

THE EFFECTS OF GRADES
ON
COGNITIVE AND AFFECTIVE LEARNING

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THESIS



This is to certify that the
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ABSTRACT

THE EFFECTS OF GRADES ON COGNITIVE AND AFFECTIVE LEARNING

by Larry C. Jensen

The purpose of this investigation was to study the effects of grades on learning. Two experiments were conducted and in each low grades were assigned to students' examinations. Subjects receiving no grades served as control groups. The second experiment used an additional treatment group of subjects who received the grades they expected. All the groups heard persuasive lectures arguing for a position that was against the initial opinions of the subjects. After listening to the persuasive lectures, the subjects were given a recall test to measure cognitive learning and an attitude test to measure affective learning.

An anxiety theory, modeled after the theories of S. B. Sarason and I. L. Child, was used to predict the effects of low grades on learning. According to this adapted theory low grades produce anxiety and the anxiety then serves as a stimulus to evoke anxiety-reducing responses. These anxiety-reducing responses are considered incompatible with efficient performance in a complex learning situation. Three hypotheses were derived from the adapted theory: 1. Low grades will be followed by less cognitive learning. 2. Low grades will be followed by less affective learning. 3. There will be less cognitive and af-

fective learning following low grades for high-anxiety subjects than for low anxiety subjects.

The hypotheses were tested in Experiment I by a two-way fixed effects model of the analysis of variance. In Experiment II t tests used. Cognitive learning was less for groups receiving grades in each experiment. In Experiment II no differences were found between groups receiving low and expected grades. Affective learning was less after receiving grades among females in Experiment II. No relationship between measured anxiety and learning was found in either experiment. Measures of self-esteem, ego-strength, academic self-concept, authoritarianism, acquiescence, and intolerance of ambiguity, did not correlate significantly with either the cognitive or affective learning scores in Experiment II.

The following conclusions were drawn about the immediate effects of grades on learning in a lecture type situation.

1. Grades are followed by less cognitive learning among males and females.
2. Grades are followed by less affective learning among females.

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I

PROBLEM

Almost no research has been conducted to determine the effects of low grades on classroom learning. This lack of research is hard to understand when the importance of grades to students is considered. Grades are thought to be powerful stimuli because they can directly influence the academic, vocational, social, and personal life of a student. In addition, students in many schools repeatedly receive grades for daily tests, quizzes, projects, as well as, more general student evaluations. Those responsible for classroom instruction would certainly benefit if the specific effects of grades were known. Unfortunately, even a straightforward question such as, "Does administering low grades improve or interfere with classroom learning?", lacks an empirically grounded answer at the present time. To help meet this need for more research about the effects of grades the reasoning and data to be presented in this and the following two chapters were used as a basis for conducting two experiments to investigate the effects of low grades upon classroom learning.

The lack of information about the effects of grades has been pointed out by scholars who have studied in this area. McKeachie (1963 p.102) states, "Considering the

importance of grading for both students and instructors, it is regrettable that there is so little empirical research." In the 1950 edition of the Encyclopedia of Educational Research, C. W. Odell, (p. 711) editing the chapter, Marks and Marking Systems, wrote that, "There had been extensive notation given to grades and grading practices, but that there were few studies objectively evaluating attempts to improve marking systems." He specifically observed that, "The question of the effects of marks upon those to whom they are given is very important and merits much study. Much opinion has been expressed, but few facts are available." Ten years later Max Wingo (1960, p. 850) stated in the 1960 edition of Encyclopedia of Educational Research,

Very little research has been done in assessing the effects of grades on classroom learning... more specific information is needed in this area, particularly with respect to such questions as these:...What are the effects of evaluation on a student's attitudes, understandings, and behavior patterns?

5 In the absence of empirical evidence, opposite predictions about the effects of grades can be made. First, the importance of grades as a motivational device has been pointed out by William McKeachie in his book entitled Teaching Tips (1963, p. 1119):

Let us then consider the case of our most important motivational device--grades. What ever a student's motivation for being in college, grades are important to him. If he is genuinely interested in learning, grades represent an expert's appraisal of his success; if he is interested in getting into professional school, good grades will unlock graduate school doors; if he wants to play football, grades are necessary to maintain

eligibility. Most students are motivated to get passing grades, and thus grades are a powerful motivational tool for teachers.

Regrettably, in more extreme situations, low grades have sometimes been misused. Teachers have used failing marks to punish or goad lazy and incompetent students. New teachers are often given the advice to grade low in order to produce maximum performance from their students. The general tone of such advice usually implies that low grades will invariably spur a student to increased learning.

In contrast to the preceding advice, the immediate result of low grades may be less rather than more learning. Support for the position that low grades will interfere with learning can be drawn from an extensive series of experiments investigating the effects of failure on learning. Reviews of these experiments report that failure is usually followed by less learning in complex learning situations (Kimble, 1961; Reed, 1960; Sarason, 1960). The theorists hypothesize that failure elicits anxiety and the anxiety elicits responses which interfere with efficient learning. If low grades constitute a type of failure and/or if low grades can elicit anxiety then one could predict less learning after administering low grades. Those participating in the current educational process can readily attest to the importance placed on grades and the strong emotional states, usually called anxiety, aroused in students when they receive failing grades. Chapter II will review some of these experiments investigating failure and learning and Chapter III will present an adaption of some theor-

ies that are used to explain how failure results in poorer performance.

The preceeding discussion has centered around what would generally be considered cognitive learning but most classroom objectives include affective in addition to cognitive outcomes. Affective and cognitive learning are here defined by Krathwohl and Bloom (1964, p.8):

Affective: Objectives which emphasize a feeling tone, an emotion, or a degree of acceptance or rejection. We found a large number of such objectives in the literature expressed as interest, attitudes, appreciations, values, and emotional sets or biases. Cognitive: Objectives which emphasize remembering or reproducing something which has presumably been learned . . . vary from simple recall of material to highly original and creative ways of combining and synthesizing new ideas . . .

If the principles or laws governing affective learning are the same or similar to the law governing cognitive learning then the laboratory findings reported above could be used to predict similiar effects of low grades upon affective learning. The following reasoning is used to support the application of the anxiety theory to affective learning. The Krathwohl and Bloom definition includes attitudes as instances of affective learning. Kimble and Garnezy, (1963: pp.584-91) while recognizing that attitudes have cognitive components, point out that attitudes are primarily affective in nature. Therefore, the acquisition of attitudes is considered affective learning. The classic paper, "The Behavior of Attitude," presented by Doobs (1937), contends that an attitude is an implicit response which is a result of previous learning. Statts and Statts

have more recently stated that attitudes result from prior learning, (1963; pp.349-51). Since an attitude is held to be a response which is dependent upon previous learning, it seems reasonable to suppose that attitude change would conform to the basic principles of learning. The anxiety theory could then be used to state that attitude change would be less when low grades produce anxiety and anxiety elicits strong competing responses that interfere with efficient attitude learning.

In contrast to this conception, Janis and Field (1959) contend that failure will increase the amount of attitude learning by lowering a subject's self-esteem. Low self-esteem subjects, according to the research of Silverman (1964) and Weiss and Fine (1956), are more persuasible. Janis and Field state that an individual who feels that he is inadequate, inferior, and a failure is motivated to ward off tension associated with his inadequacy by mechanisms which give rise to a pattern of "motivated gullability". Research supporting this self-esteem position will be presented in Chapter II. Since administering low grades would logically increase anxiety while lowering self-esteem, opposite predictions about the amount of attitude change would be made from the self-esteem theory of Janis and Field and the anxiety theory used in laboratory studies of failure.

In summary, this chapter has pointed out that traditional common sense notions say that low grades will improve learning by increasing motivation while laboratory

experiments suggest that low grades will interfere with efficient learning. It was also pointed out that low-grades should also interfere with affective learning but other researchers predict that failure should facilitate affective learning, at least when affective learning is measured by attitude change. It is concluded that there is need for a study to directly investigate the effects of low grades on both affective and cognitive learning.

II

REVIEW OF LITERATURE

The literature cited in this chapter has been delimited to research directly related to theory and procedures pertinent to this study. The first research to be reviewed deals with grades. The last part of the chapter will deal with the effects of failure on learning in laboratory situations and the effects of failure on affective learning. As pointed out in Chapter I, the findings from studies of failure are reviewed because the effects of low grades may be very similar to the effects of failure.

Effects of Grades

Noland (1964) made a comprehensive review of research dealing with the effects of grades upon the recipients. His findings agreed with statements in Chapter I by Odell, Wingo, and McKeachie. He not only found a paucity of research, but the research he found was methodologically poor. He stated, "most of the studies were simply not worth reporting." Odell (1950) had earlier stated that there were few studies with, "even semi-objective data". An example of some of these studies with poor methodology are, Barton (1926), Fay (1927), and Little (1942).

A recent study by Page (1958) investigated the effects

of written comments at the top of papers returned to students. In his study students took an objective test which was then scored and graded in the customary way. Students were matched on the basis of previous class performance and randomly assigned to three treatment groups. One group received no comments at the top of the page, one group received specified comments, and another group received any free comments the teacher wished to make. Those students who received free comments by their teacher achieved higher scores on subsequent tests. Page's findings were interpreted as demonstrating that students' performances are influenced by teachers' reactions to students' previous work.

Bostrom (1961) conducted an experiment in which he assigned high and low grades to students' essays which expressed attitudes towards gambling and socialized medicine. His hypothesis that good grades should result in repetition of previous attitudes, while poor grades should decrease the likelihood of repetition of the attitude, was confirmed. Nolan's (1964) study of the effects of grades upon subsequent academic performances was probably the most methodologically sound research of those reported in this review. He assigned grades of either an A, C, or F to a returned paper and checked student's performance on a subsequent reading assignment. An analysis of variance yielded no treatment effects even when levels of grade-point average were used. He listed several reasons for the negative results, but the most serious seemed to be the opportunity for student reaction and interaction outside of class dur-

ing the weekend before the criterion test was administered.

Laboratory Studies

Most of the studies involving failure were conducted to test predictions based on various anxiety hypotheses, and failure was usually a secondary treatment used to induce stress. These studies have reached some agreement in finding inferior performance following failure on a wide range of motor, perceptual, or intellectual tasks. Various procedures have been used to establish these stress or failure conditions. For example, Kaye (1957) and Traux (1957) instructed the subjects that their performance on the task was a reflection of their intelligence, Sperber (1961) gave a task that was impossible to complete in the allotted time; and Weinberg (1950) used personal appraisals of a student's work on laboratory tasks. Almost every study used some verbal method of inducing stress, usually an evaluation of the student's performance on the laboratory task. Spence (1958, pp.137) summarized the general situation when he stated:

Complex human learning tasks, on the other hand, typically do not involve the use of a noxious stimulus. Whatever stress is present in this situation is usually produced by instructions that aim to create in the subject the desire or need to make as good a showing as possible. While it is true that this stress may be greatly augmented by introducing failure or punishment. .

.

The only study reviewed which did not use a stress condition related to a laboratory task was conducted by Sperber (1961). The failure in Sperber's study may be of particu-

lar importance in understanding laboratory findings. He found that high stress conditions improved performance in most cases. His sample consisted of army recruits, and the stress conditions consisted of telling the recruits that the task, which would be impossible to complete, was used to determine their placement in advanced-training programs.

This study further raises the question about how applicable the results from the laboratory are to natural situations.

It is also generally found that high-anxiety students are more detrimentally affected by failure than are low-anxiety students (Davidson, Andrews, and Ross, 1956; Gordon and Berlyne, 1954; Korchin and Levine, 1957; Lucas, 1952; Mandler and Sarason, 1952; Nicholson, 1958; Sarason, 1956, 1957, 1957a, 1959, 1959a; Sarason, Mandler and Craighill, 1952; Sarason and Palola, 1960; Westrope, 1953). Sarason (1960) States that personal threats are more detrimental to high-anxiety subjects under conditions of failure. Most of these studies have used the Taylor Manifest Anxiety Scale (Taylor, 1953), its short form by Bendig (1958), or the Test Anxiety Questionnaire by Sarason and Gordon (1953). Waterhouse and Child (1953), using a questionnaire to assess the individual's characteristic responses to frustration, found that those who were thought to possess more task-interfering responses performed more poorly after they were told that they were doing poorly. A variety of intellectual and motor tasks were used. It seems likely that their questionnaire was measuring something similar to anxiety.

As the research progressed, additional variables were incorporated into the studies. Task difficulty was found to be significantly related to the other variables with high-anxiety subjects generally doing poorer as the task became more complex (Farber and Spence, 1953; Montaque, 1953; Ramond, 1953; Taylor and Spence, 1952). Simple one-response situations, such as eyelid conditioning, are contrasted with more complex tasks such as verbal maze learning (Farber and Spence, 1953), serial rote learning (Montaque, 1953), concept formation (Wesley, 1953), and problem solving (Maltzman, Fox, and Morriset, 1953). Sarason and Palola (1960) attempted to manipulate the variables of anxiety, differential motivating instructions, and task complexity simultaneously. In these studies, Sarason found triple interactions in the predicted direction. Sarason (1960) has also called attention to further aspects of the experimental situation. For example, he points out that a complex task may intrinsically evoke more threat. He recommends a closer tie-in-between studies of anxiety and stress, and studies of anxiety and task factors.

Other personal variables which are relevant include intelligence of the subjects (Spielberger and Kalzenmeyer, 1959) and sex (L'Abate, 1956). Some investigators have included both male and female subjects with no separate analysis of sex (Romanow, 1958; Sarason, 1957; Taylor and Spence, 1952; and Zipf, 1961). However, Williams (1955) found that men and women are affected differently by failure. Failed and non-failed women performed relatively

more alike than failed and non-failed men. On a verbal speed task Weinberg (1960) found that failure affects men but not women. Thus, the research is especially inconclusive about the effects of failure upon women. It seems clearly demonstrated that future studies should not combine male and female data if possible. More detailed reviews by Sarason (1960), Child (1954), Spence (1956), Jenness (1962), and Reed (1960) can be consulted to locate further findings in this area. The lack of theory about the specific effects of failure upon non-laboratory learning is recognized. Nevertheless, the only prediction which can reasonably be made from this anxiety model and its supporting research is that failure will interfere with learning in a complex task. Empirical support for this prediction is given by a study by Rhine (1957) using a different theoretical approach. He found that in a problem-solving situation, a complex task, failure interfered with the intellectual efficiency of college students.

Affective Learning

Recent studies of attitude change also indicate that failure would affect this learning, but the directional influence is not clear. Failure is an operation used both to lower self-esteem and increase anxiety. Low self-esteem is supposed to lead to increased persuasibility, while high anxiety is said to interfere with attitude change. Experimental subjects with high levels of anxiety were found to be more rigid and less capable of change (Janis, 1955).

