanoke, Virginia: Audio-Visual Publications, 1962.

McLuhan, Marshall, and Q. Fiore. *The Medium is the Massage*. New York: Bantam Books, 1967.

McLuhan, Marshall. *Understanding Media: The Extensions of Man*. New York: Signet Books, 1964.

Méras, Edmond A. *A Language Teacher's Guide*. 2nd ed. New York: Harper & Brothers, 1954.

Montmollin, Maurice. *L'enseignement programé*. Paris: Presses Universitaires de France, 1965.

Morton, F. Rand. *The Language Laboratory as a Teaching Machine*. Ann Arbor: University of Michigan, Publications of the Language Laboratory, Series Preprints and Reprints, I, 1960.

Mueller, Theodore H. *Trial Use of the ALLP French Program at the University of Akron, 1963-64*. Akron: University of Akron, 1964.

--------. *Revisions of the ALLP French Program and Second Trial Use at the University of Akron, 1964-65*. Report to the U.S. Office of Education on research conducted under Title VI, Contract No. OE-5-14-007. August 1965.

Nyrop, Kr. *Grammaire historique de la langue française*. 6 Vol. Paris: Picard, 1899-1930.

Passy, Paul. *Les sons du français*. Paris: Didier, 1932.

Pimsleur, P., et al. *Preliminary Discrimination Training in the Teaching of French Pronunciation*. Contract SAE 8950. Washington, D.C.: U. S. Office of Education, 1961.

Rivers, Wilga. The Psychologist and the Foreign Language
    Teacher. Chicago: University of Chicago Press, 1964.

Roucek, J. S., ed. Programmed Teaching: A Symposium on
    Automation in Education. New York: Philosophical
    Library, 1965.

Sapon, Stanley. Programmed Learning and the Teacher of
    Foreign Languages: Final Report of the Seminar in
    Language and Language Learning. Seattle: University
    of Washington, Department of Romance Languages and
    Literatures, 1962.

Saporta, A. Evaluation of Three Grammatical Models in the
    Teaching of Foreign Languages. National Defense
    Language Development Research and Studies. OE 12014-62.
    Washington, D.C.: Government Printing Office, 1963.

Saussure, Ferdinand de. Cours de linguistique générale.
    3rd ed. Paris: Payot, 1965.

Scherer, George A. C. and Michael Wertheimer. A Psycholinguistic
    Experiment in Foreign-Language Teaching. New York:
    McGraw-Hill Book Company, 1964.

Skinner, B. F. Verbal Behavior. New York: Appleton-Century
    Crofts, Inc., 1957.

Stack, E. M. The Language Laboratory and Modern Language
    Teaching. New York: Oxford University Press, 1960.

Stolurow, Lawrence M. Teaching by Machine. Washington, D.C.:
    Office of Education Cooperative Research Monograph No. 6,
    Contract No. OE-34010, 1961.

Suppes, P., et al. Some Quantitative Studies of Russian
    Consonant Phoneme Discrimination. Stanford, California:
    Stanford University Institute for Mathematical Studies
    in the Social Sciences, September, 1962.

Thorndike, E. L. Education. New York: Macmillan Company,
    1912.

--------. Language Learning: Summary of a Report to the
    International Auxiliary Language Association in the
    United States, Inc. New York: Bureau of Publications,
    Teachers College, Columbia University, 1933.

--------. The Original Nature of Man (Educational Psychology,
    I). New York: Teachers College, 1913.

Valdman, Albert. _Applied Linguistics: French_. Edited by
    Simon Belasco; introduction by Simon Belasco. Boston:
    D. C. Heath and Company, 1961.

————————. _Problems in the Definition of Learning Steps in
    Programmed Foreign Language Materials_. Paper delivered
    at the Kentucky Foreign Language Conference, April 29,
    1967.

————————. _Trends in Language Teaching_. New York: McGraw-
    Hill Book Company, 1966.

Wagner, R. L. _Introduction à la linguistique française_.
    2nd ed., Genève: Droz, 1955.

————————. _Supplément bibliographique à l'Introduction à la
    linguistique française_. Genève: Droz, 1955.

————————, and J. Pinchon. _Grammaire du français classique
    et moderne_. Paris: Hachette, 1962.

Wartburg, W. von. _Evolution et structure de la langue
    française_. Paris: Sabri, 1960.

———————— and P. Zumthor. _Précis de syntaxe du français
    contemporain_. Paris: Presses Universitaires de France,
    1955.

