

A STUDY OF THE EFFECTIVENESS OF FEEDBACK
IN TEACHING PRINCIPLES OF EDUCATIONAL PSYCHOLOGY

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ABSTRACT

A STUDY OF THE EFFECTIVENESS OF FEEDBACK IN TEACHING PRINCIPLES OF EDUCATIONAL PSYCHOLOGY

by Howard King Cameron

The Problem

The primary purpose of this dissertation was to determine the effect of feedback in learning principles of educational psychology. A second objective was to analyze the relationships between dependent proneness of students (which refers to characteristic reliance on others for approval and/or assistance, and conformity to demands and opinions of others) and techniques of instruction on the basis of student achievement and the attitudes students expressed toward teacher-pupil relations.

The Design

To accomplish these objectives, 123 educational psychology students were instructed according to the Integrative Technique and a lecture method. Integrative instruction was organized so as to provide the maximum amount of feedback for students. The basic pattern of the Integrative Technique was to permit students to ask questions or to further explore sub-

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ject matter covered during two previous lectures. Oftentimes, the instructor asked students to explain further the practical application of textbook principles, and questions were asked to help focus the attention of students upon the central ideas in the lectures and to help clarify student understanding. Most important, however, is the fact that each student was enticed to participate in class discussions, and received immediate feedback from his classmates or the instructor on the basis of his response. The student was informed about the acceptability, correctness, or incorrectness of his response. An effort was made to provide a student with feedback which pointed out the correctness of certain aspects of his response whenever feedback for an undesirable response was given. The teacher attempted to maintain an encouraging and supporting relationship with integratively taught students.

Hypotheses

The research hypotheses in this study are listed below:

1. If integratively taught students are given feedback for classroom responses, they will score significantly higher on the dependent variables (Final Examination; Minnesota Student Attitude Inventory, MSAI; Minnesota Teacher Attitude Inventory, MTAI) than lecture students who do not receive immediate feedback.
2. If integratively taught students are given feedback from the instructor, the experimental high dependent prone students (EHD) will score significantly higher on the Final Examination and MTAI than the experimental low dependent prone students (ELD), the control low dependent prone students (CLD), and the control high dependent prone students (CHD). Further significant differences

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on these tests will also exist between high and low dependent prone students in the order they are listed above: EHD > ELD > CLD > CHD.

Conclusions

Statistical analyses of post-treatment data yielded significant t-ratios in favor of integratively taught subjects on the Final Examination, MSAI, and MTAI. Twelve of the 62 items on the MSAI produced significant chi squares, indicating the type of classroom climate which existed in the two teaching situations. MSAI data show that experimental subjects were more responsive to the integrative type of teaching than were the control subjects. However, both groups of subjects obtained high scores on this scale.

An analysis of dependent proneness data did not support the second hypothesis. On the Final Examination, only the experimental low dependent prone students obtained a mean score which was significantly higher than that of any of the other dependent prone groups. No additional differences of a significant nature were obtained from dependent proneness analyses.

In retrospect, one might conclude that the permissive type of classroom situation makes it possible for the low dependent prone student to develop his interests and abilities in a more general manner than would be possible in a teacher controlled classroom. Also plausible is the possibility that

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the personality trait of high dependence proneness may restrict the extent to which the learner is willing to express himself freely and thereby fully develop his potentialities. Of course, these two interpretations should be further explored in subsequent research.

Post-treatment data from the Minnesota Teacher Attitude Inventory indicate a significant difference in favor of the experimental group over students taught via lecture technique. This is interpreted to be indicative of the fact that experimental subjects are better able to maintain with pupils a state of harmonious relations characterized by affection and sympathetic understanding. These integratively taught students also indicated a significant difference in their expectations to like children and to enjoy teaching.

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By

Howard King Cameron

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CHAPTER I

THE PROBLEM AND DEFINITION OF TERMS

The schools of today face an ever increasing array of problems ranging from the desirability of compulsory education to the availability of quality education for each school age child. Many of these problems have persisted in spite of the spirited and ingenious efforts to solve them. It appears to some educators that new educational problems are developing at a more rapid rate than old problems are being eliminated. Much progress, however, seems to be made yearly toward the realization of an efficiently operated school program which can adequately satisfy the needs of man in an increasingly complex society.

Statement of the problem.--One of the persistent educational problems which plagues the classroom teacher is that of increasing the effectiveness of classroom instruction. Although there are many more educational goals on which educators disagree, there seems to exist a common agreement that the quality of instruction needs to be improved. Controversy does exist, however, when the educator begins to advocate one teaching approach in preference to another. One can easily assess the validity of the above observation by merely surveying the vehement differences of opinions expressed by investigators in the area of improve-

ment of instruction.¹

The basic problem considered in the study being proposed is found in the area of improving classroom instruction. After evaluating previous investigations on teaching techniques, classroom control, etc., this writer became interested in testing the effectiveness of a specific teaching procedure. This procedure has as its basis, data from the subject matter areas of sociology, education, and personality theory.

Considered more specifically, what are the problems underlying this investigation? The primary problem poses this question: will systematically providing feedback for the responses of students have a significantly greater influence on student achievement in educational psychology than providing no feedback for the responses of students? As stated, the crucial variable is the influence of systematically provided feedback on student learning. Whereas the focal problem as phrased does not exhaust the possible effects of feedback on student behavior, it certainly seems pertinent to improving instruction.

There are two secondary, but important, questions related to the basic one previously asked. First, will a particular type of learning experience result in the students' expression of a greater understanding and acceptance of the

¹Wilbert J. McKeachie, "The Improvement of Instruction," Review of Educational Research, XXX, No. 4 (October, 1960), 351-360.

professional role displayed by effective teachers toward children? An assumption here is that different techniques of instruction will differentially affect the attitudes of students toward their perceived role of teachers. Furthermore, certain attitudes possessed by a prospective teacher, in regards to desirable instructional behavior, should have an important influence on his teaching efficiency.

As a second sub-problem, the investigator proposes to examine the role of the student's personality as it may be related to his performance under different instructional procedures. Does the personality make-up of students (in terms of high and low dependent proneness) influence their academic achievement in educational psychology under the influence of different teaching techniques? If so, a next logical question deals with the directions and manner in which this influence takes place. Is there a consistent and significant relationship between specific personality variables of students and their classroom performance? What kind of relationship exists? Can instructional planning be improved from a knowledge of such a relationship?

Purpose of the study.--The purpose of this study has as its basis the idea that there is no such thing as a finished or perfect job of teaching; there is always room for improvement in one way or another. Additional principles and theories are needed to increase the likelihood of successful teaching. Present principles and theories must be scientifically tested before their validity and applicability

can be assessed. The fundamental objective of this entire process is to create a body of knowledge which should help facilitate effective classroom instruction. This is also the basic objective of the proposed investigation.

Each new bit of data which verifies or further explains existing principles or theories underlying the educational process should increase the probability that teaching will be improved. Even if the data invalidates present beliefs, a noteworthy contribution will have been made. This study has as its objective the assessment of a principle already stated by B.F. Skinner--that immediate feedback for the responses of students will control the probability of such responses occurring or not occurring in the future.¹ If such an idea can be verified in a typical classroom situation, the teacher will have a directive for planning future classroom instruction. If the above idea is only partially substantiated, or not substantiated at all, the teacher will still be given a directive for classroom planning. Therefore, the collection of data in this study might contribute to the improvement of classroom instruction.

Justification of the study.--A great deal of research has been conducted on the effectiveness of different instructional methods. From a review of these studies,

¹Burrhus F. Skinner, "Teaching Machines," Science, CXXVIII (October 24, 1958), 969-977.

it is observed that inconsistent and inconclusive findings exist in abundance. It seems that an adherent of any particular teaching method would have no difficulty locating studies compatible with his viewpoint. The superiority of one teaching method over another has not been proven. In fact, different investigators, using similar experimental designs, have reported contrasting findings.¹ Amidst this array of confusion, the classroom teacher is left groping for the instructional method which has been experimentally demonstrated to be of value. Is it possible that one instructional technique might be better than another, or does the quality of the teaching technique depend upon the interactions of other extraneous variables? Some explanation of such diverse opinions and experimental findings in this problematic area should be possible.

One of the basic assumptions underlying this study is that the inconsistent conclusions of previous research may be interpreted as an indication (in part), of the inadequate control of experimental variables. Those studies designed to show the superiority of the lecture method over the discussion method, or of a feedback technique over no feedback, etc., suffer from the inability of the experimenter to control adequately all significant variables. Ideally, the research worker desires to organize an experimental

¹McKeachie, loc. cit.

design so that he can attribute changes in his subjects to a single independent variable. As an example, experiments in the area psychophysics may be subject to such a high degree of control. But when the problem does not permit such rigorous control, the investigator must exercise restraint in the experimental treatment of subjects and subsequent interpretation of his data.

The implication of the above discussion is that each study employing human beings should be evaluated on its own merits. The comparability of any group of research studies can be no greater than their similarity in experimental design, interests and capabilities of the experimenter, etc. When such variables as these differ from one study to the next, one should expect different experimental results. The literature on teaching will reveal that the probability of finding differences in experimental results is great.

Experimental studies on classroom teaching techniques are susceptible to the same limitations just discussed. The teaching situation is too complex for the instructor to have under control all the variables which might affect the behavior of students. Perhaps an example will clarify the viewpoint being expressed. Let us consider one of the difficult problems facing the classroom teacher. The teacher knows that reinforcement of Johnny's behavior will control the probability of that behavior occurring in the future. Johnny makes a response and the teacher hastily positively reinforces the student. Although this brief example may

appear to be a simple teaching act, it really is not. For instance, does the teacher really know that his reaction was interpreted by Johnny to be of a positive nature? Secondly, can the teacher be sure that the behavior he reinforced was actually the behavior he intended to reinforce? There are other "Johnny's" in the classroom; what is happening to them while the teacher is involved with the single student? This brief example should illustrate the momentous task of the teacher in the classroom.

Although inherent weaknesses of research studies of classroom instruction exist, it seems possible that progress can be made in this area. There is a probability that certain teacher behaviors might generally influence certain behavioral responses in students. Is it possible that research workers can inform teachers of the possible ways in which different instructional techniques generally affect unique personalities?

In relation to the teacher manipulating student behavior in the classroom, it is suggested that student achievement is greater when the pupil receives feedback (sometimes referred to as knowledge of results), from the teacher who is monitoring student responses than when the student receives no feedback.¹ The reasoning here is that feedback

¹S. Rosenberg and R. Hall, "The Effects of Different Social Feedback Conditions Upon Performance in Dyadic Teams," Journal of Abnormal and Social Psychology, LVII (1958), 271-277.

provides consequences for the responses of the student, thereby minimizing the probability that errors of the student will be compounded. Such feedback should inform the student of the correctness of his past actions, and it should guide future responses of the student when similar problems confront him. Underwood states that through feedback an individual is told his incorrect responses and can then progress more rapidly to his goal. Also, according to Underwood, feedback can serve to maintain or increase motivation.¹

The principle discussed here (effectiveness of feedback) is thought to be valid irrespective of the instructional method employed. However, the principle might be more applicable to certain types of instructional methods; this point will be dealt with later.

It seems reasonable that the more frequently and immediately a student receives feedback for his responses, the greater the probability that he will attempt and be able to give correct and more precise responses in the future. This contention has been supported by Greenspoon and Foreman in their study on the effect of delay of feedback in learning motor tasks. According to Greenspoon and Foreman, immediate feedback is thought to reduce the possible interference which might result if the interval between response

¹Benton Underwood, Experimental Psychology (New York: The Appleton Century Crofts, Inc., 1949), pp. 414-417.

and feedback were of longer duration.¹

Further support for this belief can be obtained from literature in the area of programmed instruction. In his discussion of the usefulness of programmed instruction, Skinner states:

The machine, like the private tutor, reinforces the student for every correct response, using this immediate feedback not only to shape his behavior most efficiently but to maintain it in strength in a manner which the layman would describe as 'holding the student's interest'. . . . Immediate feedback encourages a more careful reading of the programmed material than is the case in studying a text, where the consequences of attention or inattention are so long deferred that they have little effect on reading skills. . . . When an immediate result is in balance the student will be more likely to learn how to marshal relevant material, to concentrate on specific features of the presentation, to reject irrelevant materials, to refuse the easy but wrong solutions, and to tolerate indecision, all of which are involved in effective thinking.²

Likewise, when the frequently responding student is given a fixed ratio of responses to knowledge of results (feedback given for each response of the student), one should expect the student to continue to respond at a high rate.³ Bilodeau and Bilodeau state that this feedback is most effective in the initial learning of simple motor

¹Joel Greenspoon and Sally Foreman, "Effect of Delay of Knowledge of Results on Learning a Motor Task," Journal of Experimental Psychology, LI (1956), 226-228.

²Burrhus F. Skinner, loc. cit.

³Edward Bilodeau and Ina Bilodeau, "Variable Frequency of Knowledge of Results and the Learning of Simple Tasks," Journal of Experimental Psychology, LV (1958), 379-383.

tasks. An explanation of why feedback is most effective in the initial stages of learning might emphasize that this arrangement enables the student to avoid learning inappropriate movements (in the early stages of practice) which may be difficult to extinguish later on. It is the opinion of the investigator that the early confirmation of a response (via feedback to the student), strengthens the probability that the correct response will be learned and retained as an aspect of student behavior.

Norman Chansky has gathered data which indicate that the schedules and types of feedback students receive are significantly related to verbal learning. The data show that child psychology students who experienced a continuous reinforcement schedule learned significantly faster than those students who experienced an intermittent reinforcement schedule. The criterion of performance was the number of acquisition trials required to learn the age expectancy corresponding to eight items on the Vineland Social Maturity Scale.¹

Precisely what is the role of feedback in the typical learning situation? This writer prefers to think that feedback acts to inform the student whether his response is correct or incorrect and what errors may have been made. This

¹N. Chansky, "Learning: A Function of Schedule and Type of Feedback," Psychological Reports, VII (1960), 362.

information is essential for further improvement in learning. As the learner attempts a response, he is led to revise his response on the basis of information provided to him about its accuracy. Through continual feedback from the instructor, a better understanding of the response, and the ability to produce it are created in the student.

It is known that feedback can serve beneficial results, and it is probably more feasible under certain conditions. It is also true that feedback among or between students can lead to desirable changes in behavior in the same manner as feedback from the class instructor can lead to desirable changes in behavior.¹ An implication from the latter statements is that the structuring of classroom proceedings so that students receive the maximum amount of feedback is desirable.

Following from the above trend of thinking, Herbert Thelen has proposed the idea that the number of students in a classroom group is of crucial importance in determining group progress. This is thought to be such an important variable that a recommendation is made on limiting the size of the group on the basis of resources in the particular group and the type of subject matter under consideration. An implication in Thelen's proposal is that the student's "activeness of participation" is a very important factor in

¹D. Jenkins, "Feedback and Group Evaluation," Journal of Social Issues, IV (1948), 50-60.

learning. He states:

If one accepts the postulate of an experimental point of view (that one learns by assessing the situation, planning strategy, carrying it out, and appraising the consequences of his actions . . .), then we would submit that vicarious participation does not usually have these dimensions of self initiation, self direction and self evaluation which characterize first hand self directive experience.

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The size of the group should be the smallest group in which it is possible to have represented at a functional level all socialization and achievement skills required for the particular learning activity at hand.¹

The importance of Thelen's suggestion for this study (especially when the student appraises the consequences of his actions) has been experimentally tested. Among others, Skinner's findings with teaching machines have demonstrated the importance of Thelen's suggestion for the improvement of instruction. According to Skinner, the employment of his programmed instructional technique resulted in a lower error rate (on tests administered after instruction) than when students were taught via the common lecture procedure.² There appears to be a significant connection between the "activeness" of the learner, as perceived by Thelen, and the importance Skinner places upon the learner making an overt response. Both theorists accept the idea that feedback is influential in controlling the probability of subsequent student behavior.

¹Herbert Thelen, "Group Dynamics in Instruction: Principle of Least Group Size," School Review, LVII (1949), 139-148.

²Skinner, Science, CXXVIII (October 24, 1958), 969-977.

A basic question in the problem being proposed, as is evident in the above discussion, is whether feedback administered to students in a group situation (Thelen's idea) will have an effect similar to feedback administered to individual students via teaching machine (Skinner). If one accepts the findings of Jenkins, there would seem to be an affirmative answer to this question. Jenkins' data suggest that feedback played a significant role in leading group members toward accurate self evaluation.¹

It seems that if instruction can be presented to small groups of students, with ample provisions for giving feedback to students after they respond, the problem of individual differences should be handled more effectively. If Skinner is correct in his feedback principles, an instructor should expect to use feedback principles more effectively in a lecture discussion group than in a large lecture group. The small discussion group gives the teacher a greater opportunity to provide feedback for a larger number of student responses. The resulting effects should be revealed on an objective criterion selected to measure group differences after treatment.

Not only is the question of what kind of teaching technique is used important, but also the personality structure of the students undergoing instruction is an important

¹Jenkins, op. cit., pp. 58-60.

variable.¹ In light of Amidon and Flanders' findings, one should expect so-called "dependent prone students" to function quite efficiently in a situation where they have close contacts with an authority figure, and receive approval and individual attention. Perhaps the effects of the method of instruction should vary in relationship to the personality make-up of students.

Present knowledge on this matter seems to indicate the existence of a positive relationship between the instructional method used and the personality of students. This is the conclusion from Amidon and Flanders' study in which "dependent" and "independent" prone students were taught a lesson in eighth grade geometry. In discussing their findings these experimenters state:

We assume that the dependent prone students are more sensitive to the directive aspects of the teacher's behavior. As the teacher becomes more directive, this kind of student finds increased satisfaction in more compliance, often with less understanding of the problem solving steps carried out. Only when he is free to express his doubts, to ask questions and to gain reassurance, does his understanding keep pace with his compliance to the authority figure. Lacking this opportunity, compliance alone may become a satisfying goal and content understanding may be subordinated to the process of adjusting to teacher directives.²

¹Edmund Amidon and Ned Flanders, "The Effect of Direct and Indirect Teacher Influences on Dependent-Prone Students Learning Geometry," Journal of Educational Psychology, LII, No. 6 (December, 1961), 286.

²Ibid.

In the above mentioned study by Amidon and Flanders, no differences were found when independent prone students (those in the lower 25 per cent on the dependency scale) were compared separately. Hence, no significant differences were found between groups of independent prone students taught by the direct method (teacher controlled) and the indirect method (which is referred to as "feedback" in this investigation.)¹

Jokubczak and Walters' investigation (with elementary school children) offers information similar to that just presented. Highly suggestible subjects were significantly influenced by adults and peers in their perception of a light stimulus. Not very much was said, however, about the performance of high dependent prone and low dependent prone college students in an instructional situation where individually and group administered feedback was systematically given by the teacher.² Will such a teaching approach differentially favor one group of college students (high or low dependent prone) more than another? Can this difference be objectively assessed? What differential influences will feedback have on the students' perceptions of the instructor?

Not enough data have been collected for an objective and complete answer to the above questions. This study

¹See definition of "feedback" under definition of terms.

²Leonard Jokubczak and Richard Walters, "Suggestibility as Dependency Behavior," Journal of Abnormal Psychology, LIX (1959), 102-107.

should help provide a clearer answer to such questions, and thereby make a contribution to the progress of the modern educational system.

Hypotheses of the study.--The hypotheses which will be tested in this study are the following:

1. If experimental students are given feedback for classroom responses they will score significantly higher on the "dependent variables"¹ than control students who do not receive immediate feedback.
2. If experimental students are given immediate feedback from the classroom instructor, then the experimental high dependent prone students (EHD) will score significantly higher on the Final Examination and M.T. A. I. than the experimental low dependent prone students (ELD), the control low dependent prone students (CLD), and the control high dependent prone students CHD). Further significant differences on the Final Examination will also exist between high and low dependent prone students in the order they are listed above:
EHD > ELD > CLD > CHD.

The rationale behind the second set of hypotheses is as follows. In the experimental groups, both high and low

¹The term "dependent variables" here refers to scores made by students on the Minnesota Teacher Attitude Inventory, Minnesota Student Attitude Inventory, and Final Examination.

dependent prone students will receive feedback. Therefore, the degree of dependent proneness is the only significant variable uncontrolled. It has been demonstrated by previously mentioned investigators that highly dependent prone students perform at a higher level than independent prone students when they are taught according to an indirect method (feedback). Amidon and Flanders' data indicate this fact to be true for their experimental subjects.

For the second hypothesis it seems reasonable to assume that independent prone students receiving feedback will perform at a higher level than dependent and independent prone students who receive no feedback. This idea is supported by results from an experiment carried out by Flanders using the "indirect teaching approach" as his independent variable.¹ Flanders' data show that an indirect teaching technique had a significant influence on eighth grade students learning principles of social science and science.

Finally, since the dependent prone student is highly suggestible and compliant, it is suspected that he will be more likely to accept ideas expressed in lectures than the independent prone student. In a lecture situation the dependent prone student should experience great satisfaction in accepting expressed ideas at face value, and will be contented not to develop a clearer understanding of the material.

¹Ned A. Flanders, "Teacher Influence, Pupil Attitudes, and Achievement," Final Report. 1960, Cooperative Research Project No. 397, U. S. Office of Education, Department of Health, Education and Welfare, p. 113.

On the other hand, the low dependent prone student will demand more than mere facts and ideas. He will be actively searching for explanations, and trying to understand the material comprising the lecture. With these conditions prevailing, it is hypothesized that a low dependent prone student will perform at a higher level than the high dependent prone student. This is primarily expected on the basis that the dependent variable consists of an examination designed to measure the degree to which the student understands and can apply what he has learned.

Definition of terms.--For purposes of clarification and comprehension, the following terms, which appear frequently in this study, are defined.

Dependent proneness--characteristic reliance on others for approval or enjoyment of the pleasure of approval from others. It refers to reliance on others for help or assistance, and conformity to demands and opinions of others. Using the Edwards Personal Preference Schedule (EPPS), high dependent prone students are those who score at or above the 70th centile on the deference scale and at or below the 50th centile on the autonomy scale with a minimum separation of 30 centile points between the deference and autonomy scores for each subject. Low dependent prone students are those who score at or below the 50th centile on the deference scale and at or above the 70th centile on the autonomy scale, with a minimum separation of 30 points between the deference and autonomy scores. No student will be assigned to

the low or high dependent prone group unless his raw score on the consistency scale is 10 or more. This line of thinking follows the construct validation of EPPS by Bernardin and Jessor.¹

Educational psychology--that branch of knowledge which deals with the application of psychological principles to solve learning problems.

