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The Effects of Teaching Methods, Experimental Procedures, Grading, and Exam Frequency on the Academic Performance of Students in Higher Education

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THE EFFECTS OF TEACHING METHODS, EXPERIMENTAL PROCEDURES, GRADING, AND EXAM FREQUENCY ON THE ACADEMIC PERFORMANCE OF STUDENTS IN HIGHER EDUCATION

by

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ABSTRACT

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by

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Utah State University, 1973

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The purpose of this study was to demonstrate a new approach in the analysis of teaching procedures, and show the importance of certain variates on the academic performance of college students.

Objectives

The objectives of this study were threefold:

1. To determine whether an ABA approach (definition on page 19) can be used effectively to identify relevant variables influencing college student's academic performance.

2. To determine the influence of grading and exam frequency on achievement in college.

3. To compare the effectiveness of a lectureless go-at-your-own-pace teaching procedure and lecture procedures on student performance as measured on a final exam and a six month retention test.

Method

Experiment One. Using an ABA reversal procedure in a Latin square design 253 students were rotated through testing conditions to determine the effects of grading and exam frequency on college students academic performance. The four testing conditions were: (a) weekly exams given which counted towards the student's grade, (b) weekly exams given which did not count toward their grade, (c) monthly exams which counted, and (d) monthly exams which did not count. An analysis of the results with respect to the students' grade point average was also carried out.

Experiment Two. Three classes of introductory psychology were used in an interclass comparison. Each class was exposed to a different teaching procedure. Daily lectures with a monthly exam were used on the first class. Daily lectures with weekly exams were administered to the second class. The third class attended no lectures, took oral and written exams on each chapter when they felt ready for them, had to master one chapter before progressing to the next, and received immediate feedback on their test results. All three classes were also given a retention test six months later. Students performance on both the final exam and retention test were compared.

Results

Experiment One. Grading was found to significantly influence students academic performance (p .05). Though exam frequency had a consistent and systematic effect on performance, its effect was not found statistically significant. It was also noted that both variates influenced students of all grade point average ranges to the same degree rather than differentially helping only certain grade levels.

Experiment Two. It was found that the students in the go-at-your-own-pace group outscored both lecture classes on the final exam and six month retention test.

Conclusions

The following conclusions are drawn from the results of research conducted for this report.

1. The lack of differential effects in past comparative studies is due to the fact that the students' academic behavior was not differentially influenced.

2. Intraclass analytic procedures can be employed which are more sensitive than the interclass comparisons employed in the past.

3. Instructors can use grading to strongly influence college students of all grade point ranges to perform better.

4. Two things future research in college teaching should include are: (a) more sensitive experimental

procedures, and (b) a change in the variates analyzed. A stronger look should be taken at what behavioral contingencies the course includes rather than only what the teacher does in class.

5. It is suggested that higher education should direct itself to more contingent systems of instruction rather than shifting to more self-controlled learning situations.

(127 pages)

Chapter 1

INTRODUCTION

The Problem

In 1932 H. P. Longstaff reviewed the research on comparative teaching methods and noted: "The experimental evidence submitted at the present time tends to support the general conclusion that there is little difference in achievement in large and small classes; and also, that it makes little difference as to what method of presentation of the materials of the course is used."

Longstaff's conclusion was met with strong disapproval from higher education. Education has traditionally maintained the ideological conviction that student achievement could be influenced to varying degrees by different teaching methods. In the Between World Wars period education was particularly entrenched in this position that different teaching situations brewed different results in the students.[1] It was a period in which psychology gave special emphasis to individual differences and the need for designing education opportunities to emphasize and realize the differing potential of

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[1]Dubin, R. and Taveggia, T. C., "The Teaching-Learning Paradox," University of Oregon Press, Eugene, Oregon, 1969, p. 14.

individuals. There was a strong push for smaller student-faculty ratios which would enable instructors by means of small classes to employ informal, student-centered instructional methods which would be more compatible for maximizing the potential of students with different talents and abilities.

Though Longstaff's review was alarming, it did not dispel the educators' belief because they felt the amount of research up to this time was too meager and unsophisticated to draw any valid conclusions. There was dominant assumption at that time that a "scientific methodology" (just getting started in the field of education) could be applied to the analysis of comparative teaching methods which, over the next few decades, would identify the superiority of one or more teaching procedures over all the rest. It was assumed that by carefully employing experimental controls, the contrast between two or more teaching methods could be objectively ranked; it was only a matter of time.

The assumption was apparently too optimistic; for no conclusion of a superior teaching procedure can be drawn after five decades of educational research (Dubin and Taveggia, 1969; McKeachie, 1970). Wolfle summarized the research up to 1942 by simply repeating Longstaff's statement as did Birney and McKeachie (1955) over ten years later. The conviction that tutorial and small group situations were most effecacious for college-level

instruction was very strong, however, and led to continuing studies and experiments to demonstrate that this was, in fact, a scientifically grounded conclusion. The experimental evidence, however, did not support the utility of any one method over another.

In 1969 Dubin and Taveggia reviewed the literature and emphatically claimed, "The results of our intense reanalysis of data on comparative college teaching methods makes it clear that our intended goal has been achieved. We are able to state decisively that no particular method of college instruction is measurably to be preferred over another, when evaluated by student examination performance."

In a 1970 review, McKeachie stated, "The results presented in this paper substantially support their (Dubin and Taveggia) conclusion that so far as performance on course examinations are concerned, there is no strong basis for preferring one teaching method over another."

After five decades of obtaining the same results it is not surprising that educators began seeking new directions and guidelines in teaching technology. Different conclusions have been drawn by various educators as to which direction the analysis of teaching should take. Dubin and Taveggia suggest the fruitful direction of further analysis would be to examine the learning process per se much closer.

Some (e.g. Highet, 1965) believe the research demonstrates that the learning-teaching process is an art,

not susceptible to scientific analysis. Some (e.g. McKeachie, 1970) believe that this scientific approach to learning is appropriate, but that the complex interaction of relevant variables makes the analysis too difficult. Others (e.g. Wolfe, 1968) propose we remove many classroom contingencies such as grading. They feel the data demonstrate a student's accomplishments are determined mainly by his own ability and only slightly by classroom procedures.

Another major result from the fifty years of showing no method superior is the opinion of many educators that the answer lies in moving away from a strong input-output analysis of specific classroom variable effects to a much more global systems type of analysis such as contract teaching and nongraded curriculums with more attention towards attitudes of the students about the courses they take.

The Need for Future Research

Although there is wide disagreement as to the reasons why educational research has not demonstrated differential effect of various instructional procedures, most educators agree on two points. First, much more research should be carried out. In 1964 J. W. Powell stated, "The activities of teaching, learning and examining in higher education have received remarkably little attention from experimentalists. The suggestion that belief, however hallowed, stands in need of empirical

support is often met with incredulous opposition, and men whose academic work is based upon rigorous testing of accepted ideas, tend to think it somehow indecent to apply the same standard of inquiry to their own teaching and examining practices."

The second point (and the central theme of this study) deals with the direction and quality of research. McKeachie (1970) reviewed teaching methodology studies and emphasized the point that not only more, but better research was necessary. His comments supported those made by Dubins and Taveggia two years earlier. In 1969 they wrote a book called The Teaching-Learning Paradox. The emphasis of that book centered around the fact that for forty years researchers have been comparing teaching procedures with very little, if any, variation in their approach to the problem. Unfortunately no new analytical approaches came forth over the years. Year after year studies continued to employ the same intergroup, single measure comparisons. The reason was not the lack of an alternative experimental approach, however.

Over the past twenty years Division 25 of the American Psychological Association and its forerunners have made two major and strongly interrelated contributions to psychology. First, it presented a new and somewhat different approach to analyzing behavioral relationships. With this approach (commonly referred to as an ABA procedure) intrasubject and intragroup comparisons are

employed in conjunction with the systematic application and removal of variables. This is done in an effort to establish a relationship (if any) between the manipulated variable and the changes in behavior.

The application of these procedures produced the second contribution--the derivation of learning principles previously unattended to. Behavioral contingencies such as schedule effect were laid bare which had been overlooked with the more traditional experimental approach.

Equipped with his procedural tools, behavior principles and M & M's, the radical behaviorist was invited into almost every applied setting; and repaid his host with rewarding results. These settings include mental institutions (Ayllon, 1963), nursery schools (Homme et. al., 1963), social settings (Cohen, 1962), self-control and counseling situations (Goldiamon, 1965), industry (Hughes and McNamara, 1961), physiology (Heath, 1963), detention homes (Phillips, 1968), and the home (Hawkins, et. al., 1966).

In the higher educational settings, however, researchers have apparently been reluctant to employ these analytical procedures. One would be hard pressed to find a publication which employed an ABA procedure on a large class of college students. Research on college teaching has, however, employed behavioral principles and demonstrated their effectiveness in this setting (Keller, 1968; Ferester, 1968; McMichael and Corey, 1969; Sheppard and

MacDermott, 1970; Johnston and Pennypacker, 1971; Born et. al., 1972; Alba and Pennypacker, 1972). The procedures employed in these studies, however, were generally single measure comparisons (e.g. scores on final exams) between two or more different classes. The experimental design was basically an interclass comparison; the same procedure employed in almost every study carried out on teaching techniques for the past five decades. In none of the aforementioned studies was an ABA procedure used.

Purpose of the Study

There were four main purposes of this study. The first was to determine whether an ABA procedure could be productively employed in an applied educational setting with a large (over 100) number of students. The second was to determine whether grading and exam frequency had any effect on student performance. The third was to determine whether exam frequency and grading differentially influenced students having different grade point averages (GPA). The fourth was to see whether a teaching procedure involving no lectures and allowing students to go at their own pace would be more effective than lecture procedures. As previously mentioned a number of studies have employed go-at-your-own-pace procedures, but all of them also contained lectures in some form. In addition it was desired to determine whether differential effects would last. Students experiencing different teaching procedures were compared not only on the final exam, but also on a six

month retention test.

In order to accomplish all four objectives two separate experiments were carried out. Experiment One dealt with the first three objectives. An ABA procedure involving an intragroup comparison and reversal of treatments was used to determine the effects of grading and exam frequency on the academic performance of college students. Experiment Two involved the fourth objective. Students in three different classes were compared on a final exam and a six month retention test. Students in the go-at-your-own-pace attended no lectures, but were required to take both an oral and written exam over each text chapter. One of the lecture classes gave weekly exams while the other gave monthly exams.

Chapter II

REVIEW OF LITERATURE

Historical Background of Comparative Research

The history of research efforts to identify superior teaching procedures began in the period just following the first world war. In 1922 Edmundsen and Mulder carried out an experiment comparing the effectiveness of instruction in large (lecture) and small (discussion) classes in education at the University of Michigan. After evaluating the results the authors note ". . .results in terms of semester averages indicate no appreciable differences in the achievement of the large and small class included in this study" (p. 12). Reviewers (Dubin and Taveggia, 1969; McKeachie, 1970) of teaching techniques claim this to be the first comparative study carried out. Though most educators strongly disagreed with the results, Edmundsen and Mulders study was a preview of the results which would come over the next forty years. R. B. Spence and G. B. Watson like many other educators felt the discussion had to be a more effective teaching procedure than lecture. As a result of their strong feelings they carried out a study (1928) to demonstrate that Edmundsen and Mulders results were incorrect. As is evident in the

following excerpts from their study, they did not demonstrate superiority of the discussion procedure.

> The present experiment is one of the attempts which Dr. Goodwin, B. Watson and the author have made to secure better results from the teaching of Educational Psychology. The lecture method did not seem to recommend itself as wholly desirable and yet, as it is such a common type of teaching, it certainly was desirable to compare other plans with it. The experiment, therefore, sets out to compare the lecture method with a plan involving class discussion. (p. 454)
>
> . . .We can only conclude that for two large (N = 120 - 170) sections of graduate students in Educational Psychology, meeting once a week for two hours, with little previous experience of feeling in favor of the discussion method, the lecture method is superior to the discussion method in producing improvement in tests. (p. 461)

With the addition of the second study showing the same results as the first more instructors carried out studies of their own, not believing the results showing traditional (lecture) teaching methods to be as effective as any modern (discussion) course. In 1929 Barnes and Douglas stated:

> This study was planned and carried out with a view to throwing some light on the question of the value of quiz sections (discussion method) in the teaching of history. Two sections of 1927-28, one meeting three times a week for lectures and once a week in small groups. (p. 282)
>
> . . .We were led to a conclusion contrary to all expectations--namely, that the added hour a week devoted to quiz sections had no significant value. (p. 282)

In 1932 the Department of Psychology at the University of Minnesota decided to investigate the relative utility of lecture-quiz and all lecture methods of instruction on students enrolled in their introductory course. They noted the following conclusions:

> In the view of the available experimental evidence and the increasing problems brought about by quiz sections, the Department of Psychology decided to conduct a controlled investigation to ascertain, if possible, the relative merits of the lecture-quiz and all-lecture method. (p. 33)
>
> From the . . . findings we may conclude that under the conditions surrounding this experiment, there is no difference in the value of the two methods employed. (p. 48)

By 1940 the results began to be recorded into textbooks on college teaching. Cole reported the following:

> Insofar as mere mastery of elementary subject matter is concerned, the lecture method is as good as any other. The results are sometimes almost identical for the lectures and discussion classes, and often appreciably in favor of the lecture classes. (p. 324-325)

In the late 1940's a conflict arose between administrators and instructors over the efficiency of instructional techniques. On the one hand great pressure was being exerted on the administrators of institutions of higher learning. Society strongly emphasized the importance of education and demanded more people should be admitted. On the other hand educators insisted quality of instruction would decline. The group dynamics movement had a strong influence on education at this time. The college doors were open and large numbers of students flowed in. To empirically substantiate their argument that the mass education movement should be reversed, educators carried out more comparisons. The comparisons (though still over lecture and discussion) were now termed directive vs. non-directive teaching methods. Asch's (1951) study indicated the type of results obtained:

> The aim of this study was to evaluate the overall effectiveness of non-directive teaching of an undergraduate course in general psychology as compared to the traditional lecture-discussion. (p. 19)

> The results of this phase of the experiment indicate that non-directive teaching, as outlined in this study, is not as effective as the traditional teaching techniques in helping students master the factual subject matter of a course in general psychology as measured by an examination based on knowledge of textbook material.

Husband (1951) also carried out a study in an effort to show mass education to be inferior. He concluded:

> The present investigation was originally undertaken as a local report to the department and the administration to see how well or how poorly students exposed . . . to impersonal, mass, education might do. (p. 298) The main results were as follows: The lecture sections averaged for the six quarters three points higher than the small classes, with superiority appearing five quarters out of six, and the sixth coming out a tie. In no case did the smaller group earn a higher course level. (p. 299) In spite of all . . . arguments in favor of large lecture sections, which are largely based on statistics on grade-point earnings, the writer must admit that he is not 100 percent convinced of the efficiency of such "mass education." (p. 300)

It is important that Husband could not bring himself to believe the results. Most educators, however, had the same attitude. In fact, Spence displayed the same reaction by trying to explain that each procedure has its unique advantage in different conditions:

> The problem that must be solved is not the question, "Is Method A better than Method B or Method C?" but rather, "What are the conditions under which Method A produces most effective results? What are the situations where Method B is best?, etc." There are times when the lecture method is an effective aide in securing desirable

> changes in students. There are other times when the lecture method is harmful and should be replaced by discussion or individual projects or something else. (p. 462)

Unfortunately, he did not identify under what conditions each method was superior.

In 1954, Guestakov, Kelly and McKeachie carried out an inter class comparison of three teaching methods:

> . . . the design may be stated in the null form: There will be no significant differences in outcome with respect to course objectives between students whose class meetings are taught by Method 1 (recitation-drill) and those students who are taught by Method 2 (group-discussion) or by Method 3 (tutorials). (p. 195)
>
> By and large, we found no difference between the three teaching methods from the point of view of educational outcome. The few statistical differences, in general, favored the recitation-drill method. The results of the experiment, of course, were contrary to our original expectations. They constitute a clear confirmation of the general conclusions derived from experiments on instructional procedures since the early 20's. As Good recently put it, after reviewing the literature in this area, "The complexity of the teaching-learning process is such that attempts to establish the relative merit of a 'general method' of teaching are likely to prove inconclusive." (pp. 205-206)

Eight reviews of research on teaching methodology were carried out from 1932 to 1955, (Longstaff, 1932; Monroe and Marks, 1938; Underwood, 1939; Wolfle, 1942; Ruja, 1952; McKeachie, 1954; Axelrod, 1955; Birney and McKeachie, 1955). Birney and McKeachie summed it up well when they noted:

> Teaching Methods: Summary. In 1942, Wolfle summarized research up to that time by repeating Longstaff's statement of 1932: "The experimental evidence submitted to the present time tends to support the general conclusion that there is little difference in achievement in large and small classes and, also that it makes little difference as to what method of

> presentation of the materials of the course is used here." The third decade of research has not outdated Longstaff's statement. However, recent research does hold forth the promise that in the next decade we will have a better understanding of the effect of various teaching methods on student learning. (p. 58)

After 30 years, then, the results remained the same: no significant difference between teaching techniques. Also the conclusions remained the same: "No significant results so far, but next year we'll find out which one is better!"

Another 15 years passed, however, with the verdict remaining the same. Dubin and Taveggia (1969) reviewed all the comparative studies since Edmundsen and Mulder. Their conclusion was: "The results of our intensive reanalysis of data on comparative college teaching methods makes it very clear that our intended goal has been achieved. We are able to state decisively that no particular method of college instruction is measurably preferred over another, when evaluated by student examination performances." (p. 10).