Articles and Parts of Books

Anisfeld, Moshe. "Psycholinguistic Perspectives on Language
    Learning", in Albert Valdman, ed., _Trends in Language
    Teaching_. New York: McGraw-Hill Book Company, 1966.

Asher, J. J. "Sensory Interrelationships in the Automated
    Teaching of Foreign Languages", _Perceptual and Motor
    Skills_, XIV (January, 1962), 38.

Berko, Jean. "The Child's Learning of English Morphology",
    Word, XIV (August-December 1958), 150-177.

Brethower, D. M. "On Linguists and Psychologists in Second
    Language Learning, Or the Necessity of Strange Bedfellows",
    in F. Rand Morton, ed., _Programming of Audio-Lingual
    Language Skills for Self-Instructional Presentation_.
    Ann Arbor: University of Michigan, Publications of the
    Language Laboratory, Series Preprints and Reprints,
    VI, 1960.

Brown, R. and J. Berko. "Word Association and the Acquisition of Grammar", Child Development, XXXI (March 1960), 1-14.

————— and C. Fraser. "The Acquisition of Syntax", in C. N. Cofer and B. S. Musgrave, eds., Verbal Behavior and Learning: Problems and Processes. New York: McGraw-Hill Book Company, 1964.

Carroll, John B. "The Contributions of Psychological Theory and Educational Research to the Teaching of Foreign Languages", in Albert Valdman, ed., Trends in Language Teaching. New York: McGraw-Hill Book Company, 1966.

—————. "A Primer of Programmed Instruction in Foreign Language Teaching", International Review of Applied Linguistics, I (1963), 115-141.

—————. "Research on Teaching Foreign Languages", in N. L. Gage, ed., Handbook of Research on Teaching. New York: Rand McNally, 1963.

Chomsky, Noam. "Degrees of Grammaticalness", in J. A. Fodor and J. J. Katz, eds., The Structure of Language. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1964.

—————. "Review of: B. F. Skinner, Verbal Behavior", Language, XXXV (1959), 26-58.

Crowder, N. A. "Automatic Teaching by Intrinsic Programming", in A. A. Lumsdaine and R. Glaser, eds. Teaching Machines and Programmed Learning: A Source Book. Washington, D.C.: Department of Audio-Visual Instruction, National Education Association, 1960.

—————. "On the Differences Between Linear and Intrinsic Programming", in John P. DeCecco, ed., Educational Technology: Readings in Programmed Instruction. Holt, Rinehart & Winston, 1964.

Delattre, P. "Un Cours d'exercices structuraux et de linguistique appliquée", French Review, XXXIV (May 1960), 591-603.

DesCartes, René. "Discours de la méthode pour bien conduire sa raison et chercher la vérité dans les sciences", in H. Clouard and R. Leggewie, eds., Anthologie de la littérature française. New York: Oxford University Press, 1960.

Glaser, Robert. "Components of the Instructional Process" in John P. DeCecco, ed., Educational Technology: Readings in Programmed Instruction. Holt, Rinehart & Winston, 1964.

Gougenheim, G. "Le français élémentaire", <u>French Review</u>, XXVII (1954), 217-220.

Hutchinson, Joseph C. "The Language Laboratory: Equipment and Utilization", in Albert Valdman, ed., <u>Trends in Language Teaching</u>. New York: McGraw-Hill Book Company, 1966.

Joint Committee on Programed Instruction and Teaching Machines. "Criteria for Assessing Programed Instructional Materials", <u>Audio-Visual Instruction</u>, VIII (1963), 84-89.

Lane, Harlan L. "Acquisition and Transfer in Auditory Discrimination", <u>American Journal of Psychology</u>, LXXVII (June 1964), 240-248.

————. "Programmed Learning of a Second Language", in Robert Glaser, ed., <u>Teaching Machines and Programed Learning, Volume II: Data and Directions</u>. Washington, D.C.: Department of Audio-Visual Instruction, National Education Association, 1965.

————, and B. A. Schneider. "Methods for Self-Shaping Echoic Behavior", <u>Modern Language Journal</u>, XLVII (April 1963), 154-160.

Léon Pierre. "Teaching Pronunciation", in Albert Valdman, ed., <u>Trends in Language Teaching</u>. New York: McGraw-Hill Book Company, 1966.

Lumsdaine, A. A. "Assessing the Effectiveness of Instructional Programs", in Robert Glaser, ed., <u>Teaching Machines and Programed Learning, Volume II: Data and Directions</u>. Washington, D.C.: Department of Audio-Visual Instruction, National Education Association, 1965.