Exhibit understanding of educational psychology--the ability of a student to apply his knowledge of psychological teaching principles to solving problems of an application nature as measured by an objective semester examination.

Express positive attitudes toward the teacher-pupil relationship and the course--the scores made by students on tests measuring their attitudes toward the teacher-pupil relationship (M.T.A.I.), and toward their class in educational psychology (M.S.A.I.)

Feedback--this refers to the instructor's reactions to the responses of experimental students during weekly discussion periods (sometimes called knowledge of results). The instructor will pattern his teaching conduct on the basis of Anderson's "Integrative Technique" as a means of providing feedback to students.² The use of the Integrative

¹A. Bernadin and Richard Jessor, "A Construct Validation of the Edwards Personal Preference Schedule with Respect to Dependency," Journal of Consulting Psychology, XXI (1957), 63-67.

²Flanders, op. cit., pp. 5-10.

Technique as a means of providing feedback seems appropos as a result of Flanders' study mentioned previously.¹ Amidon and Flanders' "indirect technique" is basically a re-statement of the "Integrative Technique" of Anderson. Also, there is a direct relationship between an instructor's activities using the Integrative Technique and the specific act of providing feedback as envisioned by Skinner.

The Integrative Technique

- a. Teacher accepts, clarifies, and supports the ideas and feelings of pupils.
- b. Teacher praises and encourages students.
- c. Teacher asks questions to stimulate pupil participation in decision making.
- d. Teacher asks questions to orient pupils to schoolwork.

Lecture discussion method--an instructional procedure in which the teacher seeks to create interest, to influence or stimulate, and to develop critical thinking largely by the use of a verbal message, with a minimum of class participation.

Basic assumptions.--Several assumptions are implied in the above discussion. The writer assumes that it is not only desirable and necessary that student performance be improved, but that the improvement of performance is highly possible under certain conditions. Furthermore, it appears that these conditions can be specified and manipulated by the classroom instructor so as to help bring about the increase in student learning. It is assumed that what teachers

¹Amidon and Flanders, loc. cit.

do and say in the classroom will affect student behavior.

Certainly all the variables of the classroom environment cannot be juggled and manipulated as the stage performer handles the juggling of balls. Human behavior is not so placid and predictable that an observer can always forecast the S-R chain of events. There are fortuitous variables such as emotional and attitudinal dispositions of the students which cannot be controlled from day to day. However, it seems possible that such variables as age and scholastic aptitude can be controlled to some degree. This should allow the investigator to study human behavior under semi-controlled conditions. Although one will not be able to add together the variables manipulated and arrive at a precise prediction of future behavior, it should be possible to derive more reliable predictions based upon controlled observations of behavior.

In this study the writer employed certain objective measures of behavior. It is assumed that the scales validly measure the traits for which they were designed.

The analysis of variance and t-test technique are the appropriate statistics for this experiment. The F ratio will be appropriate if subjects in the population are normally distributed on the dependent variable, and are selected randomly, and if treatment effects are constant and additive.

Limitations of the study.--An experimental study dealing with human behavior (especially in a classroom situation), suffers from the experimenter's inability to adequately control

relevant intervening variables. This experiment is no exception. Such factors as pre-experimental experiences of students, differences in interest, motivation, class attendance, health, etc., will limit the generality and cause-effect interpretation of results.

In the chapter on experimental design, the reader will note that students in the experimental group are subjected not only to feedback from the instructor, but to another independent variable as well--small group discussion. This arrangement of experimental treatment has prevented the writer from exclusively attributing possible differences between experimental and control subjects to feedback. However, the investigator regarded small group discussions as an important provision for heightening the intensity of feedback. It appeared that small group discussions and the Integrative Technique were highly compatible instructional techniques, and that the discussions would help to create treatment conditions which would yield significant results. Without the small group discussion, it was thought that the Integrative Technique would not have sufficient strength. Support for this type of reasoning has already been presented on pages 11 through 14 of this dissertation. The basic rationale is that the small discussion group is a good arrangement for providing an immediate and high rate of feedback to responding students.

Preview of remaining chapters.--The remaining portion of this dissertation has the following arrangement. In

Chapter II a preview of the literature and the present status of the problem are presented. Chapter III contains a discussion of the experimental approach followed in performing the study. The reader will find the experimental results and interpretations in Chapter IV. Finally, the text of the dissertation will end in Chapter V with the summary and conclusions derived from this investigation, along with implications for future research. For convenience and simplicity, reference data will be compiled in the bibliography and appendix.

CHAPTER II

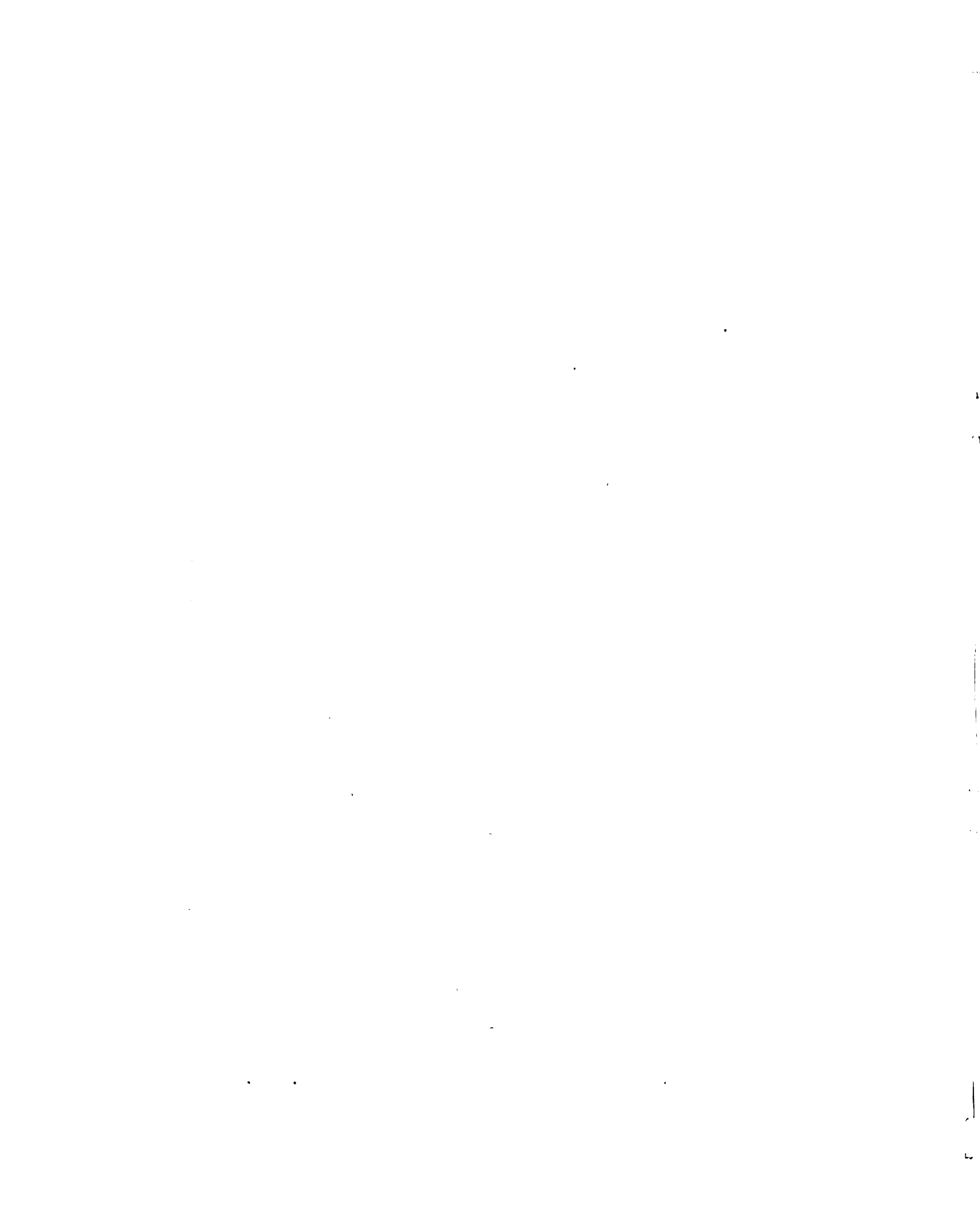
REVIEW OF THE LITERATURE

The central problem of assessing the effect of feedback on student learning is the underlying theme of this chapter. The review of the literature will be reported in the following manner. First, a definitive discussion of the experimental application of two instructional techniques in education (Dominative Pattern and Integrative Technique) will be discussed. An attempt will be made to correlate this first section with the concept of feedback and student personality (more specifically, dependency proneness). Finally, salient ideas of the chapter will be summarized.

It should be noted at this time that the vast amount of literature in this area necessitates the factor of selectivity in choosing studies to be reviewed. However, an objective presentation of different viewpoints and findings is the basic guiding goal of the writer.

Historical background.--Some techniques of classroom instruction have survived a long history of application and numerous professional debates over their desirability. One can find traces of so-called modern techniques being used by teachers during medieval times.¹ Even then, there were pes-

¹William Burnham, Great Teachers and Mental Health (New York: D. Appleton and Company, 1926), p. 35.



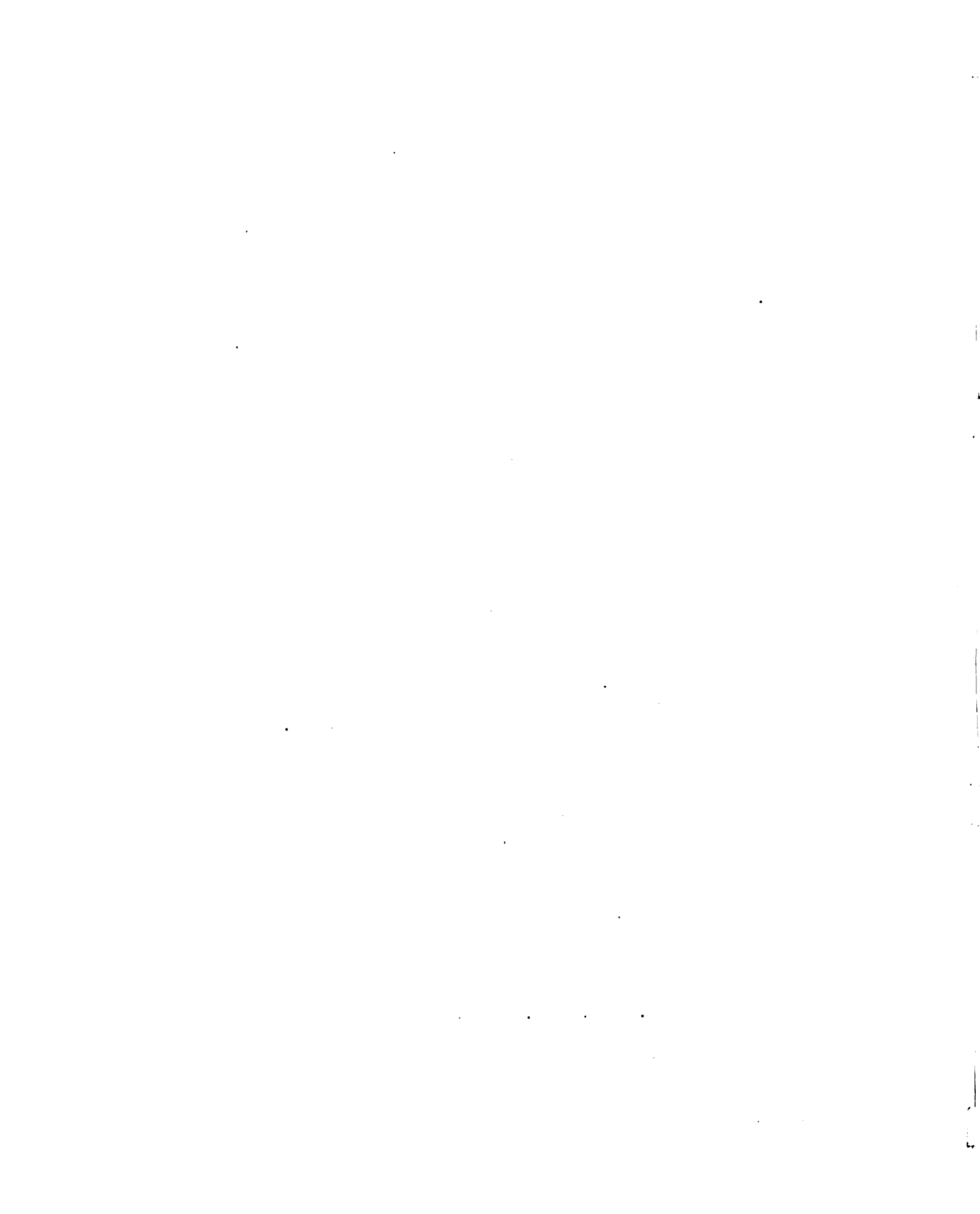
simists within the instructional rank, and the applicability of certain methods was questioned. During this period, teachers relied heavily upon techniques closely related to what Flanders has called the "Dominative Pattern".¹

The dominative pattern was popular for several reasons. Chief among them was the idea that subject matter was to be "absorbed or assimilated" by the student. This being a primary objective of instruction, one can see why a continuous lecture was popular, especially where material was scarce in written form.

Eventually a concern for providing experience in democratic living prompted some educational institutions to experiment with student participation in planning and conducting learning experiences. A survey of instructional procedures employed by teachers at various colleges depicted this trend vividly.² Such schools as Columbia University, Harvard University, Bennington College, et. al., had a high percentage of instructors who had abandoned the lecture method almost entirely and were using discussion and project techniques more extensively. Much of the stimulus for this instructional trend came from the developing field of group dynamics research.

¹Ned Flanders, Teacher Influence, Pupil Attitudes, and Achievement, op. cit., pp. 5-10.

²James G. Umstatted, Teaching Procedures Used in Twenty-Eight Midwestern and Southwestern Colleges and Universities (Austin, Texas: University Cooperative Study Society, 1954), p. 91.



Flanders discussed "dominative" and "integrative" patterns of instruction in his Cooperative Research Project.¹ Additional data covering the topic of dominative vs. integrative teaching exist in abundance. Different writers, however, have chosen to label these instructional approaches differently. The dominative pattern has been frequently referred to as "teacher controlled," "The Direct Method," "The Lecture Method," etc. The basic idea underlying all these concepts is the high degree of leadership exercised by the classroom teacher and the subjugated role played by the student. Likewise, the Integrative Technique is widely known by other names, such as "Student Centered Instruction," "Indirect Method," "Discussion Method," "Group Controlled Method," "Permissive Technique," etc. The basic idea underlying these studies is the increased involvement of students in classroom activities ranging from deciding class objectives to actually teaching the class. The following discussion will deal with the experimental application of these two instructional approaches in studies involving learned behavior. The reader should keep in mind the appropriate classification of teaching methods as they are discussed above.

Integrative vs. Dominative Teaching.--A classroom may be managed so that the teacher assumes control of all the activities in the class or so that there exists very little or no control of classroom activities on the part of anybody.

¹Flanders, op. cit., pp. 9-10.

On this continuum of classroom control one can find all shades of teacher pupil interactions. In fact, it has been reported by Flanders¹ that teachers are not as consistent in their classroom behavior as it is often believed. Flanders says that unless the teachers make careful plans, and conscientiously try to follow the plan, their behavior is apt to vary from integrative to dominative, or to be a mixture of the two.

When assessing data on the superiority of one technique of instruction over another, one finds that the literature is characterized by many contradictory and conflicting findings. Excellent surveys of the literature have been presented by Wilbert McKeachie (1954, 1958, and 1960). The Handbook of Research on Teaching, by Nathaniel Gage, also contains valuable reviews. These reviews generally present summaries of findings under the headings of different experimental approaches, discussions on various suggestions for improving instruction, and a statement on future possible trends in research. Other interesting reviews are presented in the 1958, 1961, and 1962 editions of the Annual Review of Psychology. The interested reader is referred to the above sources should he desire a more thorough treatment of the studies testing the significance of different teaching methods than is presented here. The discussion which follows

¹Flanders, op. cit., p. 116.

will primarily deal with some of the studies which seem to have a significant bearing on the proposed research.

Several researchers have examined the results from instruction based upon the lecture and discussion methods. Faw's results seem to indicate that student-centered instruction is superior to teacher-centered instruction when the variables of subject matter learned and attitudes of the students toward the course are considered. Data from his investigation indicate that subjects in the student-centered group had a more positive evaluation of the course, did better on objective type examinations, and participated more in class proceedings.¹ A very good critical analysis of Faw's study is given by Farquhar.²

The study by Asch also produced data which, in part, support the principles of student-centered instruction.³ Asch's experimental subjects appeared better adjusted than control subjects on the basis of M.M.P.I. scores, but the control subjects scored significantly higher than experimental subjects on the Final Examination. The latter finding (achievement test performance) completely contradicts that of Faw.

¹Volney Faw, "A Psychotherapeutic Method Teaching Psychology," American Psychologist, IV (1949), 104-109.

²William Farquhar, "An Investigation of the Relationships of Three Teaching Methods to Student Behavior in a How To Study Course," Ph.D. dissertation, University of Minnesota, Minneapolis, Minnesota, 1955.

³M. J. Asch, "Nondirected Teaching in Psychology: An Experimental Study," Psychological Monographs, XXVIII (1957), 278-279.

The studies by Asch and Faw appear to be quite typical of the many other research studies in the area of classroom instruction. Each investigator approached the experimental problem with the conception that a lecture method of teaching is superior to a discussion method or vice versa. The teaching technique employed was expected to bring about certain behavioral changes in the pupils of the investigators. After treatment the investigators assessed the effects of the instructional technique employed, and assigned possible differences between the control and experimental subjects to the influence of treatment.

Suppose a classroom teacher has at his disposal the investigations of Asch and Faw. The teacher must decide upon an instructional technique to follow in teaching history to students in the 10th grade. Which of the above two methods of instruction should be used? In making this decision the teacher must first determine the objectives of instruction. The method employed by Faw might better enable the teacher to help his students develop positive attitudes toward the self and the world in which they live. Present data which are available do not prove that one method is superior to the other in terms of subject matter achievement.

Rohrer's study, involving an experimental comparison of the performance of students taught in large and small sections of an American government course, is pertinent to this investigation. In summarizing the results the author states:

The most significant finding of this study is that the amount of achievement . . . varied as a function of the course instructor and did not vary as a function of the size of the class. This suggests that differential skills and abilities of instructors to present materials to large and small classes is the critical variable. No significant differences were observed between the small classes taught by the lecture or discussion methods, but differences were revealed in the achievement of students when taught by different instructors.¹

It is interesting to note the significance attributed to variability between instructors when interpreting the above data. Could it be that the strength of a specific teaching method really varies in relationship, in part, to the personality of the teacher? Such a possibility seems plausible.

One of the most revealing studies in the area of improving classroom instruction has been reported by Wispe.² Not only does Wispe further confirm the non-significant findings of other workers relative to the value of lecture vs. discussion techniques, but he also offers some stimulating suggestions which might explain these findings. Wispe reports that one of the uncontrollable variables operating to produce results from studies on instructional techniques is the personality of the students. His data indicate that there exists what he calls "want more D" students (dependent prone), "want more P" students (independent prone), and a

¹John Rohrer, "Large and Small Sections in College Classes," Journal of Higher Education, XXVIII (1957), 278-279.

²Lauren G. Wispe, "Evaluating Section Teaching Methods in the Introductory Course," Journal of Educational Research, XLV (1951), 161-185.

third group which he labeled the "satisfied students." The want more P student is viewed as fairly secure, independent, and extra-punitive. These traits enable him to adjust to classroom situations which thwart his needs for autonomy. On the other hand, the want more D student is viewed as a very insecure person; he demands an abnormal amount of structured teaching and his insecurity manifests itself in a kind of egocentric intro-punitiveness.

The study by Wispe and that of Rohrer seem to be directing the reader's attention away from the idea that an instructional method is a critical variable in improving student learning. Instead, an increasing emphasis is placed upon the personality of the students and teacher respectively. This, the writer believes, is a step in the right direction. The conflicting findings favoring one teaching method over another must possess some rational explanation, and this appears to be part of it. Undoubtedly, there are other variables pertinent to a more complete explanation, but for the moment consider the variable of student personality.

Dependency proneness and learning.--The idea that the personality of students might affect their probability of learning is nothing new. Several writers have dealt with this idea in recent years. Notable among them is Donald Smith. It should be noted that Smith and other teachers have shown very keen perception of the importance of considering student personality as a significant variable in

the learning situation.¹

But the variable highlighted by Wispe was not the general personality factor; instead, the condition of dependent proneness was stressed. What evidence exists to support the claim that such a variable of personality has been isolated?

Levy was one of the earliest investigators to discuss the condition of dependent proneness. His discussion of extreme cases of overprotection on the part of parents, and the over-dependent child developing therefrom, was widely acclaimed. Levy felt that the condition was based primarily upon a deficiency in independent training, and resulted when dependency behavior was constantly rewarded.² A somewhat different explanation is offered by Sears.³ He explains that the mother is apt to exhibit anxiety in nursing the first-born child; therefore, older children in the family are thought to be likely candidates for developing dependent proneness, since anxiety experienced in the nursing and weaning process serves as an instigagor for whatever behavior the infant was exhibiting. Since the behavior was of a

¹Donald E. Smith, "Fit Teaching Methods to Personality Structure, High School Journal, XXXIX (1955), 167.

²David Levy, Maternal Overprotection (New York:Columbia University Press, 1943), pp. 71-79.

³R.R. Sears, "Ordinal Position In the Family As a Psychological Variable," American Sociological Review, XV (1950), 397-401.

dependent nature (nursing and weaning), it developed strength as the dominant mode of satisfying needs. The attitude of "basic trust" is thought to develop from the manner in which the needs of the child are satisfied.