Earlier in 1953, Hovland, Janis, and Kelley located subjects who had low, moderate, and high attitude-change scores, and found that the high changers had higher feelings of social inadequacy than did low changers. In 1959 Janis and Field administered a persuasibility scale to high school students. They found a significant, but low ($r=.27$) correlation between feelings of social inadequacy and persuasibility for male subjects. Weiss and Fine (1956) found that after a group of subjects were exposed to a failure-insult procedure, they were more influenced by a punitive-oriented communication. Stimpson (1963) also found that subjects with low self-esteem had more attitude change following a persuasive communication than high self-esteem subjects. He used measured self-esteem, but augmented the effect by telling the subjects that they had done very poorly on a current events test. Other studies finding an inverse relationship between persuasibility and self-esteem are Lesser and Abelson (1959), and Silverman (1964, 1964a). These studies indicate that personality variables, especially self-esteem, are related to attitude change. If attitude change is a learning process, then the anxiety model could apply to attitude change in the same way it applies to cognitive learning; but no research could be found to directly support this contention.

Supporting evidence that failure also interferes with affective learning comes from Gebhard (1948). He found that college students, after experimentally manipulated success and failure experiences with nine intellectual

tasks, such as verbal arithmetic, code learning, sentence completing, symbol transposing, and algebraic reasoning, tend to prefer the activities on which they had been successful. Sears (1942) found that induced failure in a card sorting task resulted in an increase in autistic thinking, reduction of social responsiveness, and non-adjustive behavior.

12 In summary, there is a lack of research directly investigating the effects of grades on learning. To find an empirical base to predict the effects of grades on learning this research in a related area has been examined. Because of the logical relationship between low grades and failure or stress the extensive studies of failure induced in laboratories were presented. It was pointed out that in complex learning situations performance is worse following failure, especially for high anxiety subjects. In the effective domain of learning, studies using a self-esteem hypothesis were cited which suggest that failure would increase affective learning when affective learning is defined as attitude change. Other evidence was cited which indicated that failure or stress interfered with affective learning. The contradictions and dissimilarities of these findings in relationship to the effects of low grades on classroom learning is interpreted as indicating a need for directly studying the effects of grades on learning.

III

HYPOTHESES

The purpose of this investigation as stated in Chapter I is to understand the effects of low grades on learning. The cognitive and affective aspects of classroom learning are of concern. Since there is no theory with a supporting body of adequate research directly related to this particular concern, the studies and theory used in laboratory learning were utilized to help predict and explain the effects of failure on classroom learning.

Theoretical Position

This section will describe a model used to explain the effects of low grades upon classroom learning. It is acknowledged that only one kind of classroom situation was selected and this traditional lecture type situation does not adequately represent the wide range of instructional procedures available to present day education. The model is based upon the theoretical positions of Child (1953), Sarason, Mandler, and Craighill (1952), and Spence (1958). The researcher recognizes that the adopted model does not accurately represent the position of any one of the above mentioned theoreticians. The model was devised specifically for understanding the effects of low grades on classroom learn-

ing, and focuses on anxiety as the central explanatory concept. The adapted model is explained in the following paragraphs.

↓ Low grades elicit anxiety. Anxiety is an internal state characterized by several internal responses. These internal responses are considered to be primarily responses of the sympathetic division of the autonomic nervous system. Anxiety is often referred to as an unpleasant emotion. Kimble also states that "anxiety is commonly recognized as an unpleasant experience and as a disrupter of behavior." (1961, pp. 447).

15 Anxiety is one of many drives which contribute to the general drive level; like other drives, it has distinctive stimuli associated with it. These stimuli serve as cues to which responses can be learned. Because anxiety is a negative emotional state, responses which bring about a reduction of anxiety are reinforced. Reinforced anxiety-reducing responses become stronger and are elicited by anxiety-produced stimuli on subsequent occasions. These anxiety-reducing responses may be internal or external. They include such responses as day-dreaming, crying, fidgeting, gritting teeth, blacking-out, doodling, biting pencils or fingernails, talking to others or self, nervous laughs, physical or verbal aggression, withdrawal, and self-criticism. Not overlooked is the fact that some individuals develop beneficial anxiety-reducing responses such as increased attentiveness, visual scanning of a situation, and quick recall of situationally relevant information. But

these positive anxiety-reducing responses are the exception rather than the rule. According to this model, positive anxiety reducing responses would be grossly out-numbered by the more common negative anxiety-reducing responses in a normal sample of subjects. In fact, not one of the reviewed research articles mentioned any positive anxiety-reducing responses which were not specific to a designated task or situation.

In summary, the two direct effects of anxiety are to increase the subject's general drive level and to provide internal stimuli which elicit anxiety-reducing responses. In order to understand the effects of increased drive and anxiety-reducing responses, it is necessary to focus on the subject's characteristics which are brought to the learning situation.

The past events in the life of an individual provide him with characteristic ways of responding to each situation. These are often called personality traits or behavioral tendencies. Although many of these traits may interact with the anxiety state elicited by failure, the reasoning presented below and the research cited in Chapter I and II indicate that test-measured anxiety is a trait which is particularly relevant. For purposes of illustration, high and low anxiety subjects will be compared.

First, some subjects have a high anxiety-scale score, which is often considered to be a rough measure of a person's general drive level (Taylor, 1952). A low anxiety subject with a low general drive level may show

improved performance after receiving a low grade because the anxiety generated by the low grade temporarily raised his drive level above a minimum requirement. On the other hand, a high anxiety subject may already have an amply high drive level and may profit little from a temporary increase in drive level resulting from a low grade.

17 Second, Spence (1958) has suggested that high-anxiety subjects have a lower threshold of emotional responsiveness and react with a stronger emotional response, anxiety in this case, to situations containing stress. The past history of an individual probably determines the capacity of a particular stimulus to elicit anxiety. For example, students who come from situations which have demanded and expected high academic performance would experience more anxiety following a failing grade than students who have lived in an environment where grades and academic performance have never been emphasized. A high score may then reflect how some people more readily react with anxiety to a stressful stimulus.

18 Third, the anxiety-reducing responses are, according to the Child-Sarason position, stronger or more numerous in high-anxiety subjects. Because the anxiety-reducing responses are held to be task-inappropriate, the high-anxiety should be more detrimentally affected than low-anxiety subjects. Therefore the performance of high anxiety subjects should be inferior when compared with the performance of low anxiety subjects, especially on complex tasks.

The past history of a person determines the number and

strength of these anxiety-reducing responses. A description of some anxiety-reducing responses was given earlier in this chapter.

Fourth, the past history of a subject determines the basic response habits which a person emits in a classroom situation. In a traditional lecture type classroom a successful student is usually one who has learned specialized response such as listening to the lecture and taking notes. When the drive level of this student is increased it multiplies these response tendencies to produce efficient performance in this kind of a learning situation. This aspect of the model is not emphasized or controlled in this study because it is assumed that the majority of students have acquired by the time of entrance into college these basic skills.

Other traits of a person such as self-esteem, ego-strength, authoritarianism, or academic history might be used more advantageously than anxiety level in the center of the diagram to assist in predicting the effects of failure on classroom learning. For example, low self-esteem subjects may react with a more powerful set of interfering anxiety-reducing responses than do high-anxiety subjects. Several theorists such as Snygg and Coombs (1960) believe that people with negative self-concepts react to threat and anxiety by defensively reducing in-coming information. A reduction or distortion of in-coming information would impede learning.

Statement of the Hypotheses

9) From the adapted anxiety theory; it is predicted that cognitive learning will be less following low grades in a classroom. This is because effective cognitive learning in a classroom requires the learner to respond with a highly complex set of task responses to the communication. Most anxiety-reducing responses are assumed to be incompatible with the appropriate responses for attending and recalling the lecture material in this situation. Improvement resulting from heightened general drive is then cancelled out by the interference of anxiety-reducing responses. For cognitive learning in a classroom, the theory predicts the following research hypothesis:

H₁: Low grades will be followed by less cognitive learning.

Technically, one may interpret the theory to predict that low-anxiety subjects will do better after receiving low grades, but even low-anxiety subjects are believed to have some anxiety-reducing responses which are task irrelevant on a complex task. The third hypothesis will cover anxiety level differences.

Secondly, the study is interested in affective classroom learning. It is assumed that affective learning conforms in a general way to the basic principle of learning. Evidence and reasoning supporting this proposition was presented in Chapter I. The same reasoning used to predict negative effects of failure in cognitive learning is used to predict negative effects of failure in affective learn-

ing. The following is the second research hypothesis:

H₂: Low grades will be followed by less affective learning.

Because the theory focuses on the differences between high and low anxiety subjects in their customary ways of responding to anxiety, one more hypothesis can be made relevant to the effects of low grades on either cognitive or affective learning.

H₃: There will be less affective and cognitive learning following low grades for high-anxiety subjects than for low-anxiety subjects.

It should be pointed out that the confirmation or rejection of the first two hypotheses does not imply the acceptance or rejection of the ^{second} ~~third~~ hypothesis. Chapter IV will discuss the procedure used to test these hypotheses.

IV

METHOD

From the anxiety theory, the following hypotheses were derived:

- I Low grades will be followed by less cognitive learning.
- II Low grades will be followed by less affective learning.
- III There will be less affective and cognitive learning following low grades for high-anxiety subjects than for low-anxiety subjects.

This chapter will describe the method used in two experiments conducted to test the above hypotheses. Although originally only one experiment was anticipated, a second was conducted to improve the procedures used in assessing and producing attitude change. Immediately before the description of the second experiment, the basic changes will be outlined. Besides containing some methodological improvements, the second experiment is valued because it represents a replication with some variation of Experiment I.

Experiment I

Subjects

A hundred and thirty-two female and fifty-four male undergraduates enrolled in an introductory educational

psychology course at Michigan State University were used. The students were enrolled in eight discussion sections meeting at nine and ten o'clock in the morning, following a large group lecture at eight o'clock. Two discussion sections were later eliminated because the section instructor discussed the test grades which were to become part of the experimental treatment. All subjects attending class on both testing days were used.

Measurement Instruments

Three scales were used in this experiment to measure the dependent variables. An interest, attitude, and recall test were constructed. The interest scale consisted of five items asking the subjects how interested they were in the content of the presented material. Subjects could respond to each statement by circling no, undecided, or yes, which was scored as a one, two, or three point answer. Since the statements are straight-forward, it is assumed that the face validity is high. A split-half reliability using the Spearman-Brown Prophecy Formula yielded a reliability .72 which is very high considering the shortness of the test.

The attitude scale was constructed from information obtained in pilot studies. The Lickert-type items were drawn from the material and scales used in McQuire's extended attitude studies (McQuire, 1960). This is document No. 7058 in the American Documentation Institute. In this study, the scales were shortened from fifteen points to eight points. The researcher felt that additional units

which were not meaningfully used would only add additional variance to the scores. Again face validity is utilized because the questions are straight-forward. The split-half reliability using the Spearman-Brown Prophecy Formula was .92. The scale contained twenty questions with five questions for each of the four lecture topics. Scoring was done by adding the listed weights for each item. In questions where the statements were reversed or stated with a negative, a score of one received eight points and an item score of eight received one point.

The recall scale, designed to measure cognitive learning, consisted of nine multiple choice items and eight true and false items. All questions required only recall of basic information in the lecture material. The scales were scored by totaling the correct responses. Face validity was employed and the Spearman-Brown Prophecy Formula yielded a reliability of .73 which is within the acceptable range for multiple choice tests suggested by Helmstater (1964). Copies of the interest, attitude, and recall tests are located in Appendix 4.

Anxiety was assessed with Cattell's I P A T Anxiety Scale. This scale has undergone extensive validity and validity based on external criteria. A construct validity of .90 is reported by Cattell and Sheerer. The scale was selected in preference to the usual Manifest Anxiety Scale because it has more systematic validity information and less extreme content in its statements. Reported reliability ranges from .83 to .93 for test-retest and .80 to

.91 for split-half procedures. The total score is determined by adding weighed score on the three-point scale (Cattell, R. B.; Sheerer, I. H.; 1963). Copies of these materials are located in the Appendix.

Treatment

In the experimental treatment an artificial low test grade was assigned to the subjects. **The grades were test scores on the second of three examinations used in this six-credit course.** The following procedure was used to insure the subject's acceptance of the validity of the grades. Each subject when he took the test indicated the score he expected to receive on it. Each subject then received a score two grades lower than the one he expected. Thus a student who expected an A received a C, and a student who expected a C received an F. This method was believed to have yielded the experience of failure, while still maintaining the reality of the score for each individual student. The instructors who assisted in the experiment attested to the disappointed acceptance of these grades by the students. The control group received no grades.

Both groups heard four one-direction arguments to change their opinion on athletic contests between high schools, a free loan of testbooks to students, more required classes, and a one-hour compulsory study period for students. Those particular topics were selected from Mcquires messages because they could be disguised as a regular part of the course content in the educational psy-

chology course. After several pilot studies, the original scale scores were determined to be approximately 60. After hearing the argument, scores for males were 84.84 and female scores were 75.03. Similar findings for these articles were reported by McQuire (1950) when he constructed them. This seems to substantiate that the messages were effective in changing attitude as measured by these particular scales. A copy of these arguments is available in Appendix 3.

Procedure

Four weeks prior to the experimental sessions subjects were administered the I P A T Anxiety Scale. In addition, the sex and grade-point average of the student were obtained. Monday, four days prior to the experimental session, subjects took their second examination, the score of which would be used to induce failure. The last item on this examination requested students to estimate the grade they expected to receive on the examination. Wednesday, two days prior to the experimental session, each student received a card assigning them to an experimental room on Friday. The nature of the research was not explained. Subjects were then randomly assigned, by using a table of random numbers, to experimental and control groups. Groups were then randomly assigned to one of the appropriate experimental or control rooms. Since subjects, because of their class schedules, had to meet during the hour of their regularly assigned section, it was necessary to have three experimental and three control groups meeting

at nine o'clock and again at ten o'clock. The room and instructor which held control subjects at nine held experimental subjects at ten and vice versa. This procedure helped insure no contact between students in the treatment groups meeting during the two different hours. The students meeting at nine were asked not to discuss the experiment with those students meeting at ten. In addition, the first sessions ended approximately fifteen minutes before the end of the hour and the second session did not begin until ten minutes after the hour. A questionnaire distributed to the ten o'clock class indicated that no discussion concerning the experiment occurred between the groups.

When the subjects met at the scheduled hour, they received a data processing card with their names printed at the top and various unintelligible numbers. The distribution of these cards required approximately one minute. The control group received nothing. The instructor in the experimental room then decided the grade for the experimental subjects. The experiment was disguised as an investigation of student interest in a new educational journal. This rationale was presented over a closed circuit television to both experimental and control groups. The persuasive arguments were then immediately presented over television and were attributed to noted scientists and educators. The instruction which preceded the lectures stated:

Good morning. Today we would like to introduce to you a new journal which should be of special interest to those students concerned with current problems in education. As

you probably know by now, most of a student's time is devoted to textbooks which contain information at least one year old, usually much more. Michigan State University and Other Big Ten Universities are interested in developing a monthly publication to meet this deficiency. The Journal would be designed to appeal to students with only a limited amount of time and would contain the most recent information. Today I have a pilot edition of Current Issues in Education and would like to read some selections from it's contents. The Journal primarily consists of short statements by noted educators in answer to questions posed by the staff of Current Issues in Education.