The results, then, after 45 years of research are summarized in Table 1. Studies have compared lecture vs. discussion, lecture vs. lecture-discussion, and lecture vs. independent study with the results still showing no superiority. Note that all of the studies were intergroup comparisons in which only one measure was taken from each student, his score on the final or mid-term exam.

In 1970, McKeachie reviewed the literature for studies which evaluated students on attitude, motivation, and critical thinking besides factual knowledge (final

Table 1

A Summary of Comparative Teaching Studies Since 1923

Lecture versus Discussion	N	Percentage
Studies Favoring Lecturing	45	51.1
Studies Favoring Discussion	43	48.9
Studies Showing no Difference	0	0.0
Total	88	100.0

Lecture versus Lecturing plus Discussion	N	Percentage
Studies Favoring Lecture	3	37.5
Studies Favoring Lecture-Discussion	4	50.0
Studies Showing no Difference	1	12.5
Total	8	100.0

Supervised Independent Study versus Lecture	N	Percentage
Studies Favoring Independent Study	24	48.0
Studies Favoring Lecture Type Instruction	26	52.0
Studies Showing no Difference	0	0.0
Total	50	100.0

Supervised Independent Study versus Discussion	N	Percentage
Studies Favoring Independent Study	5	71.4
Studies Favoring Discussion	2	28.6
Studies Showing no Difference	0	0.0
Total	7	100.0

Table 1 (continued)

Supervised Independent Study versus Lecture-Discussion	N	Percentage
Favoring Supervised Independent Study	11	47.8
Favoring Lecture-Discussion	12	52.2
No Difference	0	0.0
Total	23	100.0

Unsupervised Independent Study versus Lecture-Discussion	N	Percentage
Favors Unsupervised Independent Study	15	60.0
Favors Lecture-Discussion	10	40.0
No Difference	0	0.0
Total	25	100.0

Supervised Independent Study versus Unsupervised Study	N	Percentage
Favors Unsupervised Study	3	25.0
Favors Supervised Study	9	75.0
No Difference	0	0.0
Total	12	100.0

exams). Though optimistically claiming we know a lot more than we did twenty years ago about effective teaching procedures, he conceded in his conclusion that we still haven't solved the problem.

The Problem of Procedure

As previously noted educators would not accept Edmundsen and Mulders' results. One after another they set

out to prove that different teaching methods would produce different student results. Each would employ the same basic experimental design. Two classes would be selected (or one class divided in half) with one experiencing one procedure for the term while the other experienced a second procedure. Study after study was carried out with the results reaffirming those of the Edmundsen study. Though the results were questioned by almost everyone, not many were concerned about the procedures used. There were a few researchers, however, that did believe that better designs could be employed which would be more effective. McCall raised the issue on adequate procedures and argued that educators were engrossed in the statistical analysis of the research to such an extent that little attention was actually given to the procurement of subjects and application of experimental procedures. In 1923, he wrote a book entitled How to Experiment in Education. In the preface he noted, "There are excellent books and courses of instruction dealing with the statistical manipulation of experimental data, but there is little help to be found on the methods of securing adequate and proper data to which to apply statistical procedures." He suggested many different types of designs including the latin square which educators could use other than the basic two-groups comparison. Unfortunately Fisher's Statistical Methods for Research Workers was published at about the same time so McCall's emphasis on procedures was overshadowed, and

little interest was generated with respect to procedures.

The question of procedure was not significantly questioned for almost 35 years. In 1958 the issue was again raised by the Bureau of Institutional Research at the University of Minnesota. They concluded:

> "Undoubtedly the most striking finding of this review is the consistent inability of investigators to demonstrate statistically significant differences between the experimental and control methods of teaching. This seemed to hold true regardless of the subject field or class size being examined. In the few studies that did suggest significant findings the differences were generally small and of doubtful practical significance. Unfortunately the finding of no significant differences does not legitimately allow one to conclude that differences in teaching efficiency are not related to method and/or class size. Rather, the fact that essentially none of the investigations have been able to demonstrate practical differences suggests that some careful examination of the experimental methodology and evaluation procedures may be in order."

In that same year Nachman and Opochinsky also began to suspect that methodology rather than the variables being manipulated might be the problem.

> Reviews of teaching research have consistently concluded that different teaching procedures produce little or no difference in the amount of knowledge gained by the students. This same conclusion has been reached despite the fact that experimenters have employed a wide variety of independent variables, such as lecture versus small classes, various types of TV classes, etc. These results are surprising if one considers that much of the research was instigated by the hypothesis that differences would be found. Furthermore, it appears as if most educators still assume that classroom techniques do in fact have specific effects. Why then have differences not been found? The purpose of this paper is to examine an alternative hypothesis, namely, that the different teaching methods have, in fact, produced differential amounts of learning but that these effects have been masked in the measurement process.

In 1964 Powell reviewed the literature and emphasized the fact that educators were not as serious as they should be in their research on teaching. He argued that instructors did not employ the same rigorous procedures for evaluating their teaching problems as they did in their personal research activities.

Campbell and Stanley (1970) argued though statistical analysis has been continually advanced over the last fifty years little has been done on the problem of data collection put forth by McCall in 1923. They said, "While the impact of the Fisher tradition has remedied the situation in some fundamental ways, its most conspicuous affect seems to have been to elaborate statistical analysis rather than to aid in securing adequate and proper data."

Application of ABA Procedures in Applied Settings

Just about the same time the Bureau of Institutional Research was arguing for the development of new procedures for studying teaching techniques the groundwork was being laid for a somewhat new approach to the analysis of behavior in applied settings. In 1960, Murray Sidman published a book entitled Tactics of Scientific Research which explains this new experimental approach. The philosophy of this approach is quite different from the Fisher tradition and difficult to define in a few specific rules. Basically, however, it differs in that the new approach advocates a much stronger "intra" type of comparison rather than an

"inter" comparison. With this approach specific subjects or groups of subjects experience a number of conditions. Generally the procedure involves three main conditions: (1) measurements of the subjects before the independent variable (IV) is applied, (2) repeated measurements of the subjects while the (IV) is being applied, and (3) repeated measurements of the subjects with the IV removed. This is in contrast to the usual procedure of giving the IV to one subject (or group) not giving it to another, and comparing the scores. The ABA procedure gets its name from A = no IV, B = IV applied, A = no IV.

An example of the ABA approach would be the following situation. One day the author and a school principle were discussing some of the problems encountered in special education classes. The issue was what could a teacher do with a child in class who did not want to interact. The principle argued little could be done by the teacher because it was the result of a deep seated emotional problem of the child. The author argued it was more probably a function of the child not finding interaction to be rewarding. To demonstrate the point an experiment was carried out on a 13 year old girl enrolled in a special education class. The first step involved measuring how much she "normally" interacted with other children. For 30 minutes each day the amount of time she even looked in the direction of another student in class was recorded for five consecutive school days. This would be defined as

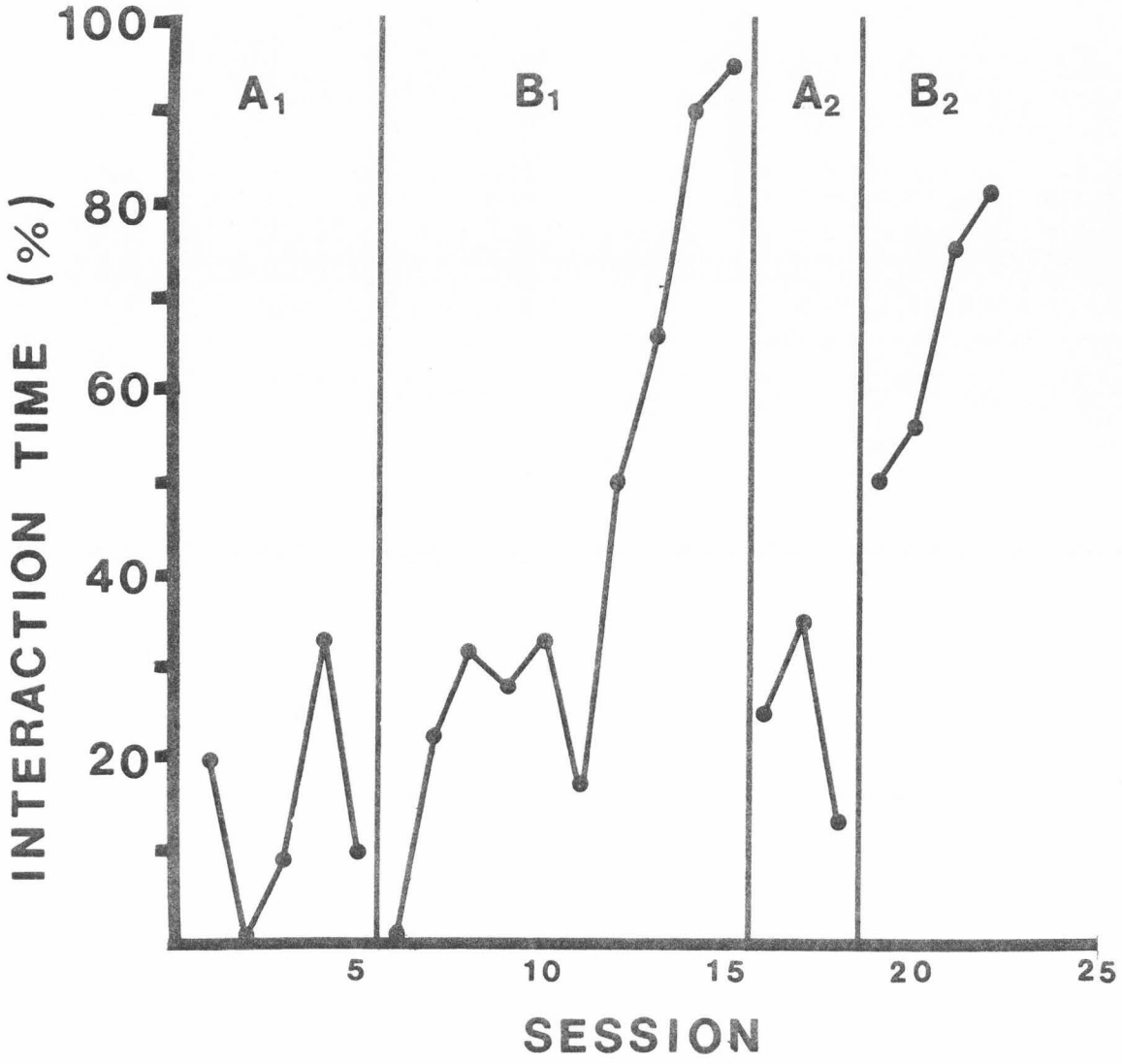

Fig. 1. Percentage of time socially interacting with classmates.

her baseline (normal rate) of interaction (A_1 on Figure 1). It was noted that she had a flip top desk and that most of the time she had the top up and appeared to just fiddle with the various objects (pencils, erasers, etc.) in it. Using teacher attention as a reinforcer (IV) the girl was

originally rewarded for looking in the direction of other students, then walking toward them, and finally engaging in conversation. This was condition B_1 in Figure 1. After she was interacting at a high level the reinforcement for interacting was removed, condition A_2. Then the fourth condition, B_2, was added because the principle wanted the girl left interacting if possible.

In contract to the ABA approach, in the Fisher tradition a number of subjects with this problem would be selected. An inferential statistical analysis would then be carried out. The greater control of extraneous variables is apparent with the ABA procedure.

The ABA approach has been employed in almost every applied situation. The first application of these procedures in applied settings was done by Theodore Ayllon (1952) in a mental institution. One patient collected large numbers of towels from various rooms and stored them in her room. Ayllon employed a satiation technique to eliminate the behavior after obtaining a baseline on the number of towels she had in her room (approximately 20 each day). The first week after obtaining a baseline, the subject was given an average of seven towels daily and by the third week this number was increased to 60. During the first week the subject enjoyed the towels, but later she complained about all the towels. After three weeks of satiating her with towels, all the towels were removed.

During the next 12 months the mean number of towels found in her room was 1.5 per week. Homme (et. al., 1963) employed the ABA procedure for controlling the behavior of nursery children. Using the Premack principle he conditioned children to sit quietly and interact with the teacher using the opportunity to push the teacher around in his chair as a reinforcer.

Cohen (1962) used an ABA procedure to analyze social interaction situations. Using pennies and candy as reinforcers he evaluated the leadership roles in a family between peers, children and adults, brothers and sisters.

These procedures have also been employed in counseling. Goldiamond (1965) analyzed a marital situation in which a husband's sulking over his wife's one mistake of infidelity was causing a severe strain on the marital relationship. In this study he also analyzed the study behavior of a subject using behavioral procedures.

Hughes (1961) applied ABA procedures in industry. Aldis (1961) discussed the implications of its use in the business world.

Phillips (1968) demonstrated the use of this procedure on juvenile delinquents who were residents in a rehabilitation center. Using a token economy he dealt with swearing, personal hygiene, punctuality, studying, and correct speech. He demonstrated the ABA procedures were an affective tool in understanding behavioral relationships in this applied setting.

Behavior therapy employing ABA procedures has been very effective in the home setting. Hawkins (et. al., 1966) training of a mother to cope with her children's behavior is a good example. Peter, a four year old, exhibited a high percentage of tantrum behaviors. After establishing a baseline it was found that the application of extinction and differential reinforcement of other behaviors were effective variables for influencing childrens behavior at home.

From these studies it is apparent that ABA procedures can be effective tools in analyzing behavior in applied settings. However, nothing had been carried out in college classrooms using this approach.

Behavior Principles

Though ABA procedures have not been used on college classes, behavior principles have. Keller (1968) compared a Personalized System of Instruction (PSI) with a traditional lecture procedure. The main features of the PSI were:

1. Students were permitted to move through the course at a speed commensurate with their abilities and other demands upon their time. They could take chapter exams when they felt ready for them.

2. Students were required to master a chapter before they could advance to new material.

3. Lectures and demonstrations were vehicles of motivation rather than sources of textual information.

4. Immediate feedback on exams was given.

At the end of the semester students in PSI outscored the lecture group on the final exam. McMichael and Corey (1969) carried out a similar study on 880 introductory students. Not only did the PSI group outscore all three classes employing lecturing, but a student survey showed the students in the PSI class to have a much more positive attitude about the course.

Johnston and Pennypacker (1971) applied a modification of PSI to an upper level undergraduate course concerned with the principles of behavior. Each student of the class was assigned to a "manager" (a student enrolled in another course who had already taken this course and received an A). Lectures were given three out of the five class periods each week. Students came to their manager when they wanted to pass off a chapter. They took written exams but expressed the answers verbally to the manager. Student performance was stated to be quite high though no objective measures were taken and no comparison was made with any other teaching procedure. Later a comparative study was carried out (Alba and Pennypacker, 1972). Seventy-six students enrolled in a human development class were divided into an experimental and a control group. Both groups were given a pretest composed of fill-in and multiple choice questions. The control group was exposed to a lecture procedure while the experimental group had the manager system. Post test results showed

the experimental group performed better on both types of questions.

Born (et. al., 1972) carried out a comparative study of PSI and lecture-discussion procedures. Students enrolled in a course on learning were assigned to either a lecture section, one of two similar PSI sections, or a fourth section that rotated through all three procedures during the course. The fourth section was especially important for it was the only study found in which an intra-group comparison had been attempted on college students. Due to the smallness of the course, however, and procedural complications, Born (et. al.) could only conclude that this was a "possible" type of analysis which could be used to analyze teaching procedures. In comparing the other three sections the PSI sections performed best. An analysis of the data indicated the superiority of the PSI procedure seemed to come from raising the performance level of poorer students more than an overall performance increase of all students.

Effects of Grading on Student Performance

During the past 10 years a strong controversy has developed over the question of whether higher education should or shouldn't use grading procedures in the evaluation of students. Many authors argue that grading practices cause many problems such as text anxiety, cheating, and a set for failure. For example, Holt (1972) feels

grading students is "illegitimate and harmful". To Glasser (1969) the grading system is a hindrance to achievement due to the possibility of failure which a student may experience. Wolfle (1968) also suggested grading systems may be stiffling academic development and students should be allowed to choose whether they are to be graded or not. As a result, many universities have shifted to non-graded, pass/fail systems.

Recent surveys indicate the shift away from grading may have been a mistake. Quann (1971) investigated the results of 150 universities across the country which employed both graded and pass/fail enrollees compared with non-pass/fail students showed a large difference in better grades earned. Non-pass/fail students received five times more "A" grades and 50 percent more "B" than pass/fail students. Conversely, pass/fail students received almost two times as many "D" grades and over twice as many "F" grades.

Gatta (1971) found similar results with high school students enrolled in chemistry courses. Students in conventionally graded courses learned course principles and concepts to a greater degree than pass/fail students as measured by the achievement test for Chemistry: Experiments and Principles Series I. The conventionally graded students also achieved higher on principles and concepts as measured by the NSTA Cooperative Examination High School Chemistry Form 1969. Inferiority in attitudes of the pass/fail

students was also noted as measured by the Silance: Attitude Toward Any School Subject.

Walker (1971) analyzed the effects of Ohio University shifting to an ABC system from an ABCDF grading system. With the ABC system students received D and F grades but they were not to go on the students permanent record. The results were analogous to those of Quann and Gatta.

Effects of Exam Frequency on Student Performance

Jones (1923) is generally given credit for carrying out the first study on the importance of exam frequency on college students. At the end of each of the 27 lectures given during the term a short quiz was given. Students in this group outscored those in a control group which had only the final exam.