In a later article, Stendler corroborates the observations of Levy and Sears, and proposes two critical periods in the socialization process for the development of dependent proneness. The first critical period occurs when the child begins to test out the mother to see if he can depend on her. The two to three year period is considered to be the second critical period. Stendler further hypothesizes that the timing of the anxiety experiences which produce dependency will also determine how the personality will be affected. In discussing this hypothesis Stendler writes:

Overdependent children produced during the first critical period [1st year] . . . will be low in ego strength, with resulting low level of aspiration and low frustration tolerance. . . . Such children will perceive the socializing agent . . . as a punishing figure rather than a helpful one. Overdependent children produced during the second critical period [3rd year] are more likely to be affected in the area of conscience. . . . They will be rigid in their ideas of right and wrong, overconforming in behavior, unduly disturbed by the wrong doings of other children. They will prefer well-defined structured situations to those which allow for more freedom of choice.¹

The idea that the dependent prone person is an overconformer and prefers well-defined structured situations is generally accepted by other investigators in the field.

¹Celia Stendler, "Critical Periods in Socialization and Overdependency," Child Development, XXIII (1952), 3-12.

Furthermore, Miller and Dollard have demonstrated that dependent modes of behavior which reveal themselves through a process of imitating adult behavior will "generalize" from one situation to another. These two learning theorists believe that such modes of dependent behavior can become a general instrumental-dependence device which may be used in any appropriate situation as a means of reaching a goal.¹

Even though the discussion of dependent proneness has thus far been restricted to the child, one must realize that many children never learn to develop the trait of independence. Although it seems possible for a child to overcome the effects of infantile experiences which produce this condition, certain environmental or rearing experiences appear vital for this occurrence. Therefore it is probable that a dependent prone child might maintain such a dependent response to authority figures throughout his lifetime. This is the opinion of Kagan and Moss.²

Knowing that dependent proneness does affect the student's reactions to environmental stimuli and his expectations and appreciation of certain interpersonal experiences, one needs to know how this personality variable operates within a formal learning situation. Wispe's data provide

¹Neal Miller and John Dollard, Social Learning and Imitation (New Haven: Yale University Press, 1941), pp. 65-74.

²J. Kagan and H. Moss, "The Stability of Passive and Dependent Behavior from Childhood through Adulthood," Child Development, XXXI (1960), 577-591.

the answer to this question.¹ It was reported that dependent prone students were characterized by intro-punitiveness, with negative attitudes toward the course, fellow students, and the instructor. However, the kind of teaching received made some difference. The group which was directly taught reported "feeling constrained and tense" in class; the group which was permissively taught reported feeling relaxed and free to recite, although they were the most critical of all the groups. The independent prone students in the permissively instructed group reported "feeling relaxed" and "free to recite" in class. Those independent prone students directly taught reported "feeling tense" and "constrained in class", and aggressed against the instructor.

A study quite germane to the one being proposed has been carried out by Flanders.² Because of its applicability, a more thorough review of Flanders' data seems warranted. Generally, the study dealt with the effects of direct and indirect teacher influence on student behavior when instructional goals were either clear or ambiguous. Eighth grade students studying geometry and social science gave the investigator an opportunity to experimentally observe such a learning process. The basic hypotheses in this study were:

1. "Direct teacher influence restricts learning when a student's perception of the goal is confused and

¹Wispe, loc. cit.

²Flanders, op. cit., pp. 15-189.

ambiguous."

2. "Direct teacher influence increases learning when a student's perception of the goal is clear and acceptable."
3. "Indirect teacher influence increases learning when the student's perception of the goal is confused and ambiguous."

The investigator also anticipated that different types of students would react differently to direct and indirect influence, that ambiguous goals increase dependent behavior, and that high dependent students would be more sensitive to changes in direct and indirect patterns of influence than students who scored low on a dependence-proneness test.

Although Flanders' experimental design possessed certain limitations, namely, variability of a single teacher's instructional technique and a too limited treatment period, his findings are very applicable to the study.

Significant differences on final test data support his hypotheses that an indirect teaching method (The Integrative Technique), produces more achievement. In both geometry and social studies indirect teacher influence produced a lower final level of dependence as shown by data obtained at the end of the work period. Very little evidence supported a sub-hypothesis that the above average, average, or below average students respond differently to direct and indirect patterns of teacher influence. Flanders also con-

cluded that the students who scored the highest (significantly so) on the instrument measuring attitudes toward the classroom were those exposed to flexible patterns of direct and indirect instruction.

Corroborating the above findings of Flanders is a report recently published under the byline of Amidon and Flanders. On the basis of data collected from the second year of Flanders' study, these authors state that:

Closer supervision, thru the use of direct influence (lecture) may be more harmful than helpful to dependent prone students. Dependent prone students learned more in the classroom in which the teacher gave fewer directions, less criticism, less lecturing, more praise, and asked more questions.¹

Additional data supporting Flanders have been published by Jokubczak and Walters.² Not only is the dependent prone person viewed as being more suggestible, he responds more strongly when adults give suggestions than when peers give suggestions.

The above data seem to indicate a direct relationship between the personality type of the student and reactions to different instructional techniques. The evidence suggests that dependent prone students learn more when the interpersonal relationship between student and teacher is of a supportive rather than an autocratic nature. Since these prin-

¹E. Amidon and N. Flanders, "The Effects of Direct and Indirect Teacher Influence on Dependent-Prone Students Learning Geometry," Journal of Educational Psychology, LII (1961), 286.

²L. Jokubczak and R. Walters, "Suggestibility As Dependency Behavior," Journal of Abnormal Psychology, LIX (1959), 102-107.

ciples are increasingly and widely gaining acceptance, the writer suggests that their validity should be tested under a more realistic classroom condition which would constitute, at least, the normal instructional time-span of one semester.

It is the opinion of this investigator that the outstanding value of the Indirect Method is that it makes possible the administration of feedback to the learner. Furthermore, it appears that feedback from the instructor and other students is more probable as a result of the indirect method, since it creates more overt student participation than the lecture technique. In other words, the student must respond if feedback is to be given by the teacher. When the instructor gives praise, asks questions, makes suggestions, reflects feelings and attitudes, clarifies statements of students, etc., he is actually providing feedback.

Assuming that feedback is a basic element of the indirect method, one might inquire about the effects of feedback in creating behavioral changes. If feedback is a critical variable, one might hypothesize that the performance of students receiving feedback will excel the performance of those who receive no feedback. On the basis of the above discussion, it also seems more probable that dependent prone subjects should benefit more from feedback than independent prone students.

In the 1961 issue of the Annual Review of Psychology, Bilodeau and Bilodeau presented a summary of research studies dealing with what they called the "feedback family."

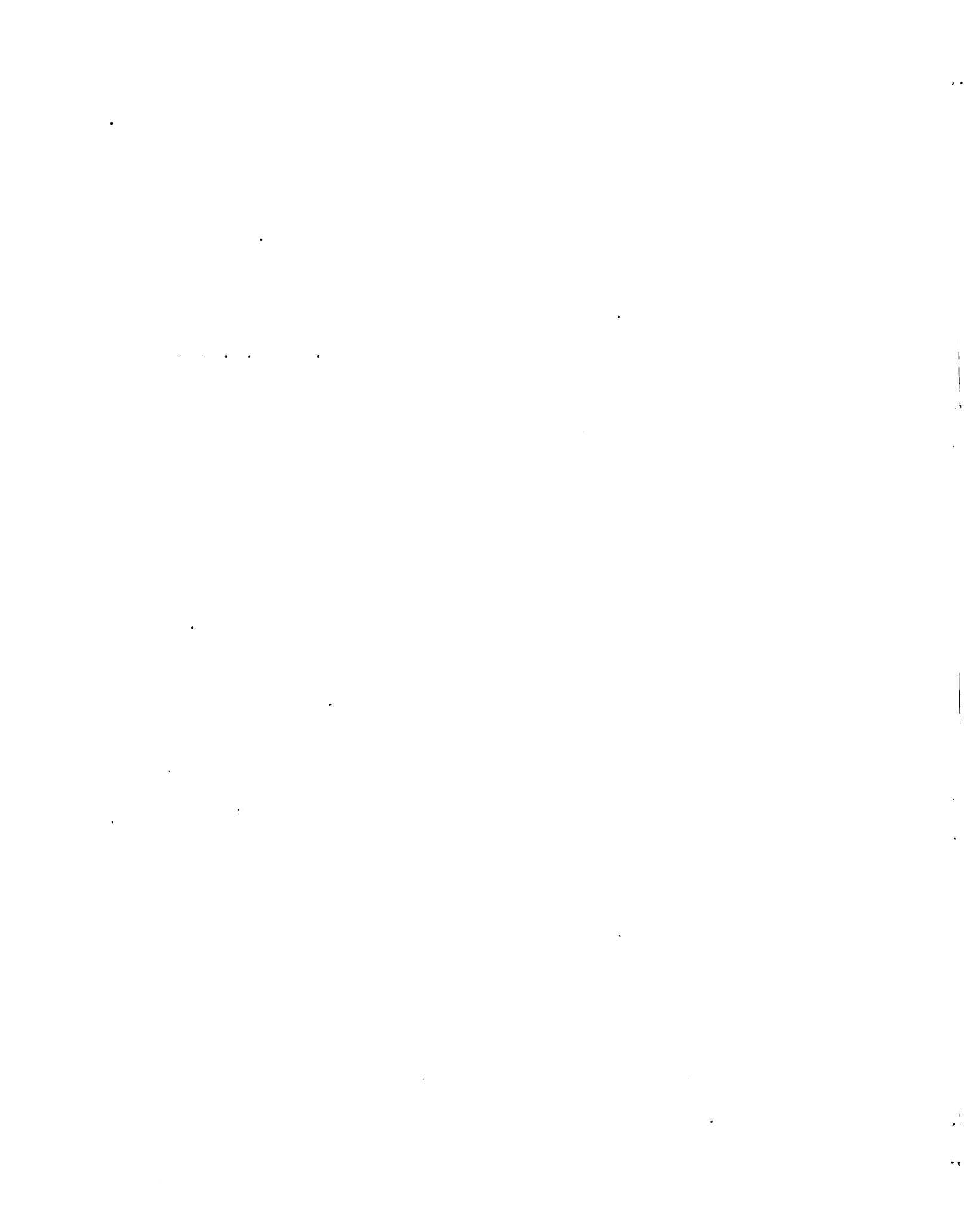
These studies were concerned primarily with motor learning.

They state:

Studies of feedback or knowledge of results (KR) show it to be the strongest, most important variable controlling performance and learning. It has been shown repeatedly, as well as recently, that there is no improvement without KR, progressive improvement with it, and deterioration after its withdrawal. A number of studies show that performance is seriously disrupted or made impossible by lags in feedback of even less than 1.0 sec. . . . No other independent variable offers the wide range of possibilities for getting man to repeat or change his Rs [response] immediately or slowly, by small or large amounts.¹

After discussing the widespread disagreement over the proper definition and function of feedback, Bilodeau and Bilodeau depict the three broad areas under which research studies of the 1950's are divided: (a) transformations, (b) temporal delay, and (c) supplements to the standard. These reviewers further state that a fourth broad area, frequency schedules, has hardly been investigated. Transformation KR refers to the experimenter presenting to the subject an independent variable which is a function of the subject's response or of the amount of error in the subject's response. Temporal delay refers to the amount of time between the occurrence of the emitted or elicited behavior and the appearance of KR. Supplements to the standard refer to giving the subject some extra indication of decent or poor performance without using "good," smiles, or cookies; the color of

¹P. R. Farnsworth, et. al., Annual Review of Psychology (Palo Alto, California: Annual Reviews Incorporation, 1961), p. 250.

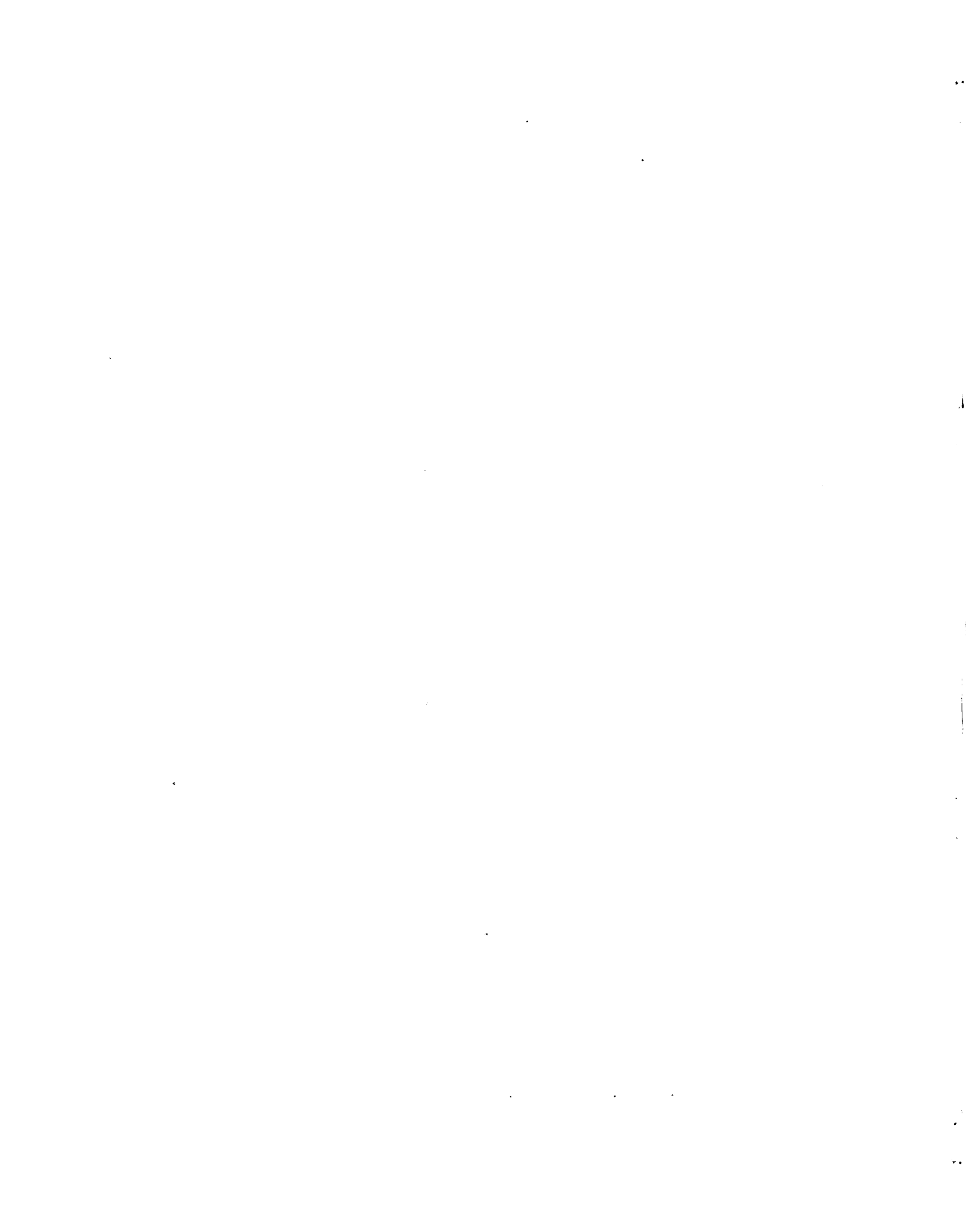


the target, a tone, etc., may convey the additional information required.

In discussing the importance of the delay in giving knowledge of performance, the writers concluded that "to delay or to give immediate KR can be quite immaterial for learning to make relatively simple Rs (when the periods between Rs are relatively free of specially interpolated Rs)."¹

In reference to the above conclusions of Bilodeau and Bilodeau dealing with the significance of delay in KR, the present writer has this reaction. First it should be noted that the above reviewers limited their conclusions in the following two ways: (1) delay of KR is thought to have insignificant effect when the responses to be learned are relatively simple, and (2) delay of KR is thought to have insignificant effect when there is little opportunity for retroactive inhibition to affect performance. In the typical classroom learning situation either the absence of one or both of the previous restrictions might make KR an aid to learning. Often the subject matter to be learned in the classroom is abstract and sometimes difficult, and the weekly, monthly, or semester basis on which units are organized allow for much retroactive inhibition. The retroactive inhibition factor seems especially applicable to the usual learning situation where a student may be concurrently enrolled in two or

¹Ibid., pp. 250-253.



more courses in which incompatible principles are taught.

Bilodeau and Bilodeau appear to offer support to the writer's interpretation of the probable role of KR in typical classroom learning. Under the topic, "Effective delays of KR," one finds the following statement:

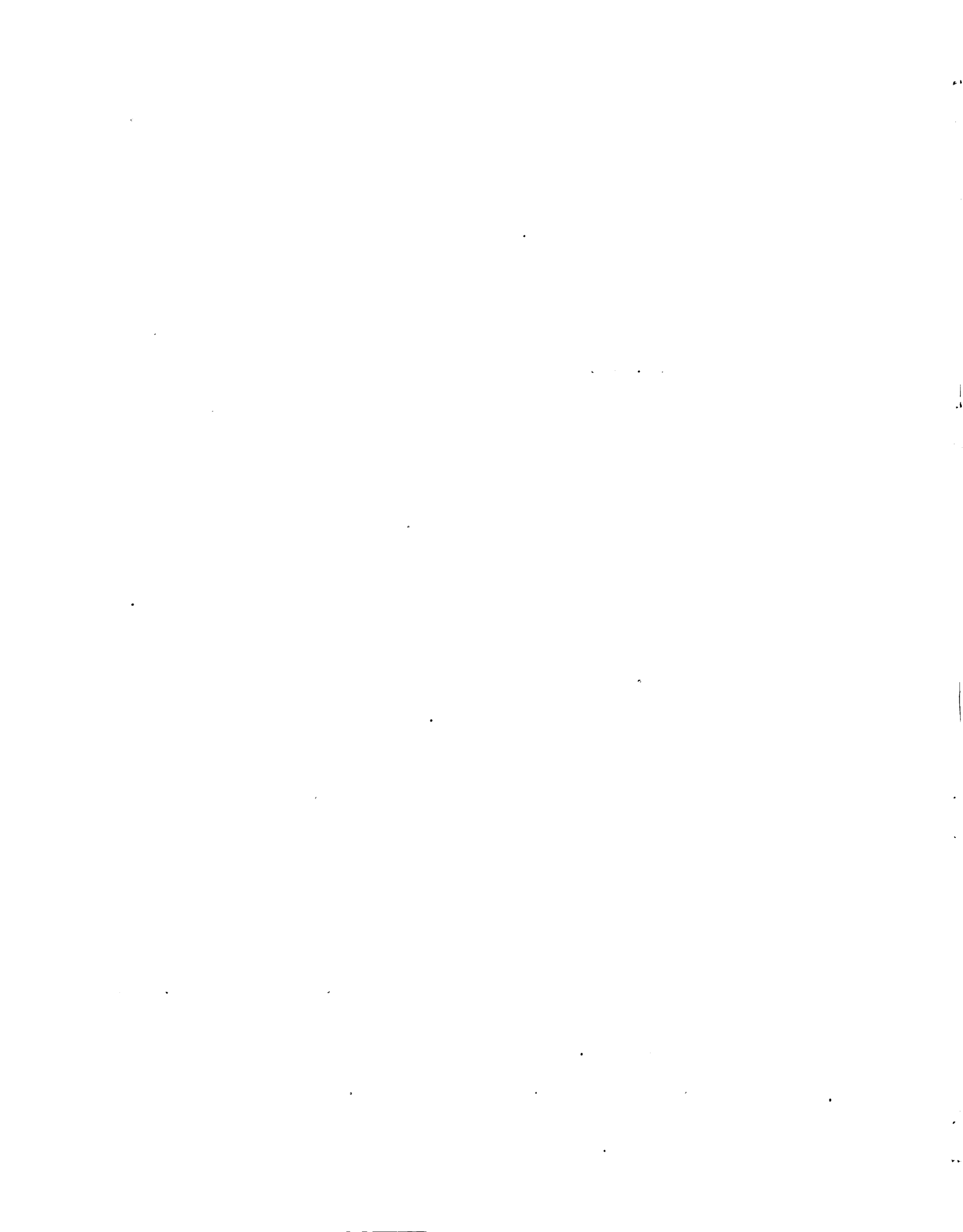
Not all delays of KR produce null results, as delays of speech or handwriting show so dramatically. It depends upon what happens between R (response) and KR. . . . When something is interpolated between R and KR or between KR and the next R performance is of a different order of magnitude.¹

The following paragraphs will consider, in detail, specific studies which have used feedback as an independent variable in a learning situation. These summaries are presented to further clarify the specific manner various investigators have conceived and manipulated this variable.

The general and basic effects of feedback on learning are positive. This conclusion seems warranted on the basis of data presented in Chapter I. In addition to the data discussed under Justification of the Study in Chapter I, further support for this position exists. For example, Bilodeau, Bilodeau, and Schumsky have shown that in a task involving lever displacing, no improvement occurred without knowledge of results, there was progressive improvement with knowledge of results, and response deterioration resulted upon withdrawal of knowledge of results.² Bourne, et. al.,

¹Ibid., 257.

²E. Bilodeau, I. Bilodeau and D. Schumsky, "Some Effects of Introducing and Withdrawing Knowledge of Results Early and Late in Practice," Journal of Experimental Psychology, LVIII (1959), 142-144.



have produced data which indicate that a reduction in completeness of feedback reduces performance on visual perception problems by a constant amount, regardless of task complexity. It is shown that completeness of feedback does affect the subject's performance.¹

Several experimenters have studied the applicability of feedback principles to verbal learning. Michael and Maccoby have reported their findings on factors which influence verbal learning from films. In addition to other objectives, ascertaining the influence of knowledge of correct response after practice (KCR) versus no such knowledge (no KCR) was attempted by these investigators. Their results indicate that students in the KCR groups scored significantly higher on a test measuring knowledge of the film viewed than students in the no KCR group. Discussing the results of this study, Michael and Maccoby state:

There was a statistically significant ($P < .01$) average gain of 16.5 percentage points from the condition of no KCR to the condition of KCR for the practice questions. . . .

