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Criticism against the application of Skinnerian programed instruction techniques to foreign language learning is advanced, while the development of a largely self-instructional guided learning program with live teachers and other students is advocated. Major attention is directed to an explanation of the principles of programed instruction, the determination of learning steps, and the concept of guided learning. The definition of language behaviors, control of student responses, teacher and student reaction, partial self-instruction, and the unpopularity of the programed instruction approach are also discussed. (AF)

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PROGRAMMED INSTRUCTION VERSUS GUIDED LEARNING IN FOREIGN LANGUAGE ACQUISITION*

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Seven years ago in a paper delivered at the first Indiana-Purdue Language Conference and aptly titled "The Language Laboratory as a Teaching Machine", F. Rand Morton painted in bold strokes a futuristic scheme in which the application of programmed instruction would revolutionize FL learning. Working with carefully programmed electronic equipment, students would acquire all language skills through self-instruction; the presence of the live teacher would be required only for occasional evaluation of student performance, for diagnosis of errors and remedial guidance. Morton's prophecy has stimulated considerable experimentation in the application of programmed instruction to the preparation of FL materials and several programmed FL courses have been distributed commercially.

However, it must be admitted that Morton's utopian "Language-Laboratory-as-a-Teaching-Machine" does not abound today and that programmed materials and programmed instruction techniques have had little impact on FL teaching as it is practiced in the average high school and college classroom of today. That we FL teachers have viewed programmed materials and self-instruction with suspicion and skepticism is clearly demonstrated by a recent survey conducted by the Center for Applied Linguistics. Of 617 college and university teachers of FL canvassed in the survey, only 64 at 62 institutions reported the use of programmed materials in their departments. In most instances the materials reported in use were being tried out on an experimental basis under the direction of their developers.

How can we account for this undeniably lukewarm response? In this paper I propose to show that the general rejection of programmed instruction by FL teachers stems from three factors. First, it stems from the inadequacy of Skinner's conception of the structure of human language and the simplistic model he proposes for its acquisition. Second, serious attempts to apply programmed instruction to FL learning were perhaps too ambitious. Rather than addressing themselves to limited and carefully specified FL tasks—for example, the teaching of spelling, the teaching of grammatical concepts, training in pronunciation, the acquisition of limited proficiency within a restricted number of vocabulary items and grammatical features—most programmers aimed at self-sufficient courses designed to lead to near-native speaking proficiency.

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Third, little attention was paid to modifications in the teaching environment and to changes in the role of the teacher that the adoption of programmed materials necessitated.

To reject, as I do in this paper, the validity of the application of Skinnerian theories of language acquisition does not imply that self-instruction is incompatible with audio-lingual oriented FL instruction, nor that the assumption by teaching machines and learners of functions now performed by live teachers will not result in dramatically more effective FL instruction. In fact, I will attempt to show how the adoption of some programmed instruction techniques and modest modifications in current FL teaching practices on the basis of some of the implications of programmed instruction can result in more effective instruction, not in Utopia, but in FL classrooms as we now know them, not in the year 2000, but today.

What is Programmed Instruction?

Before attempting to show why materials programmed according to strict Skinnerian principles cannot lead to the acquisition of any significant proficiency in a FL, it will be useful to review rapidly what these principles are. Stated most simply, programmed instruction is an educational technique which starts from the premise that learning results from the shaping of behavior toward some predetermined goal by way of a procedure determined by the learner's responses. *Shaping* is the key term in programmed instruction. It can best be understood by the following classical experiment by B. F. Skinner, the Harvard psychologist. A hungry pigeon is placed in an enclosed box containing a disc-shaped key that operates an automatic food dispenser. After a period of aimless behavior the pigeon will peck at the key, causing the dispenser to release a pellet of food. This will in turn cause the pigeon to peck again and again until it is satiated. In Skinnerian terms, the pecking of the pigeon is said to *operate* on the environment, hence the term *operant conditioning* which is applied to this type of learning.

