5-1968

Video tape demonstrations in the teaching of learning in general psychology: An experimental study

Kenneth D. Keith
Kansas State College

VIDEO TAPE DEMONSTRATIONS IN THE TEACHING OF LEARNING IN GENERAL PSYCHOLOGY: AN EXPERIMENTAL STUDY

A Thesis Submitted to the Graduate Division in Partial Fulfillment of the Requirements for the Degree of Master of Science

By 414

Kenneth D. Keith

KANSAS STATE COLLEGE OF PITTSBURG

Pittsburg, Kansas

May, 1968

ACKNOWLEDGMENTS

The author gratefully acknowledges the assistance of the following persons: Dr. Herbert P. Rumford, thesis advisor, for his direction and encouragement; Dr. Robert Steige and Dr. J. Carl Bass, thesis committee members; Mrs. Wilma Chambers, general psychology instructor, for allowing her students to serve as subjects and for constructing the achievement test used in the study; and Mr. R. D. Cummings and his staff in the Kansas State College television studio, for their technical assistance.

TABLE OF CONTENTS

ABSTRACT

The present study was concerned with the effects of supplementary televised demonstrations on achievement in general psychology. Previous research has established television as an effective instructional medium for many fields of study. The conclusions of research utilizing televised programs as instructional supplements have been equivocal however, with some studies lending support to the use of supplementary programs, and some showing their effects to be negligible. The present study was designed in view of the lack of research investigating the relationship of televised supplements to general psychology.

The subjects for this study were forty general psychology students at Kansas State College of Pittsburg. These subjects comprised twenty matched pairs, equated on the basis of pretest scores, sex, age, grade average in psychology, previous psychology courses, and mental ability. One member of each matched pair was assigned randomly to an experimental group, and one member was assigned to a control group. Both groups received identical classroom instruction in a unit on the principles of learning. In addition to the classroom instruction, the experimental group viewed six video tape demonstrations which were designed to supplement the unit on principles of learning. The experimental sessions were held three times each week for a two-week period.

Following the two-week period, both groups were administered a post-test, and gain-scores were obtained by subtracting the score made by each subject on the pretest from the score made on the post-test. The mean gain-scores of the experimental and control groups were compared, and the analysis supported the hypothesis that gain-scores, on a test covering principles of learning, of students who viewed supplementary television demonstrations would be significantly higher than those of students who did not view the demonstrations.

It was concluded that supplementary television demonstrations significantly improved the test-score performance of students who saw them. Recommendations for further research were presented, the major recommendation being that the present study be replicated with an additional step--the reversal of experimental and control groups.

LIST OF TABLES

CHAPTER I

THE PROBLEM AND DEFINITIONS OF TERMS USED

One of the problems of teaching is that of determining how to utilize available resources to the best interest of the student. Television, as a medium of instruction, and the various types of programs and demonstrations which it has made possible, are among these resources. Most of the research which has been undertaken in educational television has involved comparisons of conventional instructional techniques to televised instruction, leaving unexplored many of the instructional combinations involving both conventional methods and television, which might make learning more efficient. The present study is concerned with the effects of supplementary television demonstrations upon achievement in general psychology.

I. THE PROBLEM

Statement of the problem. Facilities for the production and recording of television demonstrations are readily available at Kansas State College. Therefore, it might well be asked whether viewing such demonstrations is of value to students in terms of increasing knowledge of subject matter. The purpose of this study was to determine the effects of supplementary television demonstrations upon achievement

on a test of principles of learning taught in general psychology.

Need for the study. Several hundred studies on educational television have established its effectiveness at all levels of instruction. However, most of these studies have been direct comparisons of the effectiveness of televised instruction and regular instruction.[1] The research needs have thus shifted from the ability of television to aid traditional education, to the problem of determining what kinds of new roles it might best play.[2]

Specifically, there is a need for research on the effectiveness of television as an instructional aid in combination with classroom instruction.[3] The present study was designed in view of this question: Do supplementary television demonstrations, viewed in addition to classroom instruction, significantly improve test scores of general psychology students? The answer to this question could be of practical use to the Department of Psychology and

---

[1] J. L. Hayman, Jr. and J. T. Johnson, Jr., "Research on the Context of Instructional Television," School Life, 1963, 45, 8-11.

[2] Ford Foundation and Fund for the Advancement of Education, Teaching by Television (New York: Ford Foundation, 1961), p. 67.

[3] Hayman and Johnson, loc. cit.

Counselor Education in determining how to utilize existing video tape demonstrations and in deciding a course of action for the production of future demonstrations.

Hypothesis. The following hypothesis was stated prior to the study: Gain-scores of students who view supplementary television demonstrations will be significantly higher than those of students who do not view the demonstrations.

Delimitations. The study was done at Kansas State College of Pittsburg during the spring semester, 1968. The experimental sessions were run between April 8 and April 19, 1968. Subjects were twenty matched pairs of students selected from a general psychology class. The subject matter which was studied and demonstrated was limited to chapter three, "Principles of Learning," and chapter four, "Human Learning, Remembering, and Forgetting," in Introduction to Psychology, by Morgan and King.[4] A one-tailed test and a five percent level of significance were used in the statistical analysis.

Limitations. The effects of only six television demonstrations were studied, and they were viewed only by the experimental group. No attempt was made to introduce

---

[4]C. T. Morgan and R. A. King, Introduction to Psychology (New York: McGraw-Hill, 1966), pp. 73-158.

another step by reversing the control and experimental groups.

The adequacy of the television demonstrations was a limitation of the study. They were developed and produced by the researcher with the assistance of the psychology faculty, graduate assistants, and personnel of the television studio at Kansas State College of Pittsburg.

Some degree of interaction between control and experimental groups may have occurred outside the classroom. Variables of this nature were beyond the control of the study.

II. DEFINITIONS OF TERMS USED

Closed-circuit television. A television system which has a closed or restricted audience. The broadcast is available only to receiving sets which are connected to the transmitter by wire, cable, or point-to-point relay.[5] The present study utilized a closed-circuit system with components connected by cable.

Control group. In an experimental design comparing two or more groups, that group not given the treatment whose effect is under study.

---

[5] L. E. Campion and Yvonne Lanagan (ed.), And TV Too! (Washington: National Education Association, 1961), p. 12.

Educational television. Programming presented for purposes of teaching or for any other serious purpose.[6]

Experimental group. That group of subjects which is given the treatment whose effect is under study. In the present study, those students viewing supplementary television demonstrations made up the experimental group.

Gain-score. The score made by any subject on a post-test immediately following the experimental treatment, minus the score made on the pretest.

Instructional aid. A device which is not self-supporting, but which aids the teaching-learning process by supplementing instruction.[7] Televised demonstrations were considered to be instructional aids in the present study.

Instructional medium. A self-supporting device which is capable of presenting an entire body of information.[8]

---

[6] G. N. Gordon, Educational Television (New York: The Center for Applied Research in Education, Inc., 1965), p. 2.

[7] National Education Association, "Monograph No. 1 of the Technological Development Project of the NEA of the U.S.," AV Communication Review, 1963, 11, 54.

[8] Ibid.

When employed in a total-teaching manner, television may be called an instructional medium.

Instructional television. Broadcasts specifically intended to aid instruction and attainment of educational objectives.[9]

Kinescope recordings. Motion-picture recordings of television broadcasts, accompanied by recorded sound. Kinescoped telecasts are of poorer quality than live broadcasts, and they cannot be replayed instantaneously, since time is required for development of the film.[10]

Matched pairs. A research design characterized by the matching of subjects according to certain pre-determined criteria. The criteria may include pretest scores on the variable to be studied, independent variables, or both.[11] In this study, pairs were matched on the basis of pretest scores, sex, age, present grade in general psychology, previous experience in general psychology, and mental ability.

---

[9] Campion and Lanagan, op. cit., p. 14.

[10] L. A. Wortman, Closed-Circuit Television Handbook (Indianapolis: Howard W. Sams and Company, Inc., 1964), pp. 92-93.

[11] B. J. Underwood, Experimental Psychology (New York: Appleton-Century-Crofts, 1966), pp. 125-128.

Open-circuit television. Broadcasting by which signals are put on the air and can be picked up by all receivers in the area which are capable of being tuned to the same channel as the transmitting station.[12]

Telecourse. A course of study taught in its entirety via television. That is, television is employed as an instructional medium, as opposed to an instructional aid.

Video tape demonstration. An instructional aid consisting of the illustration of a single principle, recorded on video tape.

Video tape recordings. Recordings of picture and sound of television broadcasts on magnetic tape. Video tape recordings are marked by excellent picture quality and capacity for instant replay.[13]

---

[12] Campion and Lanagan, op. cit., p. 12.

[13] Wortman, op. cit., p. 94.

CHAPTER II

REVIEW OF SELECTED RESEARCH AND LITERATURE

Background of Educational Television

The potential importance of radio broadcasting to education was recognized in the United States around 1920. In the following decade, nearly 200 radio stations were established by various educational institutions. These stations failed to live up to prior expectations however, and after the Great Depression only thirty-five remained.[14] In the meantime, the possibilities of televised education began to be realized.[15]

From 1932 to 1939, experimental television station W9XK of the State University of Iowa transmitted pictures which were accompanied by sound transmitted from the university's radio station, WSUI. W9XK televised over 400 programs during this time, including lectures in art, astronomy, botany, engineering, and shorthand.[16] Another of the early experiments took place in 1938, when NBC transmitted a New

---

[14] Gordon, op. cit., p. 6.

[15] Ibid., p. 7.

[16] W. K. Cumming, This Is Educational Television (Ann Arbor, Michigan: Edwards Brothers, Inc., 1954), p. 1.

York University program from the third floor of the RCA building to the sixty-second floor.[17]

Although the Federal Communications Commission (FCC) was established in 1934,[18] it had authorized only six non-experimental television stations by 1946.[19] The first station owned by an educational institution was licensed in 1948. It was station WOI-TV of Iowa State College (now Iowa State University) in Ames,[20] and operated both as a commercial and an educational station.[21] Four other institutions of higher learning were engaged in serious work with educational television in 1948: Kansas State College (now Kansas State University) was operating an experimental station; the State University of Iowa had applied for FCC permission to build a station; and the University of Michigan and American University were producing their own programs for broadcast by

---

[17] Ibid.

[18] Gordon, op. cit., p. 4.