The first article is by Mr. Thomas Wrigley who is a member of the Financial Policy Board of the American Association of Land Grant Colleges. He was asked if it was valuable and reasonable to adopt a policy of a free loan of textbooks to students in state universities. Mr. Wrigley answered:

Following the television lecture, the scales were administered for the stated purpose of finding out student interest in the journal, student feelings regarding the arguments, and how much was actually learned from listening to the topics. After the scales were completed, the nature of the experiment was explained to those subjects Participating. Appendix 4 contains all the materials described above.

Experiment II

This experiment was designed to correct certain measurement deficiencies and to further pursue the information obtained from Experiment I. This second study attempted to refine the procedure for assessing an attitude change by using a pre-test so that change scores could be obtained for each subject. In addition, new topics and stronger

arguments were used. Experiment II as a preliminary procedure correlated several personality measures with recall and attitude change in the hopes of locating a source of variance for use in the treatment by levels analysis. Personality tests which intuitively seemed to be related to persuasibility were selected and administered. They were Self-esteem, Ego-strength, Authoritarianism, Intolerance of Ambiguity, Acquiescence, and Academic Self-concept. The more usual Manifest Anxiety Scale was used in the second experiment in place of the I P A T Anxiety Scale.

Another reason for conducting the second experiment was to further analyze the treatment condition itself. Were the detrimental effects obtained in Experiment I due to the failing grades, or would non-failing grades also produce the same effects? Predictions stated in Chapter I were extended to the following experiment.

Subjects

Two Introductory Psychology classes at Brigham Young University furnished the subjects. All the subjects who were present during the experimental session and had also taken the first attitude scale were used. There were 213 females and 123 males. The course test, outline, and evaluation procedures were the same for the two classes. The classes met at eight and ten o'clock in the morning.

Measurement Instruments

Attitude change was measured for each subject with the 15-point scale reported in the Anderson study (1965).

It was scored by adding the scale units as in Experiment I. Change scores were obtained by subtracting post-test from pre-test scores. The reliability was found to be .91 using the Spearman-Brown Prophecy Formula. The recall scale consisted of ten multiple choice items and had a reliability of .54 using the Kuder-Richardson Formula. Copies of these attitude and recall scales are located in Appendix 8.

The personality scales were presented in booklets entitled, "Research Scale," "Public Opinion Questionnaire," and "The Terman-Lang Personality Inventory." The booklets are located in Appendix 6 and are described as follows.

The California F Scale. The California F Scale by Adorno, et. al. (1950) has been found to correlate with a number of outside variables including prejudice, political attitude, family ideology, teacher attitudes, social perception, rigidity, anxiety, and attitude change (Titus and Hollander, 1957). The first twenty-eight items in the Public Opinion Questionnaire constitute this scale.

Negative California F Scale. This scale consists of reflected items from the F Scale (Pederson, 1962). Acquiescence response set is measured by the extent to which subjects agree with items in spite of agreement when the item was stated in its opposite form. It was believed that subjects who acquiesce in this manner would also agree more strongly with the arguments and their scale items. Items twenty-nine to forty-four of the public Opinion Questionnaire constitute the negative California F Scale.

The Tolerance-Intolerance of Ambiguity Scale. This scale consists of items forty-five through sixty of the Public Opinion Questionnaire. Half of these items are positive and half are negative (Gudner, 1962). Intolerance of ambiguity is reflected by agreement with the positive item and disagreement with the negative items. The manner of responding to test items as well as the inferred cognitive disposition seems to imply a person who would readily agree with persuasive arguments and their subsequent scaling.

Taylor Manifest Anxiety Scale. The first fifty items of the Research Scale constitute the Manifest Anxiety Scale. These items are selected from the M M P I by clinicians who consider them to be descriptions of anxiety symptoms. A great deal of research has been done with this scale, and Taylor (1953, 1956) reports a test-retest reliability of .88 and correlations ranging from .16 to .68 between the Manifest Anxiety Scale scores and clinicians judgments.

Ego Strength. This scale consists of items fifty-one through a hundred and sixteen of the Research Scale. These items have been found to relate to improvement under therapy. Scale scores have been found to correlate with change and progression during psychotherapy. The thinking behind using this test is that a person with substantial ego-strength is in better contact with reality and is able to learn from rational information. Post-retest reliability after three months is reported at .72 (Barron, 1956).

Self-Esteem Inventory. Self-esteem was assessed by means of the "feeling of inadequacy" items from the Janis and Field personality Questionnaire (Janis and Field, 1959, pp. 200-305). This set of items was found by Janis and Field to be more highly related to persuasibility than any of the other sub-scales in their questionnaire. Items 117 through 138 constitute this scale. Wylie (1961) in a comprehensive review of self-measurement instruments indicates that very little has been done in the way of gathering validity or even reliability on many of these techniques. Since this set of items had been shown to be related to persuasibility, it was selected in spite of the lack of validity and reliability information.

Academic Self-Concept Test. This test was formulated by Wilbur Brookover of Michigan State University. It requires that students respond to ten evaluative questions regarding their academic ability. It was employed because the failing grades were believed to be more likely to directly affect the academic aspect of the self-concept. No reliability or validity information was reported (Green, et. al., 1964).

Treatment

Three treatment conditions were used. In group I subjects received a grade two units below what they had expected to receive. Group II received the grade they expected. Group III received no grades. The expected grade was obtained in the same manner as in Experiment I. All subjects listened to three one-sided arguments reported by Anderson

(1965). These arguments were disguised as a co-operative project of the Psychology Department and the Bureau of Health to help inform the public of health-related information. The students were told to consider the information as part of their regular course content. Copies of the arguments are located in Appendix 7. Anderson reports that the criteria for selection were that the main belief of the student population be initially near one extreme of the scale, and that the standard deviation be small. Anderson said he met these criteria when he used "cultural truisms" for the arguments. Cultural truism were general statements about cultural practices which are accepted without debate by the subjects. An examination of pre-test scores indicated this to also be true with the Brigham Young University sample. The arguments were found to produce significant change in the scale responses. Preliminary studies had shown that students strongly believed:

1. Everyone should get an annual chest X-ray to allow the early detection of any possible tuberculosis symptoms.
2. Everyone should brush his teeth after every meal if at all possible.
3. Everyone should see his doctor at least once a year for a routine physical checkup.

The first argument presented, to win the good will of the audience, was in favor of brushing one's teeth after every meal, then the following two arguments were against the initial attitudes of the subjects.

Procedure

Four weeks prior to the experimental session subjects

were administered the first attitude scale and personality test battery. Friday, five days prior to the experimental session, subjects took their second of four examinations, and indicated their expected grade. Wednesday each subject in the experimental groups received an I B M data processing card which contained a row of numbers across the top which were uninterpretable. After entering the classroom, the grades were disclosed by the appropriate interpretation from the instructor. An overhead projecture was used to display a chart which allowed the unintelligible numbers to be converted into letter grades. The subjects in the ten o'clock class were randomly divided into two groups. Group I received the low grades and Group II received the expected grades. Group III, those receiving no grades, met at eight o'clock and received no mention of grades. Group I contained thirty-six males and seventy females; Group II thirty-five males and sixty-eight females; Group III fifty-two males and seventy-five females. The instructor then completed reading the instructions and arguments. Care was taken to insure similar condition in the two class sections. Each class met in the same room, on the same day, with instructors similar in age, sex, training, and experience. Following this operation, the subjects heard the arguments and then completed the recall and second attitude test. The instructions which preceded the lecture stated:

As you may already know, the Bureau of Health contributes several million dollars a year into research conducted by members of the National Psychological Association. Periodically the

Association is asked to cooperate in projects of the Bureau and normally members throughout the country voluntarily assist in a wide variety of health-related undertakings. Today I would like you to listen to some recent information prepared by the Bureau of Health Staff for Adult Education. In order to signify our full support to the Bureau of Health, we will use this material as part of the normal course content. Therefore, consider the following discussion as you would any other lecture. The first message deals with the advantages of regular tooth brushing.

After administering the scales, the nature of the experiment was explained to the students participating.

V

RESULTS

As in Chapter IV, the experiments will be kept separate to avoid confusing the results and to help the reader understand how the second experiment grew out of the first. Each experiment was designed to test all three hypotheses, but a preliminary correlation of all measures in Experiment II pointed out that the third hypothesis would not be confirmed and so no formal test of Hypothesis III was made in Experiment II.

Experiment I

In order to test the three hypotheses, a fixed effect model of the analysis of variance was used. Two treatment conditions and three levels of anxiety constituted a two-by-three table for the females. A two-by-two table was used for the smaller male sample, since three levels of anxiety would have seriously reduced the number in each cell. The anxiety levels were divided at the median for the males and into thirds for the females. In the following tests the cell n is always 13 for the males and 22 for the females. The assumption of homogeneous variances can be satisfied provided that the number of observations in each cell is the same. Hays (1964) states,

Consequently a test for homogeneity of variance before the analysis of variance has rather limited practical utility, and modern opinion holds that the analysis of variance can and should be carried out without a preliminary test of variance, especially when the number of cases in the various samples can be made equal.

The assumption of statistical independence among the error components is satisfied in the following tests because of random assignment. Male and female data were treated separately as were the scores from each of the scales. The treatment by levels design was used to increase the precision of the statistical test. Note that no interaction between measured anxiety level and failure was predicted since the effects of increased measured anxiety are believed to be additive with the effects of failure. It was believed that the measured anxiety would contribute to the total variance and hence was used in the partition of the sums of squares to increase the precision of the experiment.

The first hypothesis was confirmed for both the male and female samples. The group which received the failing grades scored lower than the control group on the recall scale. The analysis of variance is summarized in Table 1 for the male data. Table 2 presents the analysis of variance summary for the female data. All the analysis of variance tables which contain a significant treatment or row effect will also present the cell means and row and column means. The size of the female sample allowed three levels of anxiety to be compared while the smaller sample of males had to be divided at the median.

Table 1.--Analysis of variance for male recall scores

Source	df	MS	F
Treatment	1	138.94	21.93*
Anxiety level	1	.17	.03
Interaction	1	8.48	1.33
Error	48	6.33	
Total	51		

Cell means and totals

	No grades	Failing grades	Total
Low anxious	13.54	11.08	12.34
High anxious	14.24	10.15	12.19
Total	13.88	10.61	

*p = .01

Table 2.--Analysis of variance for female recall scores

Source	df	MS	F
Treatment	1	229.36	35.21**
Anxiety level	2	7.57	1.16
Interaction	2	14.79	2.27
Error	126	6.51	
Total	131		

Table 2.--Continued. Cell means and totals

	No grades	Failing grades	Total
Low anxious	13.00	10.40	11.40
Middle anxious	13.54	9.72	11.63
High anxious	13.13	11.63	12.38
Total	13.23	10.58	

**p = .01

The female failure group scored lower on the interest scale than did the female control group and this supports the second hypothesis. Table 3 presents the analysis of variance summary for the female interest scores. The female attitude scores presented in Table 4 do not support the second hypothesis. There is no significant difference in attitude scores between the treatment and control groups.

Table 3.--Analysis of variance for female interest scores

Source	df	MS	F
Treatment	1	46.10	6.80*
Anxiety level	2	6.73	.99
Interaction	2	3.84	.57
Error	126	6.77	
Total	131		

Table 3.--Continued. Cell means and totals

	No grades	Failing grades	Total
Low anxious	12.05	11.18	11.61
Middle anxious	11.45	10.63	11.04
High anxious	12.73	10.86	11.80
Total	12.08	10.90	

*p = .025

Table 4.--Analysis of variance for female attitude scores

Source	df	MS	F
Treatment	1	161.48	.31
Anxiety level	2	10.03	.02
Interaction	2	674.76	1.29
Error	126	523.00	
Total	131		

For males neither the interest scores, Table 5, or the attitude scores, Table 6, supported the second hypothesis. The third hypothesis of anxiety level differences was not confirmed for either males or females. An inspection of the row effects in Tables 1 through 6 will reveal that a significant F ratio was not once approached. Therefore, the measured anxiety levels did not assist in isolating the effects of failure upon learning.

Table 5.--Analysis of variance for male interest scores

Source	df	MS	F
Treatment	1	6.94	.75
Anxiety level	1	4.32	.47
Interaction	1	.01	.00
Error	48	9.20	
Total	51		

Table 6.--Analysis of variance for male attitude scores

Source	df	MS	F
Treatment	1	135.70	.31
Anxiety level	1	504.70	1.16
Interaction	1	.31	.00
Error	48	435.85	
Total	51		

Two additional analyses were made to clarify the absence of treatment effects on attitude change. The first used three levels of grade-point average and the second used two levels of grade expectation. In neither of these cases did the rows account for enough variance to increase the precision of the experiment, therefore no effects of failure on attitude change were found in these analyses. The analysis of variance summarization tables using levels of grade-point average are Tables 13, 14 and 15 located in

Appendix 1. Only female data were used in these analyses since too much male subject loss resulted from incomplete information and cell balancing which occurred in these unplanned post-hoc analyses. The three levels of grade-point average contained subjects below, between and above 2.3 and 2.7. High grade expectation levels contained subjects expecting A or B grades, while the low-grade expectation contained subjects expecting C or less. Higher scores on the recall and interest scales were again found for the control groups, but no differences were found between the failure and control groups on the attitude scales. Row effects were not found for the attitude scales, but grade-point average was related to the scores on the interest and recall tests. These results are located in Tables 16, 17, 18 in Appendix 1. It would be surprising if high grade-point average students did not score higher on the interest and recall tests.

Experiment II

Scores on the recall test were compiled by adding the number correct while the attitude-change scores were obtained by subtracting each post-test score from the pre-test score and adding 100 to eliminate possible negatives. The first analysis performed involved correlating each personality scale with the recall and attitude-change scores. Because of the difficulties in securing subjects for additional testing, scores on some of the personality tests were missing. Smaller sample sizes were therefore

used in computing the correlation co-efficients. For the males there were 28 receiving failing grades, 22 receiving expected grades, and 21 receiving no grades. For the females there were 54 receiving failing grades, 57 receiving expected grades, and 62 receiving no grades. The correlations are listed in Table 7. Only two correlations between the personality measures on either dependent variable were significant at the .05 level. These two low-level correlations do not seem to be meaningful by themselves, and so it was concluded that none of the personality measures would help clarify the treatment effects in a treatment-by-levels design.

Next the means for the two treatment groups were compared, using one-tailed t tests and keeping the male and female data separate. The failure-grade group did not score significantly different from the expected-grade treatment. In fact, Table 8 for the males and Table 9 for the females show that the recall and attitude-change means for these two groups are very close. Finding no difference between the two treatment groups, the two treatment groups were combined so they could be compared with the control group. These two groups were combined in order to obtain the largest possible sample size to increase the power of the statistical test for a difference between the treatment groups and the control group. Because the mean and standard deviation of the two treatment groups were almost identical, separate tests of the two treatment groups with the control group would yield the same results. The similarity in scores for the low and expected grade group make

it unreasonable to attribute any treatment effect to the lowness factor alone and so it logically indicates that the effects of these two treatments are similar on the learning measured in this situation. By combining the groups in this way only two tests were required to answer the questions of interest. The first t test tested the difference between the two types of treatment and the second t test tested the difference between the treatment and control groups. The three research hypotheses were then tested but the second t test tested the effects of grades per se instead of the effects of low grades. In addition the larger sample size of the combined treatment group makes the sample size of the treatment group more equal to the size of the control group. Hays (1964) recommends using samples of similar sizes when using the t test.