The release of food is termed a reinforcing stimulus or *reinforcer* since it causes the rate of the pigeon's pecking to increase. If the pigeon's pecking were not reinforced with a pellet of food, it would soon cease or be *extinguished*. By carefully scheduling the administration or withholding of reinforcement, Skinner was able to cause pigeons and other laboratory animals to learn relatively complex behaviors, such as executing a figure eight movement or playing ping-pong. This was accomplished by reinforcing any emitted response that approximated the desired terminal response or set of responses and proceeding by successive approximation until the desired terminal behavior was reached.

To illustrate this technique called *shaping*, it might prove helpful to examine an application of it to a FL learning problem. Consider the

acquisition of a foreign language sound not present in the learner's native language. In conventional pronunciation drills the learner is expected to acquire new sounds by simple mimicry, or, in slightly more sophisticated methodologies, by contrast drills involving the pairing of native and target language near-equivalent sounds (for instance, in the acquisition of an unglided and tense German *u*, English *too* versus German *tu!* or the pairing of two contrasting sounds in the FL (for instance, in the acquisition of lax German *ü*, German *Mutter* vs. German *Mütter*). In programmed instruction one would search for intermediate steps by examining closely the active or passive sound inventory of the learner's native language. In Skinnerian terms, one would shape the new sound by starting a response chain from some response that the learner was capable of emitting already.

Let us take as example the acquisition of the English dental fricatives *th* of *thin* or *th* of *then* on the part of Frenchmen from whose native inventory they are lacking. French teachers of English customarily start by instructing their students to place the tongue between the upper and lower front teeth and to produce a friction noise. In addition to resulting in painful cases of bitten tongue tips, this procedure has the disadvantage of requiring the students to be impolite. There is a less painful and more polite way. French children and some adults lisp (French *zézayer*), as the presence in the repertory of French diction teachers of such tongue twisters as *Combien sont ces six saucissons-ci, Monsieur Sans-Souci?* attest. French lisped /s/ is acoustically similar to English *th* and it would constitute the first element in the shaping sequence. The next steps would involve using this sound in English words, contrasting it to English consonants from which it must be distinguished by the use of such minimal pairs as *thin* vs. *fin* or *thin* vs. *sin*, and finally using it in such normal-length and natural utterances as *The thin fox fled through the thick thicket.*

Implicit in the application of programmed instruction to FL learning is the assumption that human learning in general and second language learning in particular entail the acquisition of sets of behavior which do not differ substantially from the learning tasks that Skinner's pigeons and rats performed under laboratory conditions. In other words, for Skinnerians a language is a complex set of habits amenable to control by operant conditioning and to reduction to a complex chain of responses that can be shaped by appropriate reinforcement. It is of considerable interest to observe incidentally that in viewing language as a complex set of habits, Skinnerians were in good company, for this is precisely the view that is espoused by adherents to "Language Teaching in the New Key"—or, to use a more recent term, the FSM (Functional Skill Method). Since FL learners cannot presumably be enticed to emit appropriate responses by the presentation of food pellets, one must

assume that they need rewards of a less material kind, namely, they need to be informed of the correctness or incorrectness of their response.

Central to programmed instruction is the notion of control of the learner's behavior. Therefore, to program FL learning in the Skinnerian sense there are three things we must absolutely be able to do:

1. specify rigorously the behavior that the learner brings to the FL learning task (*initial behavior*) and that which he is to acquire at the end of the program (*terminal behavior*);
2. identify intermediate steps that lead from the learner's initial behavior to the desired terminal behavior;
3. *reinforce* student responses, that is, indicate to the learner whether he is responding correctly or incorrectly, and if he responds incorrectly, to cause him to modify his responses.

As what follows will attempt to show, at least the first two of these prerequisites do not obtain in FL learning, and thus, by definition, FL learning is not "programmable" in the strict sense of that word.

