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Choice, Incentive, and Dissonance-Mediated Attitude Change Toward a Reading Assignment

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Choice, Incentive, and Dissonance-Mediated
Attitude Change Toward a Reading Assignment

by

Merlyn S. Swanson

A Dissertation Submitted to the Faculty of the School of Education
of Loyola University in Partial Fulfillment of
the Requirement for the Degree of
Doctor of Philosophy

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1972
The purpose of this study was to test the effects of Choice (whether or not students were given an opportunity to decide whether to do the assignment) and Incentive (whether or not students were promised class credit for doing the assignment) upon the subsequent attitudes of students toward doing a reading assignment and upon the students' comprehension of that reading assignment. Festinger's "theory of cognitive dissonance" was the theoretical framework from which the experimental hypotheses were developed. Six hypotheses were stated, consistent with the following expectations. It was expected that the Choice and Incentive variables would show an interaction in their effects upon students' attitudes toward doing the assignment. If students were given a choice, their attitudes would be more positive when no incentive was provided than when the incentive was provided. If students were not given a choice, their attitudes would be more positive when the incentive was provided than when it was not. It was also expected that comprehension of the reading assignment would be positively related to the incentive variable, and that the choice variable would not affect comprehension.

Eighty junior high school boys were taken from their swimming classes to be tested under the four experimental conditions: (1) Choice-Incentive, (2) Choice-No Incentive, (3) No Choice-Incentive, and (4) No Choice-No Incentive. Half of the subjects were allowed to decide whether
they would do the assignment, and half were not. Half were promised class credit for doing the assignment and half were not, depending upon experimental group.

After completing the assignment, the subjects completed a rating scale designed to assess their attitudes toward doing the assignment and a test of their comprehension of the assignment.

The results did not confirm all of the experimental hypotheses. The Incentive variable had no significant effect upon either the subjects' attitudes toward the assignment or their comprehension of the assignment. The Choice variable had no significant effect upon the subjects' comprehension of the assignment. However, a highly significant relationship was found between the Choice variable and the subjects' subsequent attitudes toward doing the assignment. Those who were given a choice had significantly more favorable attitudes toward the assignment.

These results, although not as expected, were consistent with dissonance theory. It was concluded that the promise of class credit was not an effective incentive. But giving the subjects a choice in the matter of doing the assignment did result in dissonance-mediated attitude change toward the assignment. The main practical implication of these findings was that giving students more opportunities to choose their schoolwork may result in more favorable attitudes toward schoolwork.
ACKNOWLEDGEMENTS

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CHAPTER I
PURPOSE OF THE STUDY

Attitude and Reading Assignments

From the time a child has learned to read for meaning until the time he leaves school, reading assignments are recurrent tasks. Reading assignments may occur in any subject area because reading cuts across subject-area boundaries. Numerous educational objectives are associated with such assignments. These objectives may be grouped into three categories. The first category is made up of subject content objectives. The goal is reading for the information contained in the reading material. Examples of such objectives might be, "to be aware of current political issues" or "to understand the Bill of Rights."

The second category is made up of objectives that relate to the development of reading skills. The goal is that of learning to be a better reader. Examples of such objectives might be "to increase reading comprehension" or "to develop word recognition skills."

The third category is made up of objectives that relate to the development of positive attitudes toward reading activities. While the first two categories of objectives are in the cognitive domain, these objectives are in the affective
domain (Krathwohl, Bloom, & Masia, 1964). The goal is to learn to enjoy reading activities. Some examples of such objectives might be, "to appreciate the value of a reading assignment" or "to enjoy reading about American history." Such attitudinal objectives are very important, and educators are currently showing greater concern for student attitudes. After all, how a student feels about school will affect what he gets out of school. How he feels about reading will affect his responses to reading assignments. Each school experience carries its own attitudinal impact, favorable or unfavorable. These experiences have a cumulative effect which shapes the student's total attitude toward school activities. Thus, it is important for educators to consider the affective aspect of each assignment.

Despite the importance of affective outcomes, the systematic study of attitudes is in its infancy (Ammons, 1969). The present study was motivated by the premise that experimental investigation of affective outcomes can lead to better understanding, prediction, and control of affective outcomes. This understanding will enable educators to provide educational experiences that are more satisfying to students. The study focused upon one particular type of educational experience, the ubiquitous reading assignment. The purpose of the study was to investigate the effects of choice and incentive upon the subsequent attitudes of students toward a reading assignment.
Theoretical Foundations

Theory development is the means by which a behavioral science increases understanding, prediction, and control. Theory is the generalization that allows one to explain behavioral phenomena, and it states the relationships by which one predicts and controls those phenomena (Rescher, 1970). The purpose of the present study was intended to be achieved by extending and improving the theoretical foundations by which one may understand the affective outcomes of reading assignments.

The theoretical framework for the study was Festinger's (1957) theory of cognitive dissonance. His theory is one of the more important theories of attitude change. It also happens to be well suited for this study because it predicted attitudinal consequence of choice and incentive variables. The study was an attempt to test cognitive dissonance effects in a practical academic setting.

Parallels to School Practice

The study simulated, as closely as possible, a real school situation in order to maximize its applicability to actual school practices, while maintaining enough experimental control to obtain meaningful results. The experimental procedure consisted of giving students a reading assignment.
while systematically manipulating Choice and Incentive variables, and then assessing the students' attitudes toward the assignment. Because comprehension of the reading assignment was also an important outcome, it was assessed as a second dependent variable.

School assignments typically require time that the student would devote to preferred activities. To simulate this condition, the assignment given in this study was completed in school during swimming class. All of the subjects had to give up their swimming class in order to do the assignment.