.
All test scores for the KCR groups are significantly higher ($P = .05$) than the corresponding test scores for the no KCR groups. All test scores for the overt KCR groups [meaning KCR subjects orally answered practice questions covering the film] and overt no KCR groups are significantly higher ($P = .05$) than the corresponding test scores for control groups 2 and 3.²

¹Lyle Bourne, et. al., "Concept Identification As a Function of Completeness and Probability of Information Feedback," Journal of Experimental Psychology, LVI (1958), 413-420.

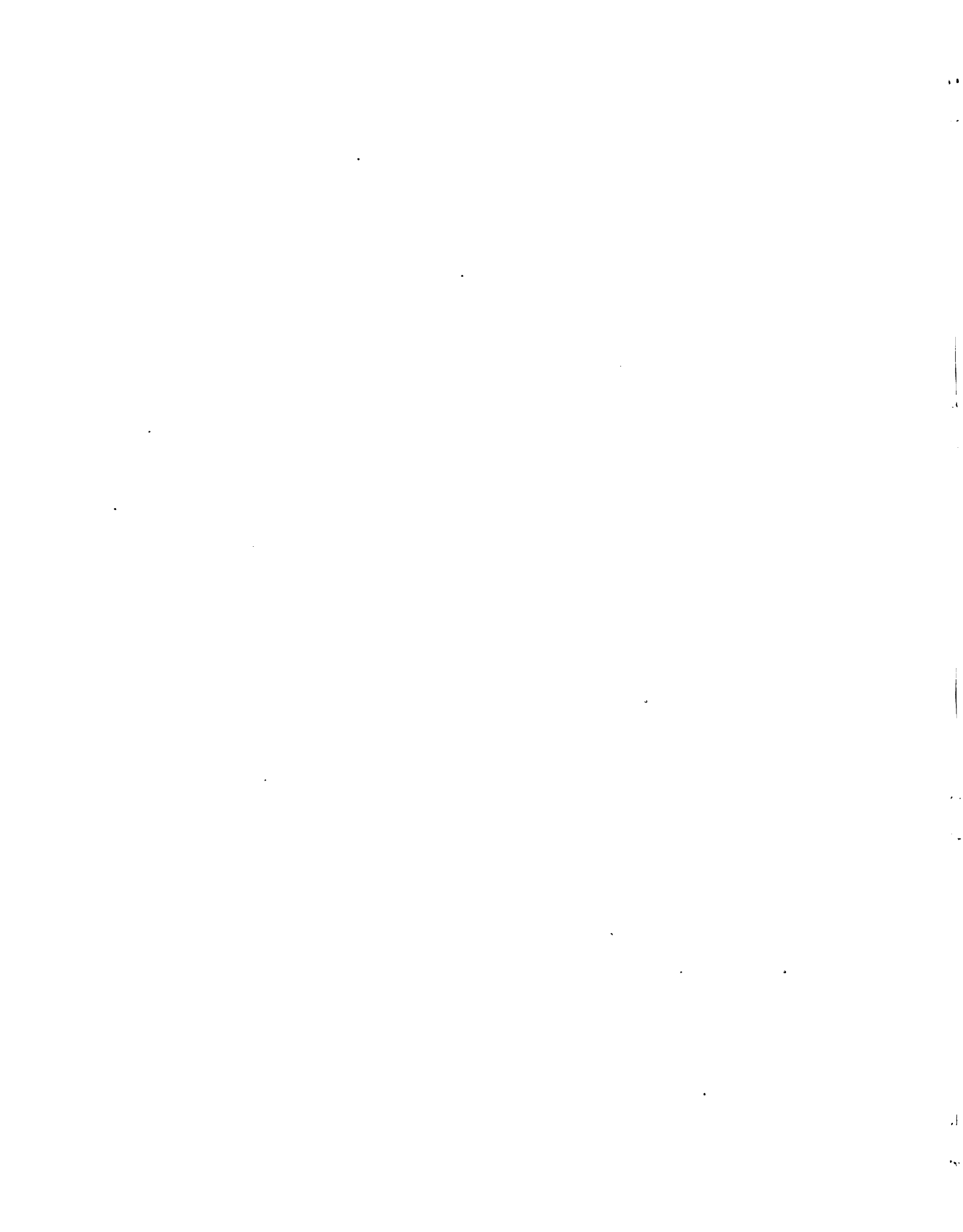
²D. Michael and N. Maccoby, "Factors Influencing Verbal Learning from Films under Varying Conditions of Audience Participation," Journal of Experimental Psychology, XLVI (1953), 414.

.....



Angell has also attempted to apply feedback principles to learning concepts in the classroom. In a learning experiment with equated groups, Angell studied the effects of immediate knowledge of quiz results on final examination scores in freshman chemistry. Subjects in his experiment were administered a total of three quizzes dealing with: (1) knowledge of facts and principles, (2) application of facts and principles in non-quantitative problems, and (3) application of facts and principles in quantitative problems. Experimental subjects were given immediate feedback via a punchboard which displayed a red color for correct answers. Control subjects did not receive such feedback. The first test was administered to students at the end of the fourth week of the semester; the remaining two tests were given to students at separate time periods during the last half of the semester. The criterion measure (final examination), which served as the dependent variable was administered to the subjects on the final day of the semester. Angell concluded that the difference between the scores of experimental and control subjects on the final examination was in favor of the subjects who had used the punchboard and received feedback. This difference was significant at the .01 level.¹

¹George Angell, "The Effect of Immediate Knowledge of Quiz Results on Final Examination Scores in Freshman Chemistry," Journal of Experimental Psychology, XLII (1948-49), 391-394.

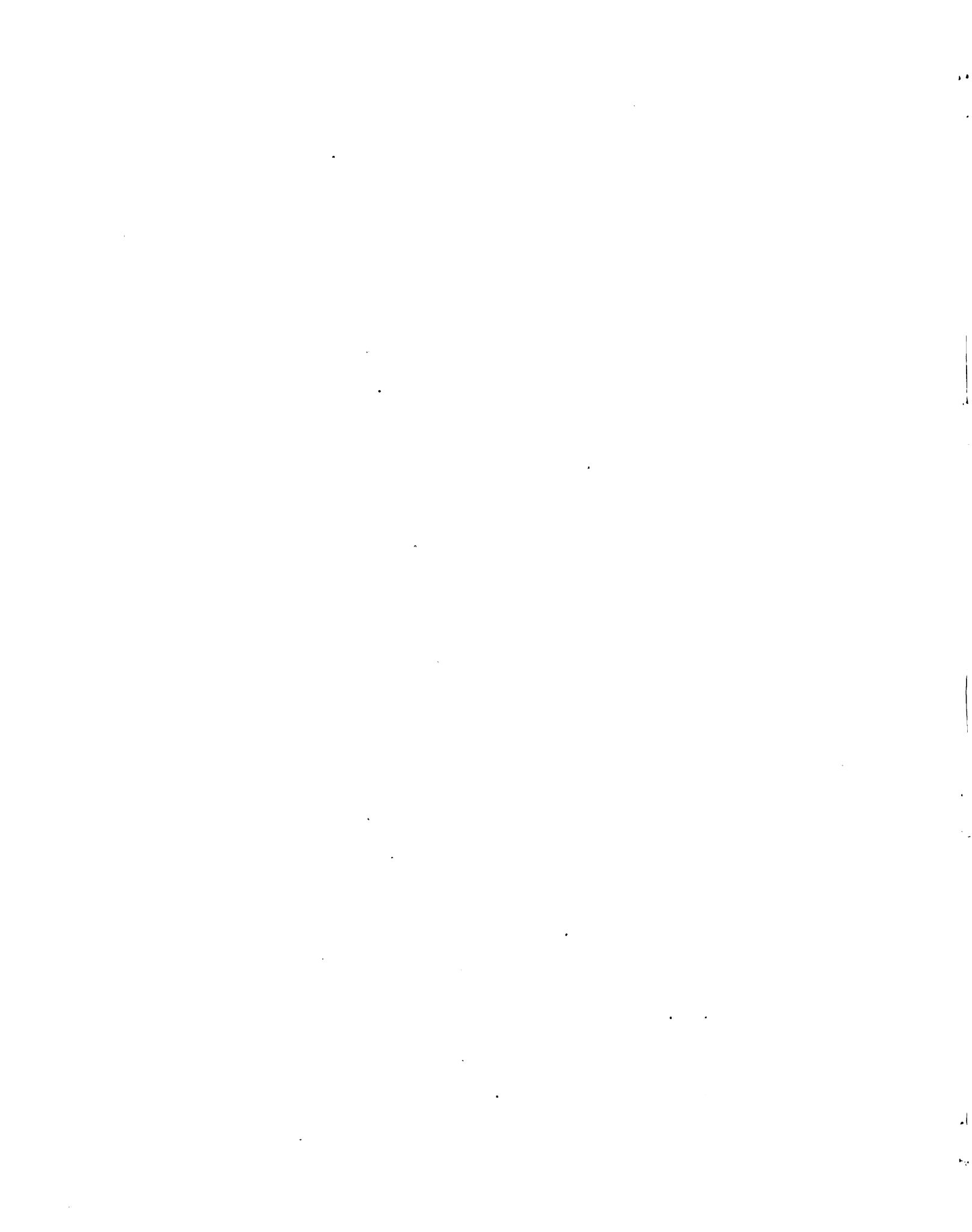


Smeltzer's study provides an interesting test of the ideas that feedback improves performance. Experimental students in his study received feedback on the basis of their performance on weekly tests administered by the instructor. Those students performing satisfactorily were rewarded with a holiday, the poor performers were assigned extra work and review of previously covered material. Control subjects in this study attended lecture sessions. Significant differences in learning of subject matter were found favoring the experimental group. Judging from the experimental design, it seems impossible to differentiate the effects of feedback from the effects of reinforcement.¹

Support for the idea that immediacy of feedback is important is found in separate studies conducted by Greenspoon and Foreman, and Saltzman. Greenspoon and Foreman report that in a task requiring subjects to draw a three inch line while blindfolded, the information concerning the accuracy of the line was delayed for 0, 10, 20, or 30 seconds in four different experimental groups. No information was given to subjects in control groups. The results indicate that increasing the length of the delay interval reduced the rate of learning. A delay up to 30 seconds was found to be superior to no information.² Saltzman's data reveal that

¹C. H. Smeltzer, "Improving and Evaluating the Efficiency of College Instruction," Journal of Educational Psychology, XXIV (1933), 283-302.

²J. Greenspoon and S. Foreman, "Effect of Delay of Knowledge of Results on Learning a Motor Task," Journal of Experimental Psychology, LI (1956), 226-228.



subjects who experienced a six second delay in receiving feedback (in learning a verbal maze), required significantly more trials and made more errors than experimental subjects who received immediate feedback.¹

Other studies seem to indicate that the role of feedback in learning is dependent upon the manner in which feedback is perceived by the recipient. Smith and Knight concluded from a field setting investigation that only "personalized feedback" increased the learning of principles in courses designed to train students in human relations management. Feedback consisted of each experimental subject describing his own behavior in the discussion group and also explaining why he behaved as he did. Each subject was told by other members of the sub-group how his behavior affected leadership problems.²

Jones, Wells, and Torrey point out that the effects of feedback from the teacher are contingent upon the students' perception of the judgment task. Their data reveal that in assessing the effect of feedback on conformity behavior, the student will be relatively unresponsive to feedback unless she feels that an error, on her part, will jeopardize her standing in the group. These investigators agree that feed-

¹I. Saltzman, "Delay of Reward and Human Verbal Learning," Journal of Experimental Psychology, XLI (1951), 437-439.

²E. Smith and S. Knight, "Effects of Feedback on Insight and Problem Solving Efficiency in Training Groups," Journal of Applied Psychology, XLIII (1959), 209-211.

back affects behavior, but in terms of conformity behavior, feedback has a conscious effect.¹

Finally how might one explain those studies where an "integrative pattern" to instruction has proven superior to the "dominative pattern"? This writer believes that the chief virtues of the integrative pattern are the following:

1. By having an interchange of ideas in the classroom among students and between students and teacher, all the participants are in a position to receive a greater amount of feedback. This is believed to be its most basic virtue.
2. The Integrative Technique helps to develop cooperative activity and stimulate expression of ideas. The expression of ideas, feelings, attitudes, etc., by students is thought to have the effect of facilitating learning.
3. The student must strive to develop an understanding of the subject matter in order to become a successful participant in the learning process. This also facilitates learning.

Summary: It is believed that the previous discussion clearly shows that one of the most important factors in improving classroom instruction is that of providing feedback to the responses of students. The data tend to indicate that

¹E. Jones, H. Wells, and R. Torrey, "Some Effects of Feedback from the Experimenter on Conformity Behavior," Journal of Abnormal and Social Psychology, LVII (1958), 207-213.

the instructional method alone is not the critical variable. When the investigator merely compares one teaching method against another, the results do not help to improve the status of knowledge in the field. On the other hand, implicit in the Review of Research is the idea that when a certain teaching principle (namely immediate feedback) is made a part of an instructional method, one should expect improvement in student performance. Likewise, instruction adjusted to a particular personality trait of the learner (dependency proneness), should also improve student performance. There is ample evidence that some students do develop the trait of dependency proneness, and that it lingers over into adolescence and adulthood in some cases. The study of Kagan and Moss, which was cited earlier, shows that many adolescents remain highly dependent upon authority figures for guidance and succorance.

CHAPTER III

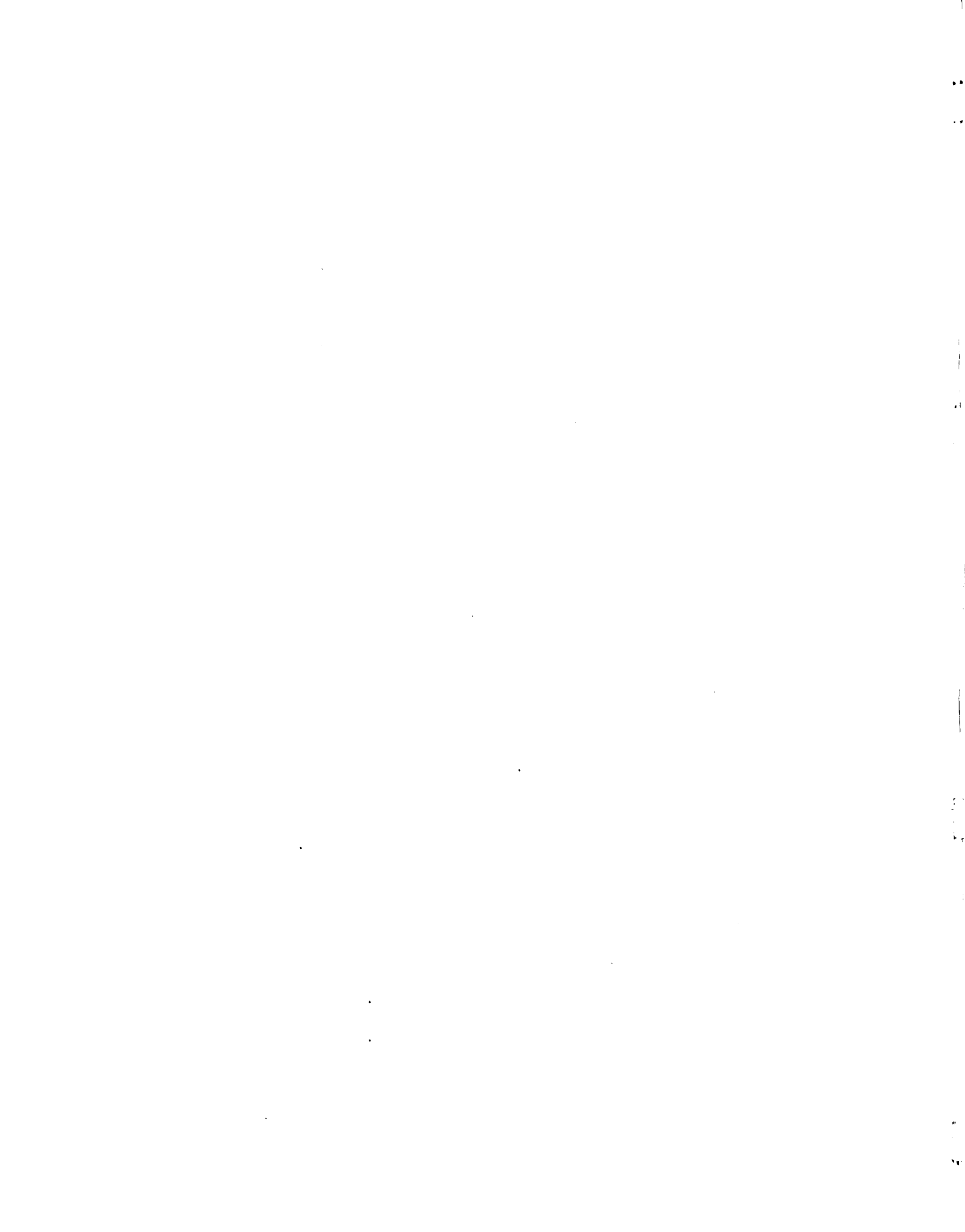
METHODOLOGY AND PROCEDURE IN THE COLLECTION OF DATA

The location and date of the study.--This study was conducted at Southern University and Agricultural and Mechanical College in Baton Rouge, Louisiana. The school is a four year college which was founded in 1880 as a result of the Land Grant Act.

Because of the laws of the State of Louisiana, the student body consists entirely of members of the Negro race. The majority of these students are residents of the State of Louisiana, with a high percentage coming from the cities of New Orleans and Baton Rouge. Likewise, many of the students reside in private homes or rented apartments off the college campus. The total enrollment is approximately 5,000 students, with almost one-half of this number enrolled in the Department of Education.

The study being reported was conducted during the first semester of the 1961-'62 school year. The treatment period lasted from September 12, 1961, until January 10, 1962. Each subject attended class three fifty-minute sessions each week.

Personnel of the investigation.--The only experimenter in this investigation was the writer. The unavailability of research assistants, plus the work load of other psychology instructors, necessitated such an arrangement. This aspect



of the study will be further discussed in the last section of the present chapter.

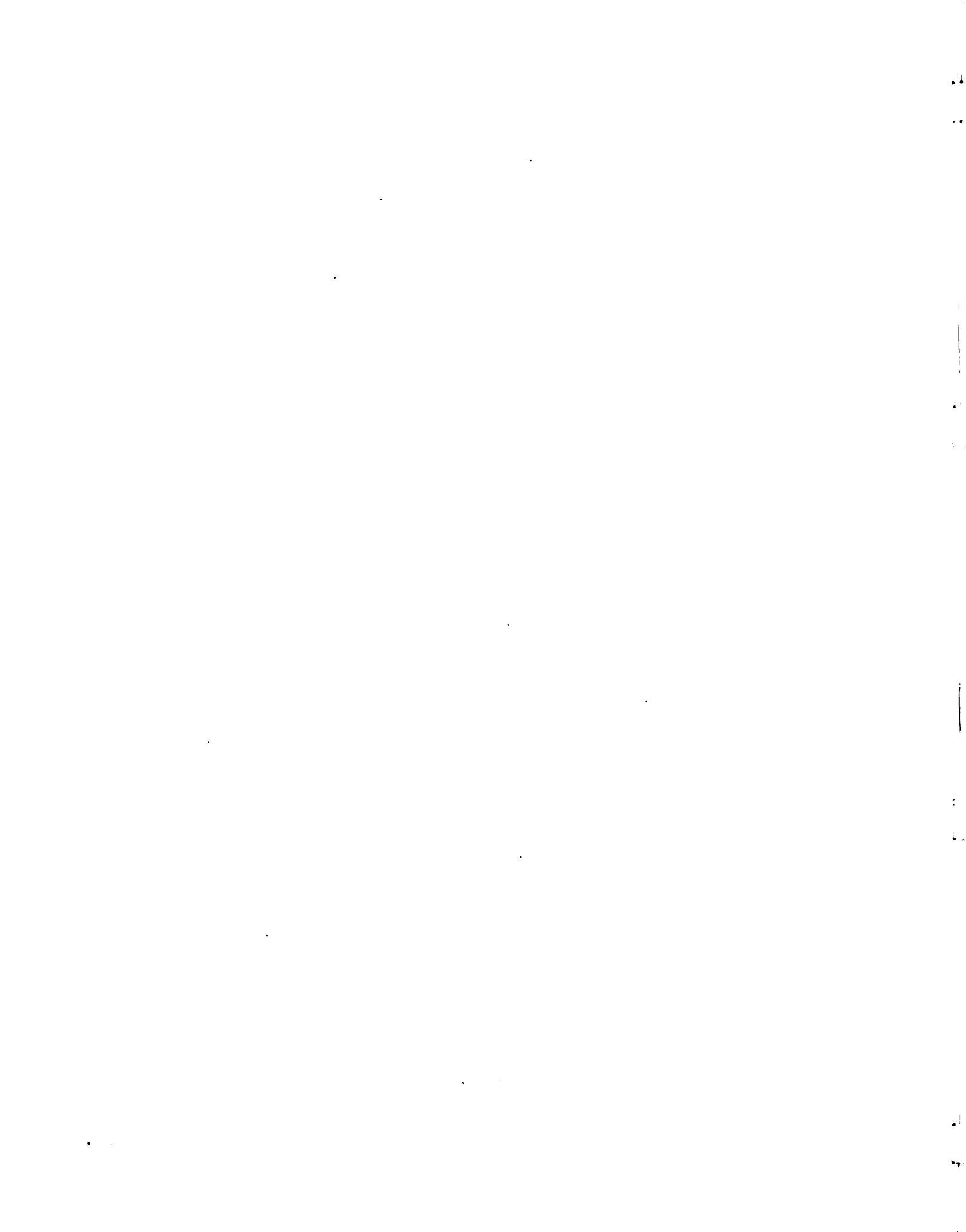
Evaluative materials employed.--Various measuring instruments were employed in the pre-experiment uniformity trial, and in testing treatment effects. Some of the tests used were compiled by the experimenter, either totally or in part, while others are well known standardized instruments.

Even though subjects in the experiment were randomly selected from the total population of students enrolling in Educational Psychology 220, and were randomly assigned to treatment groups, the experimenter chose to test for significant differences between control and experimental subjects prior to treatment. The School and College Ability Tests¹ (hereafter referred to as SCAT), was selected for this purpose. Further discussion of this test appears in the section dealing with the selection of subjects.