Defining Language Behaviors

Both Skinnerians and FSM adherents view language as consisting of a closed set of units which are directly observable and deducible from the outward behavior of speakers. Recently this view has been seriously challenged by linguists and psychologists who espouse the views of Noam Chomsky. It is claimed by Chomsky that language cannot be characterized as a closed set of habits acquired by the classical principles of reinforcement, association, and generalization, or by operant conditioning. The rapidity with which first language learning takes place in young children and the added fact that learning to speak does not necessarily require exposure to overt linguistic responses—as is demonstrated by the acquisition of speech on the part of congenitally deaf children—suggest that the capacity to learn language is an innate attribute of man and that this capacity is at least partially "wired in", as it were, in our brain. If language acquisition is not governed primarily by experience and training, then it is outside of the control of operant conditioning techniques which, as will be remembered, require observable responses. If the way in which a child goes about learning his first language is governed by some sort of internal "Language Learning Device", the way in which he goes about learning his second language is even more severely constrained, for it is in addition strongly influenced by the structure of his first language. It would thus be hazardous indeed to assume that the FL learner is a *tabula rasa* and that in shaping the terminal behavior desired we may start at zero.

The chief property of language is that it is stimulus-free and innovative, "creative", if you will. To know a language entails the ability to understand any sentence that may be produced by other speakers and to produce an infinite number of sentences, most of which have never been heard before, appropriate to given situations. The terminal behavior of a complete FL course, one that leads to near-native proficiency, cannot be specified in terms of finite sets of elements (phonemes, words, grammatical constructions), etc. Since neither the initial nor the desired terminal behavior can be specified meaningfully in the precise terms that programmed instruction requires, the determination of intermediate learning steps will be difficult indeed and it is presumptuous to claim that, in the acquisition of a particular FL, any given procedure yields the optimum sequence of learning steps. Since the problem of the determination of learning steps has been raised outside of the frame of reference of programmed instruction, and since it is one in which it is claimed that linguistics can make a significant contribution, I will discuss it in some detail.

The Determination of Learning Steps

It is true that a language may be characterized in terms of various sets of finite units (phonemes, morphemes, syntactic constructions) or, alternately, in terms of sets of primitive elements and rules that specify how these primitive elements may be combined. But to provide inventories of linguistic elements and lists of rules is not to answer some of the fundamental questions that concern FL teachers. These are among others: (1) which relationships can be established between observable language behavior and the elements and rules that characterize it; (2) which elements of language contribute most significantly to the acquisition of native-like behavior; (3) what order, if any, must exist among linguistic elements in the acquisition of native-like behavior.

Following the descriptive procedures of some linguists, FL materials of both the FSM and the programmed variety proceed in a strict linear and additive progression. The learner is first taught to pronounce all of the phonemes of the language with accuracy; he then is trained to produce long strings of phonemes without always being given the meaning they convey; he is taught to make various correlations between certain parts of these chains, e.g. *ich gehe* vs. *sie gehen;* finally, he is given the meaning of various phoneme strings and he is trained to use these in given situations. It would appear that in learning his first language a child follows precisely the reverse order: (1) he learns to attach meaning to short utterances; (2) he strings these utterances together in short sentences whose syntax may vary considerably from that of adult language; (3) he acquires gradual control of morphological features, e.g. he learns to say *one dog* vs. *two dogs* but *one horse* vs. *two horses*

and *one mouse* vs. *two mice;* (4) he gradually learns to pronounce all of the phonemes of the language with increasing accuracy. In this connection, the emphasis that is being placed on near-native pronunciation is curious since children acquire total control of phonology only after they have acquired control of the most complex features of adult grammar. To place such a high value on pronunciation in courses addressed to adolescents and adults is very dubious, and the postponement of contact with meaningful sentences for the sake of increased accuracy of pronunciation is as linguistically counter-intuitive as it is pedagogically inefficient.

One noteworthy attempt to find a principled basis for the establishment of learning steps in FL acquisition is Morton's concept of the "acoustic signifier". An acoustic signifier is a phoneme or group of phonemes which carry grammatical meaning and are capable of differentiating utterances from each other. For example, in Spanish the phoneme /o/ is considered the acoustic signifier for the first person singular (*hablo* versus *habla*) and the consonant *n* is considered the acoustic signifier for third person singular (*hablan* versus *habla*).