Turney (1931) carried out a similar comparison and obtained results supporting those of Jones'. Turney's experimental and control groups mean scores varied so much on the pre-test (3.6 SD), however, that his results have been termed suspect. Keys (1934) carried out an experiment like Turneys and also obtained essentially the same results. Keys included a comparison on retention which had not previously been done. He gave an unannounced examination covering the same material five weeks later and noted the average for the weekly group dropped from a 12 to 7 percent superiority. The results raised the question of whether or

not the advantage from exam frequency is only temporary.

Kirk Patrick (1934) found more frequent exams were more beneficial to students of lower ability in high school physics. Ross and Henry (1951) reported this to be true for college students also. They divided all the students into four quarters according to their grade point averages and found the lowest fourth to rise much higher on exams than the other levels when exam frequency was increased. Fitch (et. al., 1951) carried out an intergroup comparative study to determine the effects of monthly versus weekly quizes on 298 students enrolled in a course on government. Both experimental (weekly) and control (monthly) classes had three lectures per week plus optional discussion meetings. All students in both groups were enrolled in a prerequisite course in government given during the preceding semester. In that course weekly quizes were given to all the students. An analysis of covariance was carried out with the student's grade from the prerequisite course being the covariate. Students taking weekly quizes obtained grades significantly higher than students experiencing monthly exams. The average number of attendances at the optional discussions were also much higher for the weekly group, however.

Not all studies have shown more frequent exams to be most effective. Longstaff and Wilder (1937) obtained opposite results. Their results showed students experiencing weekly exams did not perform as well as

students given monthly exams.

Nelson (1970) compared a lecture section with only a midterm and final examination with two experimental classes--an oral interview method and a short exam method. Differences between methods were not statistically significant.

Chapter III

EXPERIMENT ONE

Method

Subjects

Two hundred ninety-nine students enrolled in an introductory psychology course during the spring semester of 1971 served as subjects (Ss). Any S who did not finish the course, or failed to take one of the four comparison tests, was dropped from the study. Twenty-two Ss dropped the course while 24 Ss failed to take at least one of the four comparison tests. This left 253 Ss on which the comparisons were made.

Procedure

On the first day of class the students were divided into four groups according to the first letter of their last name (Group I, A-F; Group II, G-L; Group III, M-R; Group IV, S-X). A course outline was distributed to all Ss stating the procedure to be followed during the term. Class was held for one hour every Monday, Wednesday, and Friday with attendance mandatory. Fifty minute lectures were given on Mondays and Wednesdays with written examinations administered on Fridays.

Two main aspects of testing were manipulated:

frequency of examinations (weekly vs. monthly) and the effect of the exams on the Ss grade (counted toward grade vs. not toward grade). The objective was to employ a procedure which would vary grading conditions during the study in such a manner that through its alternating application and removal the effect of grading on academic behavior could be demonstrated. The same was true for exam frequency. In order to accomplish this an ABA procedure was employed on each of the two variables. The two ABA procedures were superimposed in a latin square pattern so an intragroup comparison of both variables could be made concurrently. There were a total, then, of four different testing conditions: (a) weekly exam given which counted towards the S's grade, (b) weekly exams given which had no effect on the S's grade, (c) monthly exams given which did not count towards the grade, and (d) monthly exams given which counted towards the grade. Table 2 shows how the students were rotated through the four testing conditions.

The term was divided into four time periods, each terminated with the administration of the monthly exam, the first time period was actually three weeks long with each of the remaining three periods four weeks long.

During the first time period Group I Ss were given weekly, ten question, multiple choice answer quizzes which counted toward their grade; Group II was given the same weekly quizzes though they did not count toward their grade; Groups III and IV were excused Fridays and took no weekly

Table 2

Testing Schedule for all Four Groups, Showing Weekly Quizzes, Monthly Exams and Whether or Not They Counted Toward The Student's Grade

Week	Group I	Group II	Group III	Group IV
1	30 point count	30 point no count	NO TEST	NO TEST
2	30 point count	30 point no count	NO TEST	NO TEST
3	80 point count Exam #1	80 point no count Exam #1	80 point count Exam #1	80 point no count Exam #1
4	NO TEST	20 point count	20 point no count	NO TEST
5	NO TEST	20 point count	20 point no count	NO TEST
6	NO TEST	20 point count	20 point no count	NO TEST
7	80 point no count Exam #2	80 point count Exam #2	80 point count Exam #2	80 point count Exam #2
8	NO TEST	NO TEST	20 point count	20 point no count
9	NO TEST	NO TEST	20 point count	20 point no count
10	NO TEST	NO TEST	20 point count	20 point no count
11	80 point count Exam #3	80 point no count Exam #3	80 point count Exam #3	80 point no count Exam #3

Table 2 (continued)

Week	Group I	Group II	Group III	Group IV
12	20 point no count	NO TEST	NO TEST	20 point count
13	20 point no count	NO TEST	NO TEST	20 point count
14	20 point no count	NO TEST	NO TEST	20 point count
15	80 point no count Exam #4	80 point count Exam #4	80 point no count Exam #4	80 point count Exam #4

quizzes. At the end of the first time period, a forty-question multiple choice exam was given to all four groups. For Groups I and III the forty-question exam counted towards their grade; but for Groups II and IV it did not. During the second time period (weeks 4 through 7) Groups I and IV took no weekly quizzes, Groups II and III took weekly quizzes though they did not count for Group III. All four groups took a forty-question (80 point) exam at the end of week 7 which counted toward the grade for Groups II and IV, but not for Groups I and III.

As can be seen in Table 2, the testing conditions for each group changed during each time period in such a way that all four groups experienced all four testing conditions by the end of the semester. All questions used in the weekly and monthly exams were taken from the testing file supplied by the publisher of the course text, General

Psychology: Modeling Behavior and Experience, Dember and Jenkins. The four monthly exams were non-cumulative, testing only on the material covered during the ongoing time period. The behavioral measures used for this study's comparisons were the scores on the monthly exams. Weekly quiz scores were not evaluated.

An additional point of interest in the present study was whether grading and exam frequency differentially affected Ss with varied grade point averages (GPA). The cumulative GPA of each student was obtained from the Office of Records. Subjects were then categorized into one of three GPA groups (1.00-1.99, 2.00-2.99, 3.00-4.00).

Results

Both grading and exam frequency produced rather systematic and consistent effects on the students behavior. In Figure 2 the scores of all four groups were combined for each of the four testing conditions. Grading significantly influenced the academic behavior of the students ($p < .01$). With respect to grade distribution, students when in the test-counting condition averaged a little better than a "B" (3.2 on a 4 point scale with A = 4) while averaging a little worse than a "C" (1.6) in the test-no count condition.

Although the effect of exam frequency did not reach the .05 level, students consistently scored higher in the weekly exam condition than in the monthly exam situ-

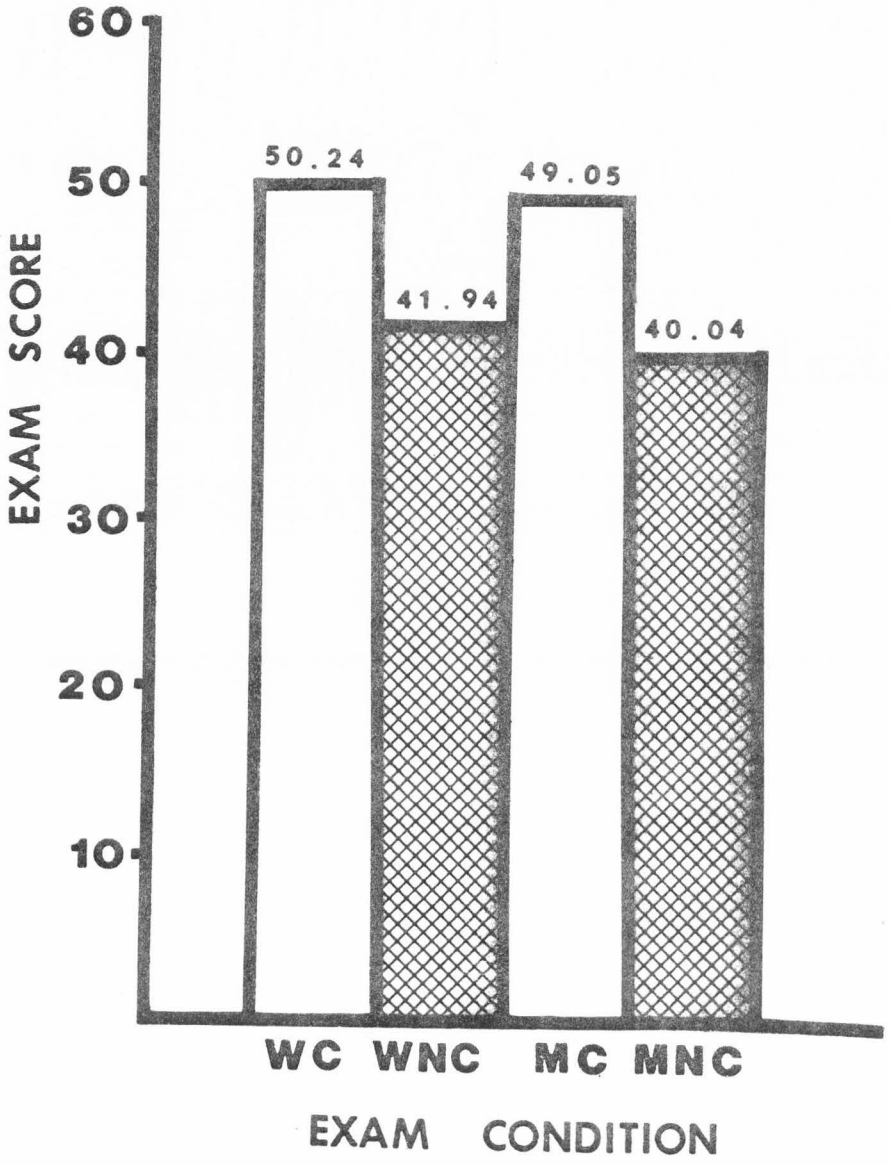

Fig. 2. Mean exam scores for all four groups in all four testing conditions. (WC--weekly exams given which count toward student's grade; WNC--weekly exams given which don't count toward grade; MC--monthly exams given which count toward grade; MNC--monthly exams given which don't count toward grade.

ation. Figure 3 shows the mean score for all four test-grade conditions in all four time periods of the study.

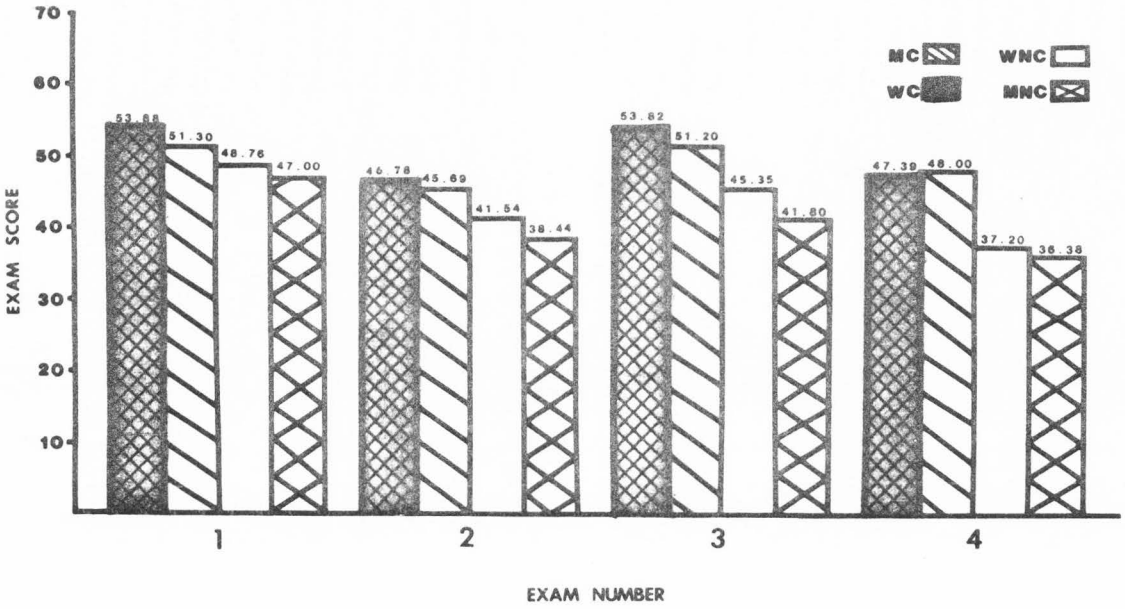

Fig. 3. Mean exam score of testing conditions on each of the four comparison examinations. (WC--weekly exams given which count toward student's grade; WNC--weekly exams given which don't count toward grade; MC--monthly exams given which count toward grade; MNC--monthly exams given which don't count toward grade).

In all comparisons of weekly vs. monthly testing except for WC vs. MC on the fourth monthly exam students scored higher when given exams weekly rather than monthly.

Figures 4 and 5 present the effects of grading and exam frequency on students according to their GPA.

Both variables were found to influence students of all GPA levels rather than differentially affecting certain ones. Again exam frequency significance was not above the .05 level, though its effects were consistent.

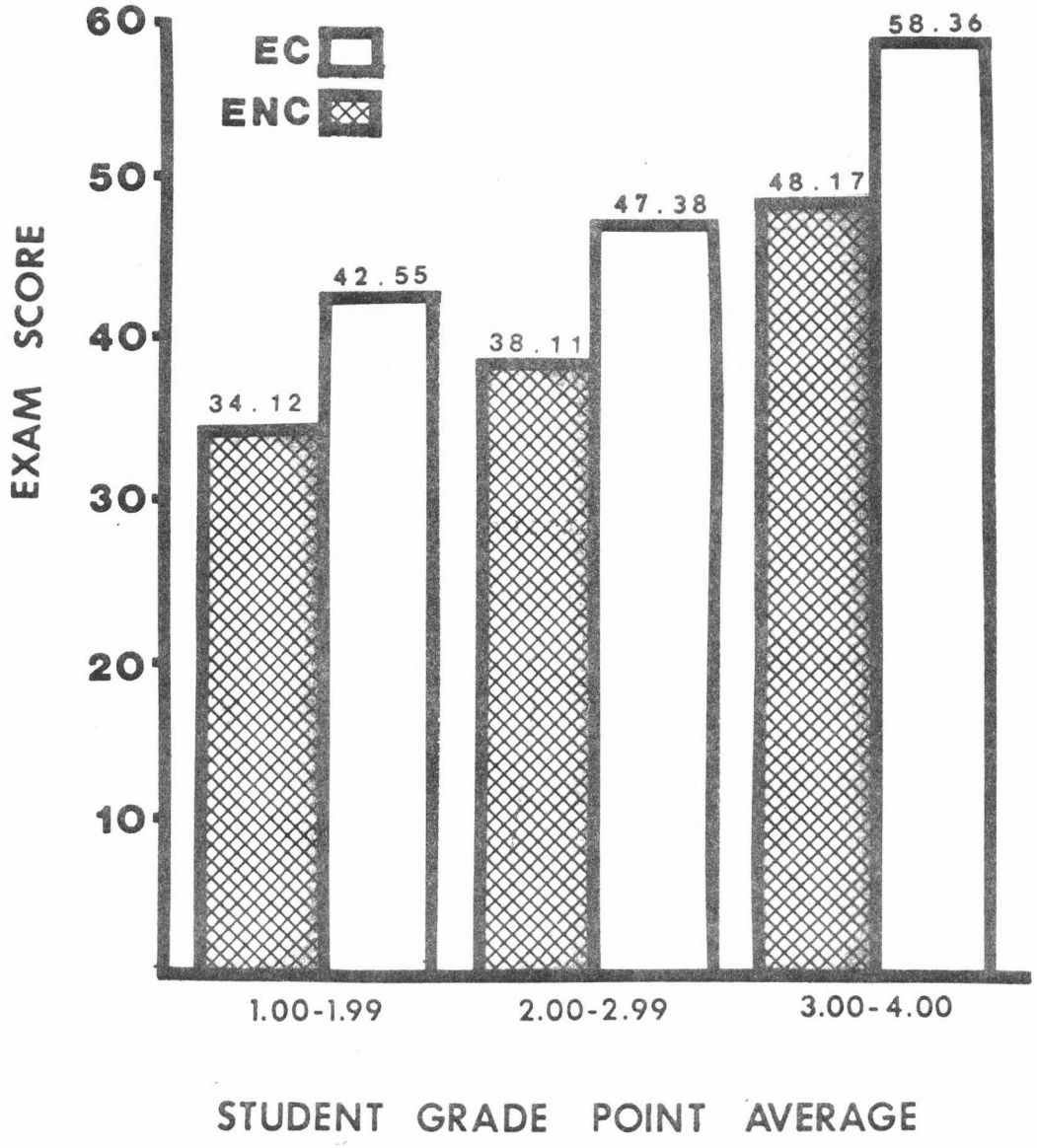

Fig. 4. Mean exam score for each of the three grade ranges in exam count (EC) conditions and exam no-count (ENC) condition.