[19] R. B. Hull, "A Note on the History Behind ETV," Educational Television the Next Ten Years (Stanford, California: Institute for Communication Research, Stanford University, 1962), p. 334.

[20] Cumming, loc. cit.

[21] Gordon, op. cit., p. 9.

commercial stations.[22] The University of Pennsylvania, Creighton University, and Columbia University were also active in programming for commercial broadcast in the late 1940's and early 1950's.[23] In April of 1952, the FCC issued an allocation plan which reserved 242 channels for use by educational television stations.[24] By 1955, ten stations were broadcasting on these channels, and in 1964 ninety were in use.[25]

The development of open-circuit broadcasting was accompanied by a corresponding increase in the use of closed-circuit television, characterized by the Pennsylvania State University project. Pennsylvania State applied in 1954 for a grant from the Fund for the Advancement of Education, and began using televised instruction in 1955. By 1957 television was involved in courses enrolling 4,200 Pennsylvania State students,[26] and between 1957 and 1960,

---

[22] Hull, loc. cit.

[23] Cumming, op. cit., pp. 14-15, 18.

[24] H. R. Cassirer, Television Teaching Today (Paris: United Nations Educational, Scientific and Cultural Organization, 1960), p. 20.

[25] Gordon, op. cit., p. 9.

[26] L. E. Dennis, "The Penn State TV Project," College Teaching by Television, J. C. Adams, C. R. Carpenter, and Dorothy R. Smith, editors (Washington: American Council on Education, 1958), p. 3.

National Defense Education Act grants were made to eighty-one institutions for the study of educational media, especially television.[27] Closed-circuit instruction was first employed in county school systems in 1956, at Hagerstown, Maryland.[28]

Gordon estimated in 1965 that there were at least 1,000 closed-circuit installations in use in the United States, of which 400-500 were being used by schools and colleges.[29]

Televised Instruction in Psychology

In 1951, McKeachie organized a fifteen-week telecourse entitled "Man in His World -- Human Behavior."[30] The course was offered through the University of Michigan, and covered various aspects of basic psychology.[31] The following topics were presented:

---

[27] Mary H. Smith (ed.), Using Television in the Classroom (New York: McGraw-Hill, 1961), p. 9.

[28] Board of Education of Washington County, Maryland, Washington County Closed Circuit Television Report (Hagerstown, Maryland: Board of Education of Washington County, 1964), p. ii.

[29] Gordon, op. cit., p. 14.

[30] W. J. McKeachie, "Teaching Psychology on Television," American Psychologist, 1952, 7, 503.

[31] Jennie W. Callahan, Television in School, College, and Community (New York: McGraw-Hill, 1953), p. 162.

1. Determinants of Behavior
2. The Scientific Approach to Behavior
3. The Cultural Background of Personality
4. The Biological Background
5. Abilities
6. Perception
7. Thinking
8. Motives
9. Learning (Habits)
10. Conflict, Frustration, and Defense Mechanisms
11. Mental Illness and Mental Health
12. The Structure of Personality
13. The Development of Personality
14. Interpersonal Relations
15. The Individual in Society

Each lesson consisted of a twenty-minute lecture or demonstration, and guest instructors were sometimes used. McKeachie concluded that one of the greatest advantages of his telecourse was the facility with which demonstrations which were unusable for large lectures could be seen easily via television.[32]

---

[32] McKeachie, op. cit., p. 504.

Western Reserve University offered another of the early televised courses in introductory psychology. It was initiated in September, 1951, and was broadcast three days per week over station WEWS of Cleveland.[33] Television students studied at home, travelling to the campus only for the final examination, and scored as well on the test as on-campus students.[34]

The first college-credit course to be presented via television at Iowa State College was a class in general psychology. It was presented during the winter quarter of 1953. Educational aspects of the course were kept intact by giving all students similar lectures, but the project was arranged so as to lend itself to a quantitative analysis of student achievement. This was done by presenting materials under four conditions:

1. TV at home -- watched and listened at home, read same text and came to Ames to take same examinations as campus students;

2. Studio class -- in studio while TV presentation was given, ten at a time, by rotation, in front of speaker, the remainder viewing on a monitor set in an adjacent studio room;

3. Kinescope class -- campus students who watched films of the TV talks, with 20 minutes of informal discussion afterwards;

---

[33] E. L. Stromberg, "College Credit for Television Home Study," American Psychologist, 1952, 7, 507.

[34] Ibid., p. 508.

4. Two campus classes -- given same materials, but in classrooms, for 50 minutes, in the usual classroom manner.[35]

Analysis of grade averages showed that the television class was better than all groups but the kinescope class, which had the highest grade average. The studio class had the lowest grades, attributed by Husband to the distraction of the studio surroundings.[36] Statistical significance of the difference between groups was not reported.

In 1954, Cumming reported that television programs teaching psychology were being produced by the following institutions: University of Michigan, Western Reserve University, University of Omaha, Iowa State College, and University of Southern California. Enrollment in those classes reported totaled nearly 1,800.[37] Although most of the classes were general or introductory psychology, two telecourses in child psychology were reported.[38]

Pennsylvania State University began using closed-circuit television to present general psychology courses in

---

[35] R. W. Husband, "Television Versus Classroom for Learning General Psychology," American Psychologist, 1954, 9, 181.

[36] Ibid., pp. 182-183.

[37] Cumming, op. cit., pp. 248-258.

[38] Ibid., pp. 250, 257.

1955.[39] Two instructors alternately taught conventional and televised psychology courses at Pennsylvania State in 1955, and students were assigned to the different classes at random. On final examinations, there was no significant difference in achievement between students taught via television and those taught by conventional methods.[40]

An additional study was done at Pennsylvania State in 1956-57, comparing televised instruction in general psychology to large-group lectures. Two instructors were alternated as in the 1955 study at the same university, and students were assigned to classes randomly without knowing that they were in an experiment. No textbook was used, making learning largely dependent upon class time, and four tests were administered. Two of the tests showed no significant difference between television and lecture groups, and of the other two tests, one favored each group. Analysis of the total scores for the semester revealed no significant difference in achievement between groups.[41]

By 1961, telecourses in psychology had become commonplace. Examples of organizations which were producing them,

---

[39] Dennis, loc. cit.

[40] Ford Foundation and Fund for the Advancement of Education, op. cit., pp. 23-24.

[41] Ibid., pp. 24-25.

in addition to those previously mentioned, include Miami University (Ohio), Missouri University, the Oregon State Board of Higher Education, Texas University, and Wayne State University.[42] The conclusion which became almost universal in comparisons of face-to-face instruction and televised instruction was "no statistically significant difference."[43]

A series of Ford Foundation grants between 1958 and 1961 gave impetus to the programs of several colleges and universities by providing funds to support television instructors who were released from part of their normal teaching duties.[44] As of 1962, general psychology telecourses taught on the released time program were enrolling over 3,000 students.[45] In psychology, as in many other subjects, the effectiveness of television as an instructional medium was well-established.[46]

---

[42] Ibid., p. 21.

[43] J. W. Meaney, Televised College Courses (New York: The Fund for the Advancement of Education, 1962), p. 14.

[44] Ibid., p. 7.

[45] Ibid., pp. 50-51.

[46] Ford Foundation and Fund for the Advancement of Education, op. cit., p. 25.

Television as an Instructional Aid

Before mid-century, educators were beginning to ponder the many potential uses of television. There was concern particularly with the need to discover effective ways to employ television as an instructional aid, and not merely as an automated replacement for teachers.[47]

The Iowa State experiment of 1953, although it was intended to test the effectiveness of television as an instructional medium and not as an aid, included one psychology class which was exposed to kinescope recordings of televised instruction plus classroom discussion. It thus was one of the first tests of an instructional method using a combination of classroom and television techniques. Although the level of statistical significance was not reported, the kinescope-discussion group in the Iowa State study achieved a higher grade average than did groups of students who were exposed only to television lessons or who received regular classroom lessons.[48]

Some of the initially important research in sight and sound supplements to classroom instruction used motion pictures. Anderson et al. conducted a study with high school

---

[47] P. Witty, "Television as an Aid to Instruction," School and Society, 1951, 74, 276.

[48] Husband, op. cit., pp. 181-182.

biology students in an attempt to determine the value of sound motion pictures to student achievement. A three-group design was employed. One group served as a control, with no films, or only those that the teacher saw fit to use. The other groups were experimental, with one receiving films at intervals throughout the class, and the other receiving films plus a discussion of the main principles of the films. It was concluded that both film groups achieved significantly better than the non-film group, and that films carefully selected to supplement the objectives of instructors are a valuable aid.[49]

Another experiment with supplementary films failed to show any significant differences in achievement among four groups of eighth grade science students when they were taught by the following instructional combinations: lecture-description, lecture-film, lecture-demonstration, and lecture-film-demonstration. It was concluded that all groups profited equally from instruction.[50] Similar findings were

---

[49] K. E. Anderson, et al., "Toward a More Effective Use of Sound Motion Pictures in High School Biology," Science Education, 1956, 40, 46-54.

[50] S. A. Huffman, Jr., "A Comparative Analysis of Four Instructional Methods in Eighth Grade Science," Dissertation Abstracts, 1959, 19, 2294-2295.

reported by McElroy when motion pictures were used to reinforce the teaching of beginning public speaking. The films were not shown to be a significant factor in improving the speaking techniques of students.[51]

Supplementary television instruction was employed by Enders in two experiments with sixth grade science classes. One of the experiments was an inter-school study in which students at one school received weekly fifteen-minute programs which were designed to supplement their regular science class. Some students saw twenty supplementary programs, while others were shown only twelve. Students at another school were taught the same material without the televised supplements. Students in the television-supplemented groups achieved significantly more than those in the conventional classes. Contrary to prior expectations however, the students viewing only twelve supplementary programs achieved more than those who saw twenty programs. This finding led Enders to conclude that the inter-school experiment did not fully demonstrate the effectiveness of supplementary television.[52]

---

[51] C. W. McElroy, "An Experimental Study to Determine the Effect of Motion Pictures in Reinforcing Instruction for the Improvement of Speaking Techniques of Students in Beginning Public Speaking Classes," Dissertation Abstracts, 1959, 19, 2296-2297.

[52] D. E. Enders, "Academic Achievement in Grade Six Science Resulting from Supplementary Instruction by Open Circuit Television," Dissertation Abstracts, 1960, 21, 131.

