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TWO PAPERS ARE INCLUDED IN THIS BULLETIN. THE MILTON SCHWARTZ PAPER, "THEORIES OF MOTIVATION AND THEIR APPLICATION TO ADULT EDUCATION," SURVEYS THE THINKING, RESEARCH, AND CONCLUSIONS OF SOME OF THE LEADING FIGURES CONCERNED WITH SOCIAL MOTIVATION. THE AUTHOR ATTEMPTS TO CLASSIFY THESE THEORIES BY GENERATING A TWO-DIMENSIONAL SCHEMA OF SOCIAL MOTIVATION. THE HORIZONTAL CONTINUUM INCLUDES POSTIVE-STRIVING THEORIES ON ONE END AND NEED-REDUCTION VIEWS ON THE OTHER. THE VERTICAL CONTINUUM PUTS ACHIEVEMENT MOTIVATION ON ONE END AND AFFILIATION-COMFORT NEEDS ON THE OTHER. AN ATTEMPT IS MADE TO DEMONSTRATE THE UTILITY OF THE SCHEMA THROUGH EXAMPLES FROM STATEMENTS OF ADULT EDUCATION STUDENTS. RICHARD LANYON, IN "PSYCHOLOGICAL LEARNING THEORY, APPLICATION TO ADULT EDUCATION," REVIEWS SOME OF THE MAJOR THINKING OF SCHOLARS IN THE FIELD OF ANIMAL LEARNING (CRUCIAL FACTORS OF AMOUNT OF PRACTICE AND REINFORCEMENT), EXAMINES FINDINGS IN THE FIELD OF HUMAN VERBAL LEARNING (ADDED CRUCIAL FACTORS OF MEANINGFULNESS AND ORGANIZATION OF MATERIALS), AND THEN SUMMARIZES APPLICATIONS OF THESE PRINCIPLES TO EDUCATION. THE AUTHOR DESCRIBES TEACHING MACHINES AS MAKING DIRECT USE OF THESE IMPORTANT PRINCIPLES OF LEARNING AND HE MAKES SUGGESTIONS FOR THEIR APPLICATION IN REGULAR CLASSROOM TEACHING. THIS DOCUMENT IS ALSO AVAILABLE FROM THE UNIVERSITY EXTENSION DIVISION, RUTGERS, THE STATE UNIVERSITY, 35 COLLEGE AVE., NEW BRUNSWICK, NEW JERSEY. (EB)

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Madison E. Weidner, Associate Dean

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Theories of Motivation and Their Application to Adult Education

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The purpose of this paper is to examine some of the major theories and findings concerning motivation from the fields of psychology and psychoanalysis, and to integrate them into a single conceptual frame-work as a schema for classifying the educational motives of adults. Three broad areas appear to make the largest contribution to contemporary thinking on motivation: animal psychology, psychoanalysis, and research on human social motives. The field of motivation is highly complex; theories are so varied and contradictory that no single conceptualization has received general support. Nevertheless, a sufficiently large number of well established facts and highly regarded views exists to warrant consolidating them into a general model.

History of Motivational Concepts

At the time that Charles Darwin's theory of structural continuity was receiving favorable attention, a social continuity theory was also advanced. If instinctive behavior is seen in animals, why not in man? The idea that the basis of man's social behavior is unlearned or instinctive was launched. This idea had a great impact on the thinking of several early giants in psychology, not the least of whom was Sigmund Freud. Freud felt that man was motivated by two basic instincts: sex and aggression (2). Both William James (5) and William McDougall (10) presented lists of social instincts which were very influential in psychology in the early part of the present century. The logical development of the "instinct" explanation of man's motivation was a continued expansion of the list of instincts until it reached ridiculous lengths. With the new approach to psychology as "behaviorism," the term "drive" was introduced as the main motivational concept. There was no longer a major place in psychology for any concept of an instinct, with its strong genetic implications and its ring of subjectivity.

Two Contemporary Approaches to Motivation

Some important sources of evidence for the proposed motivational schema come from traditional academic psychology and from psychoanalysis. These sources have given rise to two views of human motivation: *need reduction* and *positive striving*.