Masson, L. I. "The Influence of Developmental Level on the Learning of a Second Language Among Children of Anglo-Saxon Origin", <u>Canadian Education and Research Digest</u>, IV (1964), 188-192.

Miller, G. A. "Some Psychological Studies of Grammar", <u>American Psychologist</u>, XVII (November 1962), 748-62.

————, and J. A. Selfridge. "Verbal Context and the Recall of Meaningful Material", <u>American Journal of Psychology</u>, LXIII (April 1950), 176-85.

Pimsleur, P. "Discrimination Training in the Teaching of French Pronunciation", <u>Modern Language Journal</u>, XLVII (May 1963), 199-203.

--------, and R. J. Bonkowski. "Transfer of Verbal Material Across Sense Modalities", <u>Journal of Educational Psychology</u>, LII (April 1961), 104-107.

--------. "Pattern Drills in French", <u>French Review</u>, XXXIV (May 1960), 570-576.

Pressey, Sidney L. "A Simple Apparatus Which Gives Tests and Scores -- And Teaches", <u>School and Society</u>, XXIII No. 586 (March 20, 1926), 373-376.

Sapon, S. M., and John B. Carroll. "Discriminative Perception of Speech Sounds as a Function of Native Language", <u>General Linguistics</u>, III (Spring 1958), 62-72.

Saporta, Sol. "Applied Linguistics and Generative Grammar", in Albert Valdman, ed., <u>Trends in Language Teaching</u>. New York: McGraw-Hill Book Company, 1966.

Scherer, George A. C. and Michael Wertheimer. "The German Teaching Experiment at the University of Colorado", <u>German Quarterly</u>, XXXV (May 1962), 298-308.

Skinner, B. F. "The Science of Learning and the Art of Teaching", in W. I. Smith and J. W. Moore, eds., <u>Programmed Learning</u>. Princeton, New Jersey: D. Van Nostrand Company, Inc., 1962.

--------. "Teaching Machines", in A. A. Lumsdaine and Robert Glaser, eds., <u>Teaching Machines and Programmed Learning: A Source Book</u>. Washington, D.C.: Department of Audio-Visual Instruction, National Education Association, 1960.

--------. "Reflections on a Decade of Teaching Machines -- ", in Robert Glaser, ed., <u>Teaching Machines and Programed Learning, Volume II: Data and Directions</u>. Washington, D.C.: Department of Audio-Visual Instruction, National Education Association, 1965.

Sweet, R. J. "Programming Control to Elicit Maximum Effectiveness in Pronunciation", in F. Rand Morton, ed., <u>Programming of Audio-Lingual Language Skills for Self-Instructional Presentation</u>. Ann Arbor: University of Michigan, Publications of the Language Laboratory, Series Preprints and Reprints, VI, 1960.

Sweet, Waldo E. "The Choice of Syntactical and Morphological Discriminations in an Elementary Latin Program", in F. Rand Morton, ed., <u>Programming of Audio-Lingual Language Skills for Self-Instructional Presentation</u>. Ann Arbor:

University of Michigan, Publications of the Language
Laboratory, Series Preprints and Reprints, VI, 1960.

Tikhomirov, O. K. "Review of: B. F. Skinner, Verbal
Behavior", Word, XV, No. 2 (August, 1959), 362-67.

Valdman, Albert. "From Structural Analysis to Pattern Drill",
French Review, XXXIV (May 1960), 170-181.

————————. "Phonologic Structure and Social Factors in French,
the Vowel 'un'", French Review, XXXIII (1959), 153-161.

————————. "Programmed Instruction and Foreign Language
Teaching", in his Trends in Language Teaching. New York:
McGraw-Hill Book Company, 1966.

————————. "Reviews of: Fernand Marty, Programming a Basic
Foreign Language Course: Prospects for Self-Instruction:
and Elaine Burroughs, A Programmed Course in French
Phonetics", French Review, XXXVI (1963) 419-422.

————————. "Toward Self-Instruction in Foreign Language
Learning", in G. Mathieu, ed., Advances in the Teaching
of Modern Languages, Volume II. Oxford: Pergamon Press,
1966.

Working Committee on Programmed Learning of the 1962
Northeast Conference on the Teaching of Foreign Languages.
"Programmed Learning: 'A New Look at Learning'", in
W. F. Bottiglia, ed., Reports of the Working Committees.
Oxford, Ohio: American Classical League Service Bureau,
1963, 19-60.