In the intra-school experiment reported in the same study, Enders exposed four sections of sixth grade science to television supplements for one-half of their units of study. The results of this experiment were not consistent in supporting or rejecting the supplementary programs. Two of the four classes scored higher when supplementary television was in use, while the other two classes scored higher without television.[53]

A University of Alabama study attempted to determine the effectiveness of television as a supplement to the teaching of chemistry in Alabama high schools. Comparisons were made in both Negro and white schools, with qualified and unqualified teachers, and with good and poor laboratories. It was found that white students without supplementary television made statistically significant gains over those who used television. It was reported that this result was predictable due to the excellence of the science courses in the control schools -- a condition brought about by the failure of some schools to participate or to send in data. Negro students with supplementary television achieved significantly higher scores than those without television, and when all students had good laboratory facilities and well-qualified teachers, students with low mental ability achieved more with supplementary television lessons, while those with

---

[53] Ibid.

high mental ability scored higher without television. No conclusions regarding the general effectiveness of supplementary television lessons were drawn.[54]

Geddes, at New York University, employed three thirty-minute telecasts per week in combination with classroom instruction in high school mathematics. Tenth grade classes in five high schools were used, with a regular class at each school serving as a control, and a television-supplemented class serving as an experimental group at each school. The purpose of the study was to determine the effectiveness of the combined television-classroom instruction. On the basis of pretests, post-tests, and questionnaires, it was concluded that the combined teaching method including television lessons was equally effective as conventional classroom instruction.[55]

---

[54] G. M. Toffel, "Effectiveness of Instruction by Television in Teaching High School Chemistry in Alabama Schools," AV Communication Review, 1962, 10, A81-82.

[55] Dorothy C. Geddes, "The Use of Television in Teaching Tenth Year Mathematics: The Effectiveness of Teaching Tenth Year Mathematics by a Combined Method of Instruction by Television and a Classroom Teacher as Compared with the Traditional Method of Instruction by a Single Classroom Teacher," Dissertation Abstracts, 1962, 22, 4293.

Supplementary television as a device for laboratory magnification in the study of anatomy has been found to produce student performance which is not significantly different from that produced by normal laboratory methods. It does however, reduce the time spent by instructors in presenting laboratory demonstrations.[56]

A report of the use of television as a teaching aid in the Washington County, Maryland schools stated that pupil achievement can be improved significantly when television is utilized as a teaching aid in any grade, subject, ability level, or class size. The same report also commended television as an instructional aid which can bring new experiences to the school without replacing the teacher or destroying teacher-pupil relationships.[57]

With the advent of the video tape recorder, many new possibilities for the development and preservation of televised demonstrations and lessons were created. Programs may be pre-recorded, saved for future use, and replayed many

---

[56] R. M. Diamond, "The Effect of Closed Circuit Resource Television Upon Achievement in the Laboratory Phase of a Functional Human Anatomy Course: A Comparative Investigation of Television as a Magnification Device During Laboratory Demonstrations," Dissertation Abstracts, 1962, 23, 884.

[57] L. V. Hollweck, "An Overview of Educational Television," American School Board Journal, 1965, 151, 27.

times.[58] Lessons may be prepared by master teachers or experts, and then be replayed at times which fit any school schedule.[59]

Video tapes have been particularly useful supplements to education students in student teaching situations. A representative study employing video tape recordings in this manner was done by Winetrout at American International College. The recordings were not employed in the usual sense of adding lesson material which is presented by an instructor; instead, the student teachers were recorded on videotape while teaching practice lessons. The tapes were then replayed and examined by supervisors and students. This process was judged to be of value to both student teachers and to supervisors.[60]

It seems apparent in view of the research cited, that the literature pertaining to the effects of supplementary television (and motion pictures) on student achievement is equivocal. Some experiments indicate that the supplementary instruction is a significant aid, while in others

---

[58] C. R. Carpenter and L. P. Greenhill, "Facilities for Instructional Television," Educational Television The Next Ten Years (Stanford, California: Institute for Communication Research, Stanford University, 1962), pp. 311-312.

[59] "Expanding Learning Via Videotapes," American School and University, 1967, 39, 35.

[60] Ibid., p. 36.

its effects seem to have been negligible. The value or lack of value of supplementary techniques therefore has not been established in any general way. As Cassirer has pointed out, the particular strengths and weaknesses of television for any situation are unique and must be explored. The specific needs or objectives of the situation must be considered before it is decided whether television or some other aid might best be employed.[61]

The need for research in television supplementation in psychology is particularly acute. Although there have been many experiments comparing total television teaching to face-to-face teaching in general psychology, there is very little research investigating the effects of televised demonstrations as an instructional aid in this area. It was this fact which led to the design of the present study.

---

[61] H. R. Cassirer, "Some Thoughts About Educational Television," Audiovisual Instruction, 1967, 12, 1018.

CHAPTER III

METHOD AND PROCEDURE

Subjects. In an effort to evaluate the effect of video tape demonstrations on the understanding of principles of learning, twenty matched pairs of students were selected from a general psychology class at Kansas State College of Pittsburg. The subjects were matched on the basis of sex, age, pretest scores on the principles of learning, present grade in psychology, previous psychology courses, and raw scores on the Henmon-Nelson Tests of Mental Ability, Form A.[62] One member of each pair was assigned randomly to the experimental group by use of a table of random sequences of digits.[63]

Twenty of the subjects were males and twenty were females, with ten members of each sex in the experimental group, and ten of each sex in the control. The mean age of students in the experimental group was 19.2 years, and that of the control group was 20.0. Mean scores on the pretest

---

[62] T. A. Lamke and M. J. Nelson, The Henmon-Nelson Tests of Mental Ability -- Examiner's Manual (Boston: Houghton-Mifflin Company, 1957), pp. 4-5.

[63] Underwood, op. cit., pp. 641-666.

were 24.15 for the experimental group, and 23.90 for the control. The grade average in the psychology class prior to the beginning of the experiment was 2.20 for both groups. Although none of the subjects were repeating psychology at the college level, three students in each group had studied general psychology for one semester in high school. The mean scores on the Henmon-Nelson Tests was 69.10 for the experimental group, and 69.20 for the control group. Characteristics of all subjects in both groups are listed in Table I, page 27.

Apparatus. The experimental room was located in the television studio at Kansas State College of Pittsburg. It was equipped with desks for seating students, and contained one television monitor.

The six demonstrations were developed by the experimenter in the television studio at Kansas State College of Pittsburg, and were designed to supplement chapter three, "Principles of Learning," and chapter four, "Human Learning, Remembering, and Forgetting," in Introduction to Psychology, by Morgan and King.[64] The specific topics covered in the demonstrations were primary reinforcement, secondary reinforcement, extinction, avoidance and escape learning, learning set, and distribution of practice. These topics were

---

[64] Morgan and King, loc. cit.

TABLE I

CHARACTERISTICS OF SUBJECTS IN THE EXPERIMENTAL AND CONTROL GROUPS

Pair	Sub-ject	Sex	Pre-Test	Grade	H-N Score	H.S. Psych.	Age	Group
1.	1.	F	26	A	76	Yes	19	Exp.
	2.	F	25	A	74	Yes	19	Con.
2.	3.	F	28	B	82	No	20	Con.
	4.	F	30	A	79	No	22	Exp.
3.	5.	F	27	B	71	Yes	19	Con.
	6.	F	28	A	75	Yes	18	Exp.
4.	7.	M	23	B	74	No	23	Exp.
	8.	M	24	B	70	No	29	Con.
5.	9.	F	23	B	74	No	18	Con.
	10.	F	24	C	71	No	18	Exp.
6.	11.	F	20	B	61	No	19	Exp.
	12.	F	20	C	65	No	22	Con.
7.	13.	F	16	B	51	No	18	Con.
	14.	F	15	C	51	No	19	Exp.
8.	15.	M	31	C	81	No	18	Con.
	16.	M	32	C	82	No	19	Exp.
9.	17.	M	30	C	69	No	21	Con.
	18.	M	30	B	67	No	19	Exp.
10.	19.	M	27	C	78	No	19	Exp.
	20.	M	30	B	78	No	20	Con.
11.	21.	M	27	C	64	No	19	Exp.
	22.	M	24	C	69	No	19	Con.
12.	23.	F	25	C	70	No	19	Exp.
	24.	F	28	C	71	No	19	Con.

TABLE I (Cont.)

Pair	Sub-ject	Sex	Pre-Test	Grade	H-N Score	H.S. Psych.	Age	Group
13.	25.	F	24	C	63	Yes	19	Con.
	26.	F	25	C	64	Yes	19	Exp.
14.	27.	F	22	C	65	No	19	Con.
	28.	F	22	C	65	No	19	Exp.
15.	29.	M	22	C	70	No	20	Con.
	30.	M	20	C	69	No	19	Exp.
16.	31.	M	21	C	79	No	19	Exp.
	32.	M	19	D	76	No	19	Con.
17.	33.	M	26	D	74	No	19	Exp.
	34.	M	28	D	74	No	21	Con.
18.	35.	M	21	D	66	No	20	Exp.
	36.	M	21	C	66	No	21	Con.
19.	37.	F	20	D	62	No	19	Exp.
	38.	F	19	D	60	No	19	Con.
20.	39.	M	21	F	55	No	18	Exp.
	40.	M	17	D	55	No	21	Con.

selected with the aid of the general psychology faculty, who were asked to rank important concepts in the area of learning. The essential technical apparatus required for recording the demonstrations included two Dage 520 cameras, and an Ampex 660 B video tape recorder.

A sixty-five question multiple-choice test was used as a pretest and as a post-test. It was compiled by the general psychology instructor without knowledge of the content of the video tape demonstrations, and was designed to test knowledge of the principles of learning taught in general psychology.

Research design. The pretest was administered to each subject prior to the beginning of the experiment. Following the pretest, the control group received normal classroom instruction, while the experimental group received the same classroom instruction plus exposure to the video tape demonstrations. The post-test was given immediately following the experimental sessions.

Procedure. Initially, data were obtained from the general psychology instructor on each student's age, sex, previous experience in psychology, employment status, father's occupation, residence, and grade average. The Henmon-Nelson Tests and the pretest were administered, and subjects were matched on the basis of the criteria included in Table I. After the subjects had been matched in pairs,

and assigned to experimental and control groups, the experimental portion of the study was begun.