Discussion

It has been suggested that grading has either no effect on academic behavior at all, or that it differentially reinforces high achievers while selectively

punishing under achievers (Wolfe, 1968; Cronbach, 1963). Though this idea may be true at others levels of education, it is not supported in this study with respect to the

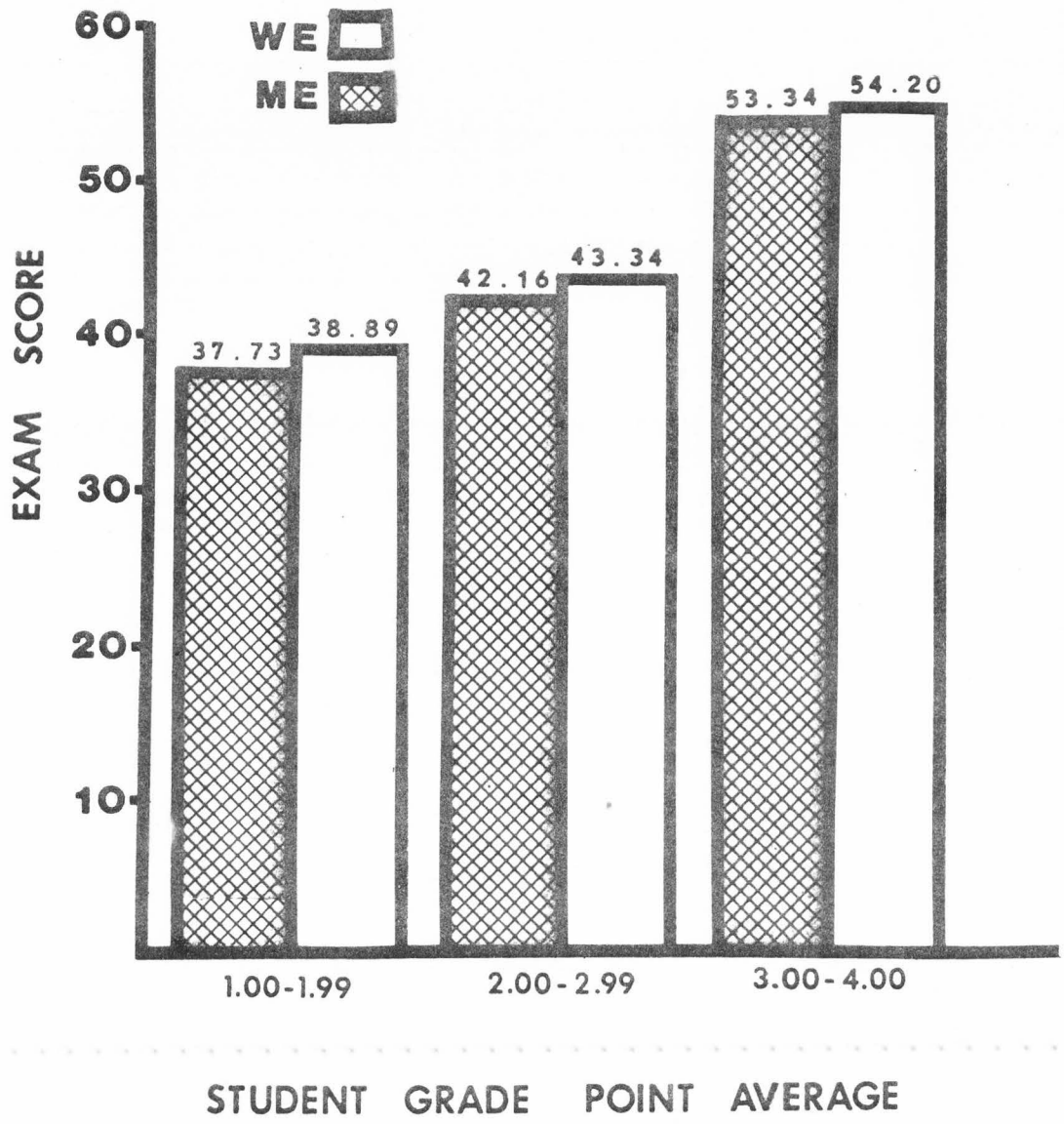

Fig. 5. Mean exam score for each of the three grade ranges with respect to whether exams were given weekly (count plus no-count) or monthly (count plus no-count).

undergraduate university level. In fact, it indicates grades can be employed as effective reinforcers for students of all achievement levels. Students were found to do better when grading was employed, regardless of their GPA. In none of the GPA ranges analyzed did grading have a negative or neutral effect on the student's performance.

Though exam frequency did not reach .05 level of significance, it consistently influenced classroom performance. On each of the four examinations given during the study there were two possible comparisons from which to draw conclusions (weekly no-count vs. monthly no-count, weekly count vs. monthly count). Of the eight comparisons shown in Figure 3, seven show students doing better when tested weekly than monthly. In only one case did monthly testing surpass weekly testing, and that was by 61 one-hundreths of a point out of a possible 80 points. In this study, as possibly in others, a particular variable had a definite, though small, effect on performance even though a common method of statistical analysis suggested it did not. The point to be made here is not the inadequacy of statistical analysis, but that experimental procedures may be employed in educational research which can demonstrate definite variable effects which are slight, but quite consistent. This brings us to the final and possibly the most important point of the study--the design.

For the past fifty years statistical tools for the

educational researchers have continually been refined with little development of selective and manipulative procedures. McCall commented on this inequacy in 1923. Campbell and Stanley (1970) argued this problem still existed forty years later. The types of comparisons currently employed in education are basically the same as those discussed by McCall fifty years ago. Generally they are intergroup comparisons. After reviewing the research on teaching procedures, Dubbin and Taveggia (1968) noted no teaching procedure has been found superior to any other by the analytical procedures used over the past. They argue differences can be found, but what is needed is a change in approach to analyzing instructional contingencies. McKeachie (1970) attempted to put his finger on the reason for the poor research results obtained when he said:

> "My own rationalization is that teaching and learning is an enormously complex business in which so many variables are involved that interaction effects, like methods effects, pop up only a little way above the apparent noise generated by other variables."[1]

McKeachie then reiterated the need for better research. In what ways is it possible to improve educational research procedures?

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[1]The argument of complexity is by no means new to the radical behaviorist. It has been vociferated in almost every applied setting as the reason empiricism has not been a fruitful approach.

In any instructional situation there are a multitude of variables influencing the student. Generally we wish to determine the effects of one particular variable. To do this three options are available. First, the effect of competing variables can be decreased, thereby accentuating the effect of the one selected to be evaluated. This may be done by holding the other variables constant, systematically manipulating them to note their differential affects, or by completely removing them. Second, the magnitude of the chosen variables may be increased so its effects rise above the "noise level" of the extraneous variables. Third, the effects of undesired extraneous variables may be statistically adjusted for as in the analysis of covariance.[2] Although the third alternative may be functional and in many cases the only possible route to go, the first two are generally considered more desirable (Sidman, 1960).

The present study employed a procedure to emphasize the first two options. By using an intragroup comparison the obtained differences were not contaminated by numerous problems which plague intergroup comparison such as teacher differences, course presentation differences, intergroup variations, and sampling differences. The increased number of measurements per student and the reversal procedure provided a better opportunity for identifying behavioral

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[2]Campbell and Stanley (1970) emphasize the usefulness of the statistical approach and lack of its application in education.

contingencies.

The procedure used in this study and related methods employed in the experimental analysis of behavior are potential steps in the direction of improving educational research. Not only does this study demonstrate ABA procedures are sensitive to variables influencing academic behavior, but that multivariate analyses are possible by superimposition of an ABA procedure for one variate on top of an ABA procedure for a second variate.

Chapter IV

EXPERIMENT TWO

Method

Subjects

Four hundred thirty two students enrolled in Introductory Psychology served as subjects (Ss). In the university registration catalog, Introductory Psychology was listed as a course taught three days a week (MWF), one hour a day for 16 weeks. Of the six sections offered that semester, Sections 5 and 6 were chosen for the study. Two hundred thirty-two Ss signed up for Introductory Psychology Section 5 which, for the study, was designated as Group I. Two hundred students signed up for Introductory Psychology Section 6 and were randomly divided into Groups II and III, each having 100 Ss.

Classroom Conditions

Course instruction took place in three major areas: (a) a classroom with 250 student seating capacity was used for lectures, (b) a room 42 feet by 26 feet, with eleven cubicles (5 feet by 5 feet) each containing two chairs and a 2 foot by 4 foot table was used for individual testing, (c) an 8 ft. sq. room was used by the instructor to meet with individual students outside of class.

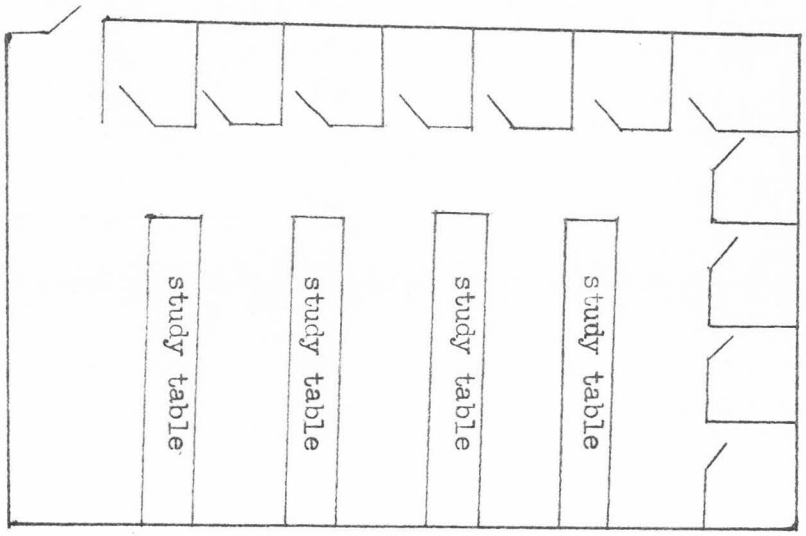

Fig. 6. A floor diagram of the eleven-cubicle room used.

Course Materials

The only textual material required for the course was Hilgard and Atkinson's Fourth Edition of Introduction to Psychology, supplied by the Harcourt, Brace and World Publishing Company. Twenty of the 24 chapters were selected as required reading in the course. Chapters 15 (Statistical Methods and Measurement), 22 (Social Psychology), 23 (Psychotherapy and Related Techniques), and 24 (Psychology as a Profession) were omitted. The chapters covered in the course are listed below:

Chapter	Topic
1	Science of Psychology
2	The Behaving Organism
3	Infancy and Childhood
4	Adolescence and Adulthood
5	Physiological Background of Motivation
6	Human Motivation
7	Emotion
8	The Sensory Basis of Perceiving
9	The Perception of Objects and Events
10	States of Awareness
11	The Nature of Learning
12	Remembering and Forgetting
13	The Management of Learning
14	Thinking, Language and Problem-solving
16	Ability Testing and Intelligence
17	Behavior Genetics
18	Theories of Personality
19	Personality Appraisal
20	Conflict and Adjustment
21	Mental Health and the Behavior Disorders

All examination materials over the required reading were multiple-choice questions taken from Ed. 1, 2 & 3 of the Test Item File for Introduction to Psychology furnished by the publisher. Each series contained 20 multiple-choice questions per chapter. The pre-test given to all Ss at the beginning of the course consisted of 140 questions randomly selected from Series 3. Six or seven questions were randomly selected chapter by chapter to insure an equal coverage of all required chapters. The 140 question pre-test was also used as both the final exam and the six-month retention test. The questions given to all three groups during the course were taken from Series 1 and 2, plus those in Series 3 not used in the pretest.

Procedure

Using the three groups an intergroup comparison of

three teaching procedures was carried out. Group I was lectured to three days a week and given a monthly exam; Group II was lectured to two days a week and given a weekly exam; Group III Ss progressed through the text on their own with no lectures and were allowed to take an exam on each chapter individually when the student felt prepared to do so.

Group I. On the first day of class a 140-question multiple-choice exam was administered to all Ss by the instructor and six teaching assistants. All tests were collected at the end of the hour, and a course outline given to each S as they left. During the second class period the instructor reviewed the course outline, which included the following points: Fifty-minute lecture was given every class period with the exception of four classes (one every four weeks) set aside for examination. On those four days an 80-question multiple choice exam was administered, taking up the whole hour. A final exam consisting of 140 questions (the pretest) was administered at the end of the term. Their grade was based on the four term exams plus the final with each question worth one point, thereby making the total points possible equal to 460. Their grade was determined by how they did with respect to the others in their class (graded on the curve).

The Ss were told the Psychology Department was interested in obtaining some information on how much a student retained six months after the course was over.

Therefore, all students in the class were told they must take a retention test some time during the next fall semester. The students were told they must take the test if they returned to Brigham Young University or the grade they earned for the course would be changed to an E. It was also stated that if a student did not return to Brigham Young University the next fall for some reason (e.g., draft, sickness, marriage, transfer to another school), he would not be required to take the retention test. The reason given them for the change of grade ultimatum was because only six students out of 280 showed up for a six-month retention test in a pilot study two years earlier when they were not required to come.

The course was carried out as planned with a student evaluation of the class administered along with the final exam. The evaluation of the course consisted of a number of questions relating to the format of the course. A copy can be found in the appendix. During the following fall semester the six teaching assistants located all returning Ss by checking registration records. A card was sent to each S telling them to come to a specified room on a specified night (approximately seven days after the cards were mailed) at a specified time for the retention test. A second card was sent out to each student the day before the test to remind them again. By the conclusion of the study, four sets of data had been obtained for Group I. These were: (a) pretest scores, (b) final exam scores,

(c) retention test scores, and (d) a subjective course evaluation.

Group II. On the first day of class the same pre-test given to Group I was administered to Section 6 of Introductory Psychology. When a S finished the exam and brought it to the front of the room, he was instructed to draw a marble without looking from an opaque container. The container had 100 white and 100 black marbles. If the S drew a white marble he was assigned to Group II, given a course outline for Group II and told to come back to this room for all future classes. If a S selected a black marble he was assigned to Group III, given a course outline for Group III and told to go to another specified room the next time the class was scheduled to meet.

During the next class period for Group II the instructor reviewed the course outline with the Ss. As was true for all three groups, attendance was mandatory. Lectures were given on Mondays and Wednesdays with a 15 question multiple choice exam given every Friday. The first 10 questions of the exam were over the material covered during the week while the last 5 questions were review questions over material covered on prior weeks. Ss were only given 20 minutes for the exam with the remaining 30 minutes used for presenting a demonstration or film. Group II, like Group I, was graded on the curve. Their grade was based on 15 weekly exams plus the 140-question final exam, making a total possible 365 points. Group II

was given exactly the same information regarding the retention test as Group I.

By the end of the study three sets of data were collected for the group: (a) pretest scores, (b) posttest scores, and (c) six-month retention test scores. No student evaluations of the class were obtained for Group II.

Group III. The procedure for Group III was based on four main points: (a) Ss would learn the text material without the aid of lectures or any other type of formal instruction requiring paid employees of the university, (b) students would master a unit of material before learning new material, (c) students would aid each other in learning textual material, and (d) students were to be given an opportunity to verbally discuss the material with someone.

During the second class period for Group III the course outline was reviewed. There were no lectures given to Ss in this group at any time during the term. They were told to read the required chapters on their own. When an S felt he understook a chapter he was to come to a room (shown in Fig. 1) to be examined over the material in the chapter. One of the six teaching assistants would take him into one of the cubicles and orally interview him over the chapter. Oral interviews proceeded as described in Ferster and Perrott (1968). A copy of this procedure is included in the appendix. Basically the oral interview

provided a knowledgeable listener (called a proctor) to whom the S demonstrated the verbal repertoire he had obtained as a result of studying the te t. An interview lasted from five to ten minutes, during which time the S paraphrased the chatper under review. The proctor asked questions occasionally, but mainly functioned as a listener. From the Ss' verbal behavior, the proctor evaluated whether the S had read and understood the material. If the proctor determined the S knew the material, he recorded a pass for the oral and gave the S a written exam composed of 15 multiple-choice questions, the first 10 being over the current chapter and the last 5 being review questions over previously past chapters. If the S could not substantially paraphrase the chapter under review, the proctor instructed him to go back for further study and schedule another interview after gaining more competence over the material.

After a S passed the oral and took the written exam, the exam was graded immediately. A S needed to get at least 7 out of the first 10 questions correct plus 3 out of the last 5 questions correct in order to advance to the next chapter. If a S did not pass the written exam, he was required to come back after further study and take an alternate exam over the same material. Figure 7 shows a flow diagram of the procedure Ss went through in passing off a chapter. As you can see, each S had to master each chapter orally and on a written exam before he could

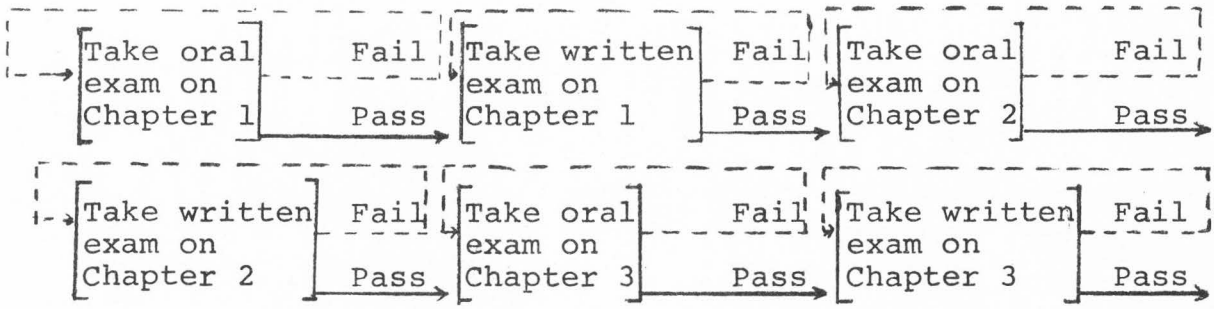

Fig. 7. Type flow diagram of procedure for students progress from one chapter to the next in sequence.

proceed to new material. The unit perfection requirement for advancement let students go ahead to new material only after demonstrating mastery of preceding material. Chapters had to be taken in the order presented in the outline; Ss were not allowed to move through the sequence by skipping a chapter and picking it up later. In this go-at-your-own-pace style all Ss proceeded through the course without lectures. They had no formal class periods to attend. As shown in Table 3, the testing room was open three hours a

Table 3

Time Schedule the Testing Room was Open During the Week

Day	Time		
Monday	8 - 9 am	1 - 2 pm	2 - 3 pm
Tuesday	11 - 12	1 - 2 pm	3 - 4 pm
Wednesday	8 - 9 am	7 - 8 pm	8 - 9 pm
Thursday	11 - 12	1 - 2 pm	3 - 4 pm
Friday	8 - 9 am	1 - 2 pm	2 - 3 pm

day, Monday through Friday with two of the six teaching assistants on duty to give oral and written exams. The teaching assistants were seniors majoring in psychology, signed up for a two credit course called Independent Research and Readings. All the teaching assistants were required to take an oral and written exam over each chapter also so they were familiar with the specific text material.