The two experimentally manipulated variables were choice and incentive. Both of these variables may be manipulated in making actual school assignments. A teacher might give students a choice as to whether or not they would do a particular assignment, or choice might be given by allowing students to choose from alternative assignments. Also, the teacher may provide no choices. In this study the choice controlled was the students' freedom to decide whether or not they would do the assignment.

A teacher might provide incentives to students by promising class credit or by giving grades. Actually, grading might not be an incentive for those students who believe that they are incapable of obtaining good grades. Grading might carry a variety of incentive values for various students.
Thus, course credit would seem to be a more satisfactory incentive for experimental purposes. In this study, incentive referred to a promise of course credit for doing the assignment.
CHAPTER II
THE THEORY OF COGNITIVE DISSONANCE

Basic Definitions

Cognitive dissonance is a theoretical construct. It is not something that can be directly observed or measured, but it is a useful concept for predicting and explaining observed behavior. Theoretically, it is an intervening variable that mediates the effects of antecedent conditions upon consequent events, which in this case are attitude changes. The need for such a construct arises when observed attitude changes do not seem to be directly related to antecedent stimulus conditions. Thus, a mediating process is assumed. To a hard-nosed scientist, it does not matter whether the mediating process really exists within the individual. The important factor is for the construct to accurately predict behavior. The theoretical construct of cognitive dissonance is useful to the degree that its occurrence can be determined from objective antecedent conditions and the extent to which the predicted attitude changes can be demonstrated as consequent events.

The original statement of the theory of cognitive dissonance was made by Leon Festinger (1957). His statement will be summarized in this chapter. The term "cognitive" refers to the knowledge, opinions, beliefs, or feelings that
one holds about one's self or one's environment. Cognitive elements, or cognitions, make up one's fund of knowledge. They represent reality to the individual, corresponding to what actually exists in the environment and in the individual's psychological world. Cognitive elements are "knowledges" (Festinger, 1957, Pp. 9). They are the basic units of attitude and belief that the individual holds to be valid.

Cognitive elements are not completely independent, but they may be related to one another in various ways. For dissonance theory, three types of relationships are important. Cognitive elements may be consonant, dissonant, or irrelevant.

If, in the individual's perception, two cognitive elements have nothing to do with each other, then one cognitive element implies nothing about the other, and their relationship is said to be "irrelevant." For example, the individual may know that school begins at nine o'clock, and he also may feel that eighteen-year-olds should be allowed to vote. These two elements of cognition have nothing to do with each other. Thus, they have an irrelevant relation to each other.

Two cognitive elements are relevant to one another if one implies something about the other. According to Festinger (1957, Pp. 18), if two cognitive elements are relevant, their relation must be either consonant or dissonant. Two cognitive elements are said to be "consonant" if, given one element,
the other may be expected to follow. That is, the two elements seem consistent to the individual. For example, one may know that the weather forecast calls for rain and that he brought his umbrella with him. These two cognitive elements have a consonant relationship.

Two cognitive elements are said to be "dissonant" if, given one element, the other may be expected not to follow. That is, the two elements seem inconsistent to the individual. Festinger (1957, Pp. 13) stated it this way: "These two elements are in a dissonant relation if, considering these two alone, the obverse of one element would follow from the other." For example, an individual may know that his grade is precariously low in math, and yet he may choose to go out rather than doing his math assignment. These two cognitive elements have a dissonant relationship.

Dissonance may be better understood by reviewing the sources from which Festinger (1957, Pp. 14) suggests it may arise. (1) Dissonance might arise from logical inconsistency. For example, an individual might believe that he will receive an "A" in history, and he may feel that he is incapable of passing the final exam in that course. The two cognitions are not logically consistent. (2) Dissonance might arise from cultural morés. For example, an individual may know that he cheated on a civics exam, and he may understand that such cheating is morally wrong. His behavior is inconsistent with
what he knows he should do. (3) Dissonance might arise from a specific opinion which, by definition, is included in a more general opinion. For example, an individual may be a supporting member of a liberal student organization, and he may be in favor of consorship of campus speakers. The latter opinion is inconsistent with the more general opinion. (4) Dissonance might arise from past experience. For example, an individual might receive a failing grade on his final report, and he might recall that he passed all of the assignments and tests in that course. His present experience is inconsistent with his past experiences.

Basic Principles

The fundamental assumption upon which the theory of cognitive dissonance is based is that there is a pressure within the individual to produce consonant relationships among cognitions and to avoid and reduce dissonant relationships. The focus of dissonance theory is upon the hypothetical condition "cognitive dissonance" which arises when cognitive elements are in a dissonant relationship. The theory states that the existence of dissonance creates psychological tension or discomfort which will motivate the individual to reduce the dissonance and to avoid further dissonance. The basic postulate of the theory is that the existence of dissonance is
a drive state which motivates the individual to reduce the dissonance and to achieve consonance or consistency in his cognitions.

The theory deals with relations between pairs of cognitive elements. It is recognized that there may be many additional elements of cognition that are consonant with either of the two elements under consideration. But the two-element simplification is sufficient for the theory.

It is also recognized that dissonance may exist in varying degrees. Two factors determine the magnitude of dissonance. The magnitude of dissonance will increase as a function of the importance of the dissonant elements to the individual. It will also depend upon the proportion of relevant elements that are dissonant with the one in question. Thus Festinger (1957, Pp. 18) states that the total amount of dissonance that exists between two clusters of cognitive elements will be a function of the proportion of all relevant relations between the dissonant clusters of elements when the clusters are weighted according to their importance.

Dissonance Reduction

Cognitive dissonance gives rise to pressures to reduce the dissonance, and the strength of those pressures is a function of the magnitude of the dissonance. The drive to
reduce dissonance may result in various modes of dissonance reduction. In general, dissonance reduction is achieved by changing one of the dissonant elements.