The need-reduction view is based on evidence from both animal psychology and from early orthodox psychoanalysis. Animal psychologists interested in the problem of motivation have concerned themselves with basic biological needs, such as hunger, thirst, and sleep. The

need-reduction view postulates that the organism's motivation to perform a large variety of activities stems from the necessity of fulfilling these basic needs. Academic psychologists who have investigated motivation in this manner have done so for several reasons. The basic biological needs are vital to life, and are concerned with processes common to all living organisms. In addition, the use of infra-human organisms (e.g. rats) in simple situations has enabled carefully controlled experiments.

What has been learned about motivation through this approach? The animal psychologists have found, as they anticipated, that these sources of motivation are indeed important for explaining the behavior of animals in simple situations. They have also been able to locate brain areas associated with several of the basic needs. These advances into physiology are exciting, but are beyond the scope of this paper.

Does the need-reduction point of view explain *human* motivation? Many, perhaps most, of the basic needs of life do not present a serious problem in our society. Food, clothing, shelter, and the like are adequately available, and thus are held by some theorists to be of limited significance in motivating our everyday behavior. However, theorists, such as Judson Brown (1) and to a considerable extent Neal Miller (11), feel that much of man's behavior is motivated by the avoidance of pain. They hold that much of man's behavior is directed toward minimizing anxiety, which is considered to have a close psychological connection with pain.

Orthodox psychoanalysis represents another point of view linking human motivation and need-reduction. Freud's hypotheses about the nature of man (2) were derived from clinical experience rather than the animal laboratory. In essence, his views hold that civilized man's behavior is determined by the interaction of two powerful forces: the raw impulsive energy, which he termed "libido," and the constraints imposed by society against any direct expression of these basic "instincts." Man is seen as continuously attempting to discharge his libidinal energy (i.e. to satisfy his basic needs) in socially approved ways.

Most of the later psychoanalysts rejected the Freudian notion that man was motivated by mere animal cravings. They favored the positive-striving point of view.

In the positive-striving view the important motivating force in man directs him toward improving his relations with society beyond the mere satisfaction of his biological needs. He is seen as motivated to develop his abilities and cultural interests for their own sakes and is innately motivated to mature and to grow in strength of character. Perhaps the most influential as well as popular motivational theory of this type is that of Abraham Maslow (6). Maslow's view also incorporates the essential features of the need-reduction views by suggesting that man must largely satisfy his basic biological needs before higher order social needs will "emerge." If and when these

needs (e.g. love and esteem) in turn are satisfied, man will attempt to fulfill the loftiest need toward which he can aspire, namely, self-actualization or the realization of his fullest potential for existence.

Another well known theorist, Carl Rogers, who is perhaps best known as the originator of nondirective or client-centered psychotherapy, takes a somewhat more definite view of human motivation as positive striving (14). He holds that if man is left to himself, his innate forces for growth will emerge. Essentially the same idea of self-fulfillment can be found in the psychoanalyst, for example, Erich Fromm's view of human motivation (3). It is interesting to note also that the universality of the positive-striving concept of human motivation extends into the Judeo-Christian philosophy of life and is a basic notion in many other religions.

These theories have originated from the clinical and the life experiences of able practitioners. Since the ideas are highly complex and do not permit direct experimental verification, any considered scientific evaluation of them is impossible at this time. However, their practical usefulness is not necessarily limited by this lack.