The Edwards Personal Preference Schedule (EPPS) was included in the battery of tests as a measure of high and low dependent proneness. The test was derived to serve as a quick and convenient measure of relatively independent normal personality variables by Allen Edwards.² The EPPS provided measures of the following fifteen personality

¹Cooperative School and College Ability Tests: Manual for Interpreting Scores (Princeton, New Jersey: Educational Testing Service, 1957), p. 5.

²Allen Edwards, Manual-Edwards Personal Preference Schedule (New York: The Psychological Corporation, 1959), p. 5.



variables: achievement, deference, order, exhibition, autonomy, affiliation, intraception, succorance, endurance, hererosexuality, and aggression. The test also provides a measure of test consistency and of profile stability in addition to the above fifteen personality variables.

Generally, the reliability of the EPPS is good. In Edwards' Manual reliability coefficients reported range from .60 to .88. Other investigators have found much higher reliability coefficients. Notable among them is Klett, whose reliability coefficients range from .90 to .94.¹

Critics have given variable evaluations of this test's validity. They range all the way from "acceptable" to a "skeptical approval for use in research" to a "denial of the test's validity."² On the other hand, Heilbrum reports a concurrent correlation of .60 between EPPS scores and an adjective check list which he designed.³ The consistency score is not thought to be a very good index for detecting student faking. Student faking (which has been referred to as the social desirability of student responses) limits the validity of this test.

¹C. J. Klett, "The Stability of the Social Desirability Scale Values in the Edwards Personal Preference Schedule," Journal of Consulting Psychology, XXI (1957), 183-185.

²O. K. Buros, The Fifth Mental Measurements Yearbook (New Jersey: Gryphon Press, 1959), p. 47.

³A. B. Heilbrum, "Relationships Between the Adjective Check-List, Personal Preference Schedule and Desirability Factors under Varying Defensive Conditions," Journal of Clinical Psychology, XIV (1958), 283-287.

The reader is referred to the definition of terms in Chapter I for a complete statement of the use of EPPS in this study. Note, however, that no student will be included in the dependent proneness analysis unless his raw score of the consistency scale is ten or higher. Allen Edwards provided this cut-off point as a reliability check in detecting whether students were responding to EPPS items on a chance basis. Edwards' data indicate that the probability of 10 or more identical choices (referring to an item being answered in the same manner when it appears twice on EPPS) occurring by chance is approximately .15.¹

The Final Examination is included as a measure of the student's ability to apply his knowledge of psychological teaching principles to solving problems of an application nature. Very few of the test items measure specific data which may have been memorized. The majority of the questions are designed to test whether the student can use his newly acquired knowledge of psychological principles to solve practical problems. An attempt is made to assess the student's basic understanding of educational psychology, and his performance in accurately generalizing on the basis of what he has learned.

The split-half reliability of the Final Examination (odd vs. even items), as estimated by the Spearman Brown Formula, is .83. This coefficient was derived from the experimental data collected at the end of the treatment period.

¹Edwards, op. cit., p. 15.

Whereas the reliability does not seem to be extremely high, it is at an acceptable level. Content validity of the final examination appears to be high after comparing test items with text-book principles and the instructor's lecture notes. A copy of the Final Examination appears in the Appendix.

The Minnesota Teacher Attitude Inventory (MTAI) was designed as a predictor of the type of teacher-pupil relationships a prospective teacher will maintain. Persons scoring at the high end of the scale should be able to maintain a state of harmonious relations with pupils, a state characterized by mutual affection and sympathetic understanding. Pupils of such teachers should like their instructors and enjoy school work. Such instructors should like children and enjoy teaching, and situations requiring disciplinary actions should rarely occur in the classroom, etc.

The MTAI is used in this study to measure the differential effects of the two teaching procedures on student perception of a teacher's role. It is suspected that the viewpoints of students in the teacher preparation course should be affected by the teaching experiences they undergo. Those in the integrative teaching situation should score higher on the MTAI than the subjects in the lecture group.

In their discussion of the experimental background of the inventory, Cook, et. al. state the assumptions on which the reliability and validity of the test are based.¹ The

¹Walter Cook, Carroll Leeds, and Robert Callis, Manual: Minnesota Teacher Attitude Inventory (New York: The Psychological Corporation, 1951), pp. 10-12.

reliability of the instrument (computed by the Spearman-Brown split-half procedure), was found to be .89. The test has a validity coefficient of .60. Both reliability and validity appear to be at acceptable levels.

The Minnesota Student Attitude Inventory (MSAI) was included as part of the experimental design to measure the extent to which the teacher employed the integrative teaching pattern for experimental subjects as against the lecture approach for the control subjects. The MSAI is a sixty-two item questionnaire which asks the student to evaluate a statement about the teaching situation. Questions relative to the method of classroom control experienced, temperament of the teacher, teaching efficiency, etc., are asked. The scale for evaluating these items ranges from strongly disagree to strongly agree. The scale is weighted on a five point continuum from -2 to +2.

The Minnesota Student Attitude Inventory was selected as a substitute for an "outside observer" or audio-visual aids to measure the variable of teaching method. The inventory was compiled by Ned Flanders at the University of Minnesota, who describes the instrument in this manner:

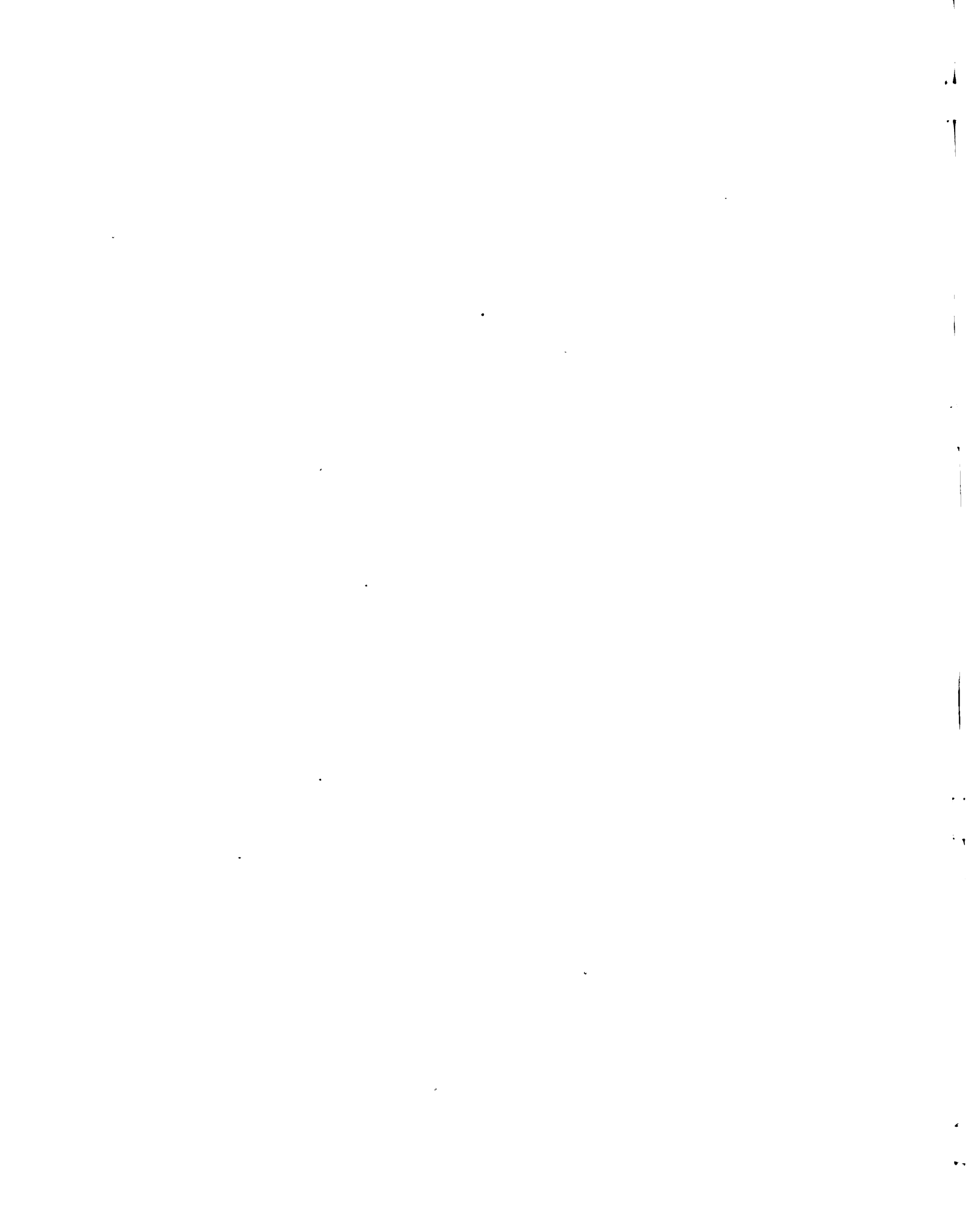
The MSAI is an attitude test which has shown a significant correlation in earlier studies with the teacher's pattern of influence. . . . The test is made up of items that reflect the student's attitudes toward the teacher, the class activities, the teacher's system of rewards and punishments, and their dependence on the teacher.¹

¹Ned A. Flanders, "Teacher Influence, Pupil Attitudes, and Achievement," Final Report. 1960, Cooperative Research Project No. 397, U. S. Office of Education, Department of Health, Education and Welfare, pp. 41-78.

With the approval of the author, several of the sixty-two items which comprise the MSAI were revised for this study. This revision was necessary due to the inapplicability of certain phrases to a population of college students. In each revised item, however, the basic intent of the question remains unchanged. A sample of this instrument can be found on page 71.

The selecting of subjects and pre-testing.---The students who participated in this study were enrolled in Educational Psychology 220 (sections 1, 7, 8 and 10). The sample of 144 students were randomly selected (via table of random numbers) from the total number of students (398) who registered for the course in educational psychology. Subjects were randomly selected from the larger group providing they possessed the following characteristics: (1) were between the ages of seventeen and twenty-one, (2) were classified as either a sophomore or junior, and (3) were taking their first course in the subject matter area of psychology. The primary reason for these restrictions was to rule out possible contaminating factors due to previous experiences of subjects.

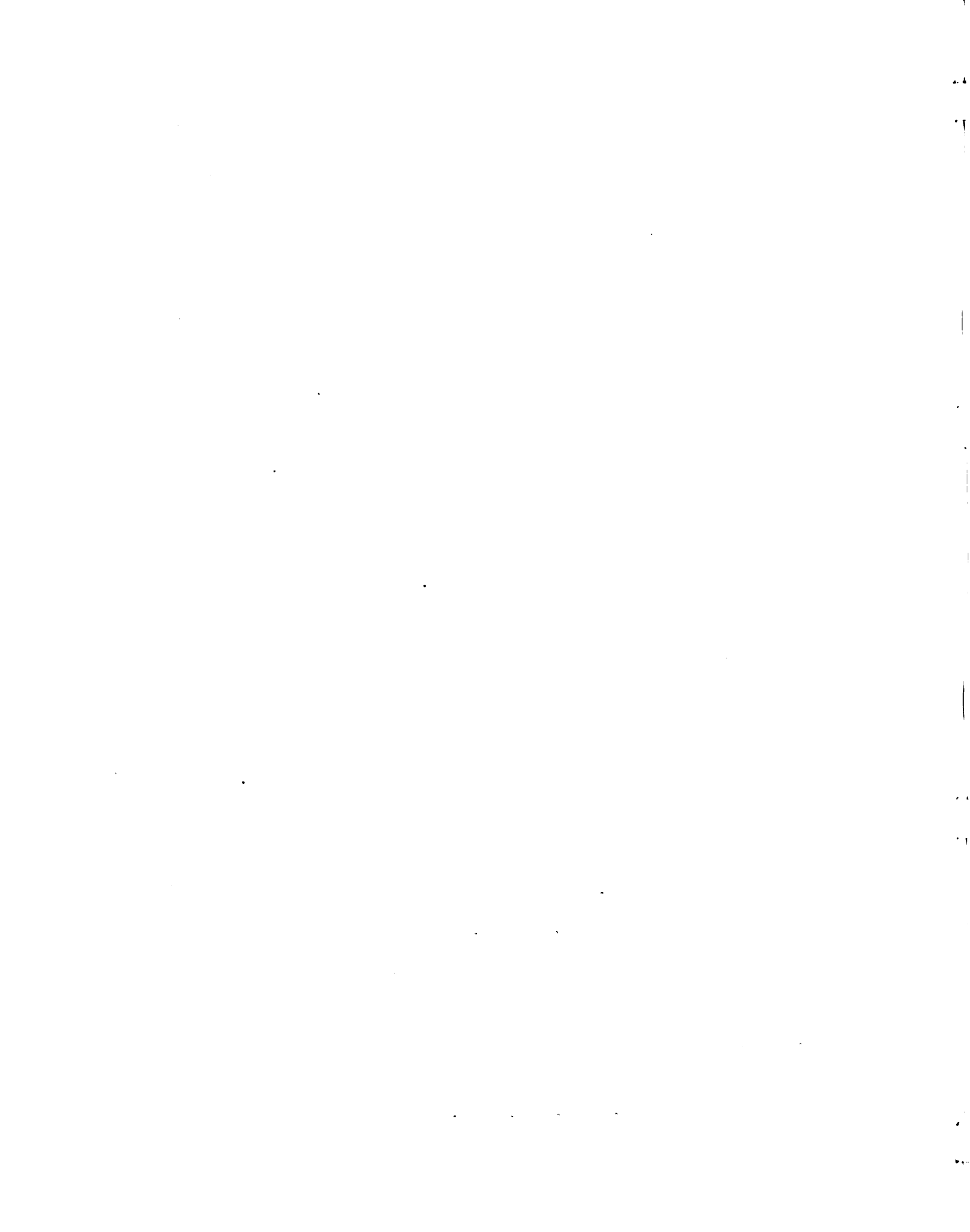
After randomly selecting the subjects for the experiment, the control and experimental groups were formed via random assignment. Both random selection and random assignment were possible due to the cooperation of administrative personnel who permitted students to register for the general educational psychology section. As a result of random assignment, two experimental classes and two control classes



were formed; each class contained thirty-six students. Therefore, the initial sample contained seventy-two students in the control group and seventy-two students in the experimental group. By the time the study was completed, this number had decreased to sixty-one students in the experimental group and sixty-two students in the control group. This reduction came about as a result of students dropping the course or withdrawing from the university. Incidentally, all statistical analysis will be computed on the basis of data obtained from the remaining 123 subjects.

Although students were randomly selected and randomly assigned, the experimenter included a "uniformity trial" check in the experimental design. Subjects were administered the School and College Ability Tests during the first class period. This test yields a verbal and quantitative score with specific measures of: (1) meaning of isolated sentences, (2) numerical computations, (3) associating meanings of isolated words, and (4) solving arithmetic problems. In Buros' review of recent tests Davis reports that both validity and reliability of this test make it a useful predictor of academic performance. Validity coefficients reported for the SCAT test range from .50 to .80 for correlations between SCAT performance and Grade Point Average. Estimates of reliability on the basis of the Kuder Richardson Formula are in the .90's.¹

¹Buros, op. cit., p. 322.



Assuming, then, that the SCAT is a valid and reliable test for predicting college performance of subjects in this experiment, the uniformity trial yields the following data. The control and experimental groups have means of 36.79 and 40.21, respectively. Scores ranged from 14 to 73 for the total test raw scores. For all practical purposes, the difference in range between the experimental and control groups is very little. Likewise, a t-test for significant difference between means of the two groups reveals that the control and experimental groups do not differ significantly in their academic capacity to undertake college work. The test for homogeneity of variance indicates that there exists a strong probability that the two samples are not drawn from a population whose variance is not equal. The t-test and homogeneity of variance data are presented in Table 1. Raw data are presented in the Appendix.

TABLE 1. -- S.C.A.T. test scores for uniformity trial

	Difference Between Means		Homogeneity of Variance	
	Mean scores	T-test score	Variance	F score
Control Group	36.79	1.80**	1800.21	1.14**
Experimental Group	40.21		1576.21	

** Indicate no significant difference, = .05.

Uniformity trial data is also available for each of the four dependent proneness groups. First it was necessary to select high and low dependent prone subjects (from experimen-

and control classes), on the basis of EPPS scores. When subjects in the dependent prone groups had been identified, their SCAT scores were obtained and served as the basis of testing the null hypothesis of no difference. For this statistical test it is desirable that the null hypothesis be accepted, since a basic assumption of t and F tests is the random selection of subjects from a normal population.

An appropriate statistical test for the uniformity trial is the analysis of variance. With 3 and 58 degrees of freedom, an F score of 2.68 is required for rejection of the null hypothesis of no difference. As is depicted in Table 2, the resulting F of .05 causes the acceptance of the null hypothesis. This statistical test indicates that there is a strong probability that no significant differences exist between the mean scores of dependent proneness groups on the SCAT.

TABLE 2. -- Summary data of uniformity trial on dependence proneness groups

	Sum of Squares	Degrees of Freedom	Variance	F	Fc
Between Sum of Squares	23.38	3	7.79	.05**	2.68
Within Sum of Squares	8676.98	58	149.60		
Total Sum of Squares	8700.27				

** F is insignificant at the .05 level of confidence.

Another instrument administered at the end of the fourth week of this investigation was the Edwards Personal Preference Schedule. Although the data on this test were collected at the above time, it was not interpreted, nor were the answer sheets scored until the treatment period had ended. This action was taken to render the writer less susceptible to any unconscious manipulation of subjects who might be classified as high or low dependent prone as a result of EPPS scores. An analysis of EPPS scores will be presented in Chapter IV.

Treatment of Subjects.--The seventy-two students in the experimental group (thirty-six in each section), met in their respective sections for two lectures each week. For the third class period, the experimental subjects were further divided into six sections, with twelve students in each section. In the smaller sections the Integrative Technique of instruction was followed. The assignment of students to small sections was on a permanent basis.

The seventy-two control subjects met three times each week for lectures. It should be recalled that the term "lecture" is here defined as an instructional procedure in which the teacher seeks to create interest, to influence or stimulate, and to develop critical thinking largely by the use of a verbal message, with a minimum of class participation. The content of lectures was basically the same for the control subjects and the experimental subjects. Lectures were based on the textbook, Psychology in Teaching and

Learning, by William Trow. However, data covered and points of view expressed came from the general field of educational psychology.

The specific teacher behavior for the control subjects may be described as follows. The instructor expressed or lectured about different psychological concepts, he gave directions and criticized students, and he justified his right to follow the above pattern on the basis of his authoritative role. Students had very little opportunity to ask questions or to express verbally their conception of or reaction to ideas. Lectures were organized so that the same amount of subject matter was covered in both the experimental and the control group. In connection with this point, one must realize that this necessitated a more thorough coverage in the control groups in some instances.

Perhaps a more thorough statement is warranted on what actually took place in the experimental sections (size 12), during the third class meetings of each week. The basic approach was to permit students to ask questions or to explore further subject matter covered during the two previous lectures. Oftentimes, the instructor asked students to explain further the practical application of textbook principles, and questions were asked to help focus the students' attention upon central points in the lectures and to help clarify student understanding. Most important, however, is the fact that each student was enticed to participate in class discussions, and received immediate feedback from his classmates

or the instructor on the basis of his responses.

Periodically, the instructor gave experimental subjects study questions which served as the basis of discussions in small groups. These questions were written for the purpose of helping the student increase his knowledge and understanding of lecture material. They also provided frequent opportunities for the instructor to provide feedback to students. Some sample copies of study questions appear in the Appendix.

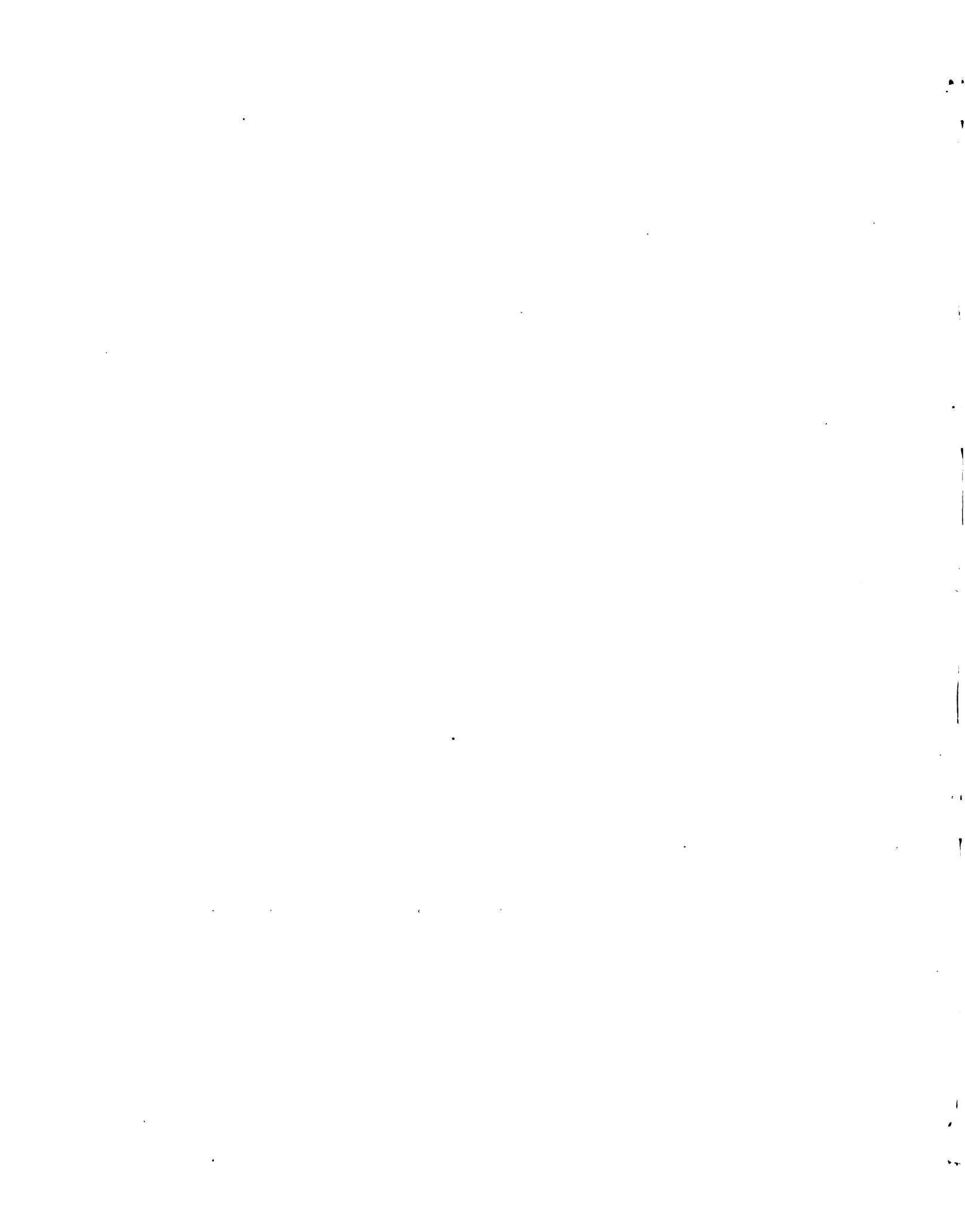
The subject matter of educational psychology provided an excellent opportunity for the teacher to accept, clarify, and stimulate the ideas and feelings of students. This was especially true of topics dealing with the teacher's role in directing classroom activities, his evaluation of pupils' performance on tests, teaching and modifying concepts and attitudes, the teacher and adult groups, etc. Much emphasis was placed upon providing this kind of supportive influence for the experimental subjects.