One mode of dissonance reduction is changing a behavioral cognitive element. For example, if an individual starts out for a picnic and it begins to rain, he may reduce the dissonance between going on a picnic and knowing that it is raining by going back home.

Another mode of dissonance reduction is changing an environmental element. For example, if an individual who seems likely to become president of an organization feels inadequate for that position, he may reduce the dissonance between the likelihood of becoming president and his feelings of inadequacy by throwing his support over to another candidate.

Another mode of dissonance reduction is adding new cognitive elements or changing existing ones. For example, if an individual who smokes believes that smoking is hazardous to his health, he may reduce the dissonance between smoking and the health hazard by deciding that stopping smoking would result in an unhealthy gain in weight or by minimizing his confidence in the smoking research.

One cannot readily predict from dissonance theory which mode of dissonance reduction an individual will employ. According to Festinger (1957, Pp. 24), cognitive elements have
varying degrees of resistance to change. It may be extremely
difficult for an individual who is "in contact with reality"
to deny the memory of his behavior or to change his perception
of something concrete in his environment. However, opinions
and attitudes may be more susceptible to change. Theoretically,
the individual who is sufficiently motivated to reduce dissonance
will change the element that is least resistant to change.

In dissonance research, the experimenter will,
typically, block all alternative modes of dissonance reduction
except for the cognition that is to be changed. Dissonance
is experimentally created in order to motivate the individual
to change that particular cognitive element. That change
is measured as evidence for the existence of the cognitive
dissonance. For example, college men who were opposed to
the draft were induced to make up a tape recorded speech in
support of the draft. A control group of college men were
asked to read pro-draft material into a tape recorder. The
attitudes of the two groups were measured before and after
they gave their speeches or read the material. It was found
that the group that made up pro-draft speeches changed their
opinions toward the draft more than the control group
(Festinger, 1957, Pp. 104).
CHAPTER III

DEVELOPMENTS IN DISSONANCE THEORY

Proposed Modifications of the Theory

Festinger's initial statement of the theory of cognitive dissonance was followed by a flurry of critical investigation. Initially, the research activity was preoccupied with validation of the theory. As a result a number of modifications or revisions have been proposed. These modifications have been proposed by investigators who accepted dissonance theory in general, but who felt that some revision would improve the correspondence between the theory and the data to which it applied. Generally, the proposed modifications specify limiting conditions within which the theory is valid. The data that prompted the suggested revisions will not be reviewed here.

Brehm and Cohen (1962) proposed that commitment was an essential factor in dissonance theory. They discussed the relation of dissonance theory to conflict theories and reported several studies, building a case for their suggested revision. Brehm and Cohen took the position that if a person makes a decision without commitment, he is free to change his mind, and should experience no dissonance. To the degree that the individual chooses to make a particular commitment, he must live with his decision. Thus the opportunity for the dissonance state
of psychological discomfort exists because of the commitment to the inconsistent element rather than because of the existence of the inconsistent element.

Festinger (1964) took into account the modifications which Brehm and Cohen suggested in describing some modifications of his own. His second book on cognitive dissonance was exclusively concerned with dissonance as it relates to decision making. Festinger accepted the notion of Brehm and Cohen that commitment was necessary in order for dissonance to occur. However, he enlarged the concept of commitment to include not only situations in which an individual chooses to take a public stand, but any situation in which the decision unequivocally affects subsequent behavior. In other words, the commitment need not be overt, but may be implied by the individual's behavior. Festinger also indicated that the amount of dissonance that exists after a decision has been made is a direct function of the number of things a person knows that are inconsistent with that particular decision. The more difficulty or conflict the person has experienced in making the decision, the greater would be the amount of dissonance generated and the tendency to justify that decision afterwards. Dissonance reduction following a decision would take the form of increasing the attractiveness of the rejected alternative. Thus, following a decision, a cognitive process occurs that accomplishes a spreading apart of the attractiveness
of the alternatives available to the decision maker. For example, girls were given information about two hypothetical applicants for the position of vice president of a company. After choosing one of the applicants, the girls tended to enhance the qualities of the chosen applicant as compared to the qualities of the unchosen applicant (Festinger, 1964, Pp. 12-15).

Greenpole (1968) felt that when you strip down dissonance theory, it can be stated in a simple mathematical formulation. Cognitive dissonance is generated by two factors. The first factor is "post decision inconsistency" which is the amount of information that the individual has that is inconsistent with the decision he has made. The second factor is "decision importance" which is simply the subjective importance of the decision to the individual. These two factors should summate to determine the amount of dissonance experienced by the individual. Greenpole's suggestion that decision is essential for dissonance to be generated seems similar to the idea that commitment is a necessary precondition.

Aronson (1968) discussed the importance of individual differences in relation to dissonance theory, and he suggested that self-concept is a major factor in dissonance theory. According to Aronson, the source of dissonance is inconsistency between cognitions and self-concept. Dissonance occurs when
a person behaves in a manner that is inconsistent with his views of himself as a person. This proposed modification restricts the applicability of dissonance theory considerably. Dissonance theory would not apply to situations in which the individual has inconsistent cognitions about the external environment. It would only apply to situations in which one of the inconsistent cognitions relates to the individual's self-concept.

Bramel (1968) similarly emphasized the individual in relation to dissonance theory. He did not agree with Aronson that the individual's self-concept must be directly involved in the dissonance. Bramel felt that the individual's self-concept need be only indirectly involved. He stated that dissonance arises when (1) the individual encounters information that disconfirms an expectation, or (2) when he discovers that he has chosen incompetently or immorally. Dissonance is "a type of anxiety" which is a feeling of personal unworthiness.