Even if we grant that learning steps may be determined exclusively by the analysis of observable behavior, it is difficult to see how this approach can be generalized. In most languages acoustic signifiers will generally be more complex than those Morton posits for Spanish. In French, for instance, the acoustic signifier that differentiates third person singular from third person plural in the present indicative is manifested by at least seven variants depending on a verb's conjugation affiliation:

1. presence versus absence of /z/ before the verb form, e.g. *ils aiment* versus *il aime;*
2. presence versus absence of the final consonant of the stem, e.g. *ils finissent* versus *il finit;*
3. presence versus absence of /z/ and the stem consonant, e.g. *ils élargissent* versus *il élargit;*
4. vowel change in the stem, e.g. *ils vont* versus *il va;*
5. vowel change in the stem plus presence or absence of /z/, e.g. *ils ont* versus *il a;*
6. vowel change plus presence or absence of stem consonant, e.g. *ils tiennent* versus *il tient;*
7. vowel change, plus presence or absence of stem consonant, plus presence or absence of /z/, e.g. *ils éteignent* versus *il éteint.*

The concept of the acoustic signifier permits one to handle relatively simple problems of co-occurrence relations such as agreement—problems, it might be noted, which can be treated effectively with pattern drills.

But precisely because it deals only with observable behavior, the acoustic signifier contributes little to the ordering of syntactic features. That so little attention has been given to that most important level of linguistic structure indicates that programmers have followed FSM proponents in assuming tacitly that most of the syntactic rules of the first language are transferred to the FL. The acquisition of deep-seated semantic distinctions such as tense and aspect are as recalcitrant to behavioral analysis as they are to acquisition by means of FSM pattern drills.

With the increasing popularity of generative-transformational grammar there has been a tendency on the part of some applied linguists and programmers to equate learning steps with transformational rules. Generative rules of whatever type represent only claims about the structure of language and should not be interpreted as claims about the pedagogical ordering of linguistic units.

For example, consider the production of English yes-no questions. It is well known that in English, interrogative, negative, and emphatic sentences all are characterized by the *do* insertion transformation. If an English verb phrase does not already contain a modal auxiliary, then *do* must be inserted (compare *I am/ I'm not* vs. *I go/ I don't go* and *I was/ I wasn't* vs. *I walked/ I didn't walk*). One might be tempted to believe that a basic course in English as a Second Language should introduce verb phrases of the type modal auxiliary plus main verb before phrases consisting of main verb forms only, that is, a sentence like *I am walking* before sentences like *I walk* since in the negative one simply inserts *not* to the former (*I am not walking*) but one must add *do* to the latter (*I do not walk*). After a variety of modal auxiliary plus main verb phrases have been presented, the student would be taught to construct emphatic sentences involving only the placement of stress on the modal auxiliary (*I am walking*), he would then proceed to the construction of emphatic sentences containing the empty function word *do* (*I do walk*), then to the construction of negative sentences and yes-no questions (*I don't work, do I work*).

But surely we must reject so literal an application of linguistic analysis to a pedagogical task. No doubt the most fruitful direction in the determination of optimal learning steps is the careful observation of student errors. Admittedly the structure of language is so complex that the testing of even a fraction of all possible strategies would be overwhelming. But the skilled and experienced teacher, particularly one who has learned the FL under the same conditions as the learner, has powerful insights into the pedagogical progression which is likely to yield the best results with given groups of learners in given teaching situations. It would be a pity for FL teachers to give up this vast treasure of accumulated knowledge for the uncertain promises of programmed instruction. These considerations underscore the weakness of contrastive

analysis, which claims to prevent student errors, and of "over-programmed" materials, which lead the student to produce only correct responses, for unless the student is in fact induced to make some errors, it is impossible for the teacher to discover how students with similar language backgrounds can acquire the FL in the best, the most natural way. Until programmers and teachers learn to observe rather than to interfere with the student's acquisition of the FL, it seems that the best solution in the organization of learning steps lies in the ordering of the course of study in terms of the situations that the student is expected to handle. Some effort should be made to grade grammatical and phonological features on the basis of a variety of criteria (teacher and programmer observations and intuition, linguistic analysis, student responses).