The experimental arrangement as discussed above is depicted in Table 3:

TABLE 3. -- Treatment model for teaching experiment

Treatment Groups	Tues. Thurs. Sat. Classes			Mon. Wed. Fri. Classes		
Control Groups N = 72	n = 36			n = 36		
Experimental Group N = 72	12*	12 n=36	12	12	12 n=36	12

*This is to indicate small sections of students experiencing the Integrative Technique of instruction once each week. The other two class periods consist of lecture groups, size 36 each. All class periods lasted for 50 minutes.



Statement of Hypotheses.--The hypotheses for this study have been stated in Chapter I. The reader is referred to page 16 should he desire to review them.

Procedures in collecting the data.--As a part of the uniformity trial, pre-treatment scores were obtained for each subject on the School and College Ability Tests. Before the fifth week of the study had ended, the Edwards Personal Preference Schedule was administered to subjects during the regular class period. During the period set aside by the University for semester examinations, the Final Examination, Minnesota Teacher Attitude Inventory, and Minnesota Student Attitude Inventory were administered to the students. The Final Examination was administered on the first day, and the remaining two tests were given to the students on the second day of the final examination week. All students were required to take each test at the same time under conditions not conducive to "cribbing." Two co-workers in the Department of Psychology served as proctors during the examinations.

Limitations and assumptions of the study.--In a study of this nature, certain limitations appear to be unavoidable. One limitation of this investigation is the loss of subjects from the experimental and control groups during the treatment period. Subsequent statistical analyses reveal that their withdrawal did not seriously affect the random sampling scheme as shown by the uniformity trial data.

Had it been possible to involve other teachers in the

instructional phase of the experiment, certain possible criticisms could have been avoided. The differential effects of the experimenter on treatment groups may have operated to contaminate treatment results. For instance, one cannot overlook the possibility that the instructor may have been more capable in teaching according to an integrative technique than in using a lecture method.

The restricted geographical area from which subjects in the study reside, and the possible cultural influences on the personality of the subjects (fostering dependency) limit the extent to which results can be generalized to other populations. If subsequent research, however, shows that college students in other geographical areas do not differ significantly from subjects in this study (in terms of dependency), the previously stated limitation may not apply.

CHAPTER IV

ANALYSES OF DATA AND PRESENTATION OF RESULTS

This chapter is organized in the following manner. First, an evaluation of the instructor's adherence to the Integrative Technique and Lecture Teaching Pattern will be discussed. Since the adherence to treatment methods is so important to the assessment of treatment results, much attention will be devoted to the interpretation of M.S.A.I. data. Following this first unit, the reader will find data pertaining to the identification of high and low dependent prone students. The third and final section contains a report of the data relative to control and experimental subjects' performance on the dependent variables.

The Minnesota Student Attitude Inventory.--The reader should note that the inclusion of the M.S.A.I. is based upon the assumption that the classroom climate can be objectively measured. Data from the M.S.A.I. will first be tested for significant differences between the mean scores of control and experimental subjects. Following this, a chi square analysis of each of the 62 M.S.A.I. items will be discussed. A final analysis will be based upon the intensity of responses subjects gave to the items on the test.

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In deriving scores for students on the M.S.A.I. each of the 62 items was assessed a certain number of points on the basis of agreement or disagreement with the Integrative Technique. The procedure used in this interpretation is explained more fully on page 60.

A test for a significant difference between the experimental mean of 57.66 and the control mean of 51.65 on the M.S.A.I. indicates that the experimental subjects scored significantly higher than subjects in the control group. The resulting t-ratio of 2.35 is significant beyond the .05 level of confidence. M.S.A.I. raw scores appear in the Appendix.

In order to compute chi squares for M.S.A.I. items, frequencies were derived by regarding "agree" and "strongly agree" responses as consisting of one category. For example, if a student responded to an item with either "agree" or "strongly agree" a single tally was recorded in the appropriate frequency cell. A similar approach was used for "disagree" responses and for those items on which the subjects were undecided. The basic assumption here is that the emotional and attitudinal factors which caused students either to agree or strongly agree on a specific item were highly similar. Therefore, agree and strongly agree, and disagree and strongly disagree are not truly dichotomous responses; each pair can be meaningfully treated as a single category.

In preparing data for chi square analyses, frequencies for each item were assigned to a 2 x 3 cell. Statistical tests

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for this variable are based upon a chi square analysis with 2 degrees of freedom and tested at the .05 level of significance.

There are 12 items on which experimental and control subjects differed significantly in their perception of the teacher-pupil relationship. Table 4 contains the data derived from M.S.A.I. which indicate such differences.

Table 4. -- Significant Student Perception of Teacher-pupil Relations -- M.S.A.I.*

	Control Subjects (N = 62)			Experimental Subjects (N = 61)			Significant Chi squares
	Yes	No	Unde- cided	Yes	No	Unde- cided	
1. This teacher asks our opinion in planning work to be done.	36	12	14	48	3	10	7.77
2. This teacher keeps order with a firm and fair hand.	35	13	14	46	4	11	6.61
3. I get along exceptionally well with this teacher.	39	12	11	49	3	9	7.73
12. This teacher takes great care in making sure we understand our lesson.	38	8	16	50	3	8	6.57
24. This teacher wants to check our work to make sure we are on the right track.	32	15	15	43	4	14	8.01
27. This teacher helps us to get the most out of every class period.	35	13	14	49	4	8	8.73

Table 4. cont'd.

	Yes	No	Unde- cided	Yes	No	Unde- cided	
28. The self control of this teacher is one of his greatest assets.	42	11	9	52	3	6	6.25
35. This teacher spends a lot of time letting us discuss psychology.	35	12	15	48	4	9	6.53
47. This class is noisy and fools around a lot.	45	3	14	37	15	9	9.86
52. This teacher makes very care-plans for each day's work.	49	4	9	37	14	10	7.28
60. This teacher likes to hear students' ideas.	29	17	16	44	5	12	10.19
62. Most of the students in this class like the instructor very much.	36	13	13	48	3	10	8.35

* All chi squares presented are significant at .05 level of confidence with 2 degrees of freedom.

An inspection of Table 3 will show that the experimental subjects differed significantly from control subjects in describing the teacher-pupil relationship. A significantly greater number of students taught on the basis of the Integrative Technique felt that they had more freedom in helping to plan class activities and directing the content of discussions. They also felt that they spent a significantly greater amount of time discussing psychological principles

in class, a type of student behavior which students felt was condoned by the instructor.

Dealing with a similar theme, a significantly greater number of control subjects indicated that the instructor made very careful plans for each day's work. The writer tends to interpret the latter as an indication of teacher control of classroom activities. There also seems to be an implication (in these students' responses) of a need for more student participation, or maybe an approval of the teacher's actions.

The students experiencing the Integrative Technique of teaching stated that they got along exceptionally well with the teacher, yet they also perceived the classroom organization as disorganized or "out of hand." This does not seem to be related to the fact that the instructor was also perceived as possessing greater self control and keeping order with a firm hand. Perhaps the incongruity in experimental and control subjects' responses to items 2 and 47 is difficult to explain. It would appear that students in the experimental group would not have perceived the instructor as "firm," and on top of this perceive the classroom situation as "fooling around a lot." The responses of experimental subjects may be partially explained by the second descriptive adjective in item 2; not only was the teacher depicted as being "firm," he was also perceived as being "fair." It is believed that students are more apt to accept firm control of their behavior when, at the same time, the

teacher is fair.

Another point of interest in connection with the above discussion is the perception by control subjects that their classes were "noisy and fooled around a lot." Of equal importance is the relatively low negatively weighted score of experimental subjects as compared to control subjects on the item (47) dealing with classroom order. Following the trend of thought in question 47, there appears to be the implication in two other responses of the experimental subjects (questions 2 and 35), that even though their class sessions were noisy, their activities were constructively oriented. The reader should note that a basic characteristic of the Integrative Technique is a classroom climate where students are constructively engaged in problem solving experiences. This characteristic is depicted in replies to item 35, where students indicate the amount of time devoted to discussing psychology, and to item 12, where students indicate the instructor's interest in promoting maximum learning.

Finally, a very important finding from the M.S.A.I. is the idea revealed in items 1, 12, 27, and 60. On these items experimental subjects differ significantly from control subjects in that the experimental subjects perceived the teacher as being more interested, and as putting forth more effort toward helping students understand the subject matter. The experimental students perceived the instructor as a helpful and interested participator in classroom activities to a greater extent than control subjects. These perceptions

alone should have proven to be highly motivating to the students. Likewise, the absence of these feelings, or diminution of them, should lower the motivation in students. It is the above factors which may be the basic explanation for the experimental subjects indicating a strong positive feeling toward the instructor.

Although the items discussed above are the only ones on which the subjects significantly differed in frequency of "agree" and "disagree" statements, responses to other items are worth noticing. Now it becomes necessary to consider the intensity of responses to the 62 items on the M.S.A.I. Intensity data is tabulated in Table 5 under the column headings of S.A.-strongly agree, A.-agree, U.-undecided, D.-disagree, S.D.-strongly disagree, and TOT.-totals. Each M.S.A.I. item was judged on a 5 point scale (-2 to +2) as being incompatible or compatible with the Integrative Technique of teaching. If the items were compatible with the Integrative Technique, they were scaled in the following manner: SA=2, A=1, U=0, D= -1, and SD= -2. If the items were incompatible with the Integrative Technique, they were scaled in this manner: SA = -2, A = -1, U = 0, D = +1, and SD = +2.

There are M.S.A.I. items on which the total frequency of agree responses is less than the total frequency of disagree responses (items 6, 8, 10, 13, 16, etc.) When only tabulated frequencies of these responses are considered, it appears in a negative manner. But when one considers the nature of items in relation to the characteristics of the

Integrative Technique, such responses are seen to be positive. In Table 5 the reader will notice that the points for each item have been arithmetically totaled.

The intensity factor in items on which control and experimental subjects differed significantly is readily observable. It can also be observed that control subjects perceived the instructor as more prone to use force to control the behavior of his students (item 7). Likewise, the control subjects judged that the teacher was very good at explaining things to a greater degree than did the experimental students (item 15). This perception might be attributed to the exclusive use of the lecture method in teaching control subjects. The latter possibility seems especially plausible when one notices responses to item 19. Students are often more positively impressed by the knowledge of teachers who lecture than by those who do not. Although both groups of subjects thought of the teacher as being a good leader (item 16), the experimental group scored higher on this variable. Surprising, also, is the fact that control subjects had such a positive perception of the instructor as revealed from item 26. It seems that control subjects were highly satisfied with the dominant role played by the lecturer. One might also suggest that such a teaching procedure may have coincided with the pattern of instruction to which control subjects had become accustomed. On the other hand, the experimental students may have indicated a greater preference for the Integrative Technique (as

Table 5. -- Items from M.S.A.I. depicting intensity of students' feelings about teacher-pupil relations - Response frequencies

Items On The Minnesota Student Attitude Inventory	Experimental Ss						Control Ss					
	S. A.	A.	U.	D.	S. D.	Total	S. A.	A.	U.	D.	S. D.	Total
1. This teacher asks our opinion in planning work to be done.	18	30	10	3	0	66	0	36	14	8	4	20
2. This teacher keeps order with a fair and firm hand.	10	36	11	4	0	52	12	23	14	13	0	34
3. I get along exceptionally well with this teacher.	12	37	9	1	2	56	3	36	11	11	1	38
4. I find it very easy to talk to this teacher.	13	29	8	9	2	42	18	27	11	3	3	54
5. This teacher never asks trick questions to show how dumb we are.	12	21	9	16	3	23	8	21	10	19	4	10
6. Most of us get pretty bored in this class.	4	11	13	23	12	26	6	6	14	29	7	25
7. This teacher is not the kind who would use force to control the behavior of his students.	10	33	10	8	0	45	20	27	10	5	0	57
8. This teacher is not highly respected by some students in this class.	3	10	13	27	8	27	5	7	13	29	8	28
9. This teacher is one of the best instructors I have ever had.	6	16	19	14	6	2	5	20	18	12	7	4
10. I don't trust this teacher.	2	2	5	29	23	69	0	13	11	27	21	66
11. Most students in this class think that this is a good teacher.	33	16	8	2	2	76	21	32	6	3	0	71
12. This teacher takes great care to make sure we understand the psychological principles covered in this course.	21	29	8	3	0	68	10	28	16	8	0	40
13. This teacher often finds it necessary to punish students in this class.	1	9	2	12	37	73	3	6	0	18	35	76
14. This teacher really understands students my age.	3	35	18	4	1	35	9	24	25	3	1	37
15. Our teacher is very good in explaining things clearly.	16	29	8	8	0	53	19	34	4	5	0	68
16. Frankly, this teacher seems to be a poor leader.	0	2	3	27	29	83	0	2	7	29	24	72
17. This teacher has lost the respect of students in our educational psychology class.	1	0	2	19	39	95	0	2	2	21	37	93

Table 5. — Continued

Items On The Minnesota Student Attitude Inventory	Experimental S ^s						Control S ^s					
	S. A.	A.	U.	D.	S. D.	Total	S. A.	A.	U.	D.	S. D.	Total
18. Sometimes things "get out of control" in this class.	0	12	0	22	27	64	0	4	1	33	24	77
19. This teacher seems to be a very intelligent individual.	11	39	8	2	1	57	17	35	7	3	0	66
20. This teacher bawls you out in front of the class.	1	2	3	24	31	82	2	4	6	18	32	78
21. This teacher makes learning very interesting.	5	16	20	19	1	5	4	17	21	18	2	3
22. This teacher has some special favorites or teacher pets.	0	4	7	22	28	74	0	1	12	26	23	72
23. Our teacher never gives extra assignments as punishment.	12	31	5	7	6	36	18	20	9	1	0	36
24. This teacher wants to check our work to make sure we are on the right track.	11	32	14	2	2	48	7	25	15	15	0	24
25. I really like this class.	11	34	12	5	1	49	13	25	18	6	1	43
26. This teacher talks so much that students are not given an opportunity to express their ideas.	0	0	2	20	39	100	0	3	0	25	34	90
27. This teacher helps us to get the most out of every class period.	15	30	12	4	0	56	5	30	14	13	0	27
28. The self control of this teacher is one of his greatest assets.	23	29	6	3	0	72	5	37	9	9	2	34
29. In class we fool around a lot in spite of the teacher.	2	9	5	19	26	58	2	6	8	31	15	51
30. When I am in trouble I can count on this teacher to help.	6	14	29	7	5	9	3	21	33	3	2	20
31. This teacher becomes confused easily.	0	2	4	21	38	87	0	3	3	30	26	79
32. This teacher talks to us in a condescending manner.	0	1	11	17	32	80	0	0	12	29	21	71

Table 5. -- Continued

Items On The Minnesota Student Attitude Inventory	Experimental S ^s					Control S ^s						
	S. A.	A.	U.	D.	S. D.	Total	S. A.	A.	U.	D.	S. D.	Total
33. Some students in this class occupy too much time talking.	14	40	4	3	0	65	20	32	8	2	0	70
34. Some students are smarter than this teacher.	0	3	9	22	27	73	0	2	10	22	28	76
35. This teacher spends a lot of time letting us discuss psychology.	22	26	9	4	0	66	10	25	15	12	0	33
36. This teacher wants students to think he knows everything.	3	5	1	23	29	70	1	1	2	24	34	88
37. The teacher makes educational psychology seem very interesting and important.	11	33	9	7	1	46	11	37	7	7	0	52
38. This is a very grouch teacher.	0	3	4	24	30	81	1	3	3	20	35	85
39. This teacher gives the impression that what we learn is more important than the grades we make.	15	34	11	1	0	63	19	33	11	0	1	67
40. This teacher is quick to see a new point.	10	39	10	2	0	57	17	35	8	1	1	66
41. This teacher is too bossy.	0	4	6	32	19	66	3	2	5	26	26	70
42. This teacher never gets angry with students in this class.	19	25	4	11	2	48	19	33	3	6	1	63
43. Students in this class don't have much time to fool around.	1	17	3	27	13	34	4	20	8	23	7	9
44. If I could get away with it, I would like to tell this teacher off.	2	1	2	28	28	79	0	1	4	26	31	87
45. This class is noisy and fools around a lot.	1	3	3	25	29	78	0	1	2	28	31	89
46. This is the best teacher I have ever had.	9	6	19	19	8	9	8	6	35	8	5	4
47. Students in this class don't feel free to express their ideas which may disagree with those of the instructor.	4	11	9	27	10	26	1	2	13	27	18	60
48. It seems like the teacher would let us talk more in this class.	0	0	1	21	39	98	3	2	8	18	31	72

Table 5. -- Continued

Items On The Minnesota Student Attitude Inventory	Experimental S ^s						Control S ^s					
	S. A.	A.	U.	D.	S. D.	Total	S. A.	A.	U.	D.	S. D.	Total
49. I would like to have this teacher as an instructor in future psychology courses.	5	19	23	12	2	15	6	22	25	8	1	24
50. This teacher believes in punishing the class for minor things.	8	21	18	10	4	19	9	19	23	8	3	26
51. This teacher has lots of fun teaching psychology.	0	19	30	10	2	5	3	24	29	6	0	24
52. This teacher makes careful plans for each days work.	9	28	11	11	3	29	30	19	9	3	1	74
53. Sometimes, just thinking about this class makes me sick.	1	5	12	34	9	45	2	2	9	36	13	56
54. I have had bad dreams about this class.	1	6	1	20	33	78	2	5	4	20	31	74
55. This teacher helps students when they have problems.	24	32	1	3	1	75	25	30	1	4	2	72
56. Many students in this class don't seem to be interested in learning psychology,	2	3	1	28	27	75	0	5	4	23	30	78
57. Something about this class makes me feel uneasy.	4	16	6	26	9	20	3	14	2	30	13	36
58. This teacher takes time to find out students' attitudes about a debateable topic.	18	26	10	6	1	54	16	33	4	4	5	51
59. This teacher uses his authority to control the behavior of his students.	14	33	5	4	5	47	15	38	5	4	0	64
60. This teacher likes to hear students' ideas.	25	19	12	2	3	61	20	9	16	11	6	26
61. I think this teacher has a grudge against some of his students.	2	2	2	21	34	83	0	10	2	19	31	91
62. Most of the students in this class like the instructor very much.	35	13	10	0	3	35	30	6	13	11	2	51

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used in this study), because these students experienced both lecture and discussion. Related to these ideas is the intensity factor of items 26 and 36.

Judging from the data presented above, it appears that the investigator was successful in structuring the teaching situations as explained in Chapter III. Students in the experimental group did perceive the instructor as a helpful individual who was greatly interested in their progress. Some of the basic characteristics of the Integrative Technique are quite evident in the significant chi squares listed in Table 4, and the direction of the intensity of feelings which have been depicted in Table 5. Likewise, there are indications that the control students experienced a teaching procedure quite different from that of the experimental students. The responses of control subjects to items 1, 15, 24, 35, 36, 43, 47, 48, etc., attest to their evaluation of the course. To them, the class was more subject-matter oriented than concerned with the teacher-student participant relationship.

Selecting high and low dependent prone subjects.--Adhering to the theory developed by Bernadin and Jessor, the investigator selected high and low dependent prone subjects on the basis of their scores on the Edwards Personal Preference Schedule. The reader can find a complete statement of this procedure discussed under definition of terms in Chapter I.

The experimental and control groups contained six low

dependent prone students in each group who scored at or above the 70th percentile on the autonomy scale and at or below the 50th percentile on the deference scale, with a minimum separation of 30 points between the autonomy and deference scores. Likewise, the experimental and control groups contained 26 and 24 students, respectively, in the high dependent prone groups. Each subject included in this treatment attained a consistency score of 10 or above. The latter is the cut-off point used in detecting unreliable E.P.P.S. records resulting from either intentional or unintentional faking of responses.

It is interesting to note the high proportion of highly dependent prone students in this group. Fifty of the 123 subjects in this experiment are classified as high dependent prone subjects. More surprising, however, is the fact that twenty of the fifty high dependent prone subjects are males. There were 42 males and 81 females in the study. Only 1 of the 12 low dependent prone subjects was a male. Assuming that the E.P.P.S. validly measures the personality of subjects in this study and the sample is not atypical, the writer perceives the desirability of further research aimed at clarifying the prevalence of high dependency in the Negro population.

An analysis of treatment effect on Final Examination scores.--The interpretation of treatment effect on the Final Examination will first be presented in terms of experimental and control group performance. Second, the data for high

and low dependent prone subjects will be analyzed. A copy of the Final Examination is included in Appendix C.

Examination of raw scores on the final test reveals that the scores for the experimental and control subjects are not very high. Sixty-two was the highest score made on the examination, which had a possible high of 100. The scores for the experimental subjects range from 18 to 62; the control subjects had a range of scores from 20 to 59. The reader will find these raw scores tabulated in Appendix C.