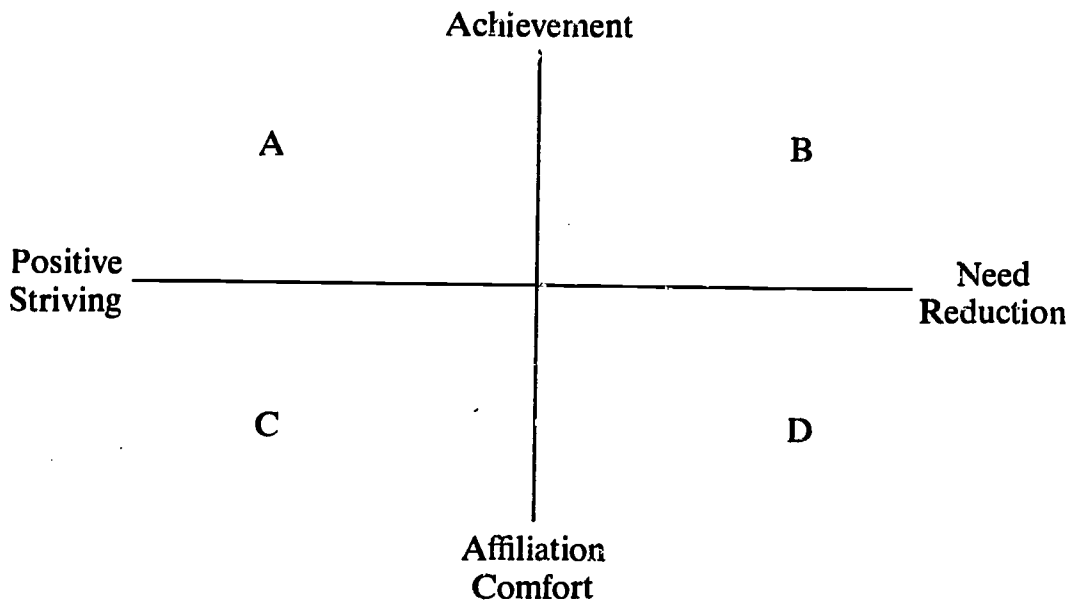
A continuum of motivational sources. The two views thus far presented, need-reduction and positive striving, are not mutually exclusive. A balanced view of human motivation should make room for both of them. In some instances, the need-reduction concept will more clearly apply, whereas in others, the concept of self-fulfillment will be more appropriate. It is therefore suggested that the two approaches be viewed as a continuum as represented on the horizontal axis in the figure on the following page.

The Third Approach: Some Other Important Needs

A motivational continuum has been derived from the findings of basic psychology. This continuum is closely tied to the traditional concepts of motivation, and has incorporated the views of many important scholars. Nevertheless, a single continuum seems too simple to serve as a satisfactory explanation of man's complex behavior in "real life" situations. We now turn to a large body of research that has developed more directly from concern with some of the commonly verbalized "social" motives such as power, achievement, and affiliation. It is not meant to imply that this research is any less valid; indeed, we will be attaching fundamental importance to it. Of the various social motives, those which have been most carefully researched are the affiliation or comfort motives and the achievement motive.

Need for affiliation or comfort. The importance of this motive is supported by evidence from human behavior and also from the behavior of primates. Harry Harlow (4) has clearly demonstrated that monkeys have what he calls an innate need for contact comfort. Harlow built two dummy mother-figures, one hard, out of wire and

The Conceptual Framework for Human Motivation



wood, and the other soft, of cloth and rubber. He then placed a milk bottle in the middle of each one, and used them as "mothers" to rear baby monkeys. The infant animals were clearly more happy when "cared for" by the soft mother. A striking illustration of the same need in humans has been reported by the psychoanalyst Margaret Ribble, who found that some human infants actually atrophied and even died when they were completely deprived of the comfort and affiliation of a mother figure (13).

The achievement motive. The importance of this complex and socially significant motive has been established through the monumental work of Harvard psychologist David McClelland (7). McClelland has devoted many years to the study of achievement motivation, and is now successfully applying his findings to the improvement of smali backward regions of the world by training members of his experimental communities in achievement needs.

A second motivational continuum The achievement motive and the affiliation or comfort motive may be regarded as establishing the ends of a second continuum of motivational forces. For purposes of the present discussion, the two continua will be assumed to be independent dimensions. A four-fold conceptual framework, as represented in the figure above, is thus generated. Up to this point in the discussion, the only justification for postulating such a framework is the demonstrated importance for human motivation of each of the concepts involved. It is hoped to demonstrate, in addition, that the suggested way of organizing these concepts enhances understanding of motivation in real-life situations, and especially with regard to adult education.