The first two hypotheses were tested by comparing the scores of control subjects with the scores of subjects who receive either low or expected grades. Table 10 for the males and Table 11 for the females present the means, standard deviations and t ratios for both recall and attitude change. Females receiving grades scored lower on the recall and attitude-change scales. Males receiving grades scored lower on the recall scale but did not have less attitude change. The third hypothesis was not formally tested because the lack of correlation between anxiety and either dependent variables indicated that the third hypothesis could not be confirmed. Chapter VI will contain a further evaluation of each hypothesis.

Table 7.--Correlations between personality measures and recall and attitude-change scores for each sex and treatment

Measure	Male no grade		Female no grade		Male expected grade		Female expected grade		Male failing grade		Female failing grade	
	Re- call	Att. chg.	Re- call	Att. chg.	Re- call	Att. chg.	Re- call	Att. chg.	Re- call	Att. chg.	Re- call	Att. chg.
Anxiety	-.01	-.29	-.14	-.16	-.04	-.05	.05	.09	.02	-.07	.04	.07
Ego strength	-.11	.33	-.05	.03	.15	-.06	.02	.09	-.28	-.07	-.03	.05
Self-esteem	-.02	.13	.13	.09	-.13	-.10	.02	.18	.24	.34	-.12	.00
Self-concept	.15	.01	.23	.06	-.14	.05	.28	.24	.15	.16	-.08	.15
Author- itarianism	-.04	.48*	-.13	.06	-.03	.08	.07	.09	-.31	.29	-.06	-.28
Acquiescence	-.13	.22	.22	-.01	.12	.02	.01	.09	-.34	.03	.00	-.05
Intolerance of ambiguity	.17	.18	.05	.00	-.16	-.06	.02	.02	.21	.06	-.26	-.42*

*p = .05

Table 8.--Comparison between the two treatment groups for
male recall and attitude-change scores

Scores	Failing grades (n=36)	Expected grades (n=35)	t
Recall			
M	4.08	4.34	.72
SD	2.00	2.01	
Attitude Change			
M	135.41	138.94	
SD	28.17	23.76	.56

Table 9.--Comparison between the two treatment groups for
female recall and attitude-change scores

Scores	Failing grades (n=70)	Expected grades (n=68)	t
Recall			
M	3.91	3.72	.67
SD	1.75	1.70	
Attitude Change			
M	132.27	132.98	
SD	28.70	32.81	.13

Table 10.--Comparison between the combined-treatment group and control group for male recall and attitude-change scores

Scores	Grades (n=71)	No grades (n=52)	t
Recall			
M	4.21	5.04	2.30*
SD	1.99	2.02	
Attitude Change			
M	137.15	140.31	.62
SD	29.96	26.05	

*p = .025

Table 11.--Comparison between the combined-treatment group and control group for female recall and attitude-change scores

Scores	Grades (n=138)	No grades (n=75)	t
Recall			
M	3.82	4.30	2.14*
SD	1.72	2.03	
Attitude Change			
M	132.63	142.89	2.37**
SD	30.69	29.64	

*p = .025

**p = .01

VI

CONCLUSION

The two experiments will be combined here so the results from both can be considered together in evaluating the hypotheses. This chapter will discuss some limitations of the research, the hypotheses, the anxiety model, an alternate explanation, and suggestions for further research.

Limitations

Before proceeding to a discussion of the hypotheses, a review of the limitations of this research may be helpful. The first limitation which should be noted is the type of classroom used in this investigation. The presentation of materials to be learned was intended to simulate a lecture type classroom so often found in traditional schools. Generalizations from this study may not apply to classrooms where more recent instructional procedures are utilized.

Second, the design of the first experiment did not allow a separation of the effects of grades per se from the effects of low grades. The second experiment used two treatment groups to correct this inadequacy and when no difference was found between the expected and low grade

groups this forced a change in the original hypotheses. This consideration will be discussed in detail later.

Third, it should be noticed that presenting the grades, learning, and testing all occurred within one hour. It is conceivable that the immediate effects of grades are stronger than the delayed effects after a period of time has elapsed. In addition, if learning were to take place over a period of time, the first learning may be adversely affected by the interfering response-tendencies, while later learning might be improved because of increased motivation. Also, it may be unfortunate to test so soon because the learning usually regarded as most valuable is that which is acquired slowly and retained over long periods of time.

Fourth, in spite of an effort to avoid an experimental atmosphere by using classroom groups and relating the persuasive messages to the course work, the experimental nature of the meetings could not be completely concealed. Whether the results can be generalized to a situation where no experimental atmosphere exists remains somewhat questionable.

Fifth, the design in Experiment II did not involve random subject assignment between those receiving and those not receiving grades although a case can be made that the groups were comparable. For a description of the groups, see Chapter IV. It is impossible to keep a group intact and to present grades to a random half without affecting those not receiving a grade. Experiment I avoided this by

having groups of randomly selected subjects meet in separate rooms. However, meeting in different rooms has the disadvantage of making the situation more artificial for the student.

Sixth, it should be pointed out that when using anxiety groups most experiments use very extreme groups. For example, a complete freshman class may be given an MMPI, and only those scoring in the upper five or ten per cent will be selected to represent high and low anxious subjects. In this experiment, all subjects enrolled in the cooperating classes were used. The high anxiety group could contain a person at the fifty-first percentile because a division was made at the median as in Experiment I with the male sample. Although for applied purposes there are advantages to using the complete range of subjects, the power of this research strategy may be less than those studies using very extreme groups.

A further limitation is that the treatment may have directly affected performance on the criterion measure by eliciting test anxiety. In order to reduce this test anxiety, students were told in both experiments that the test results would not affect their course standing.

Evaluation of the Hypotheses

Before any of the hypotheses are considered, one limitation mentioned in the preceeding section must be further considered. In Experiment I the treatment effects may have been due to the lowness of the grade or to

the grades themselves. In Experiment II no differences were observed between the low grade and the expected grade groups, while differences were found between the combined low and expected grade group and those not receiving grades. This logically leads to the conclusion that the differences observed were due to the effects of grades, not necessarily to the effects of low grades. Accordingly the low should be deleted from each of the hypotheses so that they only mention grades rather than low grades. The following discussion will refer to Hypotheses I, II, and III as they have been corrected above.

Hypothesis I refers to cognitive learning. In Experiment I, recall was less for both male and female failure groups. The difference was significant at the .01 level. In Experiment II this amended hypothesis was confirmed when the subjects receiving expected and failing grades scored lower on the recall test than those not receiving grades. The results were significant at the .025 level for males and females. Although the first hypothesis receives support from both males and females in Experiments I and II, a qualification mentioned in the preceding paragraph, is imposed by a further analysis of the treatment conditions in Experiment II. Those receiving failing did not recall less than those receiving expected grades. One explanation advanced here to account for this finding is that the expected grades were not neutral grades at all. It is believed that when the students were asked to estimate the grades they expected to receive,

they may have understated their true expectations. If this is the case, then when the expected grades were presented, they were an underestimate in terms of the subjects' expectations and hence also constituted failure. Instead of comparing a low grade event with a neutral grade event, two failure events differing only in severity would have been compared. This explanation is tenuous because it is just as reasonable to assume that students overestimated their grades. In addition, even if they were both failing grades, the low grades should still be more severe than the expected grades. Another possible explanation for the lack of difference between the treatment group is that all grades elicit anxiety. Because all grades have probably been paired with success, punishment, and failure in the past, it is likely that grades alone have become a stimulus capable of eliciting anxiety. Therefore, the first hypothesis was confirmed in both experiments, but the second experiment has strongly suggested that grades alone were responsible for the observed differences.

The second hypothesis refers to affective learning. This hypothesis was not confirmed in Experiment I. Males and females receiving grades did not differ from those not receiving grades on attitude scores. However, in Experiment II females who received failing and expected grades had less attitude change than those not receiving any grades. This difference was significant at the .01 level. For the males the combined failing and expected-grade

group did not have a different amount of attitude change than the no-grade group. Also no difference in attitude change was found between the group receiving low grades and the group receiving expected grades. Additional support for the second hypothesis was found on the interest scores for females in Experiment I. Those receiving low grades had significantly lower scores on the interest test. Interest was considered to be within the definition of affective learning according to the Krathwohl-Bloom definition presented in Chapter I. Support for the second hypothesis is summarized in Table 12.

Table 12.--Results relevant to Hypothesis II

Results supporting Hypothesis II	Results not supporting Hypothesis II
Female interest scores in Experiment I significant at .025 level of significance.	Male interest scores in Experiment I.
Female attitude-change scores in Experiment II significant at .01 level of significance.	Male attitude scores in Experiment I.
	Male attitude scores in Experiment II.
	Female attitude scores in Experiment I.

It would appear that the evidence basically supports the second hypothesis for females, but not for males. The lack of significance in differences for the males may be due to the smaller sample of male subjects. In both experiments there were twice as many female subjects. The

treatment differences in attitude change were always in the predicted direction for the males, but never reached significance. It may be that females are much more susceptible to the influence of low grades. This sex difference finding is easily incorporated into the anxiety theory. Females may characteristically have a set of ego-defensive or anxiety-reducing responses which might increase their susceptibility to persuasion.

The third hypothesis which states that there will be less recall and attitude change produced by persuasive arguments following failure for high-anxiety subjects than for low-anxiety subjects, was not confirmed in the first experiment. The second experiment used another more common measure of anxiety in case the I P A T Anxiety Scale was not actually measuring the anxiety relevant to this situation. When the preliminary analysis showed no correlation between measured anxiety and the dependent variables, the hypothesis was considered unsupported. Five other personality traits; self-esteem, academic self-concept, authoritarianism, ego-strength, and acquiescence, also yielded non-significant correlations with the dependent variables. Thus, the third hypothesis received no support from either the first or second experiment.

In summary, the following conclusions are drawn about the immediate effects of grades on learning in a lecture type classroom:

1. Grades were followed by less cognitive learning among both male and females.

2. Grades were followed by less affective learning among females.

Theoretical Implications

A problem is encountered in regard to the theoretical interpretation of the findings. It is acknowledged that the anxiety theory successfully predicts the direction of failure effects in Hypotheses I and II. However, these predictions were built around the concept of anxiety which was later found to be unrelated to the changes observed in either cognitive or affective learning. With these negative findings in both experiments, it seems awkward to maintain the anxiety hypothesis. However, the lack of relationship between measured anxiety, failure, and learning in these experiments can still be explained in accordance with the rationale presented in Chapter III. First, it should be recalled that no interaction between measured anxiety and low-grades was predicted. The effects were predicted to be additive; the learning of both high and low-anxiety groups reduced as a result of receiving low grades. The failure to find anxiety level differences does not logically imply that anxiety was absent from the situation.

It was the opinion of the researcher and assistants who observed the students during the experiment and talked to them following the experiment that there was a great deal of anxiety in almost all the subjects. It is proposed that a failing-grade on a course examination is an event which is intense enough to produce anxiety among

both high and low anxiety subjects; whereas the failure often induced in a laboratory is only able to elicit anxiety among high-anxiety subjects.

Second, affective and cognitive learning in a complex lecture situation might be a task which is especially susceptible to any interference, such as reporting examination grades. Obtaining information from a lecture necessitates concentrated attention because the material cannot be returned or reviewed a second time. It also may involve some kind of on-going organization to facilitate later recall. Effective learning most likely required an additional emotional involvement with the material on the part of the listener. For a task which is so susceptible to interference even a moderate amount of weak anxiety among low anxiety subjects may seriously result in poorer task performance. However, in a typical laboratory task such a digit symbol substitution or learning nonsense syllables the same amount of anxiety among low anxiety subjects may not appreciably reduce performance. If a learning task less sensitive to external influence had been used perhaps anxiety level differences would have been found.

The strategy mentioned in Chapter I, which proposed administering low grades to spur students on to increased learning received no support from these studies. In all groups, grades were followed by less cognitive learning. The hypothesis that low grades would lower a persons self-esteem thus making him more susceptible to attitude learning was not once supported. On the contrary, female sub-

jects had less attitude change after receiving low grades. In comparison with the above two positions, the anxiety theory outline in Chapter III and the finding from experiments investigating failure appear to be more applicable to classroom learning.

An Alternate Explanation

Although the anxiety model with the generous assistance of post hoc explanations can be adapted so as to account for the findings of these two experiments, a more parsimonious explanation is proposed.

This alternate explanation is deemed more parsimonious because it does not rely upon intervening variables to explain the same observable event. The explanation simply states that grades directly elicit responses which interfere with learning in this situation. From this viewpoint the concept of anxiety and other variables presented in Chapter III, become unnecessary because grades are considered to be powerful eliciting stimuli effective over a wide range of students in these classes. This notion is similar to Dollard and Miller's concept of a strong stimulus serving as a drive. The role of grades in these experiments may be clarified by the following illustration of a strong stimulus eliciting incompatible responses in an elementary school classroom. Imagine what would happen to performance if during an arithmetic study session the local good humor ice-cream man, or a uniformed policeman were to loudly walk into an elementary school classroom. Certainly the responses

elicited by these stimuli would interfere with performance on the assigned arithmetic task. If the statements presented in Chapter I about the importance placed on grades by students is true then grades may be a stimulus as powerful for college students as the policeman or ice-cream man was for the elementary students. This same basic idea would be stated differently in the language of other theoretical positions. For example, one might say the grades serve as a distractor or cue for other behavior or that grades occupy or dominate the center of the perceptual field when they are presented. Regardless of the constructs used, this point of view says that grades directly interfere with the observed performance in the classroom. This explanation has the advantage of being simple, straightforward and directly corresponding with the data.

Suggestions for Future Research

Further experimental research investigating marking and classroom learning seems to be called for. The argument that laboratory studies have more control and efficiency may not be so applicable in this area. Large numbers of classes are available for study and many convenient evaluating devices have been developed. Without entering a discussion of laboratory versus non-laboratory research it seems that an adequate experimental control can be achieved when directly studying classroom learning. The following experiments are suggested after considering the findings and limitations of this study.

First the failure to find differences between subjects receiving expected grades and failing grades seems to demand further understanding of the treatment conditions. Why does low grades produce effects similar to higher grades? One possible method to answer this question would be to compare good or better than expected grades with failing grades. If differences were found between good and failing grades, then the finding of no difference in this study would be attributed to expected grades being a less severe case of failure. If no differences were found then the position that grades alone can elicit anxiety would be supported. This experiment is currently being conducted by the author. Preliminary results indicate that those receiving high grades do not perform any differently from those receiving low grades.

Another line of investigation would be to vary the severity of failure. Different intensities of failure introduced on more and less meaningful performances should have differential effects. Different types of grades may also have different effects. It seems desirable from an applied point of view to discover ways of feeding back information which would not be disruptive to on-going performance.

It may also be possible to adapt some of the physiological measures of anxiety for use in a classroom setting. Sarason (1960) mentions a variety of recent techniques used to assess anxiety directly, and if this could be established, then a more direct test of the gen-

erality of the anxiety theory could be made. A direct measure of autonomic activity may lead to a further understanding of sex differences which keep reappearing in the experiments.