The mean scores on the Final Examination are 35.62 and 33.70 for the experimental and control groups, respectively. A t-test for difference between these two means indicates that the mean of the experimental group is significantly higher than the control group mean. This difference is significant at the .05 level of confidence with 121 degrees of freedom. Summary data are shown in Table 6.

Table 6. -- t-Test Data for Experimental and Control Subjects' Performance on Final Examination

	Mean Score	Standard Deviation	t-Ratio
Experimental Group	35.62	8.33	1.68
Control Group	33.70	10.70	

The reader will recall that a directional hypothesis was stated in Chapter I dealing with the performance of dependent prone students on the Final Examination. A statis-

tical test of this hypothesis necessitates an analysis of variance technique. The investigator chose to employ a simple analysis of variance, followed by t-tests of significant differences between means (if the analysis of variance yields a significant F). An obvious limitation of the one-way analysis of variance as compared to a two-way analysis of variance is the absence of data on possible interactions in a one-way analysis of variance. On the other hand, the problem of unequal and small n^s (6, 24, 6, 26), in the dependent proneness columns makes a two-way analysis of variance a questionable and complicated technique.

Therefore, in analyzing treatment effects for high and low dependent prone students, a one-way analysis of variance test was employed. The data for experimental and control low dependent prone (ELD and CLD), and experimental and control high dependent prone (EHD and CHD), subjects are presented below in Table 7.

Table 7. -- Data for low and high dependent prone subjects on Final Examination

ELD	CLD	EHD	CHD
62	42	59	44
53	39	54	43
49	38	49	42
48	30	42	40
45	29	42	40
30	25	40	39
		40	38
		38	37
		38	37
		37	37

Table 7. cont'd.

ELD	CLD	EHD	CHD
		36	34
		35	33
		35	32
		34	31
		34	31
		34	31
		33	31
		33	30
		32	29
		32	28
		30	26
		29	24
		28	18
		28	
		22	

The analysis of variance model enables the investigator to test for significant results between treatment and the test performance of high and low dependent prone subjects in experimental and control groups. The specific statistical model employed in this analysis has been discussed by Ray in An Introduction to Experimental Design. The objective of the present analysis is to differentiate error due to treatment from sampling error.

The analysis of treatment effects in the present discussion required testing the null hypothesis of no difference between experimental and control groups. With 3 and 58 degrees of freedom, an F greater than 2.68 would be required to reject the null hypothesis at the .05 level of significance. The resulting F of 3.49 necessitates the rejection of the null hypothesis. Summary data appear in Table 8.

Table 8. -- Summary data - analysis of variance for hypothesis on dependent proneness and final examination

Source of Variation	Sum of Squares	Degrees of Freedom	Variance	F
Between	1033.76	3	344.59	3.49*
Within	5720.48	58	98.76	
Total	6754.24			

* F is significant at .05 level of confidence.

It is not sufficient to know that experimental and control subjects differ significantly in mean scores. Evidence about the effect of treatment in relation to dependent proneness can also be obtained.

The E.E.P.S. scores make it possible to compare scores on the Final Examination of high and low dependent prone subjects. The experimental high and low dependent prone subjects have mean scores of 33.45 and 47.83, respectively. The control high and low dependent prone subjects have mean scores of 35.07 and 33.83, respectively.

When the mean scores of high and low dependent prone subjects are analyzed via analysis of variance technique, any significant differences among them should be detectable. As stated in Chapter I, the directional hypotheses to be tested read $EHD > ELD > CLD > CHD$. To facilitate testing of these hypotheses, one can test for significant differences between means, pairing the mean scores in a descending order (that is, highest mean score with next score in value). This ar-

rangement for testing the mean scores is depicted in Table 9, along with significant t-ratios. Each t-ratio was tested at the .05 level of significance with the appropriate degrees of freedom.

Table 9. -- t-Ratios for performance on high and low dependent prone subjects on Final Examination

Dependent Prone-ness Group	Mean Score	Differences in Mean scores	Degrees of Freedom	t-Ratios
E.L.D.	47.83			
C.H.D.	35.07	12.76	30	2.97*
C.H.D.	35.07			
C.L.D.	33.83	1.24	30	.23
C.H.D.	35.07			
E.H.D.	33.45	1.62	48	.57
C.L.D.	33.83			
E.H.D.	33.45	.38	28	.14

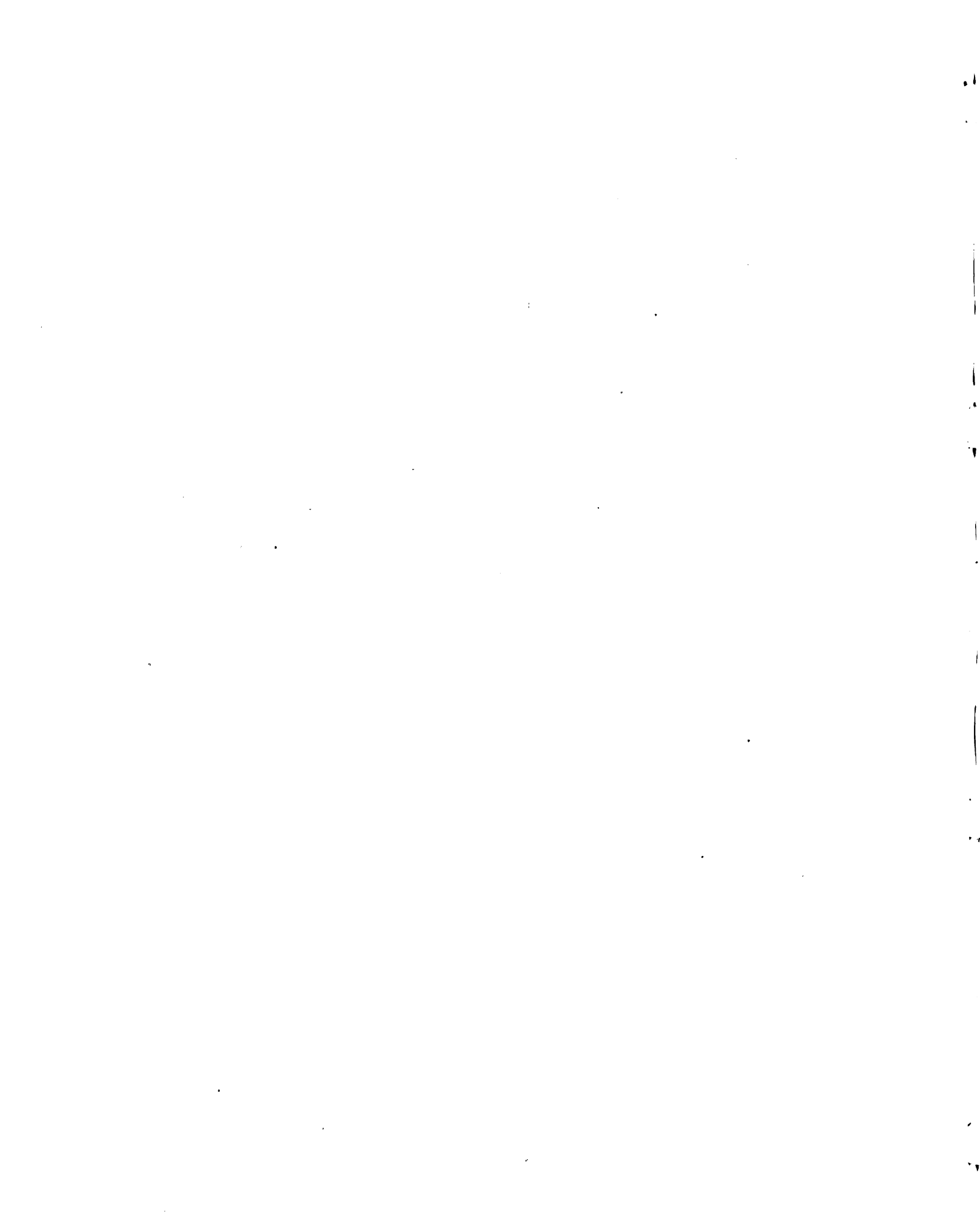
* Indicates that t-**ratio** is significant at the .05 level of significance.

An inspection of Table 9 will reveal that the experimental low dependent prone subjects obtained the highest mean score on the Final Examination, 47.83. This mean is significantly higher than any of the other sub-group means. The subjects in the control high dependent prone group had the next highest mean score, 35.07. However, no significant difference exists between this mean and any of the remaining sub-group means. Table 9 also shows that no signif-

icant differences were found between the other sub-group means.

Since a basic assumption of the analysis of variance is homogeneity of variance, the investigator employed Bartlett's Test of Homogeneity to assess the applicability of the analysis. Bartlett's test involves computation of a quantity whose sampling distribution is given by the chi square function. In the present case, the rejection of the assumption of homogeneity of variance would require a chi square equal to or greater than 7.815 (with 3 degrees of freedom), at the .05 level of significance. Bartlett's test of homogeneity yields a chi square value of 5.63. This requires the acceptance of the null hypothesis which states that the variances of high and low dependent prone subjects' scores in the population are not significantly different. Therefore, it is assumed that sample variances are homogeneous.

The chi square test gives support to the belief that the four dependent prone samples are not heterogeneous in variance. Since the F test (and some of the resulting t-tests), resulted in accepting the hypotheses of random sampling from a common population, and since the chi square test indicates it is not the variances which differ significantly, there is reason to believe that the significance of the value F (and resulting t-tests), is the result of differences in the means of dependent prone groups. This idea will be elaborated upon in Chapter V.



Effects of treatment on students' attitudes toward teaching.--The reader will recall that sub-hypotheses in this study predicted that students taught by different instructional techniques would differ significantly in their scores on the M.T.A.I., a test designed to measure the type of teacher pupil relations a prospective teacher might establish. In order to obtain data for testing this hypothesis, the experimenter administered the Minnesota Teacher Attitude Inventory to the students. Raw data of subjects' scores on the MTAI are presented in Appendix D.

As a group, the performance of students on the MTAI yielded low scores when one compares their scores with norms for the test. The highest raw score obtained on the test was 60 (64th centile), and the lowest raw score was -75 (below 1st centile for college juniors). The means for the experimental and control subjects are -1.35 (5th centile) and -15.85 (1st centile), respectively, for college juniors - academic. The investigator chose to code M.T.A.I. raw data in order to convert all numbers to positive figures; therefore a constant of 100 was added to the score of each student. Coded means for the experimental and control groups are 98.65 and 84.15, respectively. Analyses are presented with coded data.

A t-test for differences between mean scores shows that the experimental mean of 98.65 differs significantly from the control mean of 84.15. This difference is significant at the .05 level of significance with 121 degrees of

freedom. The data for this analysis are presented in Table 10.

Table 10. -- t-Test of experimental and control subjects' performance on M.T.A.I.

Treatment Group	Mean Score	Degrees of Freedom	t-Ratio
Experimental Subjects	88.65	121	4.30*
Control Subjects	84.15		

*T ratio is significant beyond the .005 level of significance.

The final statistical test in the analysis of results deals with treatment effects on the different dependent prone sub-groups in reference to M.T.A.I. scores. Before discussing this aspect of treatment effects, it is necessary to report on the assumption of homogeneity of variance in the analysis of variance model. A chi square of 1.41 was obtained from the application of Bartlett's test for homogeneity. At the .05 level of significance, with 3 degrees of freedom, a chi square equal to or greater than 7.815 is required for rejection of the null hypothesis. It can be seen that the null hypothesis of no difference must be accepted. Therefore it is assumed that no significant difference exists between the variances of the various treatment groups on the M.T.A.I.

The M.T.A.I. scores of high and low dependent prone subjects are to be tested for significant differences between means. The coded means of experimental and control

high dependent students are 93.69 and 94.87, respectively. For the experimental and control low dependent prone subjects, the mean scores are 92.93 and 93.16, respectively. Mere inspection of mean scores reveals that only the subjects in the experimental high dependent prone group deviated as much as nine points. More important, however, is whether there exists a significant difference in mean scores. Raw scores for high and low dependent prone subjects in the experimental and control groups are presented in Appendix D.

An analysis of variance test is applied to the data of dependent prone students on M.T.A.I. With 3 and 58 degrees of freedom, an F value equal to or greater than 2.68 is required for rejecting the null hypothesis of no difference at the .05 level of confidence. As the data in Table 11 indicate, the resulting F of .07 necessitates the acceptance of the null hypotheses. Therefore, it is assumed that treatment had no significant effect on the M.T.A.I. scores of dependent prone subjects.

Table 11. -- Analysis of variance data for high and low dependent prone students on M.T.A.I.

Source of Variation	Sum of Squares	Degrees of Freedom	Variance	F	F _e
Between sum of squares	208.15	3	69.38	.07	2.68
Within sum of squares	51180.85	58	882.42		
Total sum of squares	51389				

This concludes the statistical analysis of the teaching experiment data. Significant and nonsignificant findings will be further discussed in Chapter V. The summary and conclusions for this study will also be presented in this chapter.

CHAPTER V

SUMMARY, CONCLUSIONS, AND IMPLICATIONS FOR FUTURE RESEARCH

Summary of the study:--In Chapter I is found a complete statement on the purpose of the study. It will be recalled that the underlying objective was to evaluate the effect of feedback (as compared to no feedback) on the learning of psychological principles in an educational psychology course. The feedback variable was structured in terms of two methods of classroom instruction--the Integrative Technique and the lecture technique. Definitive statements of each technique were given for the purpose of demonstrating the inherent feedback aspect of the Integrative Technique as against the "less feedback" aspect of the lecture approach.

Other hypotheses in the study dealt with the effect of different instructional techniques on the attitudes of students toward teacher-pupil relations, as measured by the response of students to the Minnesota Teacher Attitude Inventory. Another group of hypotheses predicted different treatment results in relationship to the personality attribute of dependent proneness. Dependent proneness was measured by four sub-scales of the Edwards Personal Preference Schedule.

Random samples of students from the total population of co-eds enrolled in educational psychology at Southern University served as subjects. These students were taught according to the above instructional techniques for one semester. The Minnesota Student Attitude Inventory was employed to assess the degree to which the teacher adhered to the Integrative Technique and/or the lecture technique.

Because of related research reported in Chapter II, the investigator was led to expect that significant differences would be found indicating: (1) that integratively taught students would score higher on the Minnesota Teacher Attitude Inventory and Final Examination than students taught via a lecture technique and (2) that similar results would be obtained in the comparison of high and low dependent prone students in the integrative and lecture classes. Furthermore, it was expected that the performance of experimental high dependent prone students would excel that of experimental low dependent prone students. Scores which subjects made on tests following treatment served as criteria for testing experimental hypotheses.

Conclusions bearing on hypotheses:--If one reviews the results presented in Chapter IV, a complete picture of treatment effects can be seen. Briefly, certain probable conclusions from the statistical tests of experimental data may be reached.

Most basic to an adequate interpretation of experimental results is the extent to which the teacher adhered to

instructional techniques discussed in Chapters I and III. The reader will recall that the Minnesota Student Attitude Inventory (M.S.A.I.) was used as a measure of how the students interpreted the instructional behavior of the teacher. Of the 62 items on the M.S.A.I., 12 of them indicate that control and experimental students perceived the instructor in a significantly different manner. When attention is given to the degree of intensity of feelings expressed by students on the remaining 50 items, further differences in the perceptions of students become evident.

Experimental subjects (integratively taught students), perceived the teacher as being a more helpful ally in the classroom than the control students (students taught by lecture method). A trait that is given high ratings by experimental students is the "cooperativeness" of the instructor. There is evidence that these students felt that the teacher was more interested in their individual progress than did those in the control group.

On the other hand, the responses of control subjects on the M.S.A.I. indicate that the teacher played a more authoritative and directive role in the classroom. There is an implication in their responses that a greater degree of structure pervaded their classroom experiences than those of the integratively taught students. The structure which prevailed did not seem to effectively restrict the "fooling around" activity of students in the lecture group. Perhaps the seeming incongruence between the perception of classroom

structure and "fool around a lot" could be better interpreted if "fool around a lot" had been more operationally understood by the respondents.

One aspect of the M.S.A.I. data is especially noticeable. This is the high percentages of students in both the experimental and control groups who gave replies of a positive nature to the 62 items composing the M.S.A.I. Such data seem to indicate that although the instructor did vary his teaching behavior to some degree, he used (to a great extent), an integrative approach in all classes. Or, to state it another way, the proposed instructional techniques were not consistently followed in the integrative and lecture groups, respectively. A second possible meaning may be that the students responded to the M.S.A.I. not only on the basis of how they perceived the teacher's behavior, but also according to their desires of not being objectively critical of the teacher. Students may have consciously or unconsciously avoided critical responses even though they were not required to list any personal data which might have identified the respondents.

In summary, it is believed that the instructor did achieve some degree of differential treatment of subjects. However, the consistency of treatment may be questioned when one looks at the high percentage of positive answers on the M.S.A.I. Experimental subjects seem to have been integratively taught, but so were the control subjects, though to a lesser degree. The extent of integrated teaching is seen

as a reflection of the magnitude of feedback.

(Conclusions - treatment effects on Final Examination:)

--Students who received feedback from the instructor were expected to score significantly higher in the Final Examination than students who received no feedback. The reader should recall that feedback was administered via the Integrative Technique of instruction. The no-feedback group were given three fifty-minute lectures each week.

The data presented in Chapter IV indicate that students who experienced the integrative teaching pattern scored significantly higher than students in the lecture group. The means are 35.62 for the integrative students and 33.70 for the students in the lecture group. Does this difference, however, reflect the strength of integrative instructional technique? The best answer to this question seems to require a cautious and thoughtful approach. The writer believes that no conclusive answer is possible, even though the present evidence seems to point toward an affirmative answer to the previous question. One thing is certain. Students who were instructed on the basis of what is herein referred to as the Integrative Technique did score significantly higher on the Final Examination.

It is not highly probable that differences on the Final Examination can be attributed to higher scholastic ability or better educational preparation on the part of the experimental subjects. The data in Chapter III show that these traits were successfully controlled through random

selection and assignment to treatment groups.

There is the possibility that the instructor may have unconsciously taught experimental students facts and responses which may have been conducive to making high scores on the Final Examination. It must be said, however, that this possibility was conscientiously avoided. Whatever differences occurred in teaching the control and experimental students were perceived by the experimenter to be inherent in the two instructional approaches.

Were there variables which were not completely accounted for in the experiment? One may highly suspect the existence of personality differences, other than dependent proneness, which may have affected experimental outcome. For instance, it may be hypothesized that the closer relationships students had with the teacher in the Integrative Technique introduced the Hawthorne Effect. Such a conjecture has the implication that the experimental findings probably did not result from the instructional technique.

The investigator perceives the Hawthorne effect as an integral aspect of the Integrative Technique. It should be recognized that one of the main objectives of giving students feedback was to affect directly the motivational state of the pupils. In a similar manner, students who received feedback via the Integrative Technique probably felt as though they were receiving special attention. The reader should recall that the Integrative Technique was characterized in Chapter I as possessing a supportive and acceptive

type of teacher-pupil relationship. Therefore, the writer feels justified in assuming and accepting the probability that the Hawthorne effect actually added to the strength of experimental treatment. And, furthermore, any additional personality differences should have been equated in the treatment groups by random selection and assignment.

Performance of dependent prone groups on Final Examination:--The performance of high and low dependent prone subjects on the Final Examination proved to be highly erratic. The studies of previous investigators, on this topic, led the writer to hypothesize that treatment results would be significantly in favor of the high dependent prone groups taught by the Integrative Technique (see Chapter II). It was hypothesized for the experimental group that the high dependent prone subjects would score significantly higher on the Final Examination than low dependent prone subjects. The reverse hypothesis was made in reference to the performance of subjects in the control group.

Results from the study indicate that the experimental low dependent prone subjects scored significantly higher than any of the other three dependent prone groups. No significant difference in mean scores was detected among the remaining three groups.

How should these results be interpreted? First, it is unlikely that the difference in favor of low dependent prone subjects can be attributed to any general difference in capacity for higher academic study. Data presented in

Chapter III indicate that no significant difference exists between experimental and control groups on S.C.A.T. scores.

Could it be that the research hypotheses for the dependent prone comparisons should be repealed in favor of alternative sets of plausible hypotheses? What about the accuracy of E.P.P.S. in diagnosing dependent proneness; are high and low categories on the dependent proneness scale truly dichotomous groups? Might one question the degree to which experimental subjects actually experienced integrative instruction and, thereby, feedback? Perhaps one 50-minute treatment period per week was not intensive enough. These are just a few questions one might ponder in interpreting test results.

Is it logical to reason that a low dependent prone person will expend more effort to achieve an understanding of psychological principles than a high dependent prone subject when the two are confronted with a permissive learning situation? The rationale supporting this postulate is that the increased explanations and questions from the teacher (and students), cannot compensate for the high dependent personality of some students. It further implies that high dependent prone persons have an environmental orientation not conducive to success in a competitive environment, not even when there are permissive and accepting types of interpersonal relations. Although such an explanation as that being discussed might seem plausible, there exists no experimental support for it in the review of literature on

classroom instruction. Therefore it remains highly questionable, but it does appear to be a logical explanation for the results from this study.

There appears to be a second plausible explanation for the significantly higher performance of low dependent prone subjects over high dependent prone subjects in the experimental group. Could it be that the students who really "felt free" under the integrated treatment might have been the low dependent prone students? Thus, the low dependent prone students, unhampered by the restrictions of the structure imposed in the lecture treatment, might have actually spent more time delving into topics of more interest to them. This, in turn, may have resulted in greater learning generally. Probably these explanations should be given additional consideration in future research.

Another factor which might help to account for experimental results is the degree of integrative instruction for experimental students. There are two possible aspects to this factor. These aspects deal with the question of whether integrative instruction was intensive enough to clearly affect student performance. On one hand, there is the question of amount of time students actually experienced integrative teaching (one third of the total instructional period). Second is the question of whether adequate feedback was given via the integrative teaching pattern.