As mentioned earlier the written exams were immediately graded and returned to the S, with any questions answered by a teaching assistant. There were a total of 100 written examinations, five alternate 15-question forms on each chapter. Each form contained questions not found on any other form. The use of the alternate forms was randomized so that any of the five could be selected on a student's first attempt to pass off the chapter. If a S needed a second try to pass off a chapter, one of the forms he hadn't already taken was given to him.

Individual files were kept on each S. A copy is contained in the appendix. Data was recorded in a S's file concerning the oral interviews and written exams. For the oral interviews the teaching assistants recorded the date of the interview, who proctored it, and whether it was passed or not. For written exams, the date, chapter, form, and score were recorded. Each S received 10 points for each oral interview passed and up to 15 points for each written exam passed. No penalty was given to a S who took more than one try to pass an oral or written exam. For

example, Fred passed his oral on the first try and received 14 on his first written exam. George took two oral exams before passing and scored 6 out of 15 on his first written exam, 8 out of 15 on his second and 14 out of 15 on his third before passing the written. Both Fred and George would receive 24 points (10 for the oral and 14 for the written) towards their grade for that particular chapter. A student was graded on the proficiency he obtained over the material, not the time it took nor the number of mistakes made reaching that proficiency.

In order to set up the system so students would help each other learn, one other requirement was included in the procedure for Group III; Ss were used as proctors also. The teaching assistants administered all oral interviews for the first chapter. On the remaining chapters, the following procedure was employed. Starting with Chapter 2, the teaching assistants proctored only the first 16 Ss on their oral exams. The names of these 16 were then posted on a sheet outside of the testing cubicles. Following this, any S desiring an oral interview on that chapter was assigned to take it from the S whose name was on the top of the list. When a S passed his oral the S who proctored him would inform a teaching assistant who would then give the S the written exam on that chapter. After the S passed the written the S's name who proctored him was crossed off of the list of 16 and the S just having passed had his name posted on the bottom of the list. For example, if a S

(Fred) was tested by a fellow classmate (George) and passed,

George
Linda
Steve

George informs one of the teaching assistants that he passed Fred on the chapter. The teaching assistant then (a) recorded a pass on the oral exam in Fred's file, (b) recorded who passed him, and (c) gave Fred a written exam. When Fred passed the written

~~George~~
Linda
Steve
Fred

The teaching assistant crossed off George's name and added Fred to the bottom of the list. Then Linda was next in line to give an oral interview. In this way all S except the last 16 passing a chapter had the opportunity to be proctors. A S earned 5 points per interview if the person proctored passed the oral interview he proctored, plus 5 additional points per interview if the person proctored passed the written exam on his first try. The 5 additional points per interview were included as a quality check for interviews. Previous pilot data indicated oral proctoring was not carried out efficiently without the quality check. A S could proctor one oral interview on each chapter, but could not proctor more than one interview per chapter.

Ss in Group III then went through the course with no lectures, taking an oral and written, plus giving an oral

exam on each chapter. There were 35 chapter points possible (10 for oral, 15 for written, 10 for proctoring) making 700 chapter points possible. Ss were not graded on the curve; instead a student was given a grade commensurate with the percentage of points obtained on the final exam and chapter points. The distribution was: A = 90% and above, B = 80-89%, C = 70-79%, D = 60-69%, and E = 59% and below. A six month retention retest was also administered in the same manner as given to Groups I and II.

By the end of the study the comparative data collected on all three groups was: (a) pretest scores, (b) final exam scores, and (c) six month retention test scores. Subject evaluation of the course were also available for Groups I and III.

Results

The students' academic performance and retention were found to be a function of the course procedures. All three groups were comparable with respect to their knowledge of psychology going into the course. Figure 8 shows the average for all three groups on the pretest. The standard deviations for Groups I, II, and III were 10.4, 9.8, and 10.3 respectively. As might be expected, none of the means significantly differed from the others.

Figure 9 shows the mean score for all three groups on the final exam. The procedures differentially influenced student performance with Group III doing the best,

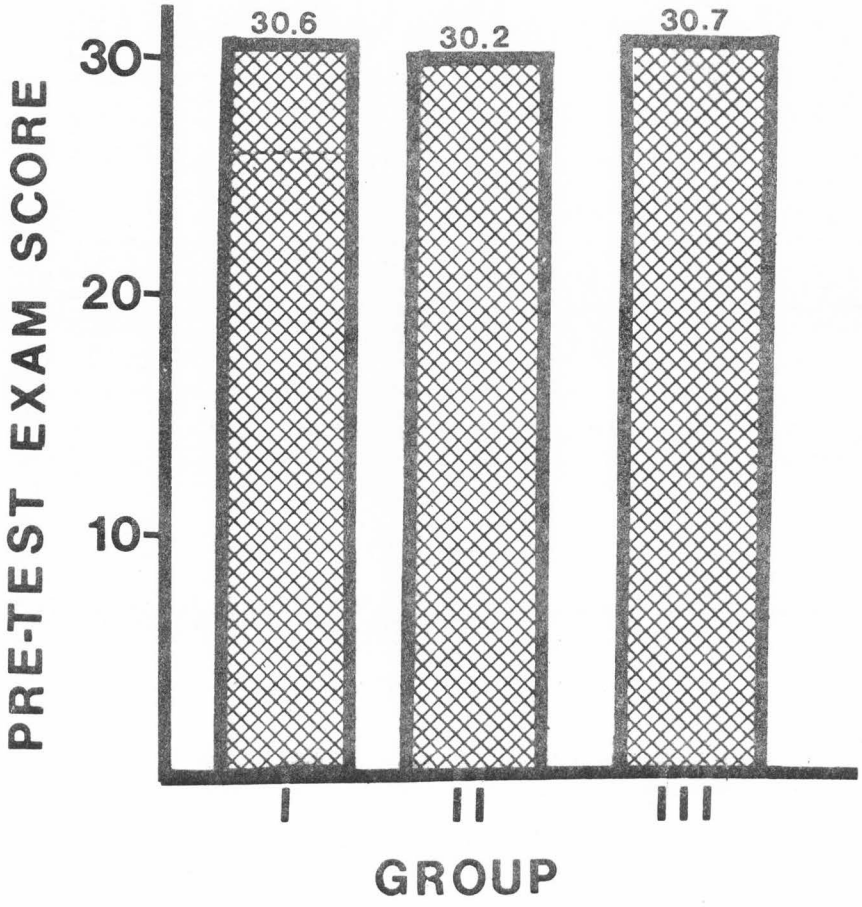

Fig. 8. Mean exam score for all three groups on the 140 question pretest.

followed by Group II and Group I in that order. The standard deviations for groups 1 through 3 were 17.3, 17.4 and 15.2 respectively.

The effects these procedures had with respect to retention were still evident after six months. Figure 10 shows the means for all three groups on the retention test. Like their performance on the final exams, students in Group III scored higher than Groups I and II. Group II did not drop as much as the other two groups, however, Group

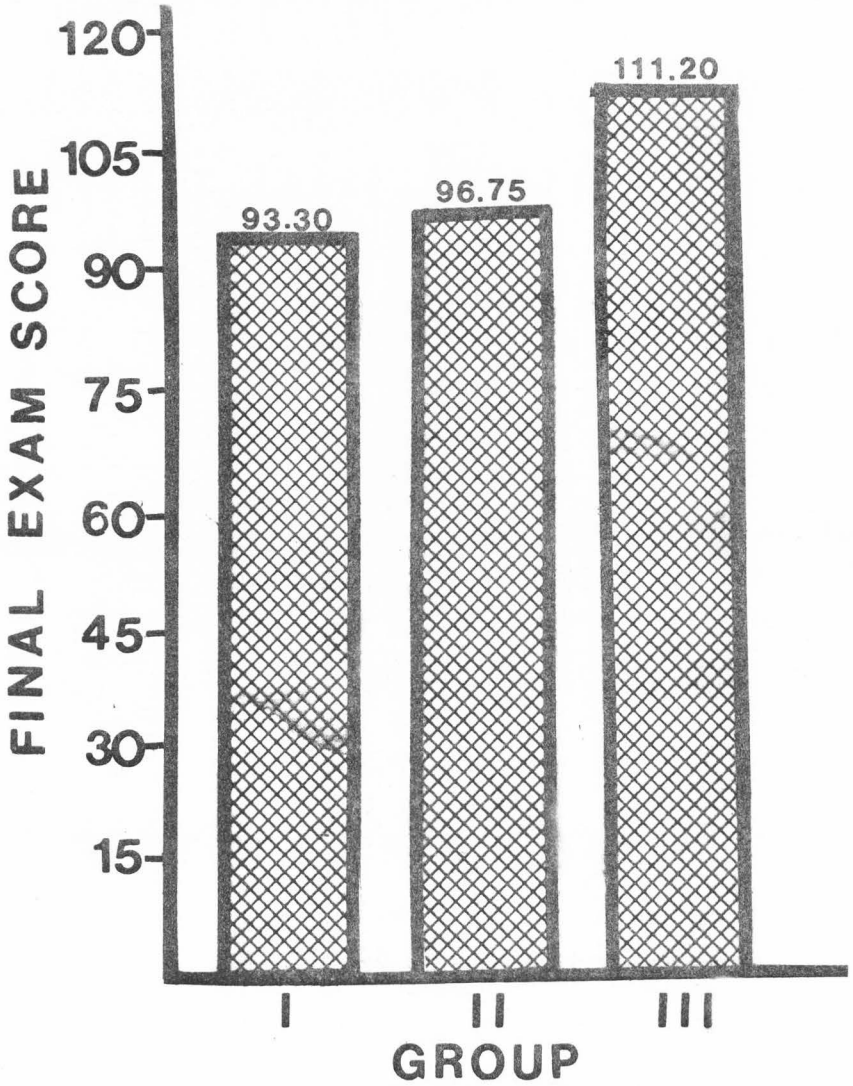

Fig. 9. Mean exam score for all three groups on the 140 question final exam.

II's mean on the retention test was 10.95 points lower than its mean on the final exam. Group I dropped 14.3 points while Group III dropped 15.5. The standard deviations for all three groups on the retention test were 14.2, 18.6, and 14.2 respectively. This difference was not significant, however.

Not only was the objective performance of the students influenced in this experiment, but their attitudes were also influenced. Table 4 shows a summary of the student's reaction to the procedures used. The evaluation

was inadvertently not given to Group II so only the feelings of Group I and III are presented.

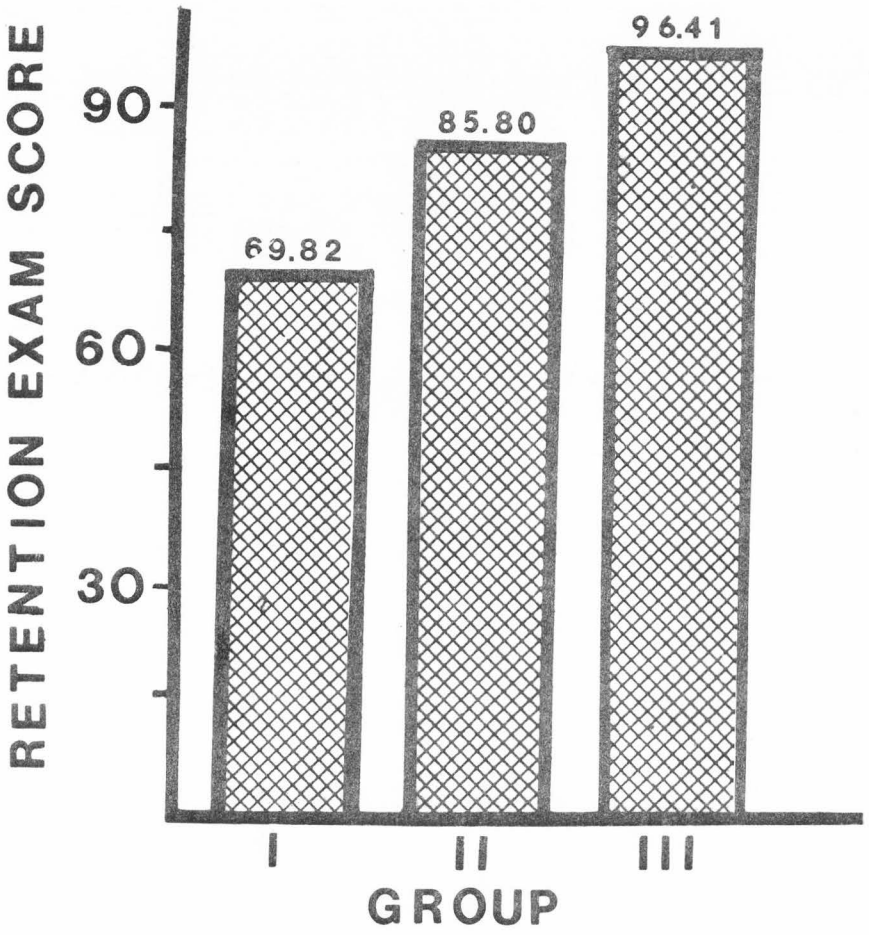

Fig. 10. Mean exam score for all three groups on the 140 question six-month retention test.

Discussion

Generally speaking, the data related to how the different groups scored on the final exam confirm and

Table 4

Student Evaluation of the Courses
(The Numerical Scores Indicate Percentages)

Question Number	Question	Group I	Group III
1.	In this course, I have:		
	a. Not totally exerted myself.	17	4
	b. Rarely done the quality of work of which I am capable.	18	6
	c. Done an average amount of work.	32	42
	d. Worked hard most of the time.	21	19
	e. Consistently done the best work of which I am capable.	18	9
2.	In this course, I have done:		
	a. Little of the required readings.	8	5
	b. Most of the required readings.	54	40
	c. All of the required readings.	38	43
	d. All required and considerable independent reading.	0	12
3.	The instructor's attitude toward students was:		
	a. Vitally concerned.	3	50
	b.	12	13
	c. Routine	70	35
	d.	8	2
	e. Cold and distant	7	0
4.	In terms of giving individual attention, the instructor was:		
	a. Much better than average.	8	35
	b. Better than average.	10	33
	c. Average.	51	30
	d. Below average.	26	1
	e. Very little.	15	1
5.	What was your overall evaluation?		
	a. Excellent.	17	36
	b. Above average.	13	28
	c. Average.	48	36
	d. Below average.	13	0
	e. Failed.	9	0

Table 4 (continued)

Question Number	Question	Group I	Group III
6.	I regard the overall organization of the course, as a whole, to be:		
	a. Excellent.	3	42
	b.	22	24
	c. Average.	49	27
	d.	21	5
	e. Very poor.	5	2
7.	I feel this course encourages independent and original thinking:		
	a. To a large extent.	25	60
	b.	38	12
	c. To an average degree.	20	21
	d. Not at all.	17	7
8.	The method of this class (i.e. lecture, programmed) was:		
	a. Outstanding.	25	29
	b. Better than other classes I've had.	19	56
	c. Average.	42	12
	d. Poor.	12	2
	e. Very poor.	2	1
9.	I regard the course, as a whole:		
	a. Highly beneficial.	31	59
	b.	26	21
	c. Average.	25	19
	d.	18	0
	e. Not at all beneficial.	0	1
10.	Were the interviews beneficial?		
	a. Highly beneficial.	-	62
	b.	-	15
	c. Of average benefit.	-	17
	d.	-	6
	e. Worthless.	-	0
11.	Were the chapter tests beneficial?		
	a. Highly beneficial.	-	71
	b.	-	12
	c. Of average benefit.	-	15
	d.	-	0
	e. Worthless.	-	2

Table 4 (continued)

Question Number	Question	Group I	Group III
12.	In regard to helpfulness and efficiency what grade would you give your proctor?		
	a. A	-	62
	b. B	-	33
	c. C	-	5
	d. D	-	0
	e. E	-	0
13.	Was this a snap course?		
	a. Yes	38	17
	b. No	62	83
14.	Were you for this teaching method when class started?		
	a. Yes	67	29
	b. No	33	71
15.	Do you advocate this method now?		
	a. Yes	74	92
	b. No	26	8
16.	Would you like other classes taught this way?		
	a. Yes	53	93
	b. No	47	7
17.	Were you "badgered" to participate?		
	a. Yes	2	4
	b. No	98	96

extend the findings of other investigators (Sheppard and MacDermot, 1970; Johnston and Pennypacker, 1971; McMichael and Corey, 1969; Keller, 1968). Teaching procedures void of classroom interaction can be applied in college courses which will affect the student's academic performance. Although the students academic performance was found to be

high without lectures, total removal of classroom sessions with the instructor seemed to have an effect on the students. A large proportion of the students commented they would like some interaction with the professor in order to get a 'feeling' for the area of psychology. Some collegues argued that these comments were due to conditioned expectations of the students. They are so used to a lecture system that they simply feel uneasy without it.