Another thorny problem in the establishment of learning steps centers on the relationship between explanation and drill in the acquisition of grammatical structures. Those programmers who agree with orthodox FSM proponents insist that grammatical structures be acquired inductively and that rules function only as "summaries of behavior." What little valid research has been carried out to throw light on this issue seems to indicate that, on the contrary, accurate and relevant formulations facilitate the acquisition of grammatical patterns. How grammatical formulations are best integrated with drills and which types of grammatical drills are most effective—or for that matter whether drills are at all effective—these are questions that weigh heavily on the determination of learning steps.

Control of Student Responses

In programmed learning unreinforced practice can be dangerous, for it may lead to the overlearning of undesired responses. It is quite easy to confirm responses when the student's task is limited to discrimination or the construction of written answers. But how can oral responses be confirmed? Three choices present themselves:

a) The instructor
b) An evaluating device
c) The student himself

The first alternative is excluded bv definition since the ultimate goal of programmed learning is self-instruction. Speech analyzing devices have been utilized but only for those aspects of the sound system whose physical parameters are such that they can be interpreted by electronic devices. For instance, Buiten and Lane have devised a system (SAID—Speech Auto-Instructional Device—) for the teaching of English prosody: pitch, stress, and rhythm. But an economically viable language-evalu-

ating device capable of controlling the production of all types of speech sounds is still in the realm of science fiction, and programmers have had to depend on student self-evaluation. Starting from the assumption that the ability to discriminate between two sounds leads directly to the ability to differentiate them, they train the student to distinguish between native and target language near equivalents, on the one hand, and to distinguish between target language sounds, on the other. The assumption has proven correct generally, and, surprisingly, the most noteworthy feature of self-instructional programs is the degree of accuracy in pronunciation attained by students. If students can be trained to evaluate their own pronunciation, they can also learn to judge whether a FL sentence they produce is grammatically correct and whether it contains the appropriate words. In the teaching of spelling and composition and in various aspects of the teaching of reading, student responses are easily reinforced since the correct written responses can always be provided.

Teacher and Student Reaction

Except for short programmed courses and situations where a program was tested by its developer (who could make immediate modifications when necessary) the use of programmed FL courses has not always been very successful. In general, programmed FL materials have proven clearly more effective than conventional materials with comparable objectives only when utilized by older and more highly motivated students. Because courses with a high proportion of self-instruction have liberated them from lockstep progress and permitted them to master the course content in a shorter period of time, these students have not reacted adversely to some of the less desirable aspects of programmed learning and self-instruction. But as regards less able (and presumably less motivated) students, Morton's assumption that all types of students could attain a reasonable audio-lingual control of a FL appears to be incorrect, at least given our present understanding of the language learning process and our inability to control motivation to any significant degree.

All extensive FL programmed courses are basically of the linear variety, for it has proven difficult in the extreme to prepare branching programs for extensive and protracted courses. In a linear program all students must progress through the same sequence of steps. In a branching program the sequence of steps that a student will follow is determined in part by his responses. Some computer-directed branching programs have been prepared for the learning of narrowly delimited FL tasks such as translation. A linear program must address itself to the average student and it runs the risk of boring the gifted student or discouraging the slow learner.

Field validation and experimental use of programmed FL courses have revealed the following shortcomings:

a) Students miss the teacher-student relationship, and teachers, on the other hand, experience difficulty in maintaining a feeling of true urgency when daily opportunity for students to communicate with the teacher and other students is lacking.

b) There is a built-in monotony in the use of programmed materials due to the sameness of the learning tasks and the surroundings in which learning takes place.

c) For most students, reinforcement by a machine is not sufficient to provide a high level of motivation and there is a necessity for "public" reinforcement.

d) Self-instruction does not provide the opportunity for the student to transfer habits and repertories learned by dialogue with a machine and in artificial drills to the natural communication situation. One might say that natural communication is not programmable by definition since in the normal use of language, one can seldom predict the responses of one's interlocutor.

e) The acquisition of a FL is a long and arduous task. Programmed learning exacerbates this problem because it makes the learner keenly aware of his degree of progress and the distance that separates him from stated goals. It is for this reason that programs that stress the audio-lingual skills are more likely to adversely affect student motivation than grammar-translation oriented programs.