Zimbardo (1969) related dissonance theory to instrumental behavior theory. His concern was not with the conditions under which dissonance is generated but with the factors that determine the amount of dissonance generated. He stated that dissonance will be greater as (1) the perceived freedom of choice increases, (2) the initial drive level increases, (3) the severity of anticipated future deprivation
or stimulation increases, and (4) the incentive for justification of commitment to deprivation or excessive stimulation decreases. The measurement of differential amounts of dissonance is far from precise. Further research will be required to refine both theory and methodology regarding the differential measurement of dissonance.

Criticisms of the Theory

Some authors have been particularly critical of the theory of cognitive dissonance. They have said that the theory is inadequate or unnecessary. McGuire (1966, Pp. 492) described the situation. "Over the past three years, dissonance theory continued to generate more research and more hostility than any other one approach."

The strongest criticism was the critical review by Chapanis & Chapanis (1964). These authors criticized the theory on the basis that it was too simple to account for "the essentials of a complex social situation." They also criticized the experimental validation of the theory on two bases. First, they felt that no valid conclusions could be drawn from cognitive dissonance research because the experimental manipulations were too complex and the crucial variables too confounded. Second, they noted a number of methodological problems among the research studies.
There have been a number of replies to Chapanis and Chapanis' criticisms. Kiesler, Collins, and Miller (1969) replied that Chapanis and Chapanis were misled by the simplicity of Festinger's hypothesis. Festinger emphasized a two-element simplification for research purposes, but this two-element simplification was not intended to represent the complexity of a real social situation. Chapanis and Chapanis also failed to take into account some important factors in their evaluation of the theory, such as the amount of data that has been accounted for by the theory. Criticisms on the basis that the theory departs from customary views of behavior are unjustified. Silverman (1964) also replied to Chapanis and Chapanis' criticisms. He stated that, while Chapanis and Chapanis criticized dissonance theory, they did not present any satisfactory alternative explanation for the findings. Also, many of the "methodological inadequacies" were acceptable experimental procedures.

Rosenberg has been an outspoken critic of dissonance theory. His first criticism (Rosenberg, 1965) was published at the same time as a criticism by Janis and Gilmore (1965), and the two articles were remarkably parallel. Both said that some dissonance data could be accounted for by experimental contaminants, and both presented a study to support their positions. One contaminant called "affect arousal" by Rosenberg was similar to what Janis and Gilmore called
"biased scanning." Their notions were that experiments on counter-attitudinal advocacy predisposed subjects to think of all the arguments they could in order to justify what they were doing. The larger the incentive, the greater would be the subject's motivation to think up such arguments. However, if the incentive were too big, it would cause suspicion and fear of being exploited. Thus there would be a negative incentive effect (Janis & Gilmore, 1965). "Evaluation apprehension", which is a desire to show the experimenter that one cannot be bribed, may also account for negative incentive effects (Rosenberg, 1965). These arguments have led to considerable debate as to whether dissonance effects can be explained on the basis of experimental contaminants (Rosenberg, 1966a & 1966b). Some review authors have shown that there is considerable support for dissonance theory in studies that have eliminated alleged sources of contamination (Aronson, 1966; Kiesler, Collins, & Miller, 1969).

Bem (1967a & 1967b) has proposed another interpretation of dissonance data based upon "self-perception." According to his argument, an individual observes his own behavior and interprets his own internal status in terms of what he sees himself doing. Thus, if an experimenter can induce a subject to behave in some manner that is contrary to the subject's attitudes, that subject will reinterpret his attitude in terms of his behavior. Subjects who comply
with an experiment for a large reward are less likely to believe that their behavior reflects their true attitudes than subjects who comply for a small reward. Mills (1967) and others have pointed out that this alternative explanation could apply to only a small portion of the dissonance studies, and so it is less satisfactory than the dissonance explanation.

Other criticisms of dissonance theory will be mentioned in the next section, but those summarized in this section have been the major attacks upon the theory. They have not done mortal damage to the theory. In fact, they have probably stimulated a considerable amount of supportive research.

Current Status

Examination of the literature leads to the conclusion that the theory of cognitive dissonance has been one of the most controversial and influential theories in the area of attitude change. Almost all of the research has been theory oriented, and cognitive dissonance has been essentially a laboratory phenomenon. There have been very few attempts to demonstrate cognitive dissonance effects outside of the laboratory. The many criticisms of the theory have not produced satisfactory alternative explanations for cognitive dissonance data. However, they have resulted in refinement and modifications.
Recent reviews (Aronson, 1963; Kiesler, Collins, & Miller, 1969; Shaw & Kostanzo, 1970) note that dissonance theory has continued to gain importance and scientific respectability. These same authors have noted some problems in the current status of the theory which will require additional attention. The most frequently mentioned problem is that of ambiguity in the definitions of cognitive dissonance concepts. For example, Pepitone (1966) noted that it is essentially impossible to specify what is a "cognitive element". Neither can one clearly specify when one cognition is "psychologically obverse" in its relationship to another. Perhaps what is psychologically inconsistent to one individual will not be to another.

Another problem is that of specifying just when and how dissonance reduction behavior will occur. There are apparently varying degrees of cognitive dissonance, and the theory does not permit measurement of dissonance other than on an ordinal scale. When dissonance is present, more than one mode of dissonance reduction may be available to the individual. The theory does not provide a clear means for determining which mode of dissonance reduction will be employed. Typically, experimenters have found it necessary to block all but one avenue for dissonance reduction.

Finally, the need for several revisions to the theory which have already been discussed suggests that the theory,
in its current form, does not sufficiently predict all of the data. In its simplicity, the theory of cognitive dissonance has failed to recognize several important variables. Some of these variables have been identified and may be incorporated into the theory at some future time.