Application to Adult Education

The framework illustrated in the chart generates four classes of motivation indicated by the letters *A*, *B*, *C*, and *D*. It is suggested that this schema provides a new and useful way of understanding motivation in the context of adult education.

The motivation of those individuals found in Category *A* are characterized by a combination of achievement and positive-striving motives. This would include people whose primary orientation is toward the improvement of society and the welfare of others. This might take the form of dedication to learning and scientific endeavor for its own sake. Alternatively such motivation may lead to significant leadership roles but again oriented toward the improvement of society, as seen in the selfless and dedicated efforts of some religious leaders or certain individuals engaged in community or welfare work.

In order to investigate the usefulness of the schema in an actual educational situation, one of the authors gathered statements from adults in evening classes regarding their reasons for taking the course. It was found that these statements of their motivation could readily be classified according to the present schema. Some illustrative examples may be presented from these data. Thus, one student wrote: "I would like to be able to contribute more to my community." Another said: "I guess I just love learning." From these statements, the educational motivation of both students would be regarded as belonging in Category *A*.

Category B combines achievement and need-reduction motives. Motives which fall in this category may be regarded as differing from the former primarily in the source of the achievement drive. The emphasis here appears to be on coping with existing pressures whose content is not directly related to the task at hand. The person's basic commitment is to the reduction of these tensions by whatever means is available. This type of motivation is clearly reflected by the statement: "My employer said I would stand a better chance of promotion if I took these courses," and by the statement: "My friends are taking this course, and I want to keep up with them."

In Category C are to be found those people whose positive-striving needs are coupled with needs for affiliation and comfort. Statements such as "I like to be with the kind of people who come to these courses" typify the group. People with such motivation are more likely to be found in creative arts courses than in science courses.

The final Category *D*, a combination of need-reduction and affiliation-comfort motives, is unlikely to find representation in a formal educational situation. It is not surprising that none of the statements gathered by the authors fitted this classification. Such people are more likely to spend their leisure time in noneducational activities, such as bowling, watching television, or attending social functions. To the

extent that it is becoming increasingly desirable for adults to continue their formal learning, it will become necessary for adult educators to pay increasing attention to ways of competing with or utilizing the apparent strong appeal of television and similar media.

Summary

This paper presented a brief systematic survey of the thinking, research, and conclusions of some of the leading figures concerned with the problems of social motivation. Further, it attempted to classify these theories by generating a two-dimensional schema of social motivation. The horizontal continuum of the framework included the positive-striving theories on one end and the need-reduction views on the other. The vertical continuum placed achievement motivation on one end and affiliation-comfort needs on the other. An attempt was made to demonstrate the utility of the schema through examples from actual statements made by adult education students.

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Psychological Learning Theory: Application to Adult Education

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Over the past several decades a vast amount of research data has been accumulated in the fields of basic animal and human learning. Most of this information has been collected by experimental psychologists interested primarily in the study of behavior as a science, and it has formed the foundation for the traditional theories of learning.

Parallel to the developments in basic experimental psychology, another large body of information about learning processes has been collected by educational psychologists. While the former group of scientists have been concerned primarily with the *discovery* of the laws and principles of learning, the latter investigators have been oriented mainly toward the *application* of learning principles. Interestingly, however, there has been comparatively little direct generalization from basic research and traditional learning theory to application in education. With few exceptions the two bodies of knowledge have been regarded as separate and distinct.

It is the purpose of the present article to examine traditional learning theory and research with a view toward delineating those laws and principles which do have potential relevance for education, and to summarize some of the work that has been done in the application of these principles. The plan is, first, to review some of the major thinking and research of scholars in the field of animal learning; second, to examine the major findings in human verbal learning research; third, to summarize existing applications of these principles to education; and fourth, to discuss additional applications to the regular classroom situation.