It may be essential for further progress in understanding the effects of grades in classroom learning to investigate subject characteristics more thoroughly. The study of children at different ages may be a starting point. Also the background and educational history of a student may be relevant. Those with repeated failure are likely to have become calloused to an additional failure experience or grade of any kind. The failure to find personality correlations with performance after failure in this study is surprising. It is generally acknowledged that people perform differently under stress and failure; so the task is to find a personality measure which will identify these people. With identification of these personality characteristics, an understanding of the relationship between failure and learning may be greatly enhanced.

Finally, it is the opinion of this researcher that studying students who repeatedly receive low grades over an extended period of time would result in the most meaningful information. Because students who receive low grades in one class often fail in others, low grades may more frequently be experienced in an extended series of evaluations. The cumulative effects of failure may be considerably more than a sum total of individual effects. A longitudinal study seems called for and a public school

setting is likely the most advantageous situation in which to observe the effects of low grades repeated over an extended period of time.

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APPENDIX 1

Tables 13-18 for Experiment I

Table 13.--Analysis of variance for female interest scores
with grade point average levels

Source	df	MS	F
Treatment	1	36.75	5.29*
G P A level	2	47.62	3.43*
Interaction	2	1.33	.19
Error	102	6.94	
Total	107		

Cell means and total

	No grades	Failing grades	Total
Low G P A	11.67	11.38	12.19
Middle G P A	11.06	10.11	10.58
High G P A	13.00	10.72	11.19
Total	11.90	10.74	11.32

*p = .05

Table 14.--Analysis of variance for female attitude scores
with grade point average levels

Source	df	MS	F
Treatment	1	296.67	.42
G P A level	2	1993.29	2.81
Interaction	2	387.79	.55
Error	102	709.71	
Total	107		

**Table 15.--Analysis of variance for female recall scores
with grade point average levels**

Source	df	MS	F
Treatment	1	228.23	26.33**
G P A level	2	41.03	4.73*
Interaction	2	6.28	.72
Error	102	8.67	
Total	107		

Cell means and totals

	No grades	Failing grades	Total
Low G P A	12.77	9.44	11.11
Middle G P A	14.88	11.44	13.17
High G P A	13.61	11.67	12.63
Total	13.76	10.85	12.30

**p = .01

*p = .05

**Table 16.--Analysis of variance for female interest scores
with expected grade levels**

Source	df	MS	F
Treatment	1	28.58	4.15*
Expected grade	1	5.25	.76
Interaction	1	3.44	.50
Errors	80	6.88	
Total	83		

Cell means and totals			
	No grades	Failing grades	Total
Low expected grade	12.05	11.28	11.66
High expected grade	11.95	10.30	11.16
Total	12.00	10.83	11.42

*p = .05

Table 17.--Analysis of variance for female attitude scores
with expected grade levels

Source	df	MS	F
Treatment	1	136.30	.25
Expected grade	1	416.30	.79
Interaction	1	90.11	.17
Error	80	529.00	
Total	83		

Table 18.--Analysis of variance for female recall scores
with expected grade levels

Source	df	MS	F
Treatment	1	126.29	18.83*
Expected grade	1	22.01	3.28
Interaction	1	.11	.02
Error	80	6.71	
Total	83		

Cell means and totals

	No grades	Failing grades	Total
Low expected grade	13.76	11.24	12.50
High expected grade	12.64	10.28	11.47
Total	13.21	10.21	11.99

*p = .01

APPENDIX 2

I P A T Anxiety Scale Used in Experiment I

I P A T SELF ANALYSIS FORM

NAME _____ TODAY'S DATE _____
First Middle Last
SEX _____ AGE _____ OTHER FACTS _____
(Write M or F) (Nearest Year) (Address, Occupation, etc., as instructed)

CONFIDENTIAL

Inside this booklet you will find forty questions, dealing with difficulties that most people experience at one time or another. It will help a lot in self-understanding if you check Yes, No, etc., to each, frankly and truthfully, to describe any problems you may have.

Start with the two simple examples just below, for practice. As you see, each inquiry is actually put in the form of a sentence. By putting a cross, X, in *one* of the three boxes on the right you show how it applies to you. Make your marks now.

1. I enjoy walking..... Yes ☐ Occasionally ☐ No ☐

A middle box is provided for when you cannot definitely say Yes or No. But use it as little as possible.

2. I would rather spend an evening:

(A) talking to people, (B) at a movie..... A ☐ In between ☐ B ☐

About half the items inside end in A and B choices like this. B is always on the right. Remember, use the "In between" or "Uncertain" box only if you cannot possibly decide on A or B.

Now:

1. Make sure you have put your name, and whatever else the examiner asks, in the place at the top of this page.
2. Never pass over an item but give some answer to every single one. Your answers will be entirely confidential.
3. Do not spend time pondering. Answer each immediately, the way you want to at this moment (not last week, or usually). You may have answered questions like this before; but answer them as you feel *now*.

Most people finish in five minutes; some, in ten. Hand in this form as soon as you are through with it, unless told to do otherwise. As soon as the examiner signals or tells you to, turn the page and begin.

STOP HERE—WAIT FOR SIGNAL

1. I find that my interests, in people and amusements, tend to change fairly rapidly.....
True ☐ In between ☐ False ☐
2. If people think poorly of me I can still go on quite serenely in my own mind.....
True ☐ In between ☐ False ☐
3. I like to wait till I am sure that what I am saying is correct, before I put forward an argument.....
Yes ☐ In between ☐ No ☐
4. I am inclined to let my actions get swayed by feelings of jealousy.....
Sometimes ☐ Seldom ☐ Never ☐
5. If I had my life to live over again I would:
(A) plan very differently, (B) want it the same.....
A ☐ In between ☐ B ☐
6. I admire my parents in all important matters.....
Yes ☐ In between ☐ No ☐
7. I find it hard to "take 'no' for an answer", even when I know what I ask is impossible.....
True ☐ In between ☐ False ☐
8. I doubt the honesty of people who are more friendly than I would naturally expect them to be.....
True ☐ In between ☐ False ☐
9. In demanding and enforcing obedience my parents (or guardians) were: (A) always very reasonable, (B) often unreasonable.....
A ☐ In between ☐ B ☐
10. I need my friends more than they seem to need me.....
Rarely ☐ Sometimes ☐ Often ☐
11. I feel sure that I could "pull myself together" to deal with an emergency.....
Always ☐ Often ☐ Seldom ☐
12. As a child I was afraid of the dark.....
Often ☐ Sometimes ☐ Never ☐
13. People sometimes tell me that I show my excitement in voice and manner too obviously.....
Yes ☐ Uncertain ☐ No ☐
14. If people take advantage of my friendliness I:
(A) soon forget and forgive, (B) resent it and hold it against them.....
A ☐ In between ☐ B ☐
15. I find myself upset rather than helped by the kind of personal criticism that many people make.....
Often ☐ Occasionally ☐ Never ☐
16. Often I get angry with people too quickly.....
True ☐ In between ☐ False ☐
17. I feel restless as if I want something but do not know what.....
Very rarely ☐ Sometimes ☐ Often ☐
18. I sometimes doubt whether people I am talking to are really interested in what I am saying.....
True ☐ In between ☐ False ☐
19. I have always been free from any vague feelings of ill-health, such as obscure pains, digestive upsets, awareness of heart action, etc.....
True ☐ Uncertain ☐ False ☐
20. In discussion with some people, I get so annoyed that I can hardly trust myself to speak.....
Sometimes ☐ Rarely ☐ Never ☐

CONTINUE ON NEXT PAGE.

A Score

B

Do not
write
in this
column

- | | | | |
|---|-----------------------------------|---|---------------------------------------|
| 21. Through getting tense I use up more energy than most people in getting things done..... | True
☐ | Uncertain
☐ | False
☐ |
| 2. I make a point of not being absent-minded or forgetful of details..... | True
☐ | Uncertain
☐ | False
☐ |
| 23. However difficult and unpleasant the obstacles, I always stick to my original intentions..... | Yes
☐ | In between
☐ | No
☐ |
| 24. I tend to get over-excited and "rattled" in upsetting situations..... | Yes
☐ | In between
☐ | No
☐ |
| 25. I occasionally have vivid dreams that disturb my sleep..... | Yes
☐ | In between
☐ | No
☐ |
| 26. I always have enough energy when faced with difficulties..... | Yes
☐ | In between
☐ | No
☐ |
| 27. I sometimes feel compelled to count things for no particular purpose..... | True
☐ | Uncertain
☐ | False
☐ |
| 28. Most people are a little queer mentally, though they do not like to admit it | True
☐ | Uncertain
☐ | False
☐ |
| 9. If I make an awkward social mistake I can soon forget it..... | Yes
☐ | In between
☐ | No
☐ |
| 0. I feel grouchy and just do not want to see people:
(A) occasionally, (B) rather often..... | A
☐ | In between
☐ | B
☐ |
| 1. I am brought almost to tears by having things go wrong..... | Never
☐ | Very rarely
☐ | Sometimes
☐ |
| 2. In the midst of social groups I am nevertheless sometimes overcome by feelings of loneliness and worthlessness | Yes
☐ | In between
☐ | No
☐ |
| 3. I wake in the night and, through worry, have some difficulty in sleeping again | Often
☐ | Sometimes
☐ | Never
☐ |
| 4. My spirits generally stay high no matter how many troubles I meet..... | Yes
☐ | In between
☐ | No
☐ |
| 5. I sometimes get feelings of guilt or remorse over quite small matters..... | Yes
☐ | In between
☐ | No
☐ |
| 3. My nerves get on edge so that certain sounds, e.g., a screechy hinge, are unbearable and give me the shivers..... | Often
☐ | Sometimes
☐ | Never
☐ |
| 7. If something badly upsets me I generally calm down again quite quickly..... | True
☐ | Uncertain
☐ | False
☐ |
| 3. I tend to tremble or perspire when I think of a difficult task ahead..... | Yes
☐ | In between
☐ | No
☐ |
| 9. I usually fall asleep quickly, in a few minutes, when I go to bed..... | Yes
☐ | In between
☐ | No
☐ |
| 0. I sometimes get in a state of tension or turmoil as I think over my recent concerns and interests..... | True
☐ | Uncertain
☐ | False
☐ |

STOP HERE.

BE SURE YOU HAVE ANSWERED EVERY QUESTION.

B Score

A Score (Covert, indir.) _____ (p. 2 score) B Score (Overt, manifest, sympt.) _____ (p. 3 score)		TOTAL RAW SCORE (A + B)
Raw Scores: Q ₃ (-) _____, C(-) _____, L _____, O _____, Q ₄ _____, Overt-Covert Ratio $\left(\frac{B}{A}\right)$ _____		
Stems: Q ₃ (-) _____, C(-) _____, L _____, O _____, Q ₄ _____		TOTAL, STANDARD STEN SCORE (from Table 2)
Standard Score Deciles (Total)		
10	Qualitative Observations:	Standard Score Stems (Total) 10
9	Diagnostic Summary:	9
8		8
7		7
6		6
5		5
4		4
3		3
2		2
1	1	

(This column normally used only when deciles are preferred to stems.)

APPENDIX 3

Arguments Used in Experiment I

The first article is by Mr. Thomas Wrigley who is a member of the Financial Policy Board of the American Association of Land Grant Colleges. He was asked if it was valuable and reasonable to adopt a policy of a free loan of textbooks to students in state universities.

Mr. Wrigley answered:

Mr. Wrigley:

Our investigations have shown quite plainly that the policy of lending text books free to students in large state universities would result in a considerable financial saving to students and would add very little to the expenses of the university. The average amount of money college students spend on required textbooks is estimated to be between thirty and forty dollars per school year. And over the period of two to four years that he stays in college, this adds up to a considerable sum. If, however, the university provided these textbooks, they could be purchased wholesale at a considerable saving. Moreover, the books could be used over and over again a number of times. It has been found, in fact, that under such circumstances, the books can be used over again each year for an average of about seven years. Hence, the cost to the university of loaning the books to students would

it is these subjects that they most need. A recent investigation has furnished substantial proof of this point. It was found that students who had to take several required courses scored eleven points higher on a general achievement test given after the first two years in college than did a matched group of students who were not required to take any specific courses. Several additional studies could be cited, showing that the greater the number of required courses in the student's program the higher the student's score on general achievement tests. As enrollments soar in our colleges, the need for more specific course requirements also grows, since there gets to be less opportunity for the faculty to impress upon students individually, the need for taking certain courses. We, on the committee, have come to the conclusion that one of the most effective ways of helping the students get the most out of their education is to have more required courses in the curriculum.

(Professor Howland, President-Elect of the National Association of Deans of Students, was asked if he had any information on whether having a compulsory study period of one hour per day results in an improvement in the study habits of college students.) He answered:

be less than six dollars per year while saving the student the 30-40 dollars per year that he must now spend even when he is able to resell his books at the end of the school year. It can be readily seen therefore, that free loan of textbooks to students would result in considerable financial saving for the students at very little added expense to the university.

(The next article is by Mr. Phillip Hartford who is Chairman of the Board of Education in a large mid-western city. He is answering the question of whether athletic contests between different schools interfere with the education of the students.)

Mr. Hartford:

Yes, I think it must be generally admitted that this is the case. The very fact that students are so interested in them is one reason for this interference. They divert the students' time and energy from their studies, which after all, are the primary part of education. No doubt education does involve some physical training, but this can be given more efficiently by gym periods and games within the school. The within-school emphasis would, in fact, assure that more students would be active participants rather than mere observers in these activities.

It is truly regrettable that we allow such stress on these between-school games that so frequently foster the rivalry and hate that we have often seen lead to violence. Furthermore, such athletic contests between different schools distort the student's sense of values so that he tends not to appreciate that the development of his intellectual skills is the true purpose of education. In all these ways, sporting contests between schools interfere with the true purpose of education.

(The next article is by Professor Collard who is a member of the Curriculum Study Committee of the National Association for Higher Education. Professor Collard was asked whether having more required courses results in a better education for the students)

PROF. COLLARD:

On that point, it seems quite clear from the investigations that have been carried out recently, that students do get more out of their education when there are more required courses in the curriculum. We all know that when there are no, or few, required courses many students avoid courses in subjects in which they have done poorly in the past. And it is, of course, these very courses that it would be most profitable for them to take, since

PROF. HOWLAND:

Yes, a recent investigation has shown that having compulsory study periods does produce a decided improvement in the study habits of college students. It was found that students who had compulsory study periods attained better grade averages and scored higher on special tests of efficiency of study habits than did students who did not have compulsory study periods. Having such periods increases the student's ability to concentrate while studying since it reduces the number of distractions. This is an especially important benefit in these days when crowded conditions in the student's living quarters are making it increasingly difficult for even the most serious minded students to avoid being distracted from their studies in their rooms. Compulsory study periods also result in their studying soon after they have heard the lecture, while the material is still fresh in their mind, which is always an advantage. Also, such study periods enable the students to find out what they do not understand while they are still in the college environment, which makes it easier for them to get further explanation from one another or from their instructor. In all these ways, having compulsory study periods every day produces

a decided improvement in the study habits of college students.