Partial Self-Instruction

Given our present lack of knowledge about many aspects of language structure and the process of language acquisition, the preparation of extensive, self-contained autodidactic programmed courses may not represent the best investment of our efforts, time, and funds. These might better be directed in three other directions: (1) research-oriented programs; (2) special-purpose programs; (3) extensive multi-componential courses featuring special-purpose programmed modules and a redefinition of the teaching context.

One of the factors that have reduced the validity of much of what purports to be research in our field is the difficulty of isolating independent variables and, particularly, of eliminating the contaminating effect of the teacher variable. Short self-instructional programs that deal with simplified but nonetheless relevant language learning tasks would make it possible to study the effect of single variables on specific language learning problems.

Difficulties in the definition of initial student behavior would be obviated by the preparation of self-contained programmed modules teaching very narrowly delimited features of pronunciation, grammar, or vocabulary. These self-contained special-purpose programmed modules could be employed in conjunction with classroom activities of a more conventional nature. Such a scheme would be particularly effective in advanced and remedial classes where students are particularly heterogeneous with regard to both relative proficiency and native language habits.

Guided Learning

Before proceeding, I should like at this point to discard the term "programmed instruction" or "programmed teaching" in favor of a new term "guided learning". I do so for two reasons. First, I should like to totally dissociate this form of FL teaching from Skinnerian theory of learning and verbal behavior. Secondly, I should like to relate it to the type of instruction performed by the experienced, skillful, and inspired FL teacher since time immemorial.

I should like to define guided learning as follows: a type of learning where the subject matter has been reduced to steps which the learner will find manageable and in which most of the learning will be acquired by the learner himself by way of self-instructional activities. Note that unlike Skinnerian programmed instruction, guided learning does not claim any procedure for discovering minimal steps on some principled bases. Rather, the manageable steps of guided learning are established on the basis of a variety of criteria—linguistic analysis, observation of student errors, teacher intuition—and they differ substantially according to the terminal objectives desired and the type of learner involved. Furthermore, in guided learning, instruction cannot be imparted totally by a teaching machine. Only those aspects of language learning which can be acquired without the presence of a mediating agent are assigned to the student and the teaching machine. The use of the term "mediating agent" serves to remind us that in some instances successful mediation between the subject matter to be learned and the learner can be performed by teacher aides, more advanced students, language laboratory monitors, and native resource persons as well as professionally trained FL teachers.

Which aspects of language learning can safely be relegated to the student and to some sort of teaching machine? We have seen that the fundamental weakness of both Skinnerian programmed instruction and the FSM is their characterization of language as a finite system of habits and their failure to perceive that the use of language under normal communicative conditions is essentially creative. To say this is not to deny the fact that significant language proficiency does require a

large part of automatic responding and mechanical manipulation. The novel sentences that the learner must somehow be led to create are nonetheless made up of a limited stock of vocabulary items composed of a very limited number of phonetic features and are generated by a finite number of grammatical rules. True native control of phonetic features and flawless manipulation of grammatical endings are by themselves trivial accomplishments, but unless we are willing to settle for pidgin-like linguistic communication, adequate to the communication of a message but lacking in grammatical well-formedness and phonological accuracy, we must insist on the accurate and fluent "performance" of novel, meaningful sentences. While mimicry and memorization are not sufficient in the acquisition of FL proficiency, they are nonetheless necessary.

It must not be assumed that the memorization, mimicry, and practice of linguistic material which are to be imparted through self-instruction need necessarily take the form of pattern drills and other activities where the learner is deprived of meaning and of reference to a concrete situation. No doubt automatic control over vocabulary and grammar features would be most efficiently acquired by way of a process resembling very much classroom instruction, except that the one-to-many interaction between teacher and class would be replaced by a one-to-one interaction between the student and the device presenting the material. Whereas in the conventional classroom, it is the teacher who paces the presentation of material, in guided learning each student may pace his own learning within the limitations of the design of the material.