In summary, the theory of cognitive dissonance has proved its value in predicting attitude change. It is far from perfect, but it has been undergoing a refinement process. Judging from the literature, there is considerable current interest in dissonance theory. It is expected that additional refinement will be made in the future, and that the theory of cognitive dissonance will become an increasingly useful tool for understanding human attitude changes.
CHAPTER IV
THE EFFECTS OF CHOICE AND INCENTIVE
IN DISSONANCE RESEARCH

Choice as an Independent Variable

Choice is a central factor in dissonance theory (Aronson, 1966). The literature more frequently refers to "decision", but the term "decision" implies that there has been a choice (Greenwald, 1968). Many of the studies of cognitive dissonance have used choice as an independent variable. This was the subject of Festinger's 1964 work. The amount of dissonance that results from a choice or decision was described as a direct function of the number of cognitions the individual has that are inconsistent with the choice or decision. The dissonance is manifest by a tendency to justify the decision after it has been made. Justification is a dissonance-reduction mechanism which may be accomplished by increasing the attractiveness of the chosen alternative or by subjectively decreasing the attractiveness of the rejected alternative (Festinger, 1964).

Considerable support for this postulate may be found outside of Festinger's own works. One type of supporting evidence comes from studies employing the "forced compliance paradigm" which has to do with the situation in which the subject has been induced to behave in a manner that is contrary
to his beliefs or attitudes. Subjects who have chosen to comply with experimenters' requests that they take a public stand in opposition to their private belief tended to see their counter-attitudinal position as more attractive (Rabbie, et. al., 1959; Kiesler & DeSalvo, 1967; Kiesler, Pallak, & Kanouse, 1968). Similarly, subjects who have been induced to do an unpleasant task have tended to see that task as more pleasant (Brehm, 1959; Brehm, 1960; Cook, 1969; Helmreich, 1968).

Another type of supporting evidence comes from studies in which changes in individuals' attitudes toward choice alternatives have been measured after the individual has made a choice. Subjects' attitudes toward chosen appliances (Brehm, 1956), toys (Brehm & Cohen, 1959), and job candidates (Fenner, Fitch, & Weik, 1966) shifted to favor the chosen alternative after the decision had been made. Gerard (1967a) showed that the amount of attitude change due to dissonance was greater under conditions of high dissonance (when the alternatives were close in value) than under conditions of low dissonance (when alternatives were disparate in value).

A third type of supporting evidence is more closely related to the proposed study. Studies in which the freedom of choice was the independent variable have shown that under conditions of greater choice, more dissonance results than under conditions of less freedom of choice. Subjects who read a negative evaluation to another person changed their
opinion of that person more negatively under Choice conditions than No Choice conditions (Davis & Jones, 1960). Subjects who wrote counter-attitudinal essays on "Why I Would Like to Become a Catholic" showed more pro-Catholic attitude change under Choice conditions than under No Choice conditions (Brock, 1962). Subjects who administered shock to others minimized the shock more under Choice than No Choice conditions (Brock & Buss, 1962). Subjects who performed a boring task minimized the boredom of the task more under Choice conditions than under No Choice conditions (Ryterband, & King, 1966). The recently published book by Zimbardo (1969) contains a number of studies employing choice as an independent variable. Some factorial studies using choice conditions as one of the variables will be discussed later.

A problem arises with the choice variable because there are degrees of freedom of choice. The greater the freedom of choice allowed, the more subjects the experimenter is likely to lose. This loss of subjects is undesirable. The less the freedom of choice allowed, the less will be the difference between the Choice and No Choice conditions and the power of the experimental test. This loss of power is undesirable.

Some studies employing Choice-No Choice conditions lose subjects from the Choice condition. According to Zimbardo (1969), the validity of the Choice condition must be questioned if subjects do not refuse to submit to the experiment. This
loss of refusing subjects is common in dissonance research, and it has been criticized as introducing bias in the subject selection. Zimbardo argued that bias could enter only if those who refused had lower thresholds for the relevant stimulation about which judgements were to be made. He showed that the refusing subjects were not affected any differently by food deprivation, dislike for eating grasshoppers, thirst, pain, and other stimulation about which judgements were to be made as the dependent variables in his research.

It is difficult to have a Choice condition without running the danger of losing subjects. Some investigators such as Linder, Cooper, and Jones (1967) have used just enough inducement to assure that no subjects would be lost. However, this procedure reduces the freedom of choice and, with it, the difference between the Choice and No Choice conditions. In the current study, a real choice was offered to those subjects in the Choice condition, thus allowing them to refuse to participate.

Incentive as an Independent Variable

Another important independent variable in dissonance research is incentive. The term "incentive" has become standard in dissonance research, although this variable has also been called payment, reward, reinforcement value, etc.
The amount of dissonance that results from a decision depends, in part, upon the amount of incentive given to select the chosen alternative. Individuals who make a choice with High Incentive for making that particular choice will experience less dissonance than individuals who make a choice under Low Incentive conditions (Lawrence & Festinger, 1962). The dynamics of the incentive variable are that individuals who have less incentive for making a decision have less justification for making that decision, and thus, experience more dissonance following the decision. There is considerable experimental support for this postulate in addition to the studies described in Lawrence and Festinger's work.

Mills (1958) found that children who cheated with Low Incentive (toy value) changed their attitude to become more lenient toward cheating than children who cheated with High Incentive. However, those who did not cheat with Low Incentive became more severe in their attitudes. Festinger and Carlsmith (1959) found that subjects in a Low Incentive ($1) group who did a boring task tended to minimize the boredom of the task and had more favorable attitudes than did a High Incentive ($20) group. Students who felt overpaid on an hourly rate for doing an interviewing task produced more than those who felt equitably paid. But when students felt overpaid on a piecework basis, their productivity was less than when they felt equitably paid (Adams & Rosenbaum, 1962).
Brehm (1962) showed that subjects who committed themselves to food or water deprivation rated themselves as less hungry or thirsty when paid $1 than when paid $5. Students who were induced to write an essay supporting an idea with which they disagreed changed their opinion more under a Low Incentive (payment) condition than under a High Incentive condition (Gerard, 1967b). Students who were underpaid (10¢) for doing an interviewing job tended to see the job as more interesting than students who were equitably (25¢) paid (Lawler & O'Gara, 1967). When committed to make a statement against their own beliefs, students in the Low Incentive ($ .50) condition showed more attitude change than students in the High Incentive ($2.50) condition (Helmreich & Collins, 1968).