All subjects attended the regular meetings of the general psychology class during the weeks April 8-12 and April 15-19. The class met three times each week. In addition, the experimental group attended showings of the six video tape demonstrations (three per week) in the following order:

1. Primary Reinforcement
2. Secondary Reinforcement
3. Extinction
4. Avoidance and Escape Learning
5. Learning Set
6. Distribution of Practice

The control group received no additional instruction, but was assigned extra, unrelated work to equalize the amount of time spent on required psychology projects.

Immediately following the two-week experimental session, the post-test was administered, so that gain-scores of the subjects in the control and experimental groups could be compared.

Data. Data were obtained from a listing of all pre-test and post-test scores. Each subject's gain-score was computed by subtracting his pretest score from his post-test score.

Statistical treatment. The mean gain-scores for the experimental and control groups were compared. The difference between the mean gains of the groups was evaluated by the computation of a t ratio for matched pairs. A discussion of this procedure is presented by Edwards.[65]

Table II was constructed to show the pretest scores, post-test scores, gain-scores, and differences in gain for each pair.

---

[65] A. L. Edwards, Statistical Analysis for Students in Psychology and Education (New York: Rinehart and Company, 1946), pp. 172-178, 291-294.

CHAPTER IV

RESULTS

This chapter is concerned with the analysis of the data obtained in the present study. Gain-scores, which were computed by subtracting pretest scores from post-test scores, were used as a measure of achievement. The difference between gain-scores of the members of each matched pair of subjects was obtained by subtracting the gain-score of each subject in the control group from that of the corresponding subject in the experimental group. These scores appear in Table II, p. 33.

The mean gain-score for the experimental group was 9.00, and that of the control group was 6.35. The mean difference in gain was 2.65, in favor of the experimental group. The standard deviation of the distribution of differences in gain was 5.88, and the standard error of the mean difference was 1.35. A summary of these computations appears in Table III, page 34.

Significance of the mean difference in gain was tested by computing a t ratio for matched pairs. This was accomplished by dividing the mean difference in gain by the standard error of the mean difference. For the one-tailed test to reach significance at the .05 level, it was necessary for the computed t to be equal to or greater than

TABLE II

RAW SCORES, GAIN-SCORES, AND DIFFERENCE IN GAIN FOR MATCHED PAIRS

	Experimental			Control			
Pair	Pre-Test	Post-Test	Gain	Pre-Test	Post-Test	Gain	Difference in Gain
1.	26	41	15	25	33	8	7
2.	30	43	13	28	37	9	4
3.	28	32	4	27	25	-2	6
4.	23	39	16	24	23	-1	17
5.	24	30	6	23	30	7	-1
6.	20	34	14	20	29	9	5
7.	15	26	11	16	22	6	5
8.	32	42	10	31	44	13	-3
9.	30	35	5	30	33	3	2
10.	27	31	4	30	32	2	2
11.	27	31	4	24	33	9	-5
12.	25	22	-3	28	33	5	-8
13.	25	34	9	24	30	6	3
14.	22	31	9	22	37	15	-6
15.	20	36	16	22	33	11	5
16.	21	36	15	19	23	4	11
17.	26	33	7	28	29	1	6
18.	21	28	7	21	30	9	-2
19.	20	32	12	19	24	5	7
20.	21	27	6	17	25	8	-2
Σ	483	663	180	478	605	127	53

TABLE III

STANDARD DEVIATION, STANDARD ERROR OF THE MEAN DIFFERENCE, AND t RATIO

Pair	X	Y	D	d	d^2
1.	15	8	7	4.35	18.92
2.	13	9	4	1.35	1.82
3.	4	-2	6	3.35	11.22
4.	16	-1	17	14.35	205.92
5.	6	7	-1	-3.65	13.32
6.	14	9	5	2.35	5.52
7.	11	6	5	2.35	5.52
8.	10	13	-3	-5.65	31.92
9.	5	3	2	-0.65	0.42
10.	4	2	2	-0.65	0.42
11.	4	9	-5	-7.65	58.52
12.	-3	5	-8	-10.65	113.42
13.	9	6	3	0.35	0.12
14.	9	15	-6	-8.65	74.82
15.	16	11	5	2.35	5.52
16.	15	4	11	8.35	69.72
17.	7	1	6	3.35	11.22
18.	7	9	-2	-4.65	21.62
19.	12	5	7	4.35	18.92
20.	6	8	-2	-4.65	21.62
Σ	180	127	53	0.00	690.50

X = Gain scores, experimental group.

Y = Gain scores, control group.

D = X-Y

$d = D - \bar{D}$

$\sigma_d = \sqrt{\frac{d^2}{N}}$ $\qquad \sigma_{m_d} = \frac{\sigma_d}{\sqrt{N-1}}$

σ_d = standard deviation of the distribution of differences between pairs.

σ_{m_d} = standard error of the mean difference.

$$t = \frac{\bar{D}}{\sigma_{m_d}} = \frac{2.65}{1.35} = 1.963$$

1.729.[66] The analysis indicated that the mean difference in gain was significant at the .05 level ($t = 1.963$, $df = 19$).

This finding supported the hypothesis that gain-scores, on a test covering principles of learning, of students who viewed supplementary television demonstrations would be significantly higher than those of students who did not view the demonstrations.

---

[66] H. M. Blalock, Jr., Social Statistics (New York: McGraw-Hill, 1960), p. 442.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary and Conclusions

A large amount of research concerning the effectiveness of total teaching via television has established it as a useful instructional medium for education in many fields of study. The most common finding in comparisons with face-to-face teaching has been "no statistically significant difference." Studies utilizing televised programs as instructional aids which supplement regular teaching, however, have been less unanimous in their conclusions. Some investigators have reported that supplementary television significantly improves student achievement, while others report no significant differences. The lack of research investigating the relationship of television supplements to general psychology is particularly apparent.

In the present study, forty general psychology students studied subject matter in a unit dealing with the principles of learning. These subjects comprised twenty matched pairs. One member of each pair was assigned to an experimental group, and one to a control. Over a two-week period, the experimental group was exposed to regular classroom instruction plus six video tape demonstrations which were

designed to supplement classwork. The control group received only the same classroom instruction.

The following hypothesis was formulated prior to the experiment: Gain-scores of students who view supplementary television demonstrations will be significantly higher than those of students who do not view the demonstrations. The hypothesis was accepted on the basis of the analysis of Chapter IV, since the mean gain-score of students in the experimental group was significantly higher than that of students in the control group. It was concluded that supplementary television demonstrations significantly improved the test-score performance of students who saw them.

This result supports the findings of Husband,[67] Anderson,[68] and the Washington County schools.[69]

Recommendations

The results of the present study and the experience gained in doing it led to several recommendations for further research.

During the course of the study, subjects in the experimental group were asked to appear three times each week

---

[67] Husband, op. cit., pp. 181-182.

[68] Anderson, loc. cit.

[69] Hollweck, loc. cit.

to view the televised demonstrations. It is quite possible that this may have created a situation which seemed artificial to the students. Although other students in the class were assigned other, unrelated work to equalize the time factor, it cannot be said with any degree of certainty that the subjects did not know they were in an experiment. This situation might be altered in at least two ways. First, research might be designed to examine differences in achievement occurring when the televised programs are used in the classroom, in combination with lectures or other classroom techniques. Second, a study might be carried out over a longer period of time, making televised programs available outside the classroom on a less frequent schedule, perhaps once or twice per week.

With regard to the finding of the present study, it is recommended that it be replicated with an additional step to be included in the procedure -- that is, the reversal of experimental and control groups. In this way a more precise evaluation of the effects of supplementary demonstrations upon achievement might be obtained. The most feasible way to accomplish such a reversal of groups would seem to be to extend the experiment into another unit of study (e.g. learning plus personality), with one group viewing demonstrations in the first area, and the other viewing demonstrations in the second area.

In addition, replications are recommended for the various other topics of general psychology. That is, could demonstrations in personality, perception, motivation, or other areas, be developed to produce effects similar to that found in the present study? If so, such programming might prove invaluable to instructors of general psychology.

Finally, replications of this study should be done with other populations, including different age groups, college majors, mental abilities, and the like. In this way some knowledge of the generality of this effect may be obtained.

BIBLIOGRAPHY

A. BOOKS

Blalock, H. M. Social Statistics. New York: McGraw-Hill, 1960.

Callahan, Jennie W. Television in School, College, and Community. New York: McGraw-Hill, 1953.

Campion, L. E. and Yvonne Lanagan (ed.). And TV Too! Washington: National Education Association, 1961.

Cassirer, H. R. Television Teaching Today. Paris: United Nations Educational, Scientific and Cultural Organization, 1960.

Cumming, W. K. This is Educational Television. Ann Arbor, Michigan: Edwards Brothers, Inc., 1954.

Edwards, A. L. Statistical Analysis for Students in y-chology and Education. New York: Rinehart and mpany, 1946.

Gordon, G. N. Educational Television. New York: The Center for Applied Research in Education, Inc., 1965.

Lamke, T. A. and M. J. Nelson. The Henmon-Nelson Tests of Mental Ability -- Examiner's Manual. Boston: Houghton-Mifflin Company, 1957.

Meaney, J. W. Televised College Courses. New York: The Fund for the Advancement of Education, 1962.

Morgan, C. T. and R. A. King. Introd tion to Psychology. New York: McGraw-Hill, 1966.

Smith, Mary H. (ed.). Using Television in the Classroom. New York: McGraw-Hill, 1961.

Underwood, B. J. Experimental Psychology. New York: Appleton-Century-Crofts, 1966.

Wortman, L. A. Closed-Circuit Television Handbook. Indianapolis: Howard W. Sams and Company, Inc., 1964.

B. PUBLICATIONS OF ORGANIZATIONS

Board of Education of Washington County, Maryland. Washington County Closed Circuit Television Report. Hagerstown, Maryland: Board of Education of Washington County, 1964.

Ford Foundation and Fund for the Advancement of Education. Teaching by Television. New York: Ford Foundation, 1961.

National Education Association. "Monograph No. 1 of the Technological Department Project of the NEA of the U.S.," AV Communication Review, 11:1-148, 1963.

C. PERIODICALS

Anderson, K. E., et al. "Toward a More Effective Use of Sound Motion Pictures in High School Biology," Science Education, 40:46-54, 1956.

Cassirer, H. R. "Some Thoughts About Educational Television," Audiovisual Instruction, 12:1017-1018, 1967.