Though it may be partially true there is another hypothesis which would seem more probable. The classroom lectures serve a greater function than simply a source for critical information. It is probably the most important motivational tool in higher education. Students generally evaluate a course along dimensions other than just factual information. Relevance, applicability, social attitudes, and sense of accomplishment in different academic fields are other evaluative dimensions. Without the classroom interaction situations these points are not impressed upon the student. Unfortunately these aspects of instruction were not considered at the beginning of this experiment so no evaluations were obtained to evaluate this. Though the students responded favorably on the questionnaire about the course mechanics, no information regarding the effects of the course on their attitude about the field of psychology was obtained. Seeing course material can be learned more effectively by means other than lectures and does not necessarily follow that the classroom interaction

with an instructor is any less important. It may become more relevant as the principles which increase the motivational influence of lectures are identified.

After a pilot study indicated students in a lecture course would score lower than the go-at-your-own-pace group, one collegue commented the difference was obviously a function solely of test frequency. Group II was then added to the proposed study in an effort to determine how much of an effect frequency had. The results indicated it did have a significant effect, but that the other variables also played a major role.

Although one procedure could cause higher scores on the final exam, its value would be extremely limited if this superiority did not continue after the course ended. Not only did Group III outscore the others on the final exam, but they also scored higher on the six month retention exam. Apparently few educators have been concerned about chronic effectiveness for none of the studies reviewed included such a comparison.

Chapter V

CONCLUSIONS

With the results of this study, it may be difficult to understand why such a large portion of the educators have discarded a behaviorally contingent approach to learning. It is not so difficult to understand, however, when you review the literature on teaching methodologies and note the results which have been consistently reported by various reviewers for the last fifty years: no significant difference in procedure effectiveness.

Of all the conclusions drawn from the literature three have received a large following. For many the literature simply reinforced their contention that education had long been laboring under the fallacious assumption that an objective scientific methodology could be applied to the analysis of comparative teaching methods. To this group the assumption that classroom variables could be controlled and manipulated to such a degree that the effect of different teaching procedures would manifest themselves and be differentially measured was completely erroneous. They believe the teaching-learning process is so complex that it is above such a cold mechanical analysis. To them the apparent failure of the scientific method in education plus its success in other areas

naturally lead to the conclusion that it is a useful methodology; but restricted to areas outside the teaching-learning process. Highet (1965) expressed it well for this point of view when he said, "Scientific teaching, even of scientific subjects, will be inadequate as long as both teachers and pupils are human beings. Teaching is not like inducing a chemical reaction: it is much more like painting a picture or making a piece of music, . . . You must throw your heart into it, you must realize it cannot all be done by formulas, or you will spoil your work, and your pupils, and yourself."

Another conclusion which many chose dealt with the complexity of the learning process. They felt the scientific approach to learning was appropriate, but that the complex interaction of relevant variables made the analysis too difficult. McKeachie (1970) emphasized this point that learning is an enormously complex business in which so many variables are involved that the interaction effects, like method effects, pop up only a little way above the noise generated by other variables.

Dubin and Taveggia's conclusion on why no differences showed up between teaching procedures also has a strong following. They felt teaching procedures were having differential effects, but that course examinations were too insensitive to teaching procedures for discriminating students' academic achievement.

This assumption about the imperfections of

examinations has significant implications for the administration of students in colleges and universities. It calls into question the entire student grading system, the system for advancement to a higher level, the basis for making scholarship and fellowship awards, and the basis for dismissing students from the academic society. Therefore, to accept this conclusion is to call into question more than merely the findings on comparative college instruction methods. This does not mean that this conclusion is incorrect, but that one should seriously consider its implications. The results of this study, however, add empirical data indicating this conclusion to be incorrect.

There is a fourth conclusion which can be drawn which may give insight into the reason why past studies have not shown various teaching procedures to have differential effect.

It is proposed that the reason various teaching procedures have not produced differential effects in the students is because relevant study behavior of the student were not differentially affected. Let's take the comparison of lecture versus discussion as an example. Using a typical lecture method, the instructor stands in front of the class and lectures on a certain amount of material. An exam is given every four or five weeks. Using a discussion technique the instructor now sits down and leads them over the material every four or five weeks and an exam is given. The difference between the two methods, then,

is mainly the behavior of the instructor, not the students. Granted, the discussion method allows for increased participation. However, there is usually a small percentage of the group that does most of the talking. This becomes more apparent the larger the class. Also, there are no contingencies applied so the verbal responses in the discussions will differentially influence student studying any more than lectures. Most of the students are simply waiting for class to end as is the case for the lecture procedure. The situation, then, is that the instructor's behavior has changed, but not the students' in any dimension which significantly influences studying the course material.

The question then becomes, "Where does educational research go from here?" Two points become clear from this study. First, we need to improve our approach in analyzing teaching procedures. Studies must be carried out which (a) accentuate the effects of the variables under analysis, and (b) minimize the influence of extraneous variables. For example, intragroup comparisons; multiple measurements of performance should be preferred; and reversal of conditions should be used where appropriate. This would increase the sensitivity of our analysis and add to our understanding of the variables involved. Researchers should not be content to manipulate only the independent variable while hoping many extraneous variables such as teacher variance and individual differences will cancel

themselves out.

The second point involves shifting our attention to other more relevant classroom variables. Rather than concentrating on what the instructor does in the classroom, more time should be spent determining what specific contingencies can be employed which will increase student performance. Most educators consider external prompts for learning such as feedback, grades, mastery before progression to be of little value in higher education. College students are assumed to have internalized the desire for learning to such an extent that these learning aids are unnecessary. The high percent of careless, inattentive, and underachieving students is a reminder that this is an incorrect assumption. College instruction needs to direct its attention to identifying various student-performance contingencies which an instructor may implement in his course. Besides grading, exam frequency, and mastery before advancement examples would include (a) allowing the student to investigate more thoroughly parts of the material he is particularly interested in once he has completed the basic course material, (b) students not having to attend lectures if high marks are obtained on exams, (c) students allowed to attend "special" lectures only if they perform well in class, (d) field trips to mental institutions and other applied settings for performing well in class.

Past studies show higher education to be somewhat

egocentric in its approach toward the teaching-learning situation. There seems to be a stronger concern for the instructor and what he does than what should be done for the student. In McKeachies and Dubins and Taveggia's comprehensive "Review of College Teaching" no mention is made of the importance of feedback, grading, exam frequency or other such variables related strongly to student performance. Their reviews deal mainly with class size and whether the instructor should lecture or lead discussion. It is interesting to note that although comparisons have shown large classes to learn as well as small classes educators have continually been trying to demonstrate superiority for small classes rather than shifting to the evaluation of other variables. School administrators have suggested that the instructors tenacity on this point is highly correlated with increased amount of work for them in larger classes. Though the magnitude of its influence can be disputed, its effect on an instructor cannot be denied.

As mentioned earlier the behavior of the instructor changes more from lecture to discussion than does the student. Instructors are more often concerned with how satisfied they feel about the class meeting than if the class meeting strongly influenced the academic behavior of the student. Too often the instructor's main concern is whether so much material was covered that day or if "he" was prepared rather than the student.

What is needed is contingencies for students' behavior to become the central theme. For example, he could take exams (oral or written) over the course material; if he doesn't obtain a certain level of mastery, he could go back over the material until he does; he could also be graded on how well he can verbalize the material. In this way, the course would be centered more toward what the student does, not what the instructor does.

The results this study and traditional comparative studies lead to the conclusion that the secret of an effective teaching procedure is that it can be a "Contingent System of Instruction". Academic achievement can be controlled by introducing contingencies which require the student to interact with course material. For example, the effectiveness of the previously cited discussion procedure could be increased by (a) requiring the students to hand in an abstract on the material to be discussed, and (b) grading the students on the comments they make in the discussion about the material. With contingencies such as these added, the discussion procedure would probably show superiority over the typical lecture situation.

Removing classroom behavioral contingencies will not be a productive approach for the educational system in general. Behavior in our society is too much a function of environmental influence and there are too many alternative reinforcers for us to expect a student to excel in education when requirements are withdrawn. The battle

between nongraded study behavior and miniskirts was lost a long time ago. Man is not most productive when behavioral contingencies in education are removed. Those who do excel in non-structured situations do so because they have internalized the reinforcing relationships which control academic achievement. Most of us, however, are too dependent upon the external environment for stimulation to achieve.

The answer for education in general, then, is the development and application of contingent systems of instruction rather than self controlled learning. As the results indicate, grades are too strong a reinforcer to realistically remove them from education. It is theoretically possible for an effective educational program to exist which is built on reinforcers other than grades, but such a dramatic change would be required in all aspects of our society that for all intents and purposes it is not very feasible.

Chapter VI

SUMMARY

Problem

For decades experimentalists have been trying to empirically substantiate the belief some teaching methods are superior to others. It was assumed that by carefully employing "scientific methodology" the contrast between two or more teaching methods could be empirically determined. The problem was viewed as a very simple one--to clearly distinguish between two or more inputs and then measure whether or not their respective outputs were alike or different. During this time the procedures used and the variables compared have essentially remained the same. In almost every case an interclass comparison was carried out to determine whether student-instructor interaction and class size influence a college student's academic performance. Unfortunately the results have consistently demonstrated no method to be superior to any other. The questions posed by researchers (Powell, 1964; Dubin and Taveggia, 1968; McKeachie, 1970) in the area are: (a) why are no differences in effect found between obviously different teaching procedures, and (b) where do we go from here?

Objective

The objectives of this study were threefold:

1. To demonstrate an ABA approach in analyzing teaching methodology can be used effectively to identify relevant variables influencing college students' academic performance.

2. To determine the influence of grading and exam frequency on achievement in college.

3. To compare the effectiveness of a lectureless go-at-your-own-pace teaching procedures and lecture procedures on students performance as measured on a final exam and a six month retention test.

Method

Experiment One. Using an ABA reversal procedure in a latin square design 253 students were rotated through four testing conditions to determine the effects of grading and exam frequency on college students academic performance. The four testing conditions were: (a) weekly exams given which counted toward the students' grade, (b) weekly exams given which did not count toward their grade, (c) monthly exams which counted, and (d) monthly exam which did not count. An analysis of these results with respect to the students' grade point averages was also carried out.

Experiment Two. Three classes of introductory psychology were used in an interclass comparison. Each class was exposed to a different teaching procedure. Daily

lectures with a monthly exam was used on the first class. Daily lectures with weekly exams was used on the second class. The third class attended no lectures, took oral and written exams on each chapter when they felt ready for them, had to master one chapter before progression to the next, and received immediate feedback on their test results. All three classes were also given a retention test six months later. The classes were compared on students performance on both the final exam and retention test.

Results

Experiment One. Grading was found to significantly influence students academic performance (pL .05). Though exam frequency had a consistent and systematic effect on performance, its effect was not found statistically significant. It was also found that both variates influenced students of all grade point average ranges to the same degree rather than differentially helping only certain grade levels.

Experiment Two. It was found that the students in the go-at-your-own-pace group outscored both other classes on the final exam and six month retention test.

Conclusions

The following conclusions are drawn from the results of research conducted for this report:

1. The lack of differential effects in past com-

parative studies is due to the fact that the students academic behavior was not differentially influenced.

2. Intra class analytic procedures can be employed which are more sensitive than the interclass comparisons employed in the past.

3. Instructors can use grading to strongly influence college students of all grade point ranges to perform better.

4. Two things future research in college teaching should include are (a) more sensitive experimental procedures, and (b) a change in the variables analyzed. A stronger look should be taken at what behavioral contingencies the course includes rather than what the teacher does in class.

5. It is suggested that higher education should direct itself to more contingent systems of instruction rather than more self-controlled learning situations.

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APPENDIXES

APPENDIX A

COURSE OUTLINE

Even though there are no prerequisites for psychology 111, you will find this course significantly different from any other introductory class you have taken in the past. Most all forms of traditional classroom procedures will be violated in order to assure you, the student, an enlightening and challenging and intellectual experience.

The object of this course is to develop in the student, a mastery of the subjects covered in the text book and a mastery of the basic principles in psychology. Your mastery of the subjects will be tested in two forms: (a) by your ability to answer objective multiple choice examination questions, and (b) by your ability to verbally explain the principles of psychology in an oral interview with a proctor.

Since there are no formal lectures, you may move through the course, from start to finish, at your own pace. You will not be held back by other students or forced to go ahead until you are ready. You may meet all the course requirements during the semester or you may not complete the job within the allotted time. How fast you go is up to you.

The work of this course will be divided into 21 units of content, which correspond to the chapter divisions in your text (see course outline). These units must be followed in the order set out by the outline and you must show your mastery of each unit (by passing both the oral exam and a written exam) before moving on to the next unit. A good share of your reading for this course may be done in the classroom, at those times when no demonstrations or other activities are taking place. The movies or demonstrations will be compulsory and points will be given for attendance. These movies and demonstrations will add to your general understanding of psychology.

The teaching staff of your course will include proctors and an instructor. A proctor is an undergraduate

who has been chosen for his mastery of the course content and orientation, for his maturity of judgement, for his understanding of the special problems that confront you as a beginning, and for his willingness to assist.

The instructor will have as his principal responsibilities: (a) the selection of all study material used in the course; (b) the construction of tests and examinations; (c) the final evaluation of each students progress; and (d) to arbitrate in any case of disagreement between students and proctors and to act as a clearing house for requests and complaints. It will be the proctors' responsibility to: (a) administer, grade, and provide adequate feedback for written exams; (b) proctor or assign student proctors for all oral exams; and (c) provide help for any of the students.

COURSE OUTLINE

TEXTS: 1. Hilgard and Atkinson - Introduction to Psychology - 4th edition.

2. Option (not to be used for testing)- Workbook for text - Student Guide with Programmed Units - for Hilgard and Atkinson's Introduction to Psychology, 4th edition, by Tevvan and Jandron.

CLASSROOM: 1317 SFLC (check schedule to see when room is available).

CLASS SCHEDULE

Suggested Deadline Date	Topic	Chapter
February 18	Psychology as a Behavior Science	1
	The Behaving Organism	2
March 4	Adolescence and Adulthood	4
	Physiological Background of Motivation	5
	Human Motivation	6
March 18	Emotion	7
	The Sensory Basis of Perceiving	8
	The Perception of Objects & Events	9
April 1	The Nature of Learning	11
	50 POINT TEST OVER FIRST 10 CHAPTERS	
	Remembering and Forgetting	12
	The Management of Learning	13
April 15	Thinking, Language & Problem Solving	14
	Ability Testing and Intelligence	16
	Behavior Genetics	17
April 29	Theories of Genetics	18
	Personality Appraisal	19
	Conflict & Adjustment	20
May 13	Mental Health and Behavior Disorders	21
	Psychotherapy and Related Techniques	22
	Social Psychology	23
May 23	FINAL BEGINS	
	200 POINT FINAL TEST OVER 21 CHAPTERS	

**You have all been assigned a proctor and will meet with him as a group only once a week to coordinate testing activities-the time you meet is determined by the group you signed up for. You may meet with the proctor individually any time he is scheduled to be in Room 1317 (check schedule of proctor times).

TESTING AND GRADING

There are two things which will determine your final grade: (a) the total points accumulated at the end of the semester; and (b) the score received on the final exam.

Testing

Oral Exams. As mentioned, each student will be required to pass an oral exam on each chapter covered in the book. The exams are proctored by the assigned proctor or a student proctor and graded on a pass or fail system. If you pass the oral exam you receive: (a) ten points; (b) the opportunity to take the written exam worth 15 points; and (c) the privilege of proctoring a classmate on the chapter you passed (worth a possible 10 points). If you fail the oral exam you may take it again until you pass it; however, you cannot take the written chapter exam, proctor and oral, or proceed to another chapter until you have passed the oral exam. Once you have completely passed a chapter (oral exam and written exam), you may then have the opportunity to proctor a classmate and receive 5 points for proctoring and another 5 points if the person you proctored passes 7 out of 10 questions on the chapter the first time he takes the written exam. You can only proctor a chapter once.

Written Exams. Each chapter written exam will consist of two parts--ten Chapter Questions and five Review Questions. Before you can proceed to the next chapter, you must get 7 out of 10 main chapter questions correct and 3 out of the 5 review questions correct. Because of the lack of review material, chapters 1 and 2 will only contain 10 questions.

After Chapter 11 there will be a 50 point mid-term and at the end of the semester there will be a comprehensive test worth 200 points.

MOVIES AND DEMONSTRATIONS

Movies and demonstrations will be spaced throughout the semester to provide the student with an opportunity to broaden his understanding of the work being done in psychology. The ten movies or demonstrations will be shown in a designated room at a pre-arranged time. It will be the responsibility of the student to attend these demonstrations and movies in order to receive 10 points for each attendance. A schedule of these activities will be provided at a later time.

Carrying Out and Interview

The instructions to the student for carrying out an interview should be fairly explicit:

An interview should last approximately ten minutes. If the student cannot substantially paraphrase the part under review in ten minutes, he should go back for further study and schedule another interview after gaining a little more fluency in the materials.

The interviewer should speak only on three occasions: (1) at the beginning of the interview when he may tell the student what is expected of him during the interview, (2) after the student has completed his discussion of the chapter and cannot say anything more, the interviewer may summarize very briefly what the student has covered, mention any topics which have been omitted, and point out any errors of fact or terminology, and (3) after the student has completed the remaining topics, the interviewer may give the student instructions for further study, or end the interview with a general remark.

To prevent inappropriate interruptions and to help him recall the content of the interview, the interviewer should equip himself with paper and pencil to record inaccuracies and omissions. The student should keep the test in front of him while speaking. The measure of his facility with the material is his ease in paraphrasing the test meaningfully within the allotted time, not his ability to memorize the chapter.

These procedures are intended to discourage digressions and conversation during the interview period. Informal discussions between students and instructors will be much more useful after the interview has proved and improved the student's fluency.