Basic Animal Learning

Much of the research that has led to the significant learning theories of today has been done with rats rather than with humans. One major reason for using rats, or other animals, is that much greater control can be exerted over their lives than is possible with humans, enabling more careful control of the relevant factors of their behavior. The question arises as to whether meaningful conclusions about complex human learning can be drawn from research done with animals. There is considerable evidence to suggest that the answer to this question is at least partly in the affirmative. However, there are some eminent learning theorists who consider it premature to attempt the task undertaken in this article. For example, Spence said:

> "... the contemporary learning theories of the experimental psychologist have very little, if any, importance as far as educational practices and objectives are concerned. Certainly those of us engaged in this endeavor have been under no illusions as to the applicability at the present time of our theoretical formulations to the practical problems of education. ... The truth of the matter is that we psychologists have been asked to solve practical problems before we had the laws of behavior necessary to do so." (6.)

Such a point of view has probably been responsible in part for the lack of generalization of the findings in basic learning research to complex educational processes. In considering Spence's view to be unduly pessimistic, we present the following discussion as one effort to bridge the gap between basic research and its application.

There are two kinds of learning theories: perceptual or insight theories, and what we shall call "elemental" theory. This paper will examine in detail the *elemental* approach to learning theory. It is also called stimulus-response theory, or S-R theory. A simple element of behavior consists of a stimulus and a response, or an S-R unit. As an example, consider a rat in a simple learning experiment. The stimulus might be a flash of light, and the rat might make the response of running across the cage. This stimulus-response sequence—light flash and running—is regarded as a simple element of behavior. The S-R approach considers that, in principle, complex behaviors can be broken down, or analyzed, into a series of simple stimulus-response elements.

Over the past three or four decades, experimental psychologists have been studying variations of this simple stimulus-response theme. Various theories of behavior have been developed to account for the results that they have obtained. By far the most significant of the theories is that of the late Clark L. Hull of Yale University (1). The essence of Hull's general theory may be expressed, in somewhat oversimplified form, by the following equation:

> Behavior (or performance) = learning (or strength of habit) $\times$ motivation (or strength of drive).

That is, in Hull's symbols: $E = H \times D$.

Let us return to the example of the rat. In order to do something, the rat must know how, and he must be motivated. How well he does it depends on how well he has learned it, and how motivated he is. Our particular interest is in that part of the theory concerned with learning, or the acquisition of knowledge. How does knowledge build up (or, in Hull's terminology, how do habits increase in strength)? What are the factors that influence the rat and the ways in which organisms acquire knowledge?

The most important single factor in simple learning is usually considered to be the *amount of practice*. The more often the rat does something, the better he becomes at it. His knowledge builds up. In Hull's terminology, the rat would build up habit-strength.

Thus, to teach the rat something, we must somehow get him to do it. The more often he does it, the better he will learn it. How can we make him practice? One way is to *reinforce* him, or *reward* him. That is, we make something pleasant happen to him every time he performs the act. Soon he learns that performing that act leads to something pleasant, and he will keep practicing as long as we keep rewarding him. Of course, the reward has to be consistent with his motivation. If he is hungry, we would reward him with food. Alternatively, we could give him a continuous shock, and then reward him by turning it off. This would make use of a universal motivation—the motivation to avoid pain.

In order to make him learn, we must get him to practice. To get him to practice, we must reward him.

How much reward is necessary? Research has shown that it doesn't really matter how much reward we give him every time, so long as the amount is sufficient to elicit the behavior again. In fact, the reward should be *minimal* in size. If we were to give him a large piece of food every time he runs, he would soon be satisfied and stop running after only a few practice trials. But if the reward is small, he will need to run many more times to satisfy his hunger.

When should the reward be given? The reward will be most effective if it is given immediately after the rat performs the act that we want him to practice and learn. If it is delayed more than a few seconds, the reward loses most of its effectiveness. What is the reason for this? If we delay the reward, there is no longer a close connection between it and the act. By the time we reward the rat, he might be doing something else, and he would connect the reward with *that*. For the reward to have the desired effect, he must get it immediately.