Diamond, R. M. "The Effect of Closed Circuit Resource Television Upon Achievement in the Laboratory Phase of a Functional Human Anatomy Course: A Comparative Investigation of Television as a Magnification Device During Laboratory Demonstrations," Dissertation Abstracts, 23:884, 1962.

Enders, D. E. "Academic Achievement in Grade Six Science Resulting from Supplementary Instruction by Open Circuit Television," Dissertation Abstracts, 21:131, 1960.

"Expanding Learning Via Videotapes," American School and University, 39:35-36, 1967.

Geddes, Dorothy C. "The Use of Television in Teaching Tenth Year Mathematics: The Effectiveness of Teaching Tenth Year Mathematics by a Combined Method of Instruction by Television and a Classroom Teacher as Compared with the Traditional Method of Instruction by a Single Classroom Teacher," Dissertation Abstracts, 22:4293, 1962.

Hayman, J. L., Jr. and J. T. Johnson, Jr. "Research on the Context of Instructional Television," School Life, 45:8-11, 1963.

Hollweck, L. V. "An Overview of Educational Television," American School Board Journal, 151:27-28, 1965.

Huffman, S. A. "A Comparative Analysis of Four Instructional Methods in Eighth Grade Science," Dissertation Abstracts, 19:2294-2295, 1959.

Husband, R. W. "Television Versus Classroom for Learning General Psychology," American Psychologist, 9:181-183, 1954.

McElroy, C. W. "An Experimental Study to Determine the Effect of Motion Pictures in Reinforcing Instruction for the Improvement of Speaking Techniques of Students in Beginning Public Speaking Classes," Dissertation Abstracts, 19:2296-2297, 1959.

McKeachie, W. J. "Teaching Psychology on Television," American Psychologist, 7:503-506, 1952.

Stromberg, E. L. "College Credit for Television Home Study," American Psychologist, 7:507-509, 1952.

Toffel, G. M. "Effectiveness of Instruction by Television in Teaching High School Chemistry in Alabama Schools," AV Communication Review, 10:A81-82, 1962.

Witty, P. "Television as an Aid to Instruction," School and Society, 74:275-276, 1951.

D. ESSAYS AND ARTICLES IN COLLECTIONS

Carpenter, C. R. and L. P. Greenhill. "Facilities for Instructional Television," Educational Television the Next Ten Years. Stanford, California: Institute for Communication Research, Stanford University, 1962. Pp. 286-332.

Dennis, L. E. "The Penn State TV Project," College Teaching by Television, J. Adams, C. Carpenter, and Dorothy Smith, editors. Washington: American Council on Education, 1958. Pp. 2-6.

Hull, R. B. "A Note on the History Behind ETV," Educational Television the Next Ten Years. Stanford, California: Institute for Communication Research, Stanford, University, 1962. Pp. 334-345.

APPENDIXES

APPENDIX A

CHECKLIST OF DEMONSTRATION TOPICS

February 8, 1968

To: General Psychology Teaching Staff

I am engaging this semester in research employing supplementary video tape demonstrations in the teaching of learning in general psychology. Hopefully, your experience in this area might prove very helpful to the project.

As you know, the textbook which is currently in use in general psychology classes at Kansas State College is Introduction to Psychology by Clifford T. Morgan and Richard A. King (McGraw-Hill, 1966). The items on the attached sheets represent demonstration possibilities which have been drawn from Morgan and King, chapter three (Principles of Learning) and chapter four (Human Learning, Remembering, and Forgetting). Topics which were omitted were those which did not appear to be readily adaptable to demonstration via video tape in view of available facilities.

I would ask you to select six items, ranking them in order of importance to understanding of learning as you see it and feasibility for demonstration. Simply place the appropriate number in the blank beside the topic ("1" for most important item, "2" for the next, etc.). Please feel free to add items or specific ideas for tape demonstrations.

Your cooperation and suggestions are sincerely appreciated.

Thank you,

Kenneth D. Keith

I. Instrumental Learning

_____Shaping

_____Extinction

_____Primary and Secondary Reinforcement

_____Partial Reinforcement

_____Stimulus Generalization

_____Discrimination Learning

_____Other (specify) _____.

II. Avoidance Learning

_____Avoidance

_____Escape

_____Punishment

_____Extinction

_____Other (specify) _____.

III. Classical Conditioning (Please specify an area which might be adaptable to our facilities if you select this item.)

_____

IV. Perceptual Learning

_____Place Learning

_____Changed-Response

_____Learning Sets

_____Perceptual Reorganization

_____Other (specify) _____.

V. Methods of Learning

_____Distribution of Practice

_____Knowledge of Results

_____Whole vs. Part Learning

_____Other (specify) _____.

VI. Measurement of Human Learning

_____Learning Curves

_____Verbal Learning Techniques

_____One-Trial and Incremental Learning

_____Other (specify) _____.

VII. The Learning Material

_____Meaningfulness

_____Perceptual Distinctiveness

_____Other (specify) _____.

VIII. Transfer of Training

_____

IX. Programmed Learning

_____

APPENDIX B

GENERAL PSYCHOLOGY TEST: LEARNING

LEARNING

1. Conditioning
   a. is too artificial a concept to be of any use
   b. is important because it provides a method of investigating modification of behavior
   c. is not an important part of psychology
   d. explains all human learning

2. Conditioned generalization is said to have occurred when a response
   a. can be shown to follow a general rule by a subject
   b. is made in one situation and withheld in others
   c. acquired in one situation occurs in similar situations
   d. acquired in many situations occurs in one of these situations

3. A child has a conditioned fear reaction to a rabbit. When he sees his mother's fur coat, he becomes very agitated. This is an instance of
   a. stimulus generalization
   b. experimental neurosis
   c. an unconditioned reaction
   d. pseudoconditioning

4. The type of learning that requires the least effort on the part of the learner is
   a. operant conditioning
   b. perceptual learning
   c. massed learning
   d. classical conditioning

5. When a subject makes the correct response to a problem and is given a reward, psychologists say that he has received
   a. positive transfer
   b. reinforcement
   c. retroactive inhibition
   d. redintegration

6. Objects for which people show a liking are apt to be useful
   a. drive stimuli
   b. stimulus objects
   c. reinforcing agents
   d. none of these

7. The conditioned response principle employed in eliminating a severe but irrational fear is to
   a. punish the person for exhibition of the fear so that fear of punishment will overcome the fear of the stimulus
   b. force contact with the feared stimulus so that extinction may occur
   c. force contact with the feared stimulus so that generalization may occur
   d. prevent any contact with the feared situation so that it will be spontaneously extinguished.

8. According to Skinner, respondent behavior differs from operant behavior in that the former
   a. more closely resembles instrumental behavior
   b. is more voluntary on the part of the organism
   c. appears to be spontaneous rather than a response to stimulation
   d. is directly under the control of the stimulus

9. Which of the following statements is least accurate? Learning is
   a. a process that always leads to improvement
   b. influenced by motivational factors
   c. a change in responding to a stimulus
   d. a change in the nervous system

10. Which of the following principles is not common to all forms of learning?
   a. rewarded repetition favors learning
   b. tasks natural to the learner are easiest to learn
   c. the learner must discover the correct response
   d. the learner must be motivated

11. The characteristic that distinguishes recollection from other forms of remembering is that
   a. the errors made are all due to omission of details
   b. events are recalled fully, without error
   c. the specific time and place of occurrences are recalled as well as the actual event
   d. productive memory is added to reproductive memory

12. Multiple-choice examination items measure retention by which method?
   a. recognition
   b. recall
   c. reinstatement
   d. savings

13. Overlearning
    a. is a serious hindrance to later recall
    b. up to about 150 percent produces a marked increase in retention
    c. increases retention in direct proportion to the degree of overlearning
    d. increases retention for dull students but not for bright students

14. Retroactive inhibition is
    a. the interference of later learning with previous learning
    b. the increase of retention after a rest period
    c. the interference of previous learning with present learning
    d. inhibition of transfer

15. Amount of forgetting does not depend upon which one of these factors?
    a. repression
    b. amount of practice
    c. retroactive inhibition
    d. the phi phenomenon

16. The theory of proactive inhibition holds that
    a. inhibitions are sometimes disruptive of transfer
    b. prior learning interferes with new learning
    c. new learning interferes with prior learning
    d. passive decay through disuse occurs in the memory traces of all people

17. Which of the following is <u>not</u> an important part of the definition of learning?
    a. learning and performance are synonymous
    b. learning refers to a relatively permanent change in behavior
    c. learning depends upon practice or experience
    d. an activity originates, or is changed, through response to a situation

18. Which of the following would most likely be considered <u>learned behavior</u> by the psychologist?
    a. a relatively permanent, non-adaptive change in behavior (such as anti-social behavior)
    b. the feeling of fright at an unannounced quiz
    c. hostility in interpersonal relationships
    d. all of the above

19. The observed fact that reinforcement seems to strengthen associations has been called the
    a. empirical law of effect
    b. stimulus theory of reinforcement
    c. theoretical law of effect
    d. need reduction theory of reinforcement

20. A long drive will keep a golfer at his game despite many balls lost in the rough. This example illustrates the significance of
    a. operant conditioning
    b. intermittent reinforcement
    c. second-order conditioning
    d. the method of approximations

21. An essential feature of classical conditioning is
    a. an unconditioned stimulus that evokes an unconditioned response
    b. a conditioned stimulus that does not initially evoke the unconditioned response
    c. paired presentations of the conditioned and unconditioned stimuli
    d. all of the above

22. The interstimulus interval is the interval between
    a. occurrence of a response and need-reduction reinforcement
    b. sensation and the occurrence of an idea
    c. onset of the conditioned and unconditioned stimuli
    d. offset of the conditioned stimulus and the beginning of the unconditioned response

23. A response is conditioned to a particular CS; in testing, it is found that other, similar stimuli will elicit the response. Such a phenomenon is called
    a. discrimination learning
    b. backward conditioning
    c. partial reinforcement
    d. stimulus generalization

24. If two stimuli, CS_1 and CS_2 are intermingled but only CS_1 is reinforced, you will produce
    a. generalization
    b. higher-order conditioning
    c. extinction
    d. discrimination

25. The feeling of dread experience when passing the spot where a severe automobile wreck was observed is most likely a result of
    a. classical conditioning
    b. instrumental learning
    c. blocked-response learning
    d. place learning