Of the extensive programmed courses which have been tried out in the last six years, it would appear that those that have most successfully passed the test of use in regular, i.e., non-experimental academic programs come closest to meeting the criteria of guided learning. I am referring notably to courses in French devised by Fernand Marty at Hollins College, Virginia; Theodore Mueller at the University of Akron and the University of Kentucky; and myself at Indiana University. In particular, these three programs rejected the goal of total self-instruction and featured the "Display Session", a practice session where the live teacher guided a small group of students (three to twelve) in the simulated natural use of the FL. However, a serious flaw that all three courses shared was adherence to some of the shaping techniques of Skinnerian programmed instruction, the over-emphasis of mechanical manipulation, and strict linear progression. These three features contribute considerably to the monotony and the tediousness that is the shared characteristic of all FL programmed courses. In a guided learning FL course sequence, self-instruction and manipulative activities will need to be gradually faded out as the learner becomes more proficient. The examination of programmed materials reveals a striking incongruity

between the quixotic attempt to fraction course content into minute learning steps at the beginning of the course and a sudden return to conventional practices toward the end. As a result the student who has become totally dependent on spoon feeding is unable to digest the richer diet and loses heart. Also, excessive formalism in the presentation of the material and deprivation from contact with normal language use frustrate the learner who wants to deal as soon as possible with concrete situations and real interlocutors who do not always provide the correct answer and whose responses are not always predictable. This poverty of the situational content of programmed courses is reflected by their general lack of visuals, a weakness shared, of course, by FSM materials.

It is my conviction that only by the adoption of guided learning will self-instruction and the use of teaching machines become generalized in FL teaching. Although it sets itself much more modest objectives than programmed instruction, guided learning would still revolutionize the administrative and pedagogical context within which FL instruction takes place. First, since it implies a considerable amount of self-instruction, it places a greater responsibility on the learner. Second, it inevitably leads to the use of team-teaching schemes and a redefinition of the functions of the professionally trained FL teacher. Finally, it has far-reaching implications on the planning of the teaching environment, including the design of audio-visual aids and equipment and the use of classroom space, and teaching schedules. Within the conventional fifty minute class the learner will be performing a great variety of learning activities all of which involve a variety of agents and which would take place in groups of varying size. With six other students he might begin with a twenty minute practice session in the language laboratory supervised by a teacher aide; he would then report to a fifteen minute Display Session led by a native speaker resource person; he would then end the period with a ten minute individual tutorial session taught by the professional teacher.

This paper has presented the thesis that, given our lack of knowledge about many aspects of language structure and of the process of language acquisition, techniques of Skinnerian programmed instruction have little to contribute to FL learning. As a corollary, it follows that FL learning is not reducible to total self-instruction. Thus the development of self-contained totally self-instructional FL courses does not represent the best investment of our effort, time, and money. Instead, the FL teaching profession would be better advised to implement radically innovating courses making use of a considerable amount of self-instruction but in which students are given the opportunity to interact with live teachers and fellow learners. The implementation of such courses would, of course, require the availability of materials that make a considerable amount of self-instruction possible and of more reliable and sophisticated equipment

than is now available, but it would be dangerous humility for the FL profession to fail to recognize that the preparation of such materials requires first and foremost actual experience with FL learning and teaching. While a knowledge of the structure of language and insights into the process of language acquisition will prove of some relevance, one must reject a paradigm of learning that has proven relevant only to the laboratory behavior of rats and pigeons. FL teachers must have no fear of self-instruction or teaching machines, for competent "live" teaching and self-instruction are complementary: the more skillful the teacher, the more he is pleased to entrust mechanical and routine drill and bookkeeping to the machine; the more effective the self-instructional component in the presentation of those aspects of language amenable to mechanical manipulation, the greater the opportunity for the teacher to lead students to "perform" in the FL and to motivate them to continue to learn.

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