These articles should be representative of the future content of this journal for we believe the leaders of education will continue to support this endeavor. In order to estimate how many issues to publish each month, and to determine the price of each issue, if any, we need your assistance. Would you please fill out the questionnaire being distributed by the instructor in your room. The booklet can be completely filled out in nine minutes after which time I will return. Thank you.

TESTING

Now we would like to thank you again for your patience and cooperation. In the studio at this time is Mr. Larry Jensen who would like to explain in detail the happenings of the last hour.

APPENDIX 4

Interest, Attitude, and Recall Scales Used in Experiment I

This booklet contains some questions which will help us determine your feelings about the journal, Current Issues in Education. This booklet has three parts: pink, blue and green. Proceed directly from Part I to Part 3 but do not return to work on previous sections once you have begun a later section. Please PRINT your name at the beginning of each section in the space provided.

Your responses will in no way affect your grade and all the information will be kept confidential. Work fast as only ten minutes are provided to complete the booklet.

SECTION 1

1. Do you feel that you would find time to read the journal, Current Issues in Education?

No

Undecided

Yes

2. Would you subscribe to the Journal if the subscription was free?

No

Undecided

Yes

3. Would you refuse to subscribe to the Journal if it cost twenty cents per monthly issue?

No

Undecided

Yes

4. Did you think the sample material was interesting?

No

Undecided

Yes

5. Do you think that students are too busy to profit from this extra reading?

No

Undecided

Yes

We have reason to believe that your feelings about the particular sample topics presented may have influenced your responses to the above items. Would you please answer questions in the next section to help us determine if this is the case. Do not change your answers recorded above. Proceed to Section 2.

SECTION 2

Each statement is followed by a scale ranging from 1-8. A 1 score represents a strongly disagree and an 8 score represents a strongly agree. Please circle the number best representing your feelings regarding the question on each scale. There are no right and wrong answers. Work rapidly, for only four minutes are allowed for answering all 20 questions.

1. The value of having athletic contests between different schools should be re-examined.

1	2	3	4	5	6	7	8
Strongly							Strongly
Disagree							Agree

2. State universities should adopt the policy of free loan of textbooks to students.

1	2	3	4	5	6	7	8
Strongly							Strongly
Disagree							Agree

3. More required courses results in a better education for the students.

1	2	3	4	5	6	7	8
Strongly							Strongly
Disagree							Agree

4. A compulsory study period of one hour per day will result in an improvement in the study habits of college students.

1	2	3	4	5	6	7	8
Strongly							Strongly
Disagree							Agree

5. Too much emphasis is placed on athletic contests between schools.

1	2	3	4	5	6	7	8
Strongly Disagree						Strongly Agree	

6. Universities should assist students in acquiring textbooks.

1	2	3	4	5	6	7	8
Strongly Disagree						Strongly Agree	

7. Required courses help the student to receive a more complete education.

1	2	3	4	5	6	7	8
Strongly Disagree						Strongly Agree	

8. A compulsory study period does produce a decided improvement in the study habits of college students.

1	2	3	4	5	6	7	8
Strongly Disagree						Strongly Agree	

9. Educators should reduce the amount of competition between schools in their athletic programs.

1	2	3	4	5	6	7	8
Strongly Disagree						Strongly Agree	

10. Universities are not able to afford the expense of assisting students in acquiring books.

1	2	3	4	5	6	7	8
Strongly Disagree						Strongly Agree	

11. The value of required courses is underestimated.

1	2	3	4	5	6	7	8
Strongly							Strongly
Disagree							Agree

12. The advantages of compulsory study periods outweigh the disadvantages.

1	2	3	4	5	6	7	8
Strongly							Strongly
Disagree							Agree

13. Athletic contests between different schools interfere with the true purpose of education.

1	2	3	4	5	6	7	8
Strongly							Strongly
Disagree							Agree

14. Loaning textbooks by the universities is preferable to individual purchases by students.

1	2	3	4	5	6	7	8
Strongly							Strongly
Disagree							Agree

15. One good way of helping the students get the most out of their education is to have more required courses in the curriculum.

1	2	3	4	5	6	7	8
Strongly							Strongly
Disagree							Agree

16. Universities should require a compulsory study period of one hour per day.

1	2	3	4	5	6	7	8
Strongly							Strongly
Disagree							Agree

17. Compulsory study periods will result in greater learning by the students.

1	2	3	4	5	6	7	8
Strongly Disagree						Strongly Agree	

18. Loaning textbooks to students by universities has more advantages than disadvantages.

1	2	3	4	5	6	7	8
Strongly Disagree						Strongly Agree	

19. It would be beneficial to place less importance on inter-school athletic competition.

1	2	3	4	5	6	7	8
Strongly Disagree						Strongly Agree	

20. More required courses will result in more student learning.

1	2	3	4	5	6	7	8
Strongly Disagree						Strongly Agree	

SECTION 3

We are also interested in determining if you gained any information from the articles. The following are questions concerning the topics read from the Journal, Current Issues in Education. Circle the correct alternative. When you are through, turn your booklet over and the instructor will pick it up. Do not return to Section 1 or 2.

1. Dr. Hartford, in regards to inter-school competition, stated:
 - a. Contests between schools help reduce student's emotional energy to a level conducive to good studying.
 - b. Physical training can be given more efficiently through gym periods.
 - c. Competition is undemocratic.
2. Dr. Hartford stated all of the following except:
 - a. Competitive athletic contests divert the student's time and energy from his studies.
 - b. Athletic contests should be between teams within the schools.
 - c. The competition hurts the image of smaller schools.
 - d. None of the above.
3. Dr. Wrigley stated that lending textbooks free of charge would save the students:
 - a. \$30-\$40. per school year.
 - b. \$40-\$50. per school year.
 - c. \$50-\$60. per school year.
4. How many years can books be reused according to Mr. Wrigley?
 - a. four years
 - b. six years
 - c. three years
 - d. eight years

5. Dr. Wrigley stated all of the following except:
 - a. Universities could purchase books wholesale.
 - b. Better quality books would be secured because publishers would know that universities would not but inferior books.
 - c. Students can resell their books at the end of the school year.
6. According to Professor Collard:
 - a. Required courses have more depth than elective courses.
 - b. Compulsory courses develop self discipline.
 - c. Students avoid courses in those areas in which they have previously performed poorly.
 - d. All of the above.
 - e. None of the above.
7. It was found that students who had to take several required courses scored on a general achievement test:
 - a. Same as students not taking required courses.
 - b. Twenty points higher after one year.
 - c. Eleven points higher after two years.
 - d. Thirty points higher after four years.
8. It was contended by Dr. Howland that compulsory study periods:
 - a. Have proved valuable in Army training programs.
 - b. Take less of the student's time in the long run.
 - c. Helps eliminate many distractions.
 - d. All of the above
9. Dr. Hartford maintained all of the statements below except:
 - a. Students with compulsory study habits attained better grade averages.
 - b. Crowded conditions are making good study areas scarce.
 - c. Students participating in compulsory study programs report that they profit from them.
 - d. Students in compulsory study periods scored higher on special test of efficiency of study habits.

For the following questions circle true if it is a statement that was actually asserted in the Journal articles. If the statement is inaccurate circle false. Also circle false if the statement was not mentioned, even if

it is true. That is, circle false if the statement was not made or if it is inaccurate.

1. Compulsory study periods allow a rest period between hearing material and studying. a. true b. false
2. Compulsory study periods result in a greater number of hours devoted to studying. a. true b. false
3. More required courses could reduce the total number of hours required for a degree since much overlap between courses would be eliminated. a. true b. false
4. The increased enrollment is a factor which gives added weight to the argument for more required courses. a. true b. false
5. Athletic contests between schools lead to violence. a. true b. false
6. Students should collect a good library of books. a. true b. false
7. Athletic contests between schools should be reduced because so many students are not interested. a. true b. false
8. Athletic contests distort the value which students place on intellectual achievement. a. true b. false

APPENDIX 5

Table 19 for Experiment II

Table 19.--Pre-treatment scores for each sex and treatment group

Measure	Male no grades	Female no grades	Male expected grades	Female expected grades	Male failing grades	Female failing grades
Att. Argument I						
M	42.57	43.83	36.95	42.63	43.28	43.94
SD	13.41	11.45	10.72	13.75	12.08	12.81
Att. Argument II						
M	53.23	52.85	50.68	53.61	49.25	53.81
SD	5.89	7.89	7.07	6.07	7.02	7.03
Anxiety						
M	15.05	17.06	15.54	18.05	17.92	16.00
SD	6.42	7.31	6.96	8.76	6.97	7.25
Ego Strength						
M	45.61	41.50	46.05	42.22	44.32	42.50
SD	4.53	7.70	6.27	5.75	4.87	7.21
Self-esteem						
M	71.57	71.06	69.50	66.98	69.17	74.28
SD	12.16	12.85	13.21	16.36	13.39	14.51
Academic Self Concept						
M	24.00	28.65	32.09	27.95	29.68	29.13
SD	11.45	10.67	10.44	8.16	8.84	10.43
Authoritarianism						
M	51.62	47.00	50.55	51.58	46.89	48.70
SD	23.81	21.55	21.17	21.05	16.92	18.94

Table 19.--Continued

Measure	Male no grades	Female no grades	Male expected grades	Female expected grades	Male falling grades	Female falling grades
Acquiescence						
M	45.90	43.32	46.22	47.94	50.46	47.32
SD	17.90	17.34	14.51	10.76	11.91	13.76
Intolerance of Ambiguity						
M	28.00	29.68	28.68	31.84	29.71	29.31
SD	11.45	10.68	8.16	10.55	8.85	10.44

APPENDIX 6

**Personality Research Scale, Public Opinion Questionnaire,
and the
Terman Lang Personality Inventory used in Experiment II**

COMPLETELY FILL IN THE HEADING ON YOUR ANSWER SHEET. BE SURE TO PUT YOUR STUDENT NUMBER IN THE BLOCK PROVIDED.

RESEARCH SCALE

The response to the information requested here will be used for research purposes only and are strictly confidential. Sincere and honest answers are necessary for this research to be accurate. Your cooperation will be greatly appreciated.

This inventory consists of numbered statements. Read each statement and decide whether it is true as applied to you or false as applied to you. If a statement is TRUE or ALMOST TRUE, blacken the circle in the first column on the answer sheet. If a statement is FALSE or NOT USUALLY TRUE, blacken the circle in the second column.

Remember to give your own opinion of yourself. DO NOT leave any blank spaces if you can avoid it.

1. I do not tire quickly.
2. I am often sick to my stomach.
3. I am about as nervous as other people.
4. I have very few headaches.
5. I work under a great deal of strain.
6. I cannot keep my mind on one thing.
7. I worry over money and business.
8. I frequently notice my hands shake when I try to do something.
9. I blush as often as others.
10. I have diarrhea (the runs) once a month or more.
11. I worry quite a bit over possible troubles.
12. I practically never blush.
13. I am often afraid that I am going to blush.
14. I have nightmares every few nights.
15. My hands and feet are usually warm enough.
16. I sweat very easily even on cool days.
17. When embarrassed I often break out in a sweat which is very annoying.
18. I do not often notice my heart pounding, and I am seldom short of breath.
19. I feel hungry almost all the time.
20. Often my bowels don't move for several days at a time.
21. I have a great deal of stomach trouble.

22. At times I loose sleep over worry.
23. My sleep is restless and disturbed.
24. I often dream about things I don't like to tell other people.
25. I am easily embarrassed.
26. My feelings are hurt easier than most people.
27. I often find myself worrying about something.
28. I wish I could be as happy as others.
29. I am usually calm and not easily upset.
30. I cry easily.
31. I feel anxious about something or someone almost all of the time.
32. I am happy most of the time.
33. It makes me nervous to have to wait.
34. At times I am so restless and I cannot sit in a chair for very long.
35. Sometimes I become so excited that I find it hard to get to sleep.
36. I have sometimes felt that I faced so many difficulties I could not overcome them.
37. At times I have been worried beyond reason about something that really did not matter.
38. I do not have as many fears as my friends.
39. I have been afraid of things or people that I know could not hurt me.
40. I certainly feel useless at times.
41. I find it hard to keep my mind on a task or job.
42. I am more self-conscious than most people.
43. I am the kind of person who takes things hard.
44. I am a very nervous person.
45. Life is often a strain for me.
46. At times I think I am no good at all.
47. I am not at all confident of myself.
48. At times I think I am going to crack up.
49. I don't like to face a difficulty or make a decision.
50. I am very confident of myself.
51. During the past few years I have been well most of the time.
52. I am in just as good physical health as most of my friends.
53. I have never had a fainting spell.
54. I feel weak all over much of the time.
55. My hands have not become clumsy or awkward.
56. I have a cough most of the time.
57. I have a good appetite.
58. I have diarrhea once a month or more.
59. At times I hear so well it bothers me.

60. I seldom worry about my health.
61. I feel unable to tell anyone all about myself.
62. I feel sympathetic toward people who tend to hang on on to their griefs and troubles.
63. I brood a great deal.
64. I frequently find myself worrying about something.
65. I have met problems so full of possibilities that I have been unable to make up my mind about them.
66. I get mad easily and then get over it soon.
67. When I leave home I do not worry about whether the door is locked and the windows closed.
68. Sometimes some unimportant thought will run through my mind and bother me for days.
69. Often I cross the street in order not to meet someone I see.
70. I dream frequently about things that are best kept to myself.
71. I go to church almost every week.
72. I pray several times every week.
73. Christ performed miracles such as changing water into wine.
74. Everything is turning out just like the prophets of the Bible said it would.
76. I believe my sins are unpardonable.
77. I would certainly enjoy beating a crook at his own game.
78. When I get bored I like to stir up some excitement.
79. I do many things which I regret afterwards. (I regret things more or more often than others seem to.)
80. I can be friendly with people who do things which I consider wrong.
81. Some people are so bossy that I feel like doing the opposite of what they request, even though I know they are right.
82. I like to flirt.
83. I am attracted by members of the opposite sex.
84. I never attend a sexy show if I can avoid it.
85. I like to talk about sex.
86. I do not like to see women smoke.
87. Sometimes I enjoy hurting persons I love.
88. I have had very strange and peculiar experiences.
89. I have strange and peculiar thoughts.
90. I have had blank spells in which my activities were interrupted and I did not know what was going on around me.
91. When I am with people I am bothered by hearing very queer things.

92. At times I have fits of laughing and crying that I cannot control.
93. I have had no difficulty in keeping my balance in walking.
94. Parts of my body often have feelings like burning, tingling, crawling, or like "going to sleep."
95. My skin seems to be unusually sensitive to touch.
96. My plans have frequently seemed so full of difficulties that I had to give them up.
97. I am easily downed in an argument.
98. I find it hard to keep my mind on a task or job.
99. My way of doing things is apt to be misunderstood by others.
100. I sometimes feel that I am about to go to pieces.
101. I feel tired a good deal of the time.
102. If I were an artist I would like to draw flowers.
103. I like to cook.
104. I like collecting flowers or growing houseplants.
105. If I were an artist, I would like to draw children.
106. When someone says silly or ignorant things about something I know, I try to set him right.
107. I am not afraid of fire.
108. I am made nervous by certain animals.
109. Dirt frightens or disgusts me.
110. I am afraid of finding myself in a closet or small closed place.
111. I have often been frightened in the middle of the night.
112. I like science.
113. I think Lincoln was greater than Washington.
114. I very much like horseback riding.
115. The man who had most to do with me when I was a child (such as my father, stepfather, etc.) was very strict with me.
116. One or more members of my family is very nervous.