French Programmes

*Burroughs, Elaine. Modern French (French A & B). Behavioral
Research Laboratories, Box 577, Palo Alto, California,
1966.[1]
Cost: French A
Text (2 Volumes): $9.74
Tapes (set of 8): $84.00
Teacher's Manual: $1.00
Test Booklet: $1.48

---

*Commercially available. Some programmes are out
of print and have not been republished.

[1]The cost listed here is subject to change.

*Burroughs, Elaine. A Programmed Course in French Phonetics.
    Behavioral Research Laboratories, Box 577, Palo Alto,
    California, 1961.
    Cost: Text: $7.70   Tapes: (set of 3) $42.30.

*Burroughs, Elaine. Programmed French: Reading and Writing.
    Behavioral Research Laboratories, Box 577, Palo Alto,
    California, 1964.
    Cost: Text (3 books): $4.95 each   Teacher's Manuals
        (3): $1.50 each.

*Collett, M. J. Middle School French, Part I and II. Methuen
    & Co. Ltd., 11 New Fetter Lane, London EC4, England, 1966.
    Cost: Part I: $1.40   Part II: $1.40.

 Dubois, B. L., et al. Preparing for French. Encyclopaedia
    Britannica Press, 425 North Michigan, Chicago 11, Illinois,
    1965.
    Cost: Programmed text and TEMAC Binder: $4.00.

*Ebacher, Joseph P. Programmed Reading French Series. Prentice-
    Hall, Inc., Englewood Cliffs, New Jersey, 1965.
    Cost: Text (5 Volumes available): $2.95 each.

*Marty, Fernand. Active French: Dialogues. Audio-Visual
    Publications, Box 5497, Roanoke, Virginia, 2nd ed., 1966.
    Cost: Text: $4.90 (paper bound); $5.50 (hard cover)
        Tapes: (nine 7" reels) $45.00.

*Marty, Fernand. Active French: Foundation Course, Book One
    and Two. Audio-Visual Publications, Box 5497, Roanoke,
    Virginia, 1965.
    Cost: Book I: $4.90   Tapes: $50.00
        Book II: $4.90   Tapes: $40.00

*Mueller, Th. and H. Niedzielski. Basic French: A Programmed
    Course. New York: Appleton-Century Crofts, 1967.
    Cost: Unknown. Programmed Text and Tapes.

*Pimsleur, Paul. Speak and Read Essential French. Tapeway,
    Box 3014 University Station, Columbus, Ohio, 1964.
    Cost: Tapes (set of 30) and Reading Booklet: $270.00.

    Testing materials:
            Tapes (Form A or B for Listening Comprehension):
                            $12.50 per form
            Tapes (Form E or F for Speaking): $12.50 per form

            Answer Booklet (Form A or B for Listening
                    Comprehension): $10.00 per set of 5
            Answer Booklet (Form C or D for Reading
                    Comprehension): $15.00 per set of 5

Politzer, Ed. Programmed Dictionary for Masterpieces of
        French Literature. Prentice-Hall, Inc. Englewood
        Cliffs, New Jersey, 1965.
        Cost: Unkown. Programmed Text and Tapes.

*Regan, T. F., and J. Estarellas. From Sound to Letter:
        Programmed Self-Instruction in French Pronunciation and
        Writing. Instructional Materials Division of Continuous
        Progress Education, Inc., 281 Connecticut Avenue, Wilton,
        Connecticut, 1966.
        Cost: Text: $6.50   Tapes: $80.00.

Stack, Edward M. French (Elementary). CLT French Series I
        (No. 16-12-03), Electronic Teaching Laboratories, 5034
        Wisconsin Avenue, N. W., Washington, D.C. [1964].
        Cost: Programmed Text and Tapes: $79.95
                Teacher's Manual: $1.25.

Turkkan, O. R. and J. Boucher. French I. Learning Foundations
        Institute, Inc., 271 North Avenue, New Rochelle, New
        York, 1964.
        Cost: For use in LEARNATRON MK II: $415.00
                        A/Z MARK I AND II: $89-$189.00
                        THE MINIK: $4.95-$14.75
              Program reusable, 106 frames: $2.00-$20.00.

*Universal Electronics Laboratories Corp. French 4009, Grade
        Level 7 thru 9. French 4010, Grade Level 10 thru 12.
        Institute for Programmed Teaching Inc., 6 East 45th
        Street, New York, New York, 1963.
        Cost: Programmed Text: $1.50 each.