INTERVIEW I

Student: The point that is emphasized, and is very critical to the whole issue of superstitious behavior, is that reinforcement is a temporal process. It has nothing to do with the causal relationship. In either contingent or accidental reinforcement there is a temporal sequence of response and reinforcement, and then the response will increase in frequency. It can be natural, that is, something that occurs in nature; it can be contrived as when you have a pigeon in a box; or it can be accidental, as when there is no causal relationship. Any act which receives the reinforcement may be increased in frequency and the reinforcement may occur randomly or, as in the articles mentioned here, it may occur in fixed intervals. In the articles, they talk about Skinner's classic experiment with the eight pigeons. In the first part he reinforced them for every 15 seconds. Two of them were performing no rituals. Six of them had performed rituals by the time he came back and I don't think he mentioned how long it took. Six of them were performing various rituals, some of the same, some of them varied. They had been conditioned in the regular FI schedule. In the second part of the experiment he extinguished the birds and then reconditioned them. He got a normal reconditioning curve for animals in training under a fixed-interval schedule. Then he extinguished them again. When he started fixed interval reinforcement again, he got a new ritual--a new form of behavior--and never got the old one back. He makes a comment that the way you can tell superstitious behavior apart from the behavior that is conditioned in a contrived setting is that when it is contrived, you shape the behavior and when you have it, it stops changing; you can look at it a day later and it will still be the same. Superstitious behavior is conditioned by temporal pairing which is a slightly different variation of the behavior that occurs after reinforcement. So you get the drift. The behavior may change over a long period of time. Skinner gives the example of a pigeon that changed readily to a new behavior. Then he talks about some human examples and describes the rain dance, and the different gambling techniques for changing your luck. He also gave an example from medicine. When I read the one about medicine, I thought of a book I was just rereading in which gout is discussed. Apparently, one of the early cures for gout involved a combination of mary things which accidentally involved colchicum. This was not used to cure the gout, but purely as a purgative. Of course, it worked. Later, the doctor who lived around the time of Galen decided that he wanted a less violent purge so he withdrew the colchicum and made a substitute. They kept on using the treatment for hundreds

of years and it never worked again. Of course, they had withdrawn the one thing that had made the cure work.

As you have observed, toward the end of this interview the student talked about related material which was recalled by his reading the chapter. Often, this kind of discussion is valid proof of the student's fluency. (Fester, Perrott, 1968).

GRADING

	Points	
Chapter Exams Written		
(2) x 10	20	
(19) x 15	195	
Chapter Exams Oral		
(21) x 10	210	
Proctoring Oral Exams		
(20) x 10	210	
Psychology Movie or Psychology Demonstration		
(10) x 10	100	
FINAL (Comprehensive)	200	
	935	
Mid Term (After Chapter 11)	50	
Student Evaluation	15	
	1000	TOTAL

A - 70% on the Final and 870 points - 93% 935 points

B - 60% on the Final and 795 points - 85% 935 points

Since all who finish the course materials and do adequate proctoring and get 60% on the final will get a "B" for the course, 80-90% of you should get a "B" or better. In other classes 80-90% of the students have done "B" work or better.

STUDY CONDITIONS

I. Physical conditions for study.

A. Environmental: (Have a definite time and place for study; secure proper light, heat ventilation, and furniture; seek a quiet place and freedom from distraction; have suitable and only relevant materials available.)

B. Physiological: (Be obedient to the laws of hygiene; seek bodily change and relaxation during long periods of study; stop short of physical fatigue.)

II. Psychological Prerequisites for study.

A. Attention: (Form the habit of forced attention: concentrate on task to be performed; have confidence in yourself; avoid impossible tasks.)

B. Motivation: (Have favorable attitudes, interests and incentives; find definite aims; have definite goals in view; relate tasks to larger goals; avoid monotony in study activities.)

C. Development of Habits: (Practice accurate repetition; make positive attack; practice reactions which will be useful later.)

D. Planning: (Distribute periods for study; analyze tasks; keep a record of time spent.)

E. Self-Evaluation: (Test yourself for personal characteristics; note your methods and standards of work.)

III. Study Habits Relating to Preparation of Assignments.

A. Reading: (Have purpose; improve speed and accuracy; enlarge vocabulary; make mental summaries; formulate questions on reading, underline important points; adapt type of reading, e.g., rapid or intensive - to purpose; read assignments first as a whole and then read more carefully; give attention to paragraph headings.)

B. Outlining and note-taking: (Organize materials reader heard; make brief outlines; make detailed outlines, evaluate important points; take concise notes; use abbreviations; take notes on lectures and from books.

C. Memorizing: (Have purpose; comprehend material to be memorized; distribute practice periods in note memory; be accurate in first reading; concentrate during repetitions; use memonic devices; adapt method, i.e., whole or part--to type of material; practice frequent recall; keep record of progress.)

D. Problem-Solving: (Get problem clearly in mind; collect all pertinent data; test hypotheses; evaluate conclusions.)

E. Reviewing: (Space reviews properly; use notes, make a brief outline; ask questions.)

F. References: (Using library and such reference aids as a dictionary, bibliographies, footnotes, periodicals, record refernces efficiently; make careful bibliographies.)

G. Making Written Reports: (Choose subject carefully; limit problem; select details; organize materials; make tentative outline; use varied vocabulary; use literary devices; write first draft rapidly; allow time to elapse before revision.)

IV. Study Habits Relating to Classroom Activities.

A. Recitation: (Be a good listener; ask pointed questions; join in class discussions; take notes; plan oral reports; practice making reports aloud.)

B. Lecture: (Listen for points of view, the plan, and the important points; take notes; evaluate; relate to your experience.)

C. Examinations: (Prepare by using summaries and notes; going over main points; making brief outlines; answering questions in text; concentrating on difficult parts; distributing study.)

D. Laboratories: (Observe and analyze carefully; represent ideas graphically; take notes; write up reports clearly.)

SURVEY Q3R METHOD OF STUDY

Survey 1

Glance over the headings in the chapter to see the few big points which will be developed. Also read the final summary paragraph if the chapter has one. The survey should not take more than a minute and will help you organize the ideas as you read them later.

Question 2

Now begin to work. Turn the first heading into a question. This will arouse your curiosity and so increase comprehension. It will bring to mind information already known, thus helping you to understnad that section more thoroughly. And the question will make important points stand out while explaratory detail is recognized as such. Turning a heading into a question can be done on the instant of reading the

heading, but it demands a conscious effort on the part of the reader to make this query for which he must read to find the answer.

Read 3

Read to answer the question, i.e., to the end of the first headed section. This is not passive plodding along each line, but an active search for an answer.

Recite 4

Having read the first section, look away from the book and try briefly to recite the answer to your question. Use your own words and name an example. If you can do this you know what is in the book; if you can't, glance over the section again. An excellent way to do this reciting from memory is to jot down cue phrases in outline form on a sheet of paper. Make these notes very brief! Now repeat steps 2, 3, 4 on each succeeding headed section. That is turn the next heading into a question, read to answer that question, and recite the answer by jotting down cue phrases in your outline. Read in this way until the entire lesson is completed.

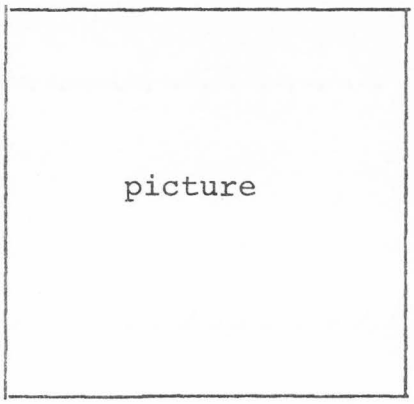
Review 5

When the lesson has thus been read through, look over your notes to get a bird's eye view of the points and of their relationship and check your memory as to the content by reciting on the major subpoints under each heading. This checking of memory can be done by covering up the notes and trying to recall the main points. Then expose the major points and try to recall the subpoints listed under it.

APPENDIX B

INTRODUCTORY PSYCHOLOGY QUESTIONNAIRE

1. Name _____
2. Student number _____
3. Age _____ Sex _____
4. Address _____
5. Year in school _____
6. Reason for taking introductory psychology
   A. General requirements
   B. Major
   C. Minor
7. What grade do you expect? ____
8. What do you expect from this course?



APPENDIX C

STUDENT POINT TOTAL SHEET KEPT IN STUDENT'S FILE

Name _____

Chapter	Date	Forum or Proctor	Score	Date	Forum or Proctor	Score	Date	Forum or Proctor	Score
1									
2									
3									
4									
5									
6									
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APPENDIX D

INTRODUCTION TO PSYCHOLOGY

1. A variable that is directly controlled or manipulated by the experimenter in scientific research is the: (a) dependnet variable, (b) intervening variable, (c) independent variable, (d) all of the above to varying degrees.

2. Above all else, the aim of science is to: (a) study man's affinity with all other animal life, (b) discover new and useful information in the form of verifiable data, (c) make naturalistic observations of behavior in the natural setting, (d) understand behavior rather than to predict and control it.

3. If an experimenter varies the tempo of music in a factory setting to observe its effect upon the rate of productivity, the dependent variable is the: (a) rate of productivity, (b) tempo of music, (c) factory setting, (d) subjects involved in the experiment.

4. Mediating processes: (a) cannot be inferred in S-R psychology, (b) occur after the dependent variable has been measured, (c) go on between the specified antedcedents and measured consequences, (d) can be studied only when stimulus and response are precisely defined.

5. That the whole is different from the sum of its parts was emphasized by the: (a) structuralists, (b) functionalists, (c) behaviorists, (d) Gertaltists.

6. Perception-centered interpretations of learning, memory and problem-solving are spoken of as forms of: (a) stimulus-response psychology, (b) behaviorism, (c) structuralism, (d) cognitive theory.

7. Scientific psychological experimentation always involves: (a) the study of intervening variables, (b) careful design that includes controls, (c) a theoretical formation, (d) all of the above.

8. Endocrine glands: (a) secrete their products onto the surface of the body, (b) secrete their products directly into the blood stream, (c) are not properly classified as effectors, (d) are strategically located in the cerebral cortex.

9. The basic units of the nervous system are specialized cells called: (a) ganglea, (b) nerves, (c) neurons, (d) centers.

10. The rhythmical electrical discharges produced by the brain as a whole are recorded by: (a) an electro-nencephalgram, (b) extirpation, (c) nerve-degeneration studies, (d) mild electrical currents that stimulate the brain.

11. Man is able to learn, remember, and think largely because of his: (a) cerebral cortex, (b) cerebellum, (c) midbrain, (d) reticular formation.

12. John is in a highly emotional state. You would expect the _____ division of the autonomic nervous system to be dominant: (a) parasympathic, (b) sympathetic, (c) central, (d) thalamic.

13. Two classes of effectors are the (a) axons and dondrites, (b) muscles and glands, (c) stimuli and receptors, (d) eye and ear.

14. The pattern that develops under extreme and long-continued stress: (a) fends off desease, (b) is known as the general adaptation syndrome, (c) exemplifies homestatic control, (d) was formulated by Rolando.

15. Orderly changes in behavior that are not contingent upon exercise or experience are called: (a) learning, (b) socialization, (c) maturation, (d) growth.

16. Maturation is largely dependnet upon: (a) stimulation by the environment, (b) learning, (c) training, (d) hereditary potentialities.

17. According to Freud, the normal sequence of psycho-sexual development begins with: (a) oral gratification and ends when heterosexual interests arise, (b) thumbsucking, (c) the phallic phase, (d) anal gratification and ends with the Oedipal stage.

18. Harlow's experiment with the wire "mother" and terry-cloth "mother" reveals that: (a) monkeys love the mother who feeds them, (b) contact comfort is an important source of security, (c) psychological accompaniments of feeding prove to be more important than had been previously thought, (d) love is a derived need based on the reduction of the tension caused by physiological drives.

19. A high frequency of behavior distrubances later in life is often the result of discipline that is: (a) object-oriented, (b) love-oriented, (c) inconsistent, (d) strict.

20. A child takes over many of his parents' values and behavior patterns through the process of: (a) identification, (b) imprinting, (c) maturation, (d) imitation.

21. Students of moral development reveal that: (a) children conform early in life in order to avoid self-condemnation, (b) children who resist temptation in one situtation will probably do so in others, (c) maturation influences are not involved, (d) resistance-to-temptation scores are not valid measures.

22. The primary six characteristics refer to: (a) voice changes, (b) the reproductive organs, (c) breast and chest development, (d) appearance of pubic hair.

23. Some adolescents give the impression of being awkward. This is probably due to: (a) sweeping changes in height and weight, (b) uneven growth of parts of the body, (c) size-age confusion on the part of observers, (d) asynchronous development of the nervous system.

24. When students checked their attitudes toward behavior items, it was found that: (a) college students disapproved of more items than did high school sophomores, (b) the number of disapproved items increased between 1943 and 1953, (c) standards tend to relax as one goes through adolescence, (d) those tolerant toward most of the items were intolerant towards others' religious beliefs.

25. Most older people remember _____ as the time of greatest happiness: (a) youth (fifteen to twenty-five years), (b) childhood (five to fifteen years), (c) middle age (forth-five to sixty years), (d) young adulthood (twenty-five to forty-five years).

26. Sex differences in achievement can probably be best explained by: (a) differences in cultural expectations for the sexes, (b) differences in the knowledge or education of the sexes, (c) differences in the ability of the sexes, (d) maturation disparity between the sexes.

27. Jim and Ruth are newly-weds who wonder whether their marriage will be happy. The most appropriate question they could ask themselves is: (a) was my childhood happy?, (b) do I have adequate sex information, (c) am I sexually compatible with my mate?, (d) is my socioeconomic background similar to that of my mate?

28. Most of later happiness in marriage is that discipline which is: (a) permissive, (b) firm but not harsh, (c) object-oriented, (d) somewhat inconsistent.

29. According to the test, the two main aspects of all motivated behavior are: (a) goals and incentives, (b) hunger and sex, (c) action and direction, (d) sex and aggression.

30. Any bodily deficit or state of deprivation can be defined as a: (a) drive, (b) need, (c) motive, (d) incentive.

31. Drives such as hunger and thirst differ from pain in that they are: (a) episodic, (b) intense, (c) cyclical, (d) homeostatic.

32. Only one of these motives has a clearly specified physiological correlate: (a) activity, (b) curiosity, (c) thirst, (d) manipulation.

33. The fact that rats continued to press levers to electrically stimulate parts of their brains clearly demonstrates that: (a) drive reduction explains most motivated behavior, (b) some goal-activity may be pleasurable apart from conditions of need, (c) masochistic behavior occurs in both lower and higher animal life, (d) incentives greatly enhance drives.

34. Chimpanzees working at a Chimp-o-mat have shown that: (a) fear is an acquired incentive, (b) drives can change, (c) animals can correct a bad diet, (d) previously neutral objects can acquire incentive power.

35. Motives may become greatly transformed so that their roots are scarcely recognizable, according to: (a) Freud's theory of human motivation, (b) Allport's concept of functional autonomy, (c) both of the above, (d) Harlow's alternative to the need-drive-incentive formulation.

36. A motivational disposition: (a) is an aroused state, (b) is a persistent tendency, (c) seeks immediate expression, (d) has about the same strength for everyone.

37. Which of the following statements is inaccurate: (a) Motives may appear in disguised form, (b) Similar motives may be manifested through unlike behavior, (c) The expression of human motives varies little from culture, to culture, (d) Any single act may express several motives.

38. According to the cognitive theorists, much of behavior: (a) set realistic goals for themselves, (b) has motives that can be inferred from observing action, (c) is guided by one's expectations, goals, and plans, (d) is lacking in purpose.

39. Subjects with histories of failures at tasks are likely to: (a) set realistic goals for themselves, (b) have high achievement motivation, (c) stay with any task assigned them, (d) set their goals unrealistically high or low.

40. Maslow classifies motives as: (a) viscerogenic and psychogenic needs, (b) physiological needs, safety needs, belongingness and love needs, esteem needs, and the need for self-actualization, (c) needs for security, recognition, response from one's fellows and new experience, (d) needs for moneostatis and self-consistency.

41. In highly emotion states, we manifest all but one of these physiological changes: (a) the blood vessels in the skin delate, (b) the pupil of the eye constricts, (c) more adrenalin is secreted, (d) muscular tension increases.

42. A part of the brain that plays a central role in the organization and activation of many types of emotional behavior is the: (a) hypothalamus; (b) reticular formation, (c) cerebellum, (d) parietal lobe.

43. Fear and anger: (a) have few bodily responses in common, (b) cannot be considered affective states, (c) are very difficult to measure physiologically, (d) have many bodily responses in common.

44. Watson and Rayner's famous experiment with the infant boy Albert, who acquired a fear of soft, furry objects, shows that: (a) emotions develop as a consequence of increased maturation, (b) both perceptual and cognitive processes are secondary processes in learning

fear, (c) fears can develop as a consequence of learning, (d) some fear responses can be explained only by assigning a role to instinctual processes.

45. A readiness to respond in a predetermined manner to a person, object, or idea is a(n): (a) preference, (b) attitude, (c) complex, (d) prejudice.

46. Fear differs from anxiety in that it: (a) usually has a specific object, (b) evokes a milder degree of emotion, (c) persists over a longer period of time, (d) occurs in the absence of real danger.

47. The characteristic level of a person's emotional reactivity is called his: (a) mood, (b) affectivity, (c) personality, (d) temperament.

48. The point at which two tones, one of higher pitch and one of lower pitch, are told apart is the _____ threshold. (a) absolute, (b) discrimination, (c) difference, (d) psychophysical.

49. According to Weber's law: (a) difference thresholds are constant from person to person, (b) the difference thresholds tends to be a constant fraction of the stimulus intensity, (c) prolonged exposure to a stimulus does not greatly influence thresholds, (d) all modalities are equally sensitive.