PUBLIC OPINION QUESTIONNAIRE

Write your name and the date in the spaces provided on the answer sheet. On the following pages there are 60 statements with which some people agree and others disagree. The best answer to each statement below is your personal opinion. We have tried to cover many different points of view. You may find yourself agreeing strongly with some of the statements, disagreeing just as strongly with others, and perhaps uncertain about others. Whether you agree or disagree with any statement, you can be sure that many other people feel the same way you do.

Please mark each statement on the answer sheet, according to the amount of your agreement or disagreement, by using the following scale:

- | | |
|---|--|
| +1: Agree more than disagree | -1: Disagree more than agree |
| +2: Mostly agree | -2: Mostly disagree |
| +3: Completely or almost completely agree | -3: Completely or almost completely disagree |

Some examples of the kinds of statements are as follows:

- a. It's a mistake to trust anybody who doesn't look you straight in the eye.
- b. When you come right down to it, it's human nature never to do anything without an eye to one's own profit.

In the first example if you disagreed more than agreed with the statement, you would mark a -1 on the answer sheet as indicated.

In the second example if you completely agreed with the statement, you would mark a +3 on the answer sheet as indicated.

Make a response to every statement. Leave none of the statements blank. You should not spend more than a few seconds marking each statement. Like everyone else, you may feel that you do not know the answer to some of the statements. When this occurs make the best response that you can and go on to the next one. Once you have responded to an item do not go back to it.

TURN PAGE AND BEGIN!

1. Obedience and respect for authority are the most important virtues children should learn.
2. No weakness or difficulty can hold us back if we have enough will power.
3. Science has its place, but there are many important things that can never possibly be understood by the human mind.
4. Human nature being what it is, there will always be war and conflict.
5. Every person should have complete faith in some supernatural power whose decisions he obeys without question.
6. When a person has a problem or worry, it is best for him not to think about it, but to keep busy with more cheerful things.
7. A person who has bad manners, habits, and breeding can hardly expect to get along with decent people.
8. What the youth need most is strict discipline, rugged determination, and the will to work and fight for family and country.
9. Some people are born with an urge to jump from high places.
10. Nowadays, when so many different kinds of people move around and mix together so much, a person has to protect himself, especially carefully against catching an infection or disease from them.
11. An insult to our honor should always be punished.
12. Young people sometimes get rebellious ideas but as they grow up they ought to get over them and settle down.

13. What this country needs most, more than laws and political programs, is a few courageous, tireless, devoted leaders in whom the people can put their faith.
14. Sex crimes, such as rape and attacks on children, deserve more than mere imprisonment: such criminals ought to be publicly whipped, or worse.
15. People can be divided into two distinct classes: the weak and the strong.
16. There is hardly anything lower than a person who does not feel a great love, gratitude, and respect for his parents.
17. Some day it will probably be shown that astrology can explain a lot of things.
18. Nowadays more and more people are prying into matters that should remain personal and private.
19. Wars and social troubles may someday be ended by an earthquake or flood that will destroy the whole world.
20. Most of our social problems would be solved if we could somehow get rid of the immoral, crooked, and feeble-minded people.
21. The wild sex life of the old Greeks and Romans was tame compared to some of the goings on in this country, even in places where people might least expect it.
22. If people would talk less and work more, everybody would be better off.
23. Most people don't realize how much our lives are controlled by plots hatched in secret places.
24. Homosexuals are hardly better than criminals and ought to be severely punished.
25. The business man and the manufacturer are much more important to society than the artist and the professor.

26. No sane, normal, decent person could ever think of hurting a close friend or relative.
27. Familiarity breeds contempt.
28. Nobody ever learned anything really important except through suffering.
29. People tend to place too much emphasis on obedience and respect for authority.
30. Sometimes, no matter how hard we try, we are bound to fail.
31. Most important things will eventually be understood by science.
32. Human experience being what it is, man's certainty of the existence of a supreme being is always questionable.
33. Since we cannot hope to live without a few problems or worries, we might as well accept them as a part of life.
34. There are people with bad manners, habits, and breeding, who nevertheless are very fine individuals.
35. It would be preferable if there were less enthusiasm about strict discipline, rugged determination, and the will to work and fight for family and country.
36. There are times when an insult to our honor should be disregarded.
37. The difficulty with many young people, is that as they get older they repress their so-called rebellious ideas.
38. It may well be that children who talk back to their ~~parents~~ actually respect them more in the long run.
39. It is unlikely that astrology will ever be able to explain anything.

40. If the world is ever to be destroyed, it will be by one of man's creations and not be a natural calamity such as a flood or earthquake.
41. Homosexuals are suffering from an illness and ought to receive our sympathetic understanding.
42. There are times when a perfectly sane, normal, decent person may think of hurting a close relative or friend.
43. Usually, the better we get to know people, the more we grow to respect and appreciate them.
44. There is really nothing to be gained in suffering for suffering's sake.
45. I like parties where I know most of the people more than ones where all or most of the people are complete strangers.
46. A good teacher is one who makes you wonder about your way of looking at things.
47. Often the most interesting and stimulating people are those who don't mind being different and original.
48. People who insist upon a yes or no answer just don't know how complicated things really are.
49. An expert who doesn't come up with a definite answer probably doesn't know too much.
50. The sooner we all acquire similar values and ideals the better.
51. In the long run it is possible to get more done by tackling small simple problems rather than large and complicated ones.
52. People who fit their lives to a schedule probably miss most of the joy of living.
53. What we are used to is always preferable to what is unfamiliar.

54. I would like to live in a foreign country for a while.
55. A good job is one where what is to be done and how it is to be done are always clear.
56. It is more fun to tackle a complicated problem than to solve a simple one.
57. A person who leads an even regular life in which few surprises or unexpected happenings arise, really has a lot to be grateful for.
58. There is really no such thing as a problem that can't be solved.
59. Many of our most important decisions are based upon insufficient information.
60. Teachers or supervisors who hand out vague assignments give a chance for one to show initiative and originality.

THE TERMAN-LANG PERSONALITY INVENTORY
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After each of the following questions choose the answer that is most appropriate for you. Work quickly but carefully and be sure to answer every question. Blacken the space on the answer sheet which corresponds to the letter above the selected alternative.

It is possible for you to fake your answers. Please do not do this. If the information yielded by this inventory is to be of any value to you and if the data it provides are to be of any use scientifically, your answers must be absolutely honest.

Answer each question; there are no "right" or "wrong" answers to the questions, so just answer them the way you really feel.

117. How often do you feel inferior to most of the people you know?

A	B	C	D	E
Very often	Fairly often	Sometimes	Once in a great while	Practically never

118. Do you ever think that you are a worthless individual?

A	B	C	D	E
Very often	Fairly often	Sometimes	Once in a great while	Practically never

119. How confident do you feel that some day the people you know will look up to you and respect you?

A	B	C	D	E
Very confident	Fairly confident	Slightly confident	Not very confident	Not at all confident

120. How often do you have the feeling that there is nothing you can do well?

A	B	C	D	E
Very often	Fairly often	Sometimes	Once in a great while	Practically never

121. Do you ever feel so discouraged with yourself that you wonder whether anything is worth while?
- | | | | | |
|------------|--------------|-----------|-----------------------|-------------------|
| A | B | C | D | E |
| Very often | Fairly often | Sometimes | Once in a great while | Practically never |
122. How much do you worry about how well you get along with other people?
- | | | | | |
|------------|--------------|-----------|-----------------------|-------------------|
| A | B | C | D | E |
| Very often | Fairly often | Sometimes | Once in a great while | Practically never |
123. In general, how confident do you feel about your abilities?
- | | | | | |
|----------------|------------------|--------------------|--------------------|----------------------|
| A | B | C | D | E |
| Very confident | Fairly confident | Slightly confident | Not very confident | Not at all confident |
124. How often do you worry about criticisms that might be made of your work by whomever is responsible for checking up on your work?
- | | | | | |
|------------|--------------|-----------|-----------------------|-------------------|
| A | B | C | D | E |
| Very often | Fairly often | Sometimes | Once in a great while | Practically never |
125. Do you ever feel afraid or anxious when you are going into a room by yourself where other people have already gathered and are talking?
- | | | | | |
|------------|--------------|-----------|-----------------------|-------------------|
| A | B | C | D | E |
| Very often | Fairly often | Sometimes | Once in a great while | Practically never |
126. When you think about the possibility that some of your friends or acquaintances might not have a good opinion of you, how concerned or worried do you feel about it?
- | | | | | |
|----------------|------------------|--------------------|--------------------|----------------------|
| A | B | C | D | E |
| Very concerned | Fairly concerned | Slightly concerned | Not very concerned | Not at all concerned |
127. How often do you feel self-conscious?
- | | | | | |
|------------|--------------|-----------|-----------------------|-------------------|
| A | B | C | D | E |
| Very often | Fairly often | Sometimes | Once in a great while | Practically never |

128. How much do you worry about whether other people will regard you as a success or a failure in your job or career?
- | | | | | |
|------------|--------------|-----------|-----------------------|-------------------|
| A | B | C | D | E |
| Very often | Fairly often | Sometimes | Once in a great while | Practically never |
129. Do you find it hard to make talk when you meet new people?
- | | | | | |
|------------|--------------|-----------|-----------------------|-------------------|
| A | B | C | D | E |
| Very often | Fairly often | Sometimes | Once in a great while | Practically never |
130. When you have made an embarrassing mistake or have done something that makes you look foolish, how long do you usually keep worrying about it?
- | | | | | |
|------------|--------------|-----------|-----------------------|-------------------|
| A | B | C | D | E |
| Very often | Fairly often | Sometimes | Once in a great while | Practically never |
131. When you have to talk in front of a class or a group of people your own age, how afraid or worried do you usually feel?
- | | | | | |
|--------------|----------------|------------------|------------------|--------------------|
| A | B | C | D | E |
| Very worried | Fairly worried | Slightly worried | Not very worried | Not at all worried |
132. When you are trying to win in a game or sport and you know that other people are watching you, how rattled or flustered do you usually get?
- | | | | | |
|----------------|------------------|--------------------|--------------------|----------------------|
| A | B | C | D | E |
| Very flustered | Fairly flustered | Slightly flustered | Not very flustered | Not at all flustered |
133. How often do you worry about whether other people like to be with you?
- | | | | | |
|------------|--------------|-----------|-----------------------|-------------------|
| A | B | C | D | E |
| Very often | Fairly often | Sometimes | Once in a great while | Practically never |
134. How often are you troubled with shyness?
- | | | | | |
|------------|--------------|-----------|-----------------------|-------------------|
| A | B | C | D | E |
| Very often | Fairly often | Sometimes | Once in a great while | Practically never |

135. When in a group of people, do you have trouble thinking of the right things to talk about?
- | | | | | |
|------------|--------------|-----------|-----------------------|-------------------|
| A | B | C | D | E |
| Very often | Fairly often | Sometimes | Once in a great while | Practically never |
136. When you are trying to convince other people who disagree with your ideas, how worried do you usually feel about the impression you are making?
- | | | | | |
|--------------|----------------|------------------|------------------|--------------------|
| A | B | C | D | E |
| Very worried | Fairly worried | Slightly worried | Not very worried | Not at all worried |
137. How often do you feel worried or bothered about what other people think of you?
- | | | | | |
|------------|--------------|-----------|-----------------------|-------------------|
| A | B | C | D | E |
| Very often | Fairly often | Sometimes | Once in a great while | Practically never |
138. How often do you have the feeling that there is nothing you can do well?
- | | | | | |
|------------|--------------|-----------|-----------------------|-------------------|
| A | B | C | D | E |
| Very often | Fairly often | Sometimes | Once in a great while | Practically never |
139. How do you rate yourself in school ability compared with your close friends?
- | | | | | |
|----------|---------------|---------|---------------|-------------|
| A | B | C | D | E |
| the best | above average | average | below average | the poorest |
140. How do you rate yourself in school ability compared with those in your class at school? I am:
- | | | | | |
|----------|---------------|---------|---------------|-------------|
| A | B | C | D | E |
| the best | above average | average | below average | the poorest |
141. What do you think you would rank in your class?
- | | | | | |
|----------------|---------------|---------|---------------|-------------------|
| A | B | C | D | E |
| among the best | above average | average | below average | among the poorest |
142. Do you think you have the ability to complete advanced training after graduation?
- | | | | | |
|-----------------|--------------|---------------------|-------------|----|
| A | B | C | D | E |
| yes, definitely | yes probably | not sure either way | probably no | no |

143. Where do you think you would rank in your class in graduate school?

A	B	C	D	E
among	above	average	below	among the
the best	average		average	poorest

144. In order to become a doctor, lawyer, or university professor, work beyond four years of college is necessary. How likely do you think it is that you could complete such advanced work?

A	B	C	D	E
Very	somewhat	not sure	unlikely	most unlikely
likely	likely	either way		

145. Forget for a moment how others grade your work. In your own opinion how good do you think your work is? My work is:

A	B	C	D	E
excellent	good	average	below average	much below
				average

146. What kind of grades do you think you are capable of getting?

A	B	C	D	E
mostly	mostly	mostly	mostly	mostly
A's	B's	C's	D's	E's

APPENDIX 7

Arguments Used in Experiment II

Some False Charges Against Tooth Brushing Practices

We are, no doubt, all aware that one should brush his teeth after every meal. Yet, from time to time, stories by well-intentioned but misguided reporters are published claiming that this healthful practice is unwise. Often these stories seem on hasty examination to be reasonable, but a closer look shows us that they are based on distortions of the facts and are misleading. While no one would claim that brushing one's teeth after every meal will positively prevent tooth decay, it is easy to demonstrate by scientific facts and figures that this practice does reduce the amount of decay and that the practice is in general a very important health measure. Because brushing one's teeth after every meal is so important, and because these distorted arguments against the practice may sometimes sound convincing on the basis of a brief reading, it will be useful to review here some of these misleading arguments against frequent tooth brushing and to show where their errors lie.

Many times the opponents of tooth brushing will quote incomplete and unreliable statistics which indicate that groups who brush their teeth frequently have a higher incidence of tooth decay than those who do little or no brushing. This, to say the least, is a misleading statement based on a statistical fallacy. If we go to the source of such statements we shall find that they rely on comparisons of western populations with small primitive societies of between high and low income groups in our own population. It is true that people in these primitive cultures have less tooth decay than we do, but it would be foolish indeed to say that this is so because we happen to brush our teeth. The poor teeth in civilized, advanced societies and especially in high income groups are due, not to tooth brushing, but to our richer diet that contains large components of citrus fruits, sugars and other substances that cause tooth decay. The brushing is not a cause of our high rate of tooth decay but is, in fact, a necessary corrective measure for this decay-causing diet. It is only by means of dental hygiene, especially brushing the teeth, that we prevent our rich diet from causing even more decay than it does.