26. In shaping an organism to make a specific response, the experimenter
    a. first reinforces only the final, complex response
    b. reinforces parts of the final, complex response
    c. must never use reinforcement
    d. restricts his subjects to rats and pigeons

27. In operant conditioning, a response is extinguished by
    a. withholding reinforcement
    b. switching to a variable interval schedule
    c. presenting secondary, rather than primary, reinforcement
    d. using a cumulative recorder

28. With regard to effective study techniques, it may be generally stated that
    a. intelligent students do not need to recite
    b. the part method is always more effective than the whole method
    c. the part method is more effective for highly meaningful material
    d. recitation nearly always results in improved learning

29. Learning meaningful material
    a. involves old learning
    b. involves previously made associations
    c. takes less time than learning non-meaningful material
    d. all of the above

30. Which of the following has <u>not</u> been considered a characteristic of short-term memory?
    a. carried by active neural processes
    b. subject to spontaneous decay
    c. limited storage capacity
    d. less subject to disruption than long-term memory

31. The gradual weakening of response resulting from presentation of the CS without the UCS is called
    a. disconnection
    b. erasing
    c. extinction
    d. elimination

32. The establishment of a conditioned response to a neutral stimulus through pairing of this stimulus with a conditioned stimulus is called
    a. Pavlovian conditioning
    b. higher-order conditioning
    c. operant conditioning
    d. trace conditioning

33. The name for the type of conditioning in which the response is strengthened by its consequences is
    a. classical conditioning
    b. instrumental conditioning
    c. respondent conditioning
    d. trace conditioning

34. A reinforcer which is effective without prior reinforcement is known as a
    a. classical reinforcer
    b. primary reinforcer
    c. conditioned reinforcer
    d. secondary reinforcer

35. Animal A is trained on a VI schedule for a long period of time; animal B is trained on a continuous reinforcement schedule for the same length of time. Both animals are then placed on extinction. You would expect
    a. animal B to make more responses during extinction than animal A
    b. animal A to make more responses during extinction than animal B
    c. animal A to stop responding almost immediately
    d. both animals to make approximately the same number of responses during extinction

36. Discrimination learning involves
    a. extinguishing responses which occur because of stimulus generalization
    b. continuous reinforcement of responses made to the S
    c. simultaneous, but not successive, presentation of the positive and negative stimuli
    d. all of the above

37. The control over responding after a go no-go discrimination has been learned is sometimes referred to as
    a. response control of behavior
    b. simultaneous control
    c. stimulus control of behavior
    d. successive control

38. In avoidance learning, the term latency refers to the elapsed time between the onset of the _____ and the beginning of the _____.
    a. conditioned stimulus, unconditioned stimulus
    b. unconditioned stimulus, conditioned stimulus
    c. conditioned stimulus, response
    d. response, conditioned stimulus

39. According to one group of psychologists, certain learning experiments demonstrate perceptual reorganization and insight in animals. Which group is this?
    a. Skinnerians
    b. Gestalt psychologists
    c. Pavlovians
    d. Instrumentalists

40. Learning curves
    a. always rise and never fall
    b. rise at first, and then fall back almost to the baseline
    c. might better be called performance curves
    d. plot errors on the horizontal axis

41. Motor learning is generally most efficient (in terms of the most accomplished in the least time) with
    a. trials closely massed together to optimize recall between trials
    b. short practice periods separated by brief rest periods
    c. trials specifically not allowing recitation
    d. long practice periods separated by long rest periods

42. The items in a series which are hardest to learn are
    a. at the end of the list
    b. at the beginning of the list
    c. in the middle of the list
    d. none of the above; the serial position does not have an effect on difficulty of learning

43. One explanation of the better memory for perceptually distinct items in a list is in terms of
    a. repression
    b. interference
    c. the Zeigarnik effect
    d. punishment

44. The absolute amount of transfer, whether positive or negative, is a function of
    a. stimulus similarity
    b. response substitution
    c. stimulus substitution
    d. response similarity

45. Negative transfer of training occurs most strongly when two paired-associates lists of nonsense syllables are related as which of the following?
    a. stimuli similar, responses similar
    b. stimuli similar, responses dissimilar
    c. stimuli dissimilar, responses similar
    d. stimuli dissimilar, responses dissimilar

46. The student inadvertently recalling previously learned Spanish words when he is trying to recall French words for an exam is troubled with
    a. unconscious reminiscence
    b. short-term memory
    c. proactive inhibition
    d. overactive savings

47. In order to perpetuate a conditioned response, one must
    a. avoid presenting the unconditioned stimulus and conditioned stimulus together
    b. avoid presenting the conditioned stimulus alone at any time
    c. occasionally present the unconditioned stimulus along with the conditioned stimulus
    d. none of these

48. In classical salivary conditioning, the food presented to the animal is considered to be
    a. the conditioned
    b. the conditioning stimulus
    c. the response
    d. the reinforcement

49. The reverse of conditioning is called
    a. extinction
    b. reinforcement
    c. generalization
    d. unconditioning

50. The kind of learning in which the response accomplishes some result is called
    a. classical
    b. respondent
    c. instrumental
    d. perceptual

51. The first event in the course of instrumental learning is
    a. reinforcement
    b. response
    c. unconditioned stimulus
    d. conditioning stimulus

52. At the beginning of extinction of an instrumental response, the rate of responding
    a. is relatively rapid
    b. decreases slightly
    c. immediately drops to zero
    d. gradually speeds up

53. Giving an animal food each time it presses a lever is an example of
    a. primary reinforcement
    b. secondary reinforcement
    c. partial reinforcement
    d. none of these

54. The acquisition of an avoidance response is typically
    a. Rather sudden
    b. rather gradual
    c. a one-step process
    d. a case of classical conditioning

55. Punishment is most effective in permanently changing behavior when
    a. it is applied to an already established habit
    b. it is mild
    c. there is an alternative response
    d. it is administered intermittently

56. Experiments on latent learning indicate that reinforcement is necessary for
    a. learning
    b. performance
    c. discrimination
    d. concept formation

57. For mirror drawing, as compared with more complicated tasks, the difference between massed and distributed practice is
    a. greater
    b. less
    c. about the same
    d. usually less, but sometimes greater

58. When learning one task interferes with the later learning of another task, the process is called
    a. formal discipline
    b. positive transfer
    c. retroactive inhibition
    d. negative transfer

59. In acquiring new responses for old stimuli, there usually is
    a. positive transfer
    b. negative transfer
    c. no transfer
    d. stimulus generalization

60. The most sensitive measure of retention is
    a. savings
    b. recall
    c. recognition
    d. reproduction

61. Retention is measured in objective examinations by the method of
    a. recognition
    b. recall
    c. savings
    d. reproduction

62. The greatest forgetting of learned material takes place
    a. very shortly after learning
    b. during the learning itself
    c. several hours after learning
    d. none of these

63. When we say there is retroactive inhibition, we mean that
    a. positive transfer has been produced
    b. learning of a task interferes with retention of earlier learning
    c. learning of a first task interferes with learning a second task
    d. pure forgetting has occurred

64. The requirement of a different response to the same stimulus in two different situations is the important condition for
    a. negative transfer
    b. retroactive inhibition
    c. both of these
    d. neither of these

65. Part methods of study are advantageous
    a. for quick rather than slow learners
    b. when the part is easily separable from the whole
    c. when the whole is relatively small
    d. when knowledge of results is of no importance

APPENDIX C

TEST SCORES OF ALL SUBJECTS

	Experimental		Control	
Pair	Pretest	Post-test	Pretest	Post-test
1.	26	41	25	33
2.	30	43	28	37
3.	28	32	27	25
4.	23	39	24	23
5.	24	30	23	30
6.	20	34	20	29
7.	15	26	16	22
8.	32	42	31	44
9.	30	35	30	33
10.	27	31	30	32
11.	27	31	24	33
12.	25	22	28	33
13.	25	34	24	30
14.	22	31	22	37
15.	20	36	22	33
16.	21	36	19	23
17.	26	33	28	29
18.	21	28	21	30
19.	20	32	19	24
20.	21	27	17	25

APPENDIX D

DEMONSTRATION SCRIPTS

Kansas State College
Instructional Television
Video-Tape Demonstrations
Department of Psychology and Counselor Education

Script

Demonstration Title PRIMARY REINFORCEMENT Number 1

Instructor Kenneth D. Keith Director R. D. Cummings

Approximate Length in minutes 9

VIDEO (Indicate major shots)	AUDIO (Outline and cue lines)
Preliminary credits	
Instructor	Operant behavior has been defined as behavior which operates upon the environment and produces consequences. The nature of the consequences may have a strong influence upon the likelihood that the behavior will occur again. If, for example, you touch the flame of a burning candle with your fingertip, the probability of repeating the behavior may become very low as a result of the painful consequence. On the other hand, the consequences of behavior

VIDEO (Indicate major shots)	AUDIO (Outline and cue lines)

may increase the probability that the behavior or response will be repeated. Good food, for instance, may sometimes be a very desirable consequence of certain types of behavior.

In operant learning, the consequence of any response is called a reinforcing stimulus. Reinforcement may be either primary or secondary. Today we are concerned with primary reinforcement.

A primary reinforcer is a stimulus or an incentive which directly affects the motivational state of an organism. Among the most commonly used primary reinforcers in experimental work are water, food, and electrical shock. Food or water can have a direct effect on the motivational state of a deprived organism, and shock can be the source of physical pain when applied to an organism.

VIDEO (Indicate major shots)	AUDIO (Outline and cue lines)

Some primary reinforcers are said to be positive reinforcers, because their presentation strengthens behavior. A rat may press a bar to obtain water, or a child may behave in a particular way to obtain candy, for example. The candy is a positive primary reinforcer.

Other primary reinforcers, such as electrical shock, are said to be negative primary reinforcers. This means that behavior is strengthened by the removal or termination of the reinforcing stimulus. In this case, a rat may learn to press a bar to turn off electrical shock, or a child may behave in a particular way so as to terminate his mother's punishment.