If adequate feedback were provided experimental students, in comparison with inadequate feedback for control

students, one should have expected significant differences in favor of experimental students. This expectation is substantiated if one compares mean scores for experimental and control subjects, overlooking the variable of dependent proneness. Likewise, if the effect of feedback is constant, the scores of high and low dependent prone students in the experimental group should be significantly higher than the scores of high and low dependent prone students in the control group. This expectation is not substantiated by the data. Only the low dependent prone students in the experimental group scored significantly higher than the control subjects. The significant difference between high and low dependent prone students in the experimental group may be explained on the basis of the personality variable (since treatment was the same). However, the data indicate that the dependent proneness of students is of no importance if they are taught by a lecture method and are highly dependent prone.

Conclusions bearing on M.T.A.I. data:--The subjects in the experimental group scored significantly higher on the M.T.A.I. than control subjects. The level of significance (.005), at which this hypothesis was tested strongly indicates that this result is not due to chance. It is highly probable that treatment did exert some influence on the manner in which students responded to M.T.A.I. items.

It seems highly probable that the Integrative Technique of instruction has some effect upon the type of teacher-

student relations prospective teachers think they will maintain. Such teachers believe they will be able to maintain with pupils a state of harmonious relations characterized by mutual affection and sympathetic understanding. Control subjects seem to possess this belief to a significantly lesser degree than experimental subjects.

When one compares the I.T.A.I. scores of high and low dependent prone subjects in the experimental and control groups, no significant difference is noted. Therefore, there appears to be no relationship between the personality make-up of students (in terms of dependent proneness) and the probable teacher-pupil relations one might establish.

Summary of the results: -- In this study dealing with the effect of feedback (Integrative Technique) on the Final Examination scores of students, it was concluded that feedback did have a significant overall effect on test performance. Similar results were obtained when the investigator tested for the effect integrative teaching might have on the probable type of teacher-pupil relations a prospective teacher might maintain. Integratively taught students appear to have a better understanding of how psychological principles should be used in teaching, and are more prone to establish positive teacher-pupil relations.

The data also show that only the low dependent prone students in the integratively taught class differ significantly for the other dependent prone groups on the Final Examination. There appears to be no relationship between

the degree of dependent proneness and the probable teacher-pupil relations a prospective teacher will maintain.

Implications for future research:--The experimenter has some suggestions to offer which he feels would have improved the quality of the reported study. The reader will find these recommendations for future research listed below.

1. It is suggested that future studies be organized so that a greater amount of time in the experimental section will be devoted to integrative teaching. A second suggestion along the same line is to include a third treatment group which will be taught entirely via the Integrative Technique. These suggestions are given for the purpose of making experimental treatment more intense and constant.
2. There also needs to be a more equitable arrangement of subjects in the dependent prone groups, and a greater number of subjects in these groups. The importance of this suggestion can be seen in a more precise and thorough analysis of experimental data.
3. Arrangements should also be made to include teaching personnel trained to employ both the lecture and the Integrative Technique of instruction.
4. The problem of group size and the possibility of creating an integrative atmosphere regardless of group size is a topic which should be further studied. The continuous increase in the school-age population necessitates more efficient techniques of teaching larger

groups of students. How this can be accomplished with the Integrative Technique of instruction remains to be answered.

5. Also of interest is the high percentage of high-dependent prone students (40%) as compared to the low percentage of low dependent prone students (approximately 1%) noticed in this study. The percentage of high dependency proneness among the male subjects is of particular interest. Several questions seem relevant for further study in relation to this observation. Is this distribution truly representative of the extent of dependent proneness in the general Negro population? If so, does the distribution differ significantly from that found in other ethnic groups? Assuming that this distribution is representative, how should the prevalence of high dependent proneness be explained? Might it be related to the specific aspect of Negro child rearing practices, to the expected social roles of youth in American society, or to some other factors? It is believed that further research is needed to obtain answers to these questions. Until such information is obtained, no general interpretation or application of dependency proneness data should be attempted.

6. Further data are needed to help teachers better understand how and why different types of classroom climates affect the performance of high and low dependent prone students. It is suggested that the plausible explanations given for the relative performance of high and low dependent prone students in this study be evaluated in future research.

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APPENDIX A

RAW SCORES

Table A. Raw Scores on the School and College Ability Tests

Experimental Subjects		Control Subjects	
73	41	67	33
67	39	63	32
67	38	63	32
62	37	60	32
58	37	59	31
57	37	56	31
55	36	53	31
55	36	53	30
54	33	53	30
53	33	53	29
52	33	51	29
52	31	50	29
52	30	49	28
49	28	48	26
47	27	46	26
46	27	44	26
45	26	43	25
45	24	43	24
44	23	42	24
44	23	41	24
44	23	40	23
44	21	37	22
43	21	37	22
43	21	37	19
43	21	35	18
42	14	34	18
42	14	34	16
41		33	15

Table A-1. Raw scores on S.C.A.T. for high and low dependent prone students

Experimental low dependent prone students	Experimental high dependent prone students	Control low dependent prone students	Control high dependent prone students
58	67		60
48	62	57	59
44	55	44	53
33	52	44	53
32	52	36	53
22	49	31	51
	46	28	50
	44		49
	42		43
	38		42
	38		41
	37		37
	37		37
	36		35
	36		34
	33		31
	33		31
	31		30
	31		30
	27		29
	26		28
	23		27
	21		26
	21		25
			24
			14

APPENDIX B

SAMPLES OF QUESTIONS GIVEN EXPERIMENTAL
SUBJECTS FOR INTEGRATIVE INSTRUCTION

EDUCATIONAL PSYCHOLOGY

Discussion Questions

1. What is the basic difference in the understanding and use of concepts by the preschool child and the middle aged child? Discuss this difference as it may be related to the method of instruction you might adopt in each case.
2. What are the basic intellectual changes which occur in the child's mental functioning during the middle age years.
3. Some investigators report a decreased interest in learning on the part of the first and second grader. What do you think are some logical explanations for this change?
4. According to your authors, what are the two basic criteria a teacher should possess in order to be an efficient instructor? Do you agree with this viewpoint? Cite additional criteria you would add to this list.
5. What was the purpose of the study conducted by Lewin, et.al.? Know the results of the study and be able to relate this data to classroom learning.



EDUCATIONAL PSYCHOLOGY

Study Questions: Teacher-pupil Relations

1. What do you perceive to be the professional responsibilities of teachers?
2. What do you perceive as the main professional problems of teachers?
3. What type of relationship should exist between students and their teachers? Why?
4. Our schools should stress cooperation as a technique of instructing students more so than competition. What are your reactions to this statement?
5. If a teacher does visit homes of her students it should be on the invitation of the child or the parent at an appointed time. The teacher should not visit while the father is away from home, or without being invited. Consider this statement from the negative and positive viewpoints.
6. One chief characteristic of poor teachers is that they fail to see and appreciate the relationships and advantages of using community resources in their instructional program. Discuss this statement by considering how the community can benefit the schools.
7. It is often said that teachers are parent substitutes. What is meant by this statement? Is it true? How do you see yourself playing this role?

EDUCATIONAL PSYCHOLOGY

Study Questions

1. Define learning. What are some limitations of your definition?
2. Distinguish among classical conditioning, instrumental learning and perceptual learning. State in meaningful language the laws of learning (both Gestalt and Associationism).
3. What is meant by stimulus generalization? Give an experimental example.
4. What is extinction? How is it produced in classical conditioning and instrumental learning? Give examples of the use of classical and instrumental learning in a classroom.
5. Define partial reinforcement. How does it affect extinction? How does it affect learning.
6. When would you recommend the use of punishment and when would you not? Define punishment according to Skinner's theory. What are the limitations of punishment as a method for controlling behavior?
7. Distinguish between discriminative learning and incidental learning.
8. What are some useful measures of progress in learning? Why does learning sometimes reach a plateau? Is there such a thing as a psychological limit?
9. What general rule can be stated about the distribution of practice in learning?
10. Does learning progress faster by reading than by spending time in recitation?
11. What is meant by transfer of training? How is it related to the Theory of Formal Discipline? How is it related to stimulus generalization.
12. Give instances of positive and negative transfer. Indicate rules for predicting when each will occur.

EDUCATIONAL PSYCHOLOGY

Discussion Questions - Testing

1. What do you think the primary objectives of classroom testing should be? Try to relate your answer to the lecture on "Goals of Educational Psychology."
2. There are psychological tests which measure various aptitudes and tests which measure scholastic aptitudes. Is there a real difference in what is being measured. Do aptitude tests measure the same thing as achievement tests?
3. Explain the basic idea in Spearman's "Two Factor Theory" of intelligence. Is either of Spearman's two factors related to Thurstone's Primary Mental Abilities."
4. Do you think that there is a real relationship between I.Q. test results and classroom performance of students? Be able to support your answer with objective data.
5. State the differences and advantages of group tests in comparison to individual tests. Verbal tests in comparison to nonverbal test? Teacher made tests in comparison to standardized test.
6. Is the I.Q. constant? Explain your feelings about this controversy.
7. What are some essential characteristics a classroom teacher should stress in selecting a standardized test for his students?
8. Examine the last examination given to students in this class. Which questions do you judge to be "good" questions? Why? What aspects seem to denote the "poor" questions?

13. Is "exercising the mind" a realistic objective for education? When can education be expected to transfer to the solution of practical problems?
14. How can retention be measured? What is the most sensitive method of measuring it?
15. How does the game of Gossip illustrate changes in retention?
16. What does negative transfer have to do with forgetting? Why is there less forgetting after a period of sleep than after a period of waking?
17. How does repression affect memory? What causes repression?
18. What advice would you give a student on the use of "whole or part" methods of learning?
19. In motor learning, what is the difference between repetition and practice?
20. How do the senses make use of cues in problem solving?
21. What does the author mean by operant learning?
22. What can teachers do to manipulate the level of aspiration of learners?
23. What can teachers do to increase the probability that students will perceive significant cues?
24. What is meant by progressive approximation? How does this make teaching effective?
25. What can the teacher do to increase the probability of transfer?
26. Is it true that the whole determines the meaning of the parts?

Educational Psychology

Name _____

Section _____

Below are some alternative proposals for grading or marking systems. For each one, indicate whether you agree or disagree and then give the reason for your decision.

1. In assigning marks, a teacher should keep in mind each student's ability and grade on the basis of whether a student is achieving as well as his ability permits.
 Agree _____ Disagree _____
 Reason: _____

2. A Teacher should give grades on the basis of improvement in the course.
 Agree _____ Disagree _____
 Reason: _____

3. A teacher should grade on how well a student is achieving, considering his home conditions, etc. It would not be fair, for example, to expect as much from a boy who works 40 hours a week to support his invalid mother.
 Agree _____ Disagree _____
 Reason: _____

4. A teacher should grade on a "curve" so pupil's achievement is compared with others in his group.
 Agree _____ Disagree _____
 Reason: _____

APPENDIX C

FINAL EXAMINATION - Sample Questions
and Raw Data

FINAL EXAMINATION - EDUCATIONAL
PSYCHOLOGY - Sample Questions

Section: _____

Name: _____

Read each question carefully.

1. Specific principles from educational psychology have what limitation as guides to teaching procedures?
 1. Specific research findings must often be modified in order to fit specific conditions
 2. Principles of educational psychology are based as much on common sense as on experimental evidence.
 3. Even scientific evidence does not help determine what procedure will be best for most situations.
2. The basic question a teacher should ask when deciding on course objectives is:
 1. "What behavior do my students have to learn in order to perform successfully in their society?"
 2. "What learning behaviors do my students have to exhibit in order to be ready for the next course?"
 3. "What does this course contribute to the academic development of my students?"
 4. "What behaviors should the students learn in order to obtain success on achievement tests?"
 5. "What does this school want the students to learn?"
3. Which of the following statements best coincides with data in the area of social class differences?
 1. Culture has no influence on the ability of students
 2. Students from "slum" homes are less prepared for successful schooling than students from middle class homes.
 3. Students everywhere (in all cultures) possess a dislike for traditional teachers.
 4. Traditional teachers are more successful with lower class students than with middle class students.
 5. Culture is of little significance in the performance of students if they are highly motivated.
4. The statement "that individual differences are normally distributed" means that:
 1. People who are below average in personality are above average in physical development.
 2. A large number of people fall close to the average but some people are found far out in either direction for any particular difference.

3. People who have marked differences when very young will approach normality as they grow older.
 4. About as many people will deviate from average as will in the average or normal group.
 5. People who are inferior in intelligence will be superior in mechanical ability.
5. One of the following statements is not true of "developmental tasks". Choose the exception.
1. "Developmental tasks" are those learnings which the culture expects all members to master at a particular age.
 2. If a person fails to master the "developmental tasks of one age, satisfying the same need at later ages is more difficult.
 3. "Developmental tasks" in different cultures differ both in what is expected and when it is expected.
 4. Developmental tasks" are those skills which are nearly complete before the child reaches puberty.
 5. At the unusual age for learning a developmental task, the culture provides opportunities which are not readily available later.
6. A teacher says, "Mary is from a middle-class family and Jane is from a lower-class one; therefore, Mary will have more motivation for schoolwork than Jane." How do you react to this statement?
1. The statement accurately reflects the relationship between social class and motivation.
 2. The teacher has the relationship reversed; Jane will be more motivated than Mary.
 3. This would be a good prediction, but the relationship is not as perfect as the statement implies.
 4. Not only does the teacher have the relationship reversed, but he is too positive in his statement of it.
 5. There is no meaningful and consistent relationship between social class and motivation.
7. Jim Jones is a ten-year-old pupil in the fourth grade. His IQ is around 130, he is at the head of his class in all subjects, and he frequently appears bored because the work is easy for him. Which of the following lines of reasoning should receive first consideration in deciding whether to advance him or keep him in his same class?
1. Jim should certainly be encouraged to skip a grade in order to give him more challenging work.
 2. Jim should be allowed to skip a grade if he has also attained an average level of physical and social development.
 3. He should be allowed to skip a grade if his physical and social development is also advanced for his age.

4. Jim should probably not be allowed to skip a grade; his teacher should be encouraged to give him extra work
 5. Jim should be given special attention regarding his social development for his is probably behind his classmates in this area.
8. Which of the following is the least desirable procedure in teaching for transfer of learning?
1. Identifying the desirable response in the form of a generalization.
 2. Identifying the desirable response in the form of a general principle.
 3. Exposing the learner to situations where the principles may be applied.
 4. Pointing out situations to which responses may be transferred.
 5. Teach the subject which you expect the student will transfer to solve his problems out of class.
9. Assume you are a teacher confronted with a boy who is essentially anti-social, anti-everything. As you talk with him about this problem you note that he has little, if any, guilty feelings about such things as cheating, fighting or stealing. Which segment of his personality structure, as defined by Freud, do you suspect as being defective?
1. The id
 2. The super ego
 3. The oedipal complex
 4. The ego
 5. Parental consolation of needs.
10. Mr. T. Chur said that one of his duties was to develop a sense of responsibility in his pupils. Mr. Prince Ipal asked him what specific behavioral outcomes he had in mind. Mr. Chur might best have replied:
1. "I want my pupils to recognize that they are accountable for their own behavior."
 2. "My pupils should act in a trustworthy manner."
 3. "My pupils should volunteer for worthwhile activities and then satisfactorily complete the job for which they volunteered."
 4. "My pupils should develop a state of mind in which they see themselves as free citizens capable of conducting their own affairs but recognizing an obligation to others."
 5. "I think my pupils should salute the flag properly whenever the National Anthem is played."

11. B.F. Skinner states that good teachers build good habits and desirable attitudes in students by "shaping their behavior", by this he means:
1. The teacher constantly moulds student's behavior in the classroom.
 2. The teacher is critical of desirable behavior at all times
 3. The teacher rewards any behavior approximating the desired behavior.
 4. The teacher asks pertinent questions to students
 5. None of the above.
12. Cronbach tells about a study which gives some evidence on how a demonstration can be most effective. To apply the conclusions of this study, suppose that you are a home economics teacher demonstrating how to make a pie crust. How should you conduct the demonstration?
1. Silently perform each step. Have class describe what you are doing. Correct their description if necessary.
 2. Ask pupils to think about the last pie their mother baked describe process. Demonstrate correct method and compare.
 3. Perform demonstration while at the same time giving a complete verbal description of each step.
 4. Silently perform demonstration. Have pupils watch carefully all the way through. Then ask each pupil to write out a complete description.
 5. Perform each step without interruptions, and then test student's knowledge of the process.
13. Reviews are most efficient and effective when:
1. Distributed with a shorter interval between each session
 2. Not distributed but concentrated in a session before the test.
 3. Distributed evenly with the same interval between each session.
 4. Distributed with an increasing interval between each session
 5. None of the above.
14. Miss Confort considers herself as an "accepting" teacher. Which of the following would be consistent with her self-concept?
1. Continually praises her students for desirable behavior and assist those exhibiting undersirable behavior to adjustment.
 2. Encourage her students to organize their own projects.
 3. Like to have her students come to her for advice when in doubt.
 4. Points out the errors made by pupils and corrects errors for them.
 5. Accepts all types of behavior in the classroom.

15. Pupils in your 4th grade arithmetic class have not been doing well on multiplication problems recently. The teacher across the hall suggests that you conduct a contest and award a prize to the pupil who does best on your next test. How would you evaluate this proposal?
1. It would be a good incentive only for the two or three pupils who know they have some chance of winning.
 2. Competition should never be used because it arouses tension and damages self-respect.
 3. It might work to motivate the whole class because nobody would want to come in last
 4. Although there are several disadvantages, the main advantage would be that the losers would learn how they might do better the next time.
 5. Since we live in a competitive world, the more experiences like this we provide the better prepared pupils will become.
16. Which of the following is not a chief purpose of evaluation of students when using achievement tests.
1. Evaluation helps the learner realize how he should change or develop his behavior.
 2. Evaluation helps the learner attain satisfaction when he is doing as he should.
 3. Evaluation helps the teacher judge how adequate his teaching methods are.
 4. Evaluation helps the teacher judge how interested the students are in his subjects.
 5. Evaluation assists in making administrative judgement.
17. Which is the most correct and realistic statement of interpretation to a student of a test score of 79th percentile.
1. You did better than 79 out of 100 people.
 2. You scored near the top one fifth of people who took this test.
 3. You scored at the 79th percentile give or take a standard error of measurement of 5 points.
 4. Twenty-one people out of one hundred did better than you on this test.
 5. Your score is higher than 79 percent of the students in this class.
18. Which one of the following statements is not true of human emotions
1. Outward compliance and friendliness and strong feelings of hostility can exist in the same person.
 2. Positive emotions are displaced when no means is found for expressing them.

3. Suppression of emotion has harmful consequences only when this pattern is continued over many situations.
 4. Psychiatric interviews try to arouse emotional conflicts the patient has refused to recognize.
 5. Emotional behavior must discharge itself before a person can operate at an intellectual level.
19. Often times teachers find themselves responsible for conseling students. Those who resort to the use of directive guidance should remember that.
1. Directive guidance requires more skill on the part of the teacher.
 2. Directive guidance requires less skill on the part of the teacher.
 3. Only those persons thoroughly trained in counseling should counsel students.
 4. The social stimulus value of a person should be the focal point.
 5. They are assuming part of the responsibility for outcome of counseling.
20. A good teacher knows that he can best improve parent-teacher cooperation by
1. Sending reports of students progress home to parents
 2. Keeping the principal well informed on problem students
 3. Supplementing knowledge derived via social perception with home visitations.
 4. Insuring through efficient teaching that all his student will receive "good grades".
 5. Supplementing the regular school marks with ratings of personality traits.

Table C. Final Examination Raw Scores

Experimental Group		Control Group	
62	34	59	32
57	34	57	32
53	34	54	32
50	33	47	32
49	33	45	31
48	33	43	31
45	33	42	31
44	32	42	30
44	32	42	30
44	32	40	30
43	31	40	30
43	31	39	30
42	31	39	29
40	31	38	29
40	30	38	29
40	30	38	29
40	29	38	29
39	29	36	28
39	29	36	28
38	28	35	28
38	28	35	27
38	28	35	27
38	27	34	27
37	26	34	26
37	26	34	25
37	26	34	25
37	24	34	24
36	23	34	23
36	23	34	22
35	23	33	22
	18	33	20

APPENDIX D

RAW SCORES ON THE MINNESOTA TEACHER ATTITUDE INVENTORY

Table D. Raw Scores on the Minnesota Teacher Attitude Inventory*

Experimental Group		Control Group	
160	96	136	76
156	95	132	75
150	94	130	75
149	92	128	74
148	92	126	73
145	91	125	72
143	90	124	70
135	89	119	70
131	88	117	68
131	87	115	68
129	86	108	68
128	83	107	68
128	81	105	67
127	78	105	67
126	77	103	66
122	71	102	65
118	70	100	64
109	70	100	64
108	69	96	63
108	68	95	62
107	67	94	62
106	64	88	57
106	63	87	52
105	62	85	52
104	61	84	51
103	59	84	50
103	58	83	49
102	57	82	47
98	51	80	45
97	49	79	29
	42	79	25

*A constant of 100 has been added to raw scores to eliminate negative numbers.

Table D-1. Raw scores on Minnesota Teacher Attitude Inventory*

ELDP	EHDP	CLDP	CHDP
136	132	156	150
128	130	108	148
87	128	108	145
84	126	81	129
75	124	57	126
47	117		106
	108		104
	95		102
	85		97
	82		96
	82		95
	80		94
	76		92
	75		92
	72		89
	70		78
	70		77
	69		71
	68		70
	68		68
	66		67
	62		64
	52		59
	51		58
	50		
	29		

*A constant of 100 has been added to raw scores to eliminate negative numbers.

APPENDIX E

**Raw Scores of Subjects on the
Minnesota Student Attitude Inventory**

Table E. Raw Scores of Subjects on the Minnesota Student Attitude Inventory

Experimental Subjects		Control Subjects	
105	56	96	51
95	56	96	51
81	56	87	49
81	55	81	49
80	55	79	49
80	54	75	47
80	51	72	47
80	50	71	47
79	50	70	46
77	49	68	45
75	48	68	43
74	46	66	43
72	45	65	43
72	45	65	42
72	44	65	42
72	43	64	41
69	43	64	40
67	42	64	39
66	42	63	39
66	41	61	38
64	40	60	37
64	38	60	36
64	36	58	35
64	35	57	34
63	35	55	31
62	33	54	29
62	32	53	24
59	27	53	23
59	27	52	14
57	25	52	2
57		51	0

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