The incentives employed in a school are seldom monetary. They are usually "grades" or "credit". No cognitive dissonance studies have been found that employed grades as incentives. One experiment used grades to vary the importance of the subjects' decisions, but the way that the grades were used did not apply to the incentive variable (Mills, et. al., 1959). Only one study has been found that employed class credit as an incentive (Holmes & Strickland, 1970). The effects of the class credit variable were similar to those found in other studies employing monetary incentives. That study will be described later in this chapter.

The timing of the incentive is a critical factor in
dissonance research. This fact was discovered when Rosenberg (1965) failed to find dissonance effects under certain temporal conditions. Subsequently, the effects of timing have been further studied and are better understood. Linder, Cooper, and Jones (1967) reported two studies in which students were asked to write counter-attitudinal essays under Choice and No Choice conditions and High ($2.50) and Low ($ .50) Incentive conditions. Subjects were informed about the incentive either before or after making their decisions. The inverse relationship between incentive and attitude change occurred only when the subjects were informed about the incentive before making their decisions whether or not to comply with the experiment. When they were informed about the incentive after making their decisions, a direct relationship was obtained. Rossomando and Weiss (1970) also assessed the influence of timing of the incentive variable. Students were told that they would receive $1.50 or $5.00 for writing a counter-attitudinal essay in favor of raising tuition. The inverse relation between incentive and attitude change was found only when the subjects were paid after the measurement of attitude change was made. When the subjects were paid before measuring attitude change, a direct relationship was found.

Two additional studies might easily be confused as applying to this same incentive-time interaction, but they do
not. Helmreich (1968) found an interaction between amount of justification and the timing of the justification. Justification has not been equated to incentive, and should not be confused with the incentive variable. Cook (1969) found a time-incentive interaction. However, the time variable was not the timing of the incentive, but the timing of the attitude assessment.

The current study did not employ the kind of monetary rewards that have served as incentives for most dissonance studies. Rather, course credit was promised as an incentive. Whether course credit would be equivalent to monetary rewards was not known, but it is the kind of incentive most frequently used in schools. The hypotheses assumed that the two kinds of incentives would have equivalent effects.

No time variable was included in the study. The experimental procedure took into account the effects of timing upon the relationship between incentive and attitude change so that the effects of the incentive would not be negated by improper timing. The subjects were informed of the incentive before deciding whether to comply, and the incentive object (course credit) was not given before the attitude change measurement.
Choice x Incentive Interaction

Three recent dissonance studies have varied both choice and incentive conditions with similar results. When subjects were given freedom of choosing whether to comply, incentive size has been inversely related to attitude change. But when subjects were given no choice, incentive size has been directly related to attitude change. Linder, Cooper, and Jones (1967) found these relationships in an experiment in which students were asked to write a counter-attitudinal essay advocating a ban on college speakers. The incentives were $0.50 and $2.50. Holmes and Strickland (1970) employed three incentive conditions in which students were told that they would receive zero, one, or two hours of experiment credit for their psychology class. Half of the subjects were given a choice as to whether or not they would participate, and half were given no choice. A pre-test showed that the attitudes of the volunteers and the non-volunteers were not different. The subjects wrote a counter-attitudinal essay on student involvement in university affairs. In the Choice condition, attitude change was inversely related to incentive. But in the No Choice condition, attitude change was directly related to incentive. Sherman (1970) did a similar experiment in which students were paid $0.50 or $2.50 for writing a counter-attitudinal essay against instituting a week-long
reading period. In the Choice condition, attitude change was inversely related to incentive. But in the No Choice condition, a positive relationship was found.

In the three studies reported above a similar interaction between Choice and Incentive conditions was found. When the subjects were given an opportunity to choose whether or not to participate, dissonance was created because they had chosen to perform a somewhat disagreeable task. Dissonance theory predicted that cognitive dissonance would be greater the smaller the incentive because greater incentive would provide greater justification for making the affirmative choice. Thus attitude change would be greater as the incentive was decreased, yielding an inverse relationship between incentive and attitude change. When the subjects were given no opportunity to choose whether or not to participate, dissonance was not created by choosing to do a disagreeable task. Under the No Choice condition, greater incentive tended to result in greater attitude change, yielding a direct relationship between incentive and attitude change.

For this study, an interaction between choice and incentive effects upon dissonance-mediated attitude change was predicted. The hypotheses for the study were consistent with the findings of the studies reported above.
Effects of Choice and Incentive Conditions

Dissonance research is generally concerned with attitude change. Cognitive dissonance brings about a readiness to perceive certain stimulus conditions in dissonance-reducing ways. The specific attitude change that occurs depends upon the nature of the experiment, and several types of changes have been shown to result from the freedom of choice variable. Subjects who have written counter-attitudinal essays have changed their attitudes more in the direction of their written statements under the choice condition than under the No Choice condition, except when incentives were added to the experimental procedure (Brock, 1962; Linder, Cooper, & Jones, 1967; Holmes, & Strickland, 1970; Sherman, 1970). Subjects who have read a negative evaluation to a person had more negative attitude change under the Choice condition than under the No Choice condition (Davis & Jones, 1960). Subjects who administered shocks to another person minimized the painlessness of the shock more under the Choice condition than under the No Choice condition (Brock & Buss, 1962). Subjects who engaged in boring tasks had more positive attitudes toward the tasks under the Choice condition than under the No Choice condition (Brehm & Cohen, 1959; Ryterband & King, 1966).