We will illustrate today the effects upon behavior of a positive primary reinforcer. Specifically, we will observe the effects of water

VIDEO (Indicate major shots)	AUDIO (Outline and cue lines)
	as a consequence of bar-pressing in rats. To do this, it will be necessary for us to move to the experimental laboratory of the Kansas State College Psychology Department.
Shoot sign -- "Experimental Laboratory"	
Stop Move to lab.	
Skinner box	The apparatus which you see here is used for the study of operant behavior in rats. It is presently
Water dispenser (zoom)	equipped with a water dispenser and
Bar (zoom)	a bar which can be pressed to activate the water dispenser. (Press bar a few times.)
Skinner box	We are now going to turn the apparatus off, so that a bar-pressing response will not produce water, and place a rat in the box. The rat has been deprived of water for several hours, and has not learned the bar-pressing response. Since the rat has not pressed the bar to produce

VIDEO (Indicate major shots)	AUDIO (Outline and cue lines)
	a reinforcing consequence in the past, the probability of a bar press in this situation is extremely low. Furthermore, random pressing or touching of the bar will not be reinforced, since the apparatus is not operating. Some degree of activity occurs, but no bar-pressing. Since water has not been obtained, the degree of deprivation, or motivational state, has not been reduced. In fact, the rat is more and more deprived as time passes.
Swing to other box	Now we will observe another rat, also deprived of water for several hours. This rat has pressed the bar in the past to produce water. In fact, he is now pressing the bar five times for each drop of water. The water has thus become an effective primary reinforcer for bar-pressing behavior. The response rate is high, as is the probability of additional similar behavior.

VIDEO (Indicate major shots)	AUDIO (Outline and cue lines)
	- - - - - - - - - Pause - - - - - - - - -
	It might be expected however, since a primary reinforcer directly influences the motivational state, that the rate of responding would decrease as the organism obtains more and more reinforcements. This is true -- the motivational state in the case of the rat is the number of hours of water deprivation. If he drinks until he is satiated (or "full"), he is no longer deprived, and the motivational state has been significantly altered.
Shoot until responding stops.	In the case of negative primary reinforcement, which consists of the removal of aversive stimulation such as shock, the motivational state is altered by the reduction or removal of pain.
Stop Return to studio.	
Instructor	We have seen the striking effect of primary reinforcement upon both

VIDEO (Indicate major shots)	AUDIO (Outline and cue lines)
	behavior and motivational states. Although we have used water as an example, we might have observed very similar effects with various other primary reinforcers.
	It should be repeated, in conclusion, that the effects of primary reinforcers are not limited to sub-human organisms. Food, water, heat, cold, and pain, among others, are all potentially important reinforcing stimuli for human behavior.
The End	

Kansas State College
Instructional Television
Video-Tape Demonstrations
Department of Psychology and Counselor Education

Script

Demonstration Title SECONDARY REINFORCEMENT Number 2

Instructor Kenneth D. Keith Director R. D. Cummings

Approximate Length in minutes 15

VIDEO (Indicate major shots)	AUDIO (Outline and cue lines)
Preliminary credits	
Instructor	We have previously seen that primary reinforcers are those which strengthen operant behavior by directly influencing a motivational state or by reducing a physiological need. These needs include the needs for food and water and to escape pain. Although the primary reinforcers which reduce such needs are very important to the shaping and maintenance of behavior, it is obvious that much of the behavior which we see in humans is not directly influenced by them. It is this observation which brings us to the study of secondary reinforcement.

VIDEO (Indicate major shots)	AUDIO (Outline and cue lines)

A secondary reinforcer has been defined as a stimulus which becomes reinforcing after it has been paired with a primary reinforcer. If a buzzer is paired with the presentation of water to a rat, the sound of the buzzer may in itself become reinforcing to the rat. Or, if the sound of his mother's voice is always paired with feeding for a small child, the mother's voice may become reinforcing to him. To say that any stimulus is reinforcing, of course, simply means that it increases the probability of certain types of behavior. The rat may repeatedly press a lever to produce the sound of a buzzer, or the child may learn to behave in a certain way to win his mother's approval.

Among the most common secondary reinforcers affecting every day human behavior are words (especially praise and scolding), money, attention,

VIDEO (Indicate major shots)	AUDIO (Outline and cue lines)

affection, academic titles or degrees, promotions, and various status symbols. All these things have become reinforcing, or are potentially reinforcing due to association with primary reinforcers such as food, water, or relief from pain. They all represent goals or incentives for which people will work or behave in the required way.

Today we are going to attempt to alter simple human verbal behavior through the application of secondary reinforcement. We will use two types of secondary reinforcement which are typically very effective in controlling the behavior of college students. They are verbal approval and money.

Our subject, who is presently in another room, will be asked simply to say words -- any words at all. He will be stopped after each block of twenty words, and then after a

VIDEO (Indicate major shots)	AUDIO (Outline and cue lines)

pause of a few seconds, he will be instructed to begin again. Each block of twenty words will constitute one trial, and ten trials will be completed.

During the first two trials, I will simply record the subject's words, and say nothing. In trials three to ten, our subject will be reinforced for each plural noun that he says. The reinforcement will be verbal approval in the form of the words "good" or "okay." In addition, during the last two trials, the subject will be given a nickel each time he says a plural noun. Words such as dogs, students, or teachers would be reinforced, in addition to any other plural noun.

The purpose of non-reinforcement during the first two trials is to establish a baseline or free operant level. This simply means that we need to know how often we can expect

VIDEO (Indicate major shots)	AUDIO (Outline and cue lines)
	our subject to emit plural nouns before reinforcement is instituted. After reinforcement is instituted, we would expect an increase in the number of plural nouns emitted.
Graph	Let us review now the procedure to be followed. During the first two trials we will simply record the subject's baseline verbal output. During trials three to eight, plural nouns will be reinforced with "good" or "okay," and in trials nine and ten the verbal reinforcement will be supplemented with nickels.
Instructor	It should be pointed out that this exercise does not have the control or design of a true experiment. It is intended simply to be a demonstration of a well-established principle.
Stop Shoot sign -- "Trial 1" Instructor and subject	We are studying verbal behavior and how people use words. Your job today is very simple -- when I say

VIDEO (Indicate major shots)	AUDIO (Outline and cue lines)
	"begin," you say words -- any words at all will do -- for instance, "piano," "cow," "student," "houses," and so on. There is no time limit -- just say single words; no sentences and no numbers. After you have said a group of words, I will say "stop." After a few seconds, I will say "begin" again. Ready? Begin.
Shoot Trials 1 and 2 Stop Shoot Trials 5, 7, and 9. Stop Shoot graph.	The data for the ten trials just completed appears here. The trials have been plotted along this line, and the number of plural nouns for each trial on this scale. The first two blocks were used to determine the subject's baseline level. He verbalized one plural noun on the first trial, and two on the second. During the verbal reinforcement trials, the output of plural nouns increased to twelve, and when money was added, it went up to eight and then eleven.

VIDEO (Indicate major shots)	AUDIO (Outline and cue lines)
Instructor	The demonstration which we have done here, although it was very simple, may give some indication of the effectiveness of secondary reinforcement. As we look around us, it is possible every day to observe the applications of secondary reinforcement. Parents, for example, seldom need to apply primary reinforcers. They use in their place praise, approval, encouragement, or the threat of punishment -- all of which have been previously paired with primary reinforcers. Workers are not paid with food or other primary reinforcers, but with money or the promise of various fringe benefits, which have become powerful secondary reinforcers. The important common characteristic of all secondary reinforcers is that they become effective through a learning process, as a result of accompanying primary reinforcers.
The End	

Kansas State College
Instructional Television
Video-Tape Demonstrations
Department of Psychology and Counselor Education

Script

Demonstration Title EXTINCTION Number 3

Instructor Kenneth D. Keith Director R. D. Cummings

Approximate Length in minutes 8

VIDEO (Indicate major shots)	AUDIO (Outline and cue lines)
Preliminary credits	
Instructor	In instrumental (or operant) conditioning, it is quite possible to remove or extinguish a response which has been learned. This is accomplished by the withholding of reinforcement. After many non-reinforced trials, we would expect that the behavior would not occur at all, or at least not more often than it did before reinforcement was instituted. The rate of responding, or the strength of a habit decreases gradually during extinction trials.
	If a rat, for instance, has learned to press a bar to obtain water, its rate of responding gradually decreases

VIDEO (Indicate major shots)	AUDIO (Outline and cue lines)

when water is withheld. Likewise, parents may extinguish undesirable habits in their children by arranging contingencies which insure nonreinforcement of the unwanted behavior.

An important factor which determines to a large degree the rate with which extinction comes about is the schedule of reinforcement which has previously been in effect. When every response has been reinforced during training, extinction takes place relatively soon. An example of this may be seen in the common soft drink machine -- If it has always operated in the past and fails to work today, you are not likely to waste many coins in trying to get a drink from it. Your behavior extinguishes relatively quickly.

When previous responses have been reinforced intermittently however, resistance to extinction is much

VIDEO (Indicate major shots)	AUDIO (Outline and cue lines)
	greater. A slot machine for example, pays off infrequently, but the behavior shown by most people in operating it is very persistent. It is difficult to extinguish.
	If you will return with me to the experimental laboratory, we may be able to observe the effects of non-reinforcement upon the behavior of a rat.
Shoot sign-- "Experimental Laboratory"	
Rat in box	This rat has been conditioned to press the bar to obtain a single drop of water. At this time, he has been deprived of water for several hours, and then placed in the box. He is now on extinction trials, since water is no longer available, and no amount of bar-pressing will produce water. We see that his rate of responding is initially high -- Extinction is not yet in evidence.
Fade out	
Rat in box--superimpose sign -- "Five minutes"	After five minutes of non-reinforced responding, the rat continues

VIDEO (Indicate major shots)	AUDIO (Outline and cue lines)
	to press the bar, though not so rapidly as before. He still goes to
Fade out	the water dispenser to look for water.
Rat in box -- superimpose sign -- "Fifteen minutes"	Fifteen minutes have now passed,
Fade out	and our rat still responds, though not so persistently as before.
Rat in box -- superimpose sign -- "Thirty minutes"	After thirty minutes, the rat responds infrequently, giving an
Fade out	occasional press to be sure that the contingencies are still the same.
Rat in box -- superimpose sign -- "Forty-five minutes"	By the time forty-five minutes have passed, the rat shows little interest in the bar. Extinction, at least for this session, has occurred.
Stop	
Return to studio	
Graph	As we may see here, the response rate for the rat which we have been observing accelerated rapidly at first, with one hundred responses during the first five minutes. The rate began declining thereafter, until it leveled off after about

VIDEO (Indicate major shots)	AUDIO (Outline and cue lines)
	thirty-five minutes, with very few additional responses being made.
Instructor	We have observed the effect of a relatively short extinction period on the behavior of a rat which was conditioned to bar-pressing. If we were to observe the rat for a longer time, we would probably see additional spurts of bar-pressing from time to time before total extinction would take place.
	Extinction represents a continuous schedule, in that reinforcement <u>never</u> follows a response. The extinction process may be speeded up if, in addition to withholding reinforcement of undesirable behavior, we reinforce other, incompatible behavior. If a mother wants to extinguish swearing in her child, she may ignore the child when he swears, and reinforce good grammar, which is incompatible with swearing.