50. For which of the following do we experience sensory adaptation: (a) vision, (b) smell, (c) temperature, (d) all of the above.

51. The most sensitive portion of the eye in normal daylight vision is a small area of the retina called the: (a) optic chiasma, (b) occipital lobe, (c) fovea, (d) retina.

52. A monochromat: (a) has monocular vision, (b) cannot perceive depth, (c) is totally color blind, (d) can see only one color.

53. Frequency is to pitch as amplitude is to: (a) noise, (b) timbre, (c) saturation, (d) loudness.

54. Kinesthesis is possible because receptors exist in the: (a) basilar membrane, (b) simicircular canals, (c) olfactory bulbs, (d) miscles, tendons, and joints.

55. The incident of the pygmy who misperceived a herd of buffalo as insects reveal that: (a) the perception of objects is sometimes subliminal, (b) size constancy is achieved through experience, (c) the disparity in

size between two objects enhances misperceptions, (d) stereoscopic vision is not always to be trusted.

56. The experiment using the wife-and-mother-in-law ambiguity emphasizes: (a) the effect of experience on figure-ground perception, (b) the "thing-like" nature of objects, (c) the effect of needs and values on object perception, (d) that the whole is different from the sum of its parts.

57. If we blink two separated lights alternately on and off fast enough, we will get: (a) retinal disparity, (b) tachistoscopic motion, (c) a stereoscopic effect, (d) the phiphenoneon.

58. Perceptive, superpositon of objects, height inplane and gradient of texture are all: (a) monocular cues to distance, (b) binocular cues to distance, (c) apt to produce illusions, (d) apt to produce ambiguous figure-ground effects.

59. The most primitive organization in perception is for: (a) form, (b) figure-ground relationships, (c) location constancy, (d) size constancy.

60. Perception can be influenced by: (a) needs and values, (b) preparatory set, (c) both of the above, (d) neither of the above.

61. Which statement is in closest accord with the position of the text regarding extrasensory perception? (a) It is clear that perception often requires no sense-organ stimulate whatever, (b) Entersensory perception is not a legitimate field for scientific inquiry, (c) The reservations of the majority of psychologists toward ESP is little more than stubborn prejudice, (d) Psychologists should keep an open mind about issues such as ESP since this permits empirical checking.

62. Psychologists who interpret learning by means of cognitive processes emphasize the role of: (a) simultaneous stimuli, (b) habits, (c) associations, (d) understanding.

63. Classical conditioning is the name given to the method by which organisms acquire or learn connections between stimuli and responses through _____ learning? (a) insightful, (b) trial and error, (c) multiple response, (d) associative.

64. Anything that will strengthen the association between the conditioned stimulus and the conditioned response

is called: (a) reinforcement, (b) substitution, (c) generalization, (d) spontaneous recovery.

65. In classical conditioning, if we continually present the conditioned stimulus without the unconditioned stimulus we get: (a) spontaneous recovery, (b) stimulus generalization, (c) operant behavior, (c) extinction.

66. When a response has been extinguished but later reappears without further reinforcement, we have the phenonenon of: (a) insight, (b) spontaneous recovery, (c) inhibition, (d) generalization.

67. In escape conditioning the reinforcement is: (a) the presentation of food, (b) usually a light or a buzzer, (c) the termination of some painful stimulus, (d) a drug of some sort.

68. Tim is given a list containing previously learned items interspersed among many that are unfamiliar. He is asked to label each word he believes he has seen on the original list. This would be a test of: (a) recall, (b) recognition, (c) reintegration, (d) relearning.

69. Assume that Mary required 100 trials to learn a list of 50 nonsense syllables on the original learning and that two months later she required only 10 trials to learn the same criterion of mastery. In this case her saving score would be _____: (a) 40, (b) 50, (c) 90, (d) 100.

70. The curve of retention typically falls: (a) rapidly at first and then gradually taper off, (b) slowly at first and then rapidly tapers off, (c) rapidly for well-organized material, (d) slowly for nonsense syllables and illogical material.

71. This theory of forgetting emphasizes that new learning interferes with the retention of old learning: (a) proactive inhibition, (b) motivated forgetting, (c) retroactive inhibition, (d) passive decay through disuse.

72.

Experiment group:	Learn A	Learn B	Recall A
Control group:	Learn A	Rest	Recall A

The above is an experimental arrangement for testing: (a) preactive inhibition, (b) repression, (c) retroactive inhibition, (d) spontaneous change in the memory traces.

73. Ordinarily, when subjects are absorbed in a series of tasks but are permitted to complete only some of them, they tend to: (a) repress much of what they have learned, (b) recall the unfinished tasks better, (c) use selective perception in both learning and recall, (d) recall completed tasks better.

74. The consolidated theory predicts that, if ECS is administered in a stimulus situation quite different from that in which the initial learning took place: (a) the results will be the same as those predicted by the conditioned-inhibition hypothesis, (b) the amnesic effect will not occur, (c) the changed environment will have no significant effect, (d) the animal will show emotional disturbances.

75. A subject has learned a list of three items. Given that after several trials we have tallied the number of errors for the first, second, and third items, respectively which of the following would support the serial-position effecay: (a) 5, 10, 7, (b) 7, 5, 10, (c) 5, 7, 10, (d) 10, 5, 7.

76. He would say that transfer exists when: (a) previous learning makes it easier to learn something else, (b) previous learning makes it more difficult to learn something else, (c) both of the above, (d) task 2 immediately follows task 1.

77. In which task would negative transfer be likely? (a) flying a small kite, then a large kite, (b) typing on an Underwood typewriter, than a Remington, (c) driving with an automatic shift, then a standard shift, (d) shooting an air rifle, then a 22-caliber rifle.

78 When we teach a monkey to ignore positional cues and reinforce him with food only when he selects a triangle regardless of its size or color, we are interested in whether: (a) reward is more rewarding than punishment is punishing, (b) he can learn to learn, (c) operant conditioning facilitates learning more than classical conditioning does, (d) animals learn by making specific kinds of movement responses.

79 Principles transfer more readily when the student has: (a) not yet mastered the basic problem, (b) had a wide variety of problems, (c) practiced the basic problem to a high degree of mastery, (d) had no experience with the basic problem.

80 Controlling learning through punishment: (a) may produce only temporary results, (b) is a very effective way to learn, (c) produces predictable results, (d) is wrong soley on humanitarian grounds.

81 We can deal with events that happened some time ago because: (a) most thinking occurs in meditation, (b) free association is possible, (c) reveries occur often, (d) thought is symbolic.

82 A test designed to pin down the connotative meanings of words is: (a) the Personal Preference Schedule, (b) a concept mastery test, (c) the semanic differential test, (d) the scale of values test.

83 When a symbol stands for a class of objects or events with common properties, we say it: (a) has connotative meaning, (b) has denotative meaning, (c) is a concept, (d) is conductive to creative thinking.

84 Children are most likely to solve some kinds of transposition problems when: (a) they can understand the somatic meaning of concepts, (b) they can state the solution in words, (c) the solution does not require abstract-thinking ability, (d) the problems involve objects encountered previously.

85 There is some debate by students of brain physiology regarding the nature of thinking. The centralists believe that: (a) a physiology of conditioned responses provides a physiology of thinking, (b) all thinking goes on in action of some sort, (c) there are localized thought centers in the brain, (d) thinking goes on inside the brain and nervous system with muscular movements acting as facilitators.

86 Insight is most synonymous in meaning to which of the following stages in scientific discovery? (a) incubation, (b) preparation, (c) verification, (d) illumination.

87 Probably a dominant theme underlying all the characteristics of creative persons is: (a) being in the top 5 percent in intelligence, (b) flexibility, (c) critical thinking, (d) all of the above.

88 An aptitude test measures a person's: (a) capacity to learn, (b) mastery of a subject area, (c) skills as a result of training, (d) all of the above.

89. Tests that measure consistently are said to have the characteristic of: (a) reliability, (b) validity, (c) both of the above, (d) neither of the above.

90. Binet devised a system of measuring intelligence in terms of: (a) mental age, (b) standard score, (c) critical ration, (d) factor analysis.

91. A child of average intelligence with a chronological age of five should have a mental age of: (a) four, (b) five, (c) eight, (d) none of the above.

92. The classification of the retarded into morons, imbeciles, and idiots has been discarded because: (a) idiots are actually brighter than imbeciles, (b) these labels have actually become terms of reproach, (c) imbeciles are educable, whereas the others are only trainable, (d) five categories are more appropriate.

93. Which statement regarding the stability of the I.Q. during the school years is most accurate: (a) the I.Q. differences of 15 points within a ten-year span, (b) The average I.Q. remains fairly constant for groups of children, (c) Changes in I.Q. are closely related to environmental events.

94. The characteristics of a person that can be observed and described are called: (a) genotypes, (b) chromosomal typology, (c) phenotypes, (d) behavior genetics.

95. A recessive trait, if controlled by a single gene pair: (a) never appears as a phenotype in the offspring, (b) may appear in the offspring, if it is carried by either parent, (c) occurs only in defective offspring, (d) must be carried by both parents to appear in the offspring.

96. Mongolism: (a) is a sex-linked trait, (b) results from an extra chromosome, (c) results from too few chromosomes, (d) results from defective chromosomes.

97. If one member of the gene pair is dominant and one is recessive: (a) the pair is called homozygous, (b) the pair is called heterozygous, (c) the pair is called a phenotype, (d) only the dominant gene will be transmitted to the offspring.

98. The ultimate I.Q. of children adopted within the first few months of life correlates more highly with that of: (a) their foster mothers but not their foster fathers, (b) their blood parents, (c) both foster parents, (d) research yields inconclusive results.

99. In heredity vs. environment studies, correlation coefficients lead to results: (a) favoring the hereditary interpretation, (b) favoring the environmentalist interpretation, (c) agreeing with those obtained by considering mean changes, (d) differing from those obtained by considering pairs of scores.

100. Taking into account the research done on the relationship between one's racial background and intelligence, we can conclude that: (a) according to verbal tests, the rank in order of intelligence is Causasoid, Mongoloid, African, and American Indian, (b) there are many more gifted persons in the Caucasion race, even thougn the Negroes may have higher intelligence than Caucasions for kinds of abilities that are not yet measurable by existing tests, (c) Orientals have many more gifted persons, even though intelligence falls into a normal distribution in all racial groups, (d) there is a great overlap in intelligence among racial groups.

101. The enduring features or deeper unity underlying each person's way of adjusting is called his: (a) personality structure, (b) trait hierarchy, (c) model behavior, (d) life style.

102. A person who is tall, thin, and stoop-shouldered and who has fine hair, delicate skin, and a sensitive nervous system would be classified by W. H. Sheldon as a(n): (a) endormorph, (b) ectomorph, (c) mesomorph, (d) polymorph.

103. Stereotype is most often associated with which of the following theories of personality? (a) type theory, (b) learning theory, (c) trait theory, (d) psychoanalytic theory.

104. When we attempt to describe a personality by its position on a number of scales, we are using: (a) type theory, (b) learning theory, (c) trait theory, (d) psychoanalytic theory.

105. Which of the following is a developmental theory of personality? (a) trait theory, (b) type theory, (c) learning theory, (d) all of the above.

106. Learning theory and psychoanalytic theory are similar in that both: (a) take into consideration the same basic drives, (b) are developmental theories, (c) place emphasis on the role of reward and punishment in learned behavior, (d) are interactional theories of development.

107. In psychoanalytic theory, the irrational, impulsive portion of personality is called the: (a) animus, (b) persona, (c) livido, (d) id.

108. When a psychologist attempts to appraise a persons affiliative or achievement needs, he is trying to assess his: (a) motivational dispositions, (b) stylistic traits, (c) social attitudes, (d) all of the above.

109. A self-rating device that typically asks many questions about a person is the: (a) scientific scale, (b) projective test, (c) graphic rating scale, (d) personality inventory.

110. A standardized personality inventory that has control keys for detecting those who give many improbable answers or who take the test in a careless manner is the: (a) Edwards Personal Preference Schedule, (b) Allport scale of values test, (c) Cattell 16 PF Questionnaire, (d) Minnesota Multiphasic Personality Inventory.

111. A personality test that measures motivational dispositions or needs is the: (a) Allport scale of values test, (b) Edwards Personal Preference Schedule, (c) Cattell 16 PF Questionnaire, (d) Minnesota Multiphasic Personality Inventory.

112. Which of the following is a projective test? (a) Minnesota Multiphasic Personality Inventory, (b) Thermatic Apperception Test, (c) Edwards Personal Preference Schedule, (d) Cattell 16 PF Questionnaire.

113. Which test is most ambiguous in content? (a) a sentence completion test, (b) Thematic Appreception Test, (c) Rorschach inkblot test, (d) Thurstione Nuerotic Inventory.

114. When psychologists ask outside observors to judge an individuals characteristics, they are using: (a) personality inventories, (b) projective tests, (c) rating scales, (d) all of the above.

115. In approach conflicts the mutually exclusive goals are: (a) positive incentives, (b) negative incentives, (c) mixed incentives, (d) none of the above necessarily.

116. Kathy dislikes both mathematics and German and is having difficulty in deciding which of the two subjects she should study first. She has a (n): (a) approach avoidance conflict, (b) double approach-avoidance

conflict, (c) avoidance-avoidance conflict, (d) approach-approach conflict.

117. The tendency to go away from a negative incentive is: (a) stronger the farther the subject is from it, (b) stronger the nearer the subject is to it, (c) weaker that the tendency to approach a positive incentive, (d) unaffected by changes in drive level.

118. Frustration is caused by: (a) personal deficiencies, (b) conflicts, (c) environmental obstacles, (d) all of the above.

119. Tim is ten years of age, when under tension he sucks his thumb. We call this: (a) repression, (b) denial, (c) stereotype, (d) regression.

120. We use defense mechanisms to: (a) defend ourselves against anxiety, (b) protect our self-esteem, (c) both of the above, (d) neither of the above.

121. Mr. X is deceptive and dishonest but does not like to acknowledge these traits in himself. "You can't trust most people further than you can throw them," he tells others. This illustrates: (a) rationalization, (b) projection, (c) denial, (d) reaction-formation.

122. The adjusted person: (a) is a social conformist, (b) lacks conflicts, (c) has zest for living, (d) all of the above.

123. The chief sympton of neurosis is having: (a) hallucinations, (b) delusions, (c) phobias, (d) anxiety.

124. We get exaggerated mood swings from the normal to deep depression or to wild excitement with: (a) anxiety reactions, (b) schizophrenic reactions, (c) manic-depressive reactions, (d) paranoid reactions.

125. Autism involves: (a) absorption in an inner fantasy life, (b) delusions and hallucinations, (c) "queer behavior", (d) neologisms.

126. The "executive monkey" experiments illustrate: (a) psychosomatic illnesses, (b) organic psychoses, (c) conversion reactions, (d) characters disorders.

127. A psychopathic reaction: (a) is not very serious, (b) is a character disorder, (c) involves too much moral development, (d) involves a highly developed conscience.

128. What is the probability that a baby born today will be hospitalized for mental illness at some time during his life? (a) .05, (b) .50, (c) .10, (d) .01.

129. Psychoanalysis use free association as a technique of treatment in order to: (a) establish rapport, (b) assess ego functioning, (c) help the client restrain his id impulses, (d) make unconscious feelings and thoughts conscious.

130. If a client forgets his appointment, a likely interpretation is that: (a) he is unconsciously expressing resistance, (b) avreaction has occurred, (c) his transference is interce, (d) he is working through.

131. Even though the therapist has brown hair, the client, who perceives him as having gray hair and as being much older than he actually is, behaves toward him as he does toward his father. What had occurred: (a) rapport, (b) insight, (c) transference, (d) avreaction.

132. Avreaction is synonymous with: (a) catharsis, (b) insight, (c) working through conflicts, (d) dissociation.

133. Traditional therapists criticize behavior therapy on the grounds that: (a) an anxiety heirarchy is artificial, (b) it deals only with symptoms and leaves the conflict unresolved, (c) reciprocal inhibition cannot occur, (d) counter-conditioning produces maladaptive responses.

134. Behavior therapists maintain that: (a) by substituting more appropriate habits, one can cure the illness, (b) inner conflicts must be treated directly, (c) symptom substitution is maladaptive, (d) symptom substitution is all right, but conflicts are still unresolved.

135. Probably the most characteristic aspect of eclectic therapy is: (a) insight, (b) transference, (c) learning, (d) flexibility.

136. A group of boys dislike their authoritarian leader, and when they bully a helpless member of their own group they are engaging in: (a) projection, (b) cognitive disaonence, (c) in-group-out-group behavior, (d) scapegoating.

137. Advocancy differs from propaganda in that it: (a) is impersonal and objective, (b) is based on data and arguments entirely open for discussion, (c) makes an

objective but it really biases, (d) is more like a debate than a discussion.

138. In Asch's experiment, small groups of subjects observed a standard straight line and then judged which of three other lines equaled it in length. Asch was interested in learning: (a) whether the autokinetic effect holds for both prejudice and non-prejudiced subjects, (b) the basis for in-group-out-group behavior, (c) whether people conform to social influences, (d) the personality characteristics of perceptual analyzers versus synthesizers.

139. Opinions differ from attitudes in that they: (a) involve some kind of expectation or prediction, (b) represent an orientation, (c) represent a readiness to respond, (d) are measurable by the Likert scale.

140. In which situation would we have cognitive imbalance? (a) X sees Y and Z happily together and is fond of both of them, (b) X sees Y and Z happily together and dislikes both of them, (c) X sees Y and Z happily together. X likes Z but dislikes Y, (d) None of the above necessarily.

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