The present study predicted that Choice and No Choice conditions would affect dissonance-mediated attitude change.
toward an assigned reading task. Thus, attitude toward the reading task was one of the dependent variables. A performance variable, comprehension of the reading material, was the other dependent variable. High and Low choice conditions have not been shown to affect such a performance variable. Thus, it was predicted that the choice condition would not affect comprehension of the reading material.

The incentive variable has been shown to be an important variable in studies of dissonance-mediated attitude change. The specific effects of incentive depend upon the nature of the experiment. Subjects who advocated a counter-attitudinal idea in an essay or verbal statement changed their opinion to conform more closely to the one expressed under Low Incentive conditions than under High Incentive conditions, except when they were not allowed freedom of choice (Festinger & Carlsmith, 1959; Gerard, 1967; Linder, Cooper & Jones, 1967; Helmreich & Collins, 1968; Holmes & Strickland, 1970; Rossomando & Weiss, 1970). The greater the incentive to cheat, the more severe became the attitudes of children who resisted temptation and the more lenient became the attitudes of those who cheated (Mills, 1958). The smaller the monetary incentive for food or water deprivation, the more subjects minimized their hunger or thirst (Brehm, 1962). The greater the payment, the more negative were the eventual attitudes of subjects toward a dull proofreading task.
But measures of performance did not vary significantly (Cook, 1969). Subjects paid by the hour produced more when they perceived their pay as inequitably large. But when paid on a piecework basis, they produced less when they perceived their pay as inequitably large (Adams & Rosenbaum, 1962). Subjects who were paid an inequitably low wage tended to see their interviewing jobs as more interesting and less important than did better paid subjects. They also produced more interviews, but the interviews were poorer in quality (Lawler & O'Gara, 1967).

The current study predicted that incentive conditions would affect dissonance-mediated attitude change toward an assigned reading task. That is, the measured attitudes of the subjects toward the task would show an interaction between Choice and Incentive conditions. Under the High Choice condition, the subjects' attitudes toward doing the reading assignment would be directly related to the amount of incentive provided. Under the No Choice condition, the subjects' attitudes toward doing the assignment would be inversely related to the amount of incentive provided.

Some studies have shown effects of incentive conditions upon performance measures, but there has not been consistency in the kind of performance for which the incentive was given. Cognitive dissonance, or attitude change resulting from dissonance, has not been shown to have any systematic affect
upon performance measures. Thus the present study predicted that the Incentive conditions would affect performance on the reading task, but Choice conditions would not. The subjects' comprehension of the reading assignment would be directly related to the amount of incentive provided, irregardless of Choice condition.
CHAPTER V
DEVELOPMENT OF THE CURRENT STUDY

Pilot Study

A pilot study was conducted as part of the development procedure for the current study. The pilot study employed only one independent variable, a Choice and No Choice variable. No incentive variable was employed. There were two dependent variables. One was the subjects' judgements regarding the difficulty of the reading assignment, and the other was the subjects' comprehension of what they had read. Dissonance was varied by manipulating the choice conditions. Two hypotheses were tested relating dissonance effects to each of the two dependent variables.

(1) Subjects who perceive that they have had a choice in the matter of reading difficult material will perceive that material as less difficult than subjects who have been given no choice.

(2) Subjects who perceive that they have had a choice in the matter of reading difficult material will comprehend that material better than subjects who have been given no choice.
The subjects were randomly drawn from two fifth grade classes in an elementary school located in a middle-class community. The subjects were divided into two groups, with ten students in each group. The two groups were matched on the basis of sex and reading comprehension scores. Scores obtained on the Iowa Silent Reading Test were used for matching purposes. Table 1 shows the data upon which the two groups were matched.

The reading material used for this pilot study was the story part of the Traxler High School Reading Test. At the end of the story, two questions were typed in order to measure the subjects' estimation of the difficulty of the reading material. Twenty comprehension questions about the reading material were reproduced separately. These questions were given to the subjects after they had finished the reading and had completed the two questions about its difficulty. Thus the comprehension questions could not influence the subjects' judgement about the difficulty of the reading material. These materials may be seen in Appendix A.

The two groups were tested during their regular school classes. The No Choice group was given the No Choice instructions in which they were simply told that they would do a difficult reading task. The Choice group was given Choice instructions in which they were allowed to decide whether or not to read the material. These instructions follow.
### TABLE 1

DATA UPON WHICH GROUPS WERE MATCHED
FOR THE PILOT STUDY*

<table>
<thead>
<tr>
<th>CHOICE GROUP</th>
<th>NO CHOICE GROUP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Subject Number</strong></td>
<td><strong>Sex</strong></td>
</tr>
<tr>
<td>1</td>
<td>F</td>
</tr>
<tr>
<td>2</td>
<td>M</td>
</tr>
<tr>
<td>3</td>
<td>F</td>
</tr>
<tr>
<td>4</td>
<td>M</td>
</tr>
<tr>
<td>5</td>
<td>F</td>
</tr>
<tr>
<td>6</td>
<td>F</td>
</tr>
<tr>
<td>7</td>
<td>F</td>
</tr>
<tr>
<td>8</td>
<td>M</td>
</tr>
<tr>
<td>9</td>
<td>M</td>
</tr>
<tr>
<td>10</td>
<td>F</td>
</tr>
</tbody>
</table>

4 Male       Mean: 6.94       4 Male       Mean: 6.92
6 Female     S.D.: 1.37       6 Female     S.D.: 1.46

* Iowa Tests of Basic Skills, Reading Test
I am here to find out just how well fifth graders can do on a difficult reading task. In order to determine this, I have a story here for you to read. When you get this story, you simply read it at a natural speed. At the end of the story you will find two questions. After you have read the story and answered the two questions, raise your hand, and I’ll come to your desk and give you another sheet with some more questions on it.