VIDEO (Indicate major shots)	AUDIO (Outline and cue lines)
	In summary, the important aspect of extinction is the complete withholding of reinforcement, which brings about a decrease in the frequency of the learned behavior.
The End	

Kansas State College
Instructional Television
Video-Tape Demonstrations
Department of Psychology and Counselor Education

Script

Demonstration Title AVOIDANCE AND ESCAPE LEARNING Number 4

Instructor Kenneth D. Keith Director R. D. Cummings

Approximate Length in minutes 6

VIDEO (Indicate major shots)	AUDIO (Outline and cue lines)
Preliminary credits Instructor	Although much learning comes about as a result of positive reinforcement, there is also a good deal of learning which is based on the effects of negative reinforcement. Negative reinforcement refers simply to the process by which behavior is strengthened by the removal of a stimulus. The stimulus is usually an aversive or unpleasant one, such as electrical shock, verbal disapproval, loud noise, or any other punishing stimulus. Two main types of learning result from negative reinforcement. They are escape learning and avoidance learning.

VIDEO (Indicate major shots)	AUDIO (Outline and cue lines)
	Escape learning is simply learning to get out of an unpleasant situation after you are in it. The simplest example is the rat in a box
Sketch	which can be wired for electrical shock. One side of the box is safe, and the other side is capable of transmitting a shock to the feet of the rat. The two sides are separated by a hurdle. When a rat is placed in this, the shock side of the box and is shocked, he quickly learns to jump over to the safe side. In other words, he learns to escape the painful shock. People also learn very effectively in this manner, devising all sorts of ways to escape unpleasant situations.
Instructor	Avoidance learning is learning to avoid or prevent an unpleasant situation before it arises. If the rat,
Sketch	for instance, has been placed in the box a number of times and then

VIDEO (Indicate major shots)	AUDIO (Outline and cue lines)
	shocked, he is likely to begin jumping to the safe side before the shock is administered -- He learns to avoid the shock. Humans are equally adept at learning avoidance responses. We learn, for example, to make excuses if we want to avoid an unpleasant social situation.
Instructor	Today we will attempt to demonstrate simple escape and avoidance learning with a human subject. The aversive stimulus which we will use to create an unpleasant situation is a loud noise. The subject will be seated before a light. Each time the light comes on, it will be followed after five seconds by the recorded noise. Our subject will be able to terminate the noise by operating a switch. If he does this, he will of course be escaping. If not, the noise will remain on for thirty seconds. After a few trials, we

VIDEO (Indicate major shots)	AUDIO (Outline and cue lines)
	would expect him to operate the switch as soon as the light appears. In that event, the noise will not be presented at all, and the subject will have avoided the aversive stimulus. Although we must assume that our subject has had some experience with electrical switches, it is not likely that he has used them in exactly the way that he will today.
Subject	(Run several trials, super-imposing appropriate trial signs.)
Instructor	Although the noise which we have employed as an aversive stimulus was not punishing in a painful sense, it was sufficiently unpleasant to evoke escape and avoidance behavior. By the second trial, our subject was operating the switch to escape the stimulus, and on the fourth trial he began to avoid the noise by operating the switch before the noise

VIDEO (Indicate major shots)	AUDIO (Outline and cue lines)
	began. You may have noticed that the subject learned to avoid very quickly after he had learned to escape -- This is typical of avoidance learning. It should also be noted that the behavior which leads to escape or avoidance of the aversive stimulus is strengthened in the process. It is thus reinforcing to escape or avoid the unpleasant situation.
The End	

Kansas State College
Instructional Television
Video-Tape Demonstrations
Department of Psychology and Counselor Education

Script

Demonstration Title LEARNING SET Number 5

Instructor Kenneth D. Keith Director R. D. Cummings

Approximate Length in minutes 8

VIDEO (Indicate major shots)	AUDIO (Outline and cue lines)
Preliminary credits	
Instructor	You have probably noticed that sometimes the solution to a difficult problem suddenly "comes to you" in what we often call a moment of insight. It may be confusing to attempt to explain such an event, because you may not be aware of previous learning or experience which could account for your behavior in this instance.
	Closer scrutiny of sudden solution or insight learning however, reveals that it is most often a carry-over or transfer of previously learned behavior, to a new problem. That is, past learning may be related to

VIDEO (Indicate major shots)	AUDIO (Outline and cue lines)
	a new problem in such a way as to make its solution easier. This transfer is often called learning set.
	We are going to attempt to create a learning set in a subject to illustrate the effects of previous learning on problem-solving behavior. The problem is the Maier two-string test, and is arranged as follows: Two strings are suspended from the ceiling -- They are far enough apart so that both cannot be reached at the same time. The subject is instructed to tie them together.
	Obviously, this is impossible unless some type of aid is employed.
Pliers (zoom)	Notice, however, that a pair of pliers has been left in the room near the strings. If the subject were to tie the pliers to one of the strings in pendulum fashion, the problem could be solved easily by swinging the plier pendulum, grasping

VIDEO (Indicate major shots)	AUDIO (Outline and cue lines)
	the other string, and catching the pendulum on its return swing.
Instructor	We have asked two subjects to memorize a list of words. The first subject was given a list of words unrelated to the two-string problem. The second was given a list containing words such as "pliers" and "pendulum," which relate directly to the problem.
	We will now allow both subjects to attempt to solve the problem. If the word list given to subject number two is sufficiently pertinent to the conditions of the two-string task, we might expect to see a quick solution, as opposed to the random trial-and-error behavior which subject number one is likely to emit. Both subjects will be allowed to work for two minutes.
Stop	
Shoot sign -- "Subject 1"	
Subject 1	(Let subject work for about two minutes)

VIDEO (Indicate major shots)	AUDIO (Outline and cue lines)
Shoot sign --"Subject 2"	
Subject 2	(Let subject work for about two minutes)
Instructor	We have seen here, in a very simple case, how previous related learning can lead to the type of behavior which we typically call "insight." Our first subject, whose prior learning task was unrelated to the task at hand, was unable to solve the problem in the allotted time. Subject number two, on the other hand, was apparently able to utilize her previous learning to good advantage in the new situation. Previous experience enabled her to <u>learn how to learn</u> on the new problem -- This is a learning set.
<u>The End</u>	

Kansas State College
Instructional Television
Video-Tape Demonstrations
Department of Psychology and Counselor Education

Script

Demonstration Title DISTRIBUTION OF PRACTICE Number 6

Instructor Kenneth D. Keith Director R. D. Cummings

Approximate Length in minutes 12

VIDEO (Indicate major shots)	AUDIO (Outline and cue lines)
Preliminary credits	
Instructor	One of the significant problems involved in human learning is that of determining the most effective means of practicing. Is it more efficient, for example, to study for a test in long, intensive sessions, or would several shorter sessions be more effective? And which type of practice is most beneficial for the learning of motor skills?
	These questions are answered by the rule of distribution practice. If practice is taken in fairly short intervals with relatively frequent rest periods, the practice is said to be distributed. On the other

VIDEO (Indicate major shots)	AUDIO (Outline and cue lines)
	hand, long practice sessions with little or no rest are said to constitute massed practice. The general rule of distribution of practice states that short working periods with frequent rest periods lead to more effective learning than do periods of massed practice.
	Generally speaking, this rule has been shown to hold for nearly all types of human learning -- making it one of the most widely applicable laws of learning. A common device
Mirror Apparatus	for the demonstration of the rule of distribution of practice is a mirror tracing apparatus. This standard laboratory instrument has been used in a variety of experimental studies. The subject's task is to trace, by looking in a mirror, a pattern which is attached to the board. A metal shield prevents the subject from looking directly at his

VIDEO (Indicate major shots)	AUDIO (Outline and cue lines)
	hand or the pattern; yet, it does not interfere with his hand and arm movements. One of the common patterns
Zoom on design	which is used is a star-shaped figure which is made up of two sets of lines approximately a quarter of an inch apart. The subject has to trace between the lines with a pencil without touching the sides of the star. As learning progresses, subjects become able to trace the design more and more quickly.
Instructor	Today we will attempt to demonstrate the different effects of distributed and massed practice upon speed of learning in mirror tracing. We have four subjects who have been divided into two pairs on the basis of approximately equal initial ability at mirror tracing. Each pair will be given five trials on the mirror tracing problem. The first pair will be given a one-minute rest period at

VIDEO (Indicate major shots)	AUDIO (Outline and cue lines)
	the end of each trial. This, of course, is distributed practice. The second pair of subjects, upon finishing each trial, will be required to begin another with no rest. In other words, the second pair will be taking massed practice. After the five trials, the time required for each subject to complete each trial will be recorded. We would expect more rapid performance from all subjects after a few practice trials -- This is simply a function of learning. What we are most interested in however, is which subjects improve more quickly -- those with distributed practice, or those who have massed practice?
Stop	
Shoot sign -- "Distributed Practice"	(Run distributed trials.)
Stop	
Shoot sign -- "Massed Practice"	(Run massed trials.)
Stop	

VIDEO (Indicate major shots)	AUDIO (Outline and cue lines)
Data sign	As we may see here, the average time required for completion of the first trial by the subjects with distributed practice was sixty-five seconds, as compared with sixty seconds for the subjects with massed practice. On the third trial, the mean time for the subjects on distributed practice was thirty-five seconds, while those on massed practice required thirty-eight seconds. By the end of five trials, subjects on distributed practice were down to twenty-five seconds, whereas those on massed practice needed forty-three seconds to complete the trial.
Instructor	Of course, we have not run enough trials, or sessions of sufficient length, to make the differences between massed and distributed practice seem as dramatic as they might be over a longer period of time. The general rule holds however: It is

VIDEO (Indicate major shots)	AUDIO (Outline and cue lines)
	more important to have short practice periods with fairly frequent rest periods than to have long, intensive practice periods with little or no rest. This principle has many practical applications. Studying and verbal learning are among the most important for college students.
The End	