Another faulty argument that one sometimes hears is the claim that tooth decay occurs mostly while the food is in the mouth and that, therefore, brushing the teeth after the meal fights decay when it is already too late to do much good. Even though tooth decay does occur mainly while the food is in the mouth, we must recognize that when the meal is over many food particles remain in the mouth lodged between the teeth for long periods after the meal unless they are removed by brushing. This, in fact, is why it is so important to brush our teeth after each meal. Hence, while it is true that decay occurs for the most part while food is in the mouth, this fact is a good reason for, rather than against, frequent tooth brushing. When we fail to brush our teeth after each meal food particles remain in our mouths indefinitely with the result that tooth decay occurs continuously. It is important that such misleading arguments as those which we saw here do not cause us to neglect the simple and highly effective health practice of brushing our teeth after every meal.

Some Disadvantages of Routine Medical Check-Ups

An example of how people can be led into error by oversimplification is furnished by the often-repeated advice that everyone should go to his doctor annually for a thorough physical examination even in the absence of any particular symptoms. This advice usually comes from well-intentioned but naive laymen rather than informed physicians or public health authorities. While the advice seems fine on superficial analysis, a closer examination readily shows that the practice would entail so many dangers that we can be thankful that few people actually follow this ill-considered advice. A little thought on the matter will readily indicate that if everyone did indeed visit his doctor routinely for a thorough check-up once a year even when he was not suffering from any particular symptoms, many bad results would follow. Physicians are already in short supply and such a practice would make it impossible for them to give proper attention to patients in serious need of treatment. Moreover, having to carry out these routine examinations would interfere with the system of

medical specialization from which so many of our recent medical advances have come. Because one hears this ill-advised recommendation regarding routine medical visits repeated so often, it might be well to consider some ill effects of such a practice in a little more detail.

An examination of basic statistics leads us to realize that our medical resources would soon be swamped if indeed everyone visited his physician once a year for a thorough medical check-up. The United States population is approximately 2,000,000,000. The number of practicing physicians in this country is less than 100,000. This means that even if every physician in the country devoted full time to such routine medical examinations each one would have to do almost 2,000 examinations each year which would mean he would hardly have time to give each person a thorough examination, even if all physicians devoted themselves exclusively to this task. So brief an examination would likely miss symptoms that presently are detected with the more thorough examinations that is possible when people typically see their physician only when they have a particular complaint. More important, the physician's time would be so completely monopolized with his routine health check-ups that he would be unable to give adequate attention to really sick people. If we all restrain ourselves from

monopolizing the time of doctors, which is already in heavy demand, all of us will profit in the long run as the physicians can concern themselves most with those who really need their help. Preoccupation with sickness even when in the best of health, would tend to increase the person's health worries. In turn, these worries themselves can bring on illness. Also these routine scheduled annual visits for expensive, thorough check-ups would tend to lessen the likelihood of the patient's going for an immediate check-up when a symptom did suddenly arise. Because of this misleading advice to get a complete check-up once a year is repeated so often, it might be wise to consider some ill-effects of such a practice in more detail. Medical authorities have argued against routine general physical check-ups once each year also because of the great expense involved and the likelihood that the money so spent might be diverted more usefully to other activities promoting health. Medical aid already is very expensive, as is well know, and the proportions of the American citizen's budget which is currently going for medical purposes is becoming increasingly burdensome.

Still another bad effect of flooding the medical facilities with demands for frequent complete medical exam-

inations is that they would interfere with the carefully worked out organization of the medical profession, the balance between specialists and general practitioners and would, as can be seen from the statistics cited above, require that all physicians spend a major part of their time in carrying out these examinations. That such a demand on the time of all physicians would interfere with medical efficiency is obvious when we consider that most of the medical specialities like surgery or internal medicine or neurology are full-time professions and cannot be effectively carried on as a side line. Even devoting himself full-time to his specialty leaves the physician hard pressed for sufficient time to keep up with the most recent developments in his field and for the constant accumulation of experience in his specialty. It would be doubly inefficient to divert the time of such highly trained specialists to giving routine physical examinations. Not only would their own special talents not be utilized, but they would very often lack the more general knowledge needed for most efficiently carrying out general examinations. Hence, when we all exercise a measure of restraint and see our physician only when there is some positive reason for doing so, the general efficiency of the medical profession will increase with the resultant gain for all of us.

Some Harmful Effects of Chest X-Rays

Medical associations and public health authorities have recently begun to question the wisdom of repeated X-ray examinations for detecting TB (tuberculosis). Exposure to radiation--even the small amount encountered in the X-ray examination--has come to be recognized as a health risk which is no longer necessary as far as TB is concerned. Today, TB is so rare in this general population that such "shotgun" techniques as universal chest X-rays are extremely wasteful of needed resources. Furthermore, the chest X-ray has been largely outmoded by newer and safer methods of TB diagnosis. Let us examine in more detail some of the evidence that has led public health officials to advise against the continuation of these campaigns to get everyone to have repeated chest X-rays.

It is particularly unwise to urge that everyone expose himself to the radiation dangers involved in having chest X-ray examinations each year, in view of the fact that TB has become a relatively rare disease in this country, confined chiefly to specific and predictable subgroups of

the population. Today, TB occurs with frequency only in underdeveloped countries. In the U. S. only underprivileged groups with an inadequate diet show any considerable frequency of TB. The resources now devoted to expensive campaigns to give X-ray exams for TB to all Americans each year is considerable. These campaigns to check up on a disease that has actually become quire rare in the general population are costly, not only in money but in the time of skilled medical personnel. The fight against TB could be carried out much better by devoting these resources, now largely wasted, to a concentrated attack on the disease in the underprivileged groups in our society.

One of the most serious hazards involved in X-ray diagnosis is the possibility that repeated exposure to this type of radiation will produce cancer. In recent years there has been an alarming increase in the incidence of bone cancers, leukemia, and related malignant diseases. Studies on the effects of atomic fallout have shown that this alarming increase can be traced, at least in part, to the supposedly small amount of radioactive waste given off by these nuclear bomb tests. Exposure to any kind of radiation--gamma rays, X-rays, etc.--allows powerful invisible particles to penetrate to the vulnerable tissues

deep within our bodies, damaging these tissues and producing malignant tumors or "cancer". Scientists at Stanford Medical School recently exposed monkeys to regular X-ray radiations and found that 85% of these animals developed cancer at the region of exposure after ten such treatments. In humans, X-rays are particularly likely to produce bone cancer and leukemia (a form of cancer affecting the white blood cells.) Because of this grave danger, it is essential that we keep X-ray dosage at a minimum and not undergo X-ray examinations for TB (or any other disease) routinely each year. Rather we ought to confine our exposure to these dangerous radiations to the rare occasions when there is some positive reason for suspecting the disease and upon specific recommendation of a physician.

Another reason for discontinuing these general X-ray campaigns is that several new tests for TB are now in existence, the best known of which is the skin test. This is a simple, safe and inexpensive substitute for the X-ray examination. Many of the foremost centers for TB diagnosis are now relying primarily on these skin tests, thus avoiding the unnecessary exposure of their patients to dangerous dosages of radiation from chest X-rays. Not only is the skin test safer and cheaper than the chest X-ray, but also it is a surer means of detecting TB. Detecting TB symptoms

in chest X-ray photographs still involves an element of subjective judgment. While trained physicians are highly accurate in this detection, the possibility of missing faint symptoms always remains. The skin test has eliminated this possibility of having an error and reduced the detection of any TB signs, however faint, to a certainty. These considerations indicate why health authorities are now recommending that the practice of getting annual chest X-ray examinations for detecting TB be discontinued.

APPENDIX 8

Attitude and Recall Scale Used in Experiment II

PAGE 1

Inside this cover are two short tests. It is necessary that you complete each to satisfy the research jointly conducted by the National Psychological Association and the Bureau of Health. The Bureau of Health is attempting to reach the public through education and needs to know more about public opinion.

This booklet can be completed in a few minutes after which the nature of the research will be explained and any questions you have about the research will be answered.

After you have completed a test, go to work on the next one. Do not return to change answers on a previous test. Your cooperation is appreciated.

Besides wishing to know how you feel about the public health material, we would like to know if you learned anything about the problem. The following questions will be used for research purposes only, and will not affect your course grades. Answer the following question according to what you can remember from the presented material. Do not return and work on the public opinion questionnaire. Use the IBM answer sheet provided.

1. According to the announcement, the incidence of tooth decay is higher in our society than in some where the teeth are not brushed so frequently. This is because:
 - a. primitive people inherit stronger teeth.
 - b. primitive people do not have the enamel worn down by frequent brushings.
 - c. tooth decay is simple not detected as often because of the absence of dentists.
 - d. primitive people may have less rich diets.
 - e. all of the above.
2. The argument that because tooth decay occurs mostly while food is in the mouth and it is usually too late for brushing to do much good is faulty due to:
 - a. the paste leaves a coating if decay fighting film that may remain from one brushing to the next.
 - b. some food remains in the mouth indefinitely unless brushing occurs.
 - c. it takes several minutes for food to break down into decay causing acid so brushing early enough usually stops decay.
 - d. all of the above.
3. Which of the following is the safest way to detect TB?
 - a. blood test.
 - b. skin test.
 - c. X-ray
 - d. none of the above.
4. Annual medical check-ups are advised by:
 - a. health authorities.
 - b. physicians.
 - c. laymen.
 - d. all of the above
5. According to the Bureau of Health statement, TB is not as serious a medical problem because:
 - a. modern drug treatments have made TB cures almost certain.
 - b. too restricted to a small part of the population.
 - c. massive chest X-rays is a cheap and safe way to detect TB.
 - d. the public's awareness of TB symptoms leads to early detection, and the subsequent treatment in early stages of the disease.
 - e. none of the above.

6. Annual checks would, according to the announcements,
 - a. help physicians practice preventive medicine.
 - b. help physicians balance load over the week.
 - c. reduce expense to individual family by treating illness in early stages.
 - d. increase health worries of patients.
 - e. none of the above.
7. Which of the following is characteristic of the X-ray examination:
 - a. cheap.
 - b. certain detection.
 - c. no trained personnel required.
 - d. can be harmful is used too much.
 - e. most economical procedure in long run for large segments of a population
8. Economically, annual check-ups would:
 - a. be economic burden on poor.
 - b. inefficiently use physicians time.
 - c. swamp existing facilities.
 - d. divert money from other more important health practices.
 - e. all of the above.
9. Which of the following is characteristic of other TB detection tests:
 - a. cheaper but not as certain.
 - b. more certain and sure but not as cheap.
 - c. cheaper, certain.
 - d. dangerous because of danger of infection.
 - e. faster.
10. Annual time check-ups would:
 - a. interfere with specialization within medical profession.
 - b. reduce likelihood that patient will as readily see doctor when real symptoms occur.
 - c. require specialists to give examinations for which they may not have the general knowledge required.
 - d. all of the above.

BUREAU OF HEALTH OPINION SURVEY

In order to assess public opinion, the following questionnaire is presented. Please indicate your feelings about the following statements by circling the number that best indicates your belief about the truth of the statement. Answer the questions in the order presented, and do not skip any question. Again, your honest cooperation is appreciated.

Everyone should get a chest x-ray each year in order to detect any possible TB symptoms at an early stage.

/ 1 /	/ 2 /	/ 3 /	/ 4 /	/ 5 /	/ 6 /	/ 7 /	/ 8 /	/ 9 /	/ 10 /	/ 11 /	/ 12 /	/ 13 /	/ 14 /	/ 15 /
/ Definitely /	Probably			Uncertain			Probably			Definitely				
false	false						true			true				

Everyone should brush his teeth after every meal if at all possible.

/ 1 /	/ 2 /	/ 3 /	/ 4 /	/ 5 /	/ 6 /	/ 7 /	/ 8 /	/ 9 /	/ 10 /	/ 11 /	/ 12 /	/ 13 /	/ 14 /	/ 15 /
/ Definitely /	Probably			Uncertain			Probably			Definitely				
false	false						true			true				

Everyone should see his doctor at least once a year.

/ 1 /	/ 2 /	/ 3 /	/ 4 /	/ 5 /	/ 6 /	/ 7 /	/ 8 /	/ 9 /	/ 10 /	/ 11 /	/ 12 /	/ 13 /	/ 14 /	/ 15 /
/ Definitely /	Probably			Uncertain			Probably			Definitely				
false	false						true			true				

Brushing one's teeth can become a harmful practice, if one does it too often.

/ 1 /	/ 2 /	/ 3 /	/ 4 /	/ 5 /	/ 6 /	/ 7 /	/ 8 /	/ 9 /	/ 10 /	/ 11 /	/ 12 /	/ 13 /	/ 14 /	/ 15 /
/ Definitely /	Probably			Uncertain			Probably			Definitely				
false	false						true			true				

Chest x-rays examinations for TB should be taken regularly and often.

/ 1 /	/ 2 /	/ 3 /	/ 4 /	/ 5 /	/ 6 /	/ 7 /	/ 8 /	/ 9 /	/ 10 /	/ 11 /	/ 12 /	/ 13 /	/ 14 /	/ 15 /
/ Definitely /	Probably			Uncertain			Probably			Definitely				
false	false						true			true				

If everyone were to get a complete physical checkup once every year more harm than good would result.

/ 1 /	/ 2 /	/ 3 /	/ 4 /	/ 5 /	/ 6 /	/ 7 /	/ 8 /	/ 9 /	/ 10 /	/ 11 /	/ 12 /	/ 13 /	/ 14 /	/ 15 /
/ Definitely /	Probably			Uncertain			Probably			Definitely				
false	false						true			true				

There are disadvantages to brushing one's teeth too often, as well as too seldom.

/ 1 /	/ 2 /	/ 3 /	/ 4 /	/ 5 /	/ 6 /	/ 7 /	/ 8 /	/ 9 /	/ 10 /	/ 11 /	/ 12 /	/ 13 /	/ 14 /	/ 15 /
/ Definitely /	Probably			Uncertain			Probably			Definitely				
false	false						true			true				

Even though one may not have any reason for suspecting TB, it is a good idea to have frequent chest x-ray examination.

/ 1 /	/ 2 /	/ 3 /	/ 4 /	/ 5 /	/ 6 /	/ 7 /	/ 8 /	/ 9 /	/ 10 /	/ 11 /	/ 12 /	/ 13 /	/ 14 /	/ 15 /
/ Definitely /	Probably			Uncertain			Probably			Definitely				
false	false						true			true				

People should not be urged to have a complete medical checkup as often as once a year.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Definitely			Probably			Uncertain			Probably			Definitely		
false			false						true			true		

The best way to prevent tooth decay is to brush one's teeth frequently.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Definitely			Probably			Uncertain			Probably			Definitely		
false			false						true			true		

Chest x-ray examinations for TB should be taken regularly and often.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Definitely			Probably			Uncertain			Probably			Definitely		
false			false						true			true		

We should all have medical checkups, not only when we feel ill, but also at frequent intervals even when we feel well.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Definitely			Probably			Uncertain			Probably			Definitely		
false			false						true			true		

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