Human Learning

As far as we can tell, the basic principles of animal learning which we have just considered apply equally well to human learning. Underwood (7) has summarized the important factors influencing human learning of *verbal* materials. Let us examine some of them. Again, *practice* is found to be crucial. This becomes readily apparent in learning a foreign language. For example, in building up knowledge of vocabulary there is no substitute for sheer practice. In reading, the more frequently a particular word is encountered, the better it will be learned.

There is another way in which practice is important in the learning of verbal materials. This is in rehearsing the material, either by making

an active effort to remember out loud what has been learned, or by going over it silently. Such "practicing" is called *active recitation.*

A second important factor in human verbal learning is *knowledge of results.* Learning is more efficient if the learner finds out immediately after practicing each unit whether he did it correctly. How is this similar to learning in animals? It is *reinforcing* to know that the act was performed correctly. As was the case with animal studies, it is found to be important that the reinforcer, in this case knowledge of results, should come *immediately* after the act. However, in humans there is an interesting exception to the rule of immediate reinforcement. Society exerts tremendous pressures on us to postpone immediate satisfactions in favor of ultimate goals. These efforts of society go contrary to the most powerful principles of learning. The relevance of this point for adult education, parenthetically, should be clear. From the basic principles of learning, adults should prefer the immediate satisfactions of the TV set at home to attending evening classes, where the reinforcements are not so immediate.

There is another important factor influencing human verbal learning, and one which is diffucult to study in animals. We are referring to *meaningfulness.* The more meaningful the material, the easier it is to learn. When a large number of unrelated facts are to be memorized, the task is simplified if the facts can somehow be made meaningful. One way in which they can be given meaning is by *organizing* them. The common study device of a mnemonic aid makes use of the principle of meaningfulness or organization.

While there are other variables important in verbal learning, the main ones have been mentioned—practice, active recitation, knowledge of results, meaningfulness, and organization. Although some of the terminology is different, it can be seen that animal learning and human learning do have basic similarities.

Application in Teaching Machines

We are now ready to consider the application of these basic psychological principles to education. How might we use them? A famous Harvard psychologist, B. F. Skinner (4, 5), asked himself the same question when he realized how ineffective the traditional methods for teaching children in the classroom were. Skinner made a list of the main principles of learning, as we have done. His peculiar genius enabled him to invent a special kind of teacher that used these principles as efficiently as possible. He invented the *teaching machine.* Teaching machines range from highly complex and almost completely automatic instruments, to simple hand operated devices. Let us consider a simple teaching machine. The material to be learned is organized in a special way, or *programmed,* and put inside the machine. Take

the example of a child learning simple arithmetic. He turns the handle until something appears in the slot at the front of the machine. It says $2 + 2 =$. He then works out the problem in his head and says the answer aloud or writes it on the program. As soon as he has "rehearsed" his answer, he turns the handle again, and the next thing to appear in the slot is $2 + 2 = 4$. If he had said 4, then he is reinforced. If he had said 5, he is informed that the correct answer was 4. Then he turns the handle again, and the next problem might be $3 + 3 =$.

How do teaching machines make use of the basic principles of learning?

First, the principle of *meaningfulness* and *organization* is utilized. The program is prepared by an expert in the field of knowledge to be learned. The material is organized in such a way that it will be as meaningful as possible, and so that each step follows logically from the previous one. It is organized into many hundreds of little steps.

Second, the principle of *practice* is employed. Each line in the program represents one practice trial. Each unit of knowledge is repeated in several different ways, so that the student gets several practice trials for the same unit. The principle of *active recitation* is used when the student recites the material aloud. Most teaching machines are built in such a way that the student must record the right answer in the machine before it can advance. This is a variation in the principle of active recitation.

Third, there are several principles connected with *reinforcement*. How is the student reinforced? We know that he must get sufficient reinforcement or he will not continue with the learning task. One kind of reinforcement he gets is through knowledge of results, since the correct answer is presented to him immediately. Although the amount of reinforcement he gets out of any one trial is probably very small, we know that he needs only a minimal amount of reinforcement per trial. For children, another source of reinforcement is the pleasure derived from manipulating the machine, which is like a toy to them.

It is thus apparent that Skinner's teaching machine makes direct use of the important principles of learning. The material is highly organized and meaningful. It is broken down into simple elements and is presented in many practice trials. A small, but sufficient, amount of reinforcement follows immediately after each correct response made by the student, and his errors are automatically corrected for him. He actively engages in the process by reciting his response aloud, or by recording it in some other way.

An interesting extension of Skinner's teaching machine has been developed by O. K. Moore (3). More has been successful in using a similar machine, adapted from an electric typewriter, to teach children to read. As an integral part of the process, the child also learns to type.

Application in the Classroom

There are also many way in which the basic principles of learning can be applied in regular classroom teaching. Some of them are already commonplace, but many new and imaginative variations are possible. Let us consider the principles one by one, to see how they might be utilized in the classroom.

Practice. By now the importance of practice should be self-evident. One common application of the principle of practice is in the study cards which are often used in learning a foreign language. On one side of a card is the English word, and on the other side is the foreign language word. The student looks at the word on one side, and says what he believes to be the equivalent word on the other side. Then he turns the card over immediately to get his knowledge of results and his reinforcement. If he was right, he puts the card aside and goes on. If he was wrong, he says the correct response aloud several times. Then he puts the card on the bottom of the pile so that he will get a further practice trial with it later on. Study cards might be regarded as a rudimentary form of the teaching machine.

It is interesting that much practice is often put into learning wrong responses. This is an important principle in neurotic behavior. People who are anxious often do inappropriate things. That is, they practice wrong responses. The more thoroughly they learn the wrong response, the less likely they are ever to learn the right ones.

Meaningfulness and organization. Material should be presented by the instructor in as meaningful and organized a manner as possible. This principle suggests the importance of thorough preparation on the part of the instructor. A well-organized summary, or a carefully prepared diagram, is a valuable advantage in learning.

Principles connected with reinforcement. The instructor can systematically reward correct statements by the students. Rather than give large amounts of reinforcement at infrequent intervals, he should give small amounts at frequent intervals. It need be no more than a head-nod, or a smile, or "Mm-hmm," or "good." Minimal reinforcement of this kind, if given systematically and frequently, has a very powerful effect on learning. The psychotherapist often makes use of the same principle. He appears to be doing very little beside saying "good," or "Mm-hmm," or giving a smile every now and then. However, he is dispensing these social cues as systematic reinforcement for the particular things he wants the client to do, say, or learn. We are also reminded of the class of high school students who taught their teacher to stand in one particular place in the room by systematically paying attention to him only when he was standing in that spot.

There is a further important point about reinforcement. It is a fact that punishment—that is, negative reinforcement—can be used

to bring about learning in the same way as reward. This is the basis of the common use of punishment as a disciplinary tool. However, it should be noted that punishment is not as effective as reward in bringing about learning. Further, the indiscriminate use of punishment should be discouraged, since it frequently has undesirable side-effects. It is well known that discipline will often generate such feelings as anxiety, hostility, and apathy.

Knowledge of results. This seems to be particularly important in correction with such students as the adults who attend evening courses. It has been established by Irving Lorge (2) and by others that there are several factors peculiar to adult education in contrast to college-age education. Adults are more variable in their abilities, they are uncomfortable in submitting to formal examinations, and they are more eager to participate actively in the classroom. In addition, they have a greater need for feedback as to their learning progress. The particular importance of the principle of knowledge of results is reflected in each of these differences.

There are many possible ways in which the instructor could make use of the principle of knowledge of results. For example, he might prepare short informal quizzes for the students. The questions require the students to record their answers in some simple way. Then the instructor calls out the answers, letting each student correct his own effort. He does not collect the papers, nor does he ask the students how well they did. His sole purpose would be to give the students an opportunity to get the benefit of immediate knowledge of results, without the usual anxiety connected with taking a test.

Summary

Three aims guided the preparation of this paper. First, it was attempted to introduce contemporary learning theory and some basic principles of learning. Second, ways in which these principles have been applied in education were discussed. Third, it was hoped to stimulate thinking about some of the important problems still to be faced in achieving an integration between the theory of learning and real-life use in education.

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