(For the Choice condition only.) Now I don’t want anyone to feel like he has been forced to do this. Whether or not you take part in this experiment is up to you. So I’m going to pass out some slips of paper. Just take one slip, put your name on it, and indicate whether you will take part. If you mark yes, of course, I’ll give you the reading. But if you mark no, just remain at your seat and work quietly.

According to the first hypothesis, the subjects in the Choice condition should have perceived the reading material as more difficult than subjects in the No Choice condition. Responses to the two questions designed to measure perceived difficulty failed to confirm this prediction. Chi Square analysis indicated that the differences between the groups were not significant.

According to the second hypothesis, the subjects in the choice condition should have comprehended the reading material better than those in the No Choice condition. The data did not support this prediction either. The mean raw score for the Choice group was 10.1 with a standard deviation of 3.59. These figures for the No Choice group were 9.9 and
The difference between these means obtained a t value of 1.89 which was not significant. Table 2 shows the comprehension data.

Discussions with the students following the experiment led to some conclusions about the experiment. First, the measure of estimated reading difficulty was not successful. The questions designed to measure estimated difficulty level did not discriminate well because almost all of the subjects chose the same response. Secondly, the comments of the subjects suggested that their judgements regarding the difficulty of the reading material may not have been influenced by the experimental conditions. However, their attitudes about reading the material seemed to be noticeably affected by the different choice conditions. Third, the low scores on the comprehension test suggested that the reading material was too difficult for the fifth-grade students.

The conclusions from the first pilot study suggested that a similar procedure could be employed with either older subjects or simpler reading material, if a satisfactory measure of the subjects' attitudes toward the reading assignment could be developed. A measure of attitude toward doing the reading assignment would relate more directly to dissonance theory as a dependent variable than the measure of estimated difficulty of the reading material. Subjects who disliked doing the reading assignment did not necessarily tend to see it as more difficult.
TABLE 2

COMPREHENSION SCORES OBTAINED
FROM THE PILOT STUDY

<table>
<thead>
<tr>
<th>CHOICE GROUP</th>
<th>NO CHOICE GROUP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject Number</td>
<td>Raw Score</td>
</tr>
<tr>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>10</td>
</tr>
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<td>5</td>
<td>10</td>
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<td>6</td>
<td>12</td>
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<tr>
<td>7</td>
<td>17</td>
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<tr>
<td>8</td>
<td>11</td>
</tr>
<tr>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>10</td>
<td>13</td>
</tr>
</tbody>
</table>

Mean: 10.1  
S.D.: 3.59  
Mean: 9.9  
S.D.: 2.86
Instrument Development

A two-part rating scale was designed to measure attitudes toward the reading assignment. The scale contained two items with five choices each, arranged on a Likert scale. Both items were designed to assess the subjects' degree of liking or dislike for the assignment. Scores on the two items were summed to yield total scores from 2 to 10. A small trial run was made to test the effectiveness of this instrument.

Six seventh grade boys were taken from their gym classes and were given the story part of the Traxler High School Reading Test. Three of the subjects were given the Choice instructions, and three subjects with matching reading test scores were given the No Choice instructions. They read the assignment and filled out the attitude rating scale. The materials used appear in Appendix B.

The subjects' responses are shown in Table 3. There was a good spread of chosen responses, suggesting that the questions could discriminate variations in attitude. The attitude scores ranged from a score of 6 to a score of 10. The groups were far too small for this trial run to be considered a pilot test of any hypotheses. But the results suggested that the attitude scale would be adequate as a measuring instrument for the purposes of the current study.
TABLE 3

RESPONSES TO THE ATTITUDE RATING SCALE

<table>
<thead>
<tr>
<th>Subject</th>
<th>Choice Group</th>
<th>No Choice Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hollister</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Benson</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Fehring</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Cohen</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Holste</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Labahn</td>
<td>6</td>
<td>3</td>
</tr>
</tbody>
</table>

| Question # 1     | 4            | 3               |
| Question # 2     | 3            | 3               |
| Attitude Score   | 7            | 6               |

|                | 10           | 6               |
|                | 6            | 6               |
|                | 6            | 6               |
CHAPTER VI

EXPERIMENTAL PROCEDURE

Development of Research Hypotheses

In the current study, the subjects were taken from their swimming classes to be given a reading assignment under varied experimental conditions. Following the reading, they completed the attitude rating scale and a test of their comprehension of the reading material. The two dependent variables assessed were the subjects' attitudes about doing the reading assignment, and their comprehension of the assignment.

The subjects were divided into four groups to be called Choice-Incentive, Choice-No Incentive, No Choice-Incentive, and No Choice-No Incentive. These four groups represented every possible combination of the two independent variables. Choice and No Choice represented whether or not the subjects were given an opportunity to choose not to do the assignment. Incentive and No Incentive represented whether or not the subjects were promised course credit for doing the assignment.

It was expected that subjects in the Choice-No Incentive condition would experience cognitive dissonance. The perception that they have had a choice would be dissonant with the perception that they would have preferred to go to
swimming class. This dissonance would be a drive stimulus for these subjects to change their attitude toward the reading assignment. They would tend to see the assignment as more desirable, and thus reduce the dissonance. Therefore, in the absence of incentive, it was expected that the Choice group would show a more positive attitude toward the reading assignment than the No Choice group.

Subjects in the No Choice-No Incentive group would not experience dissonance about complying with a relatively undesirable activity. Since they were given no choice, they would not have a cognition that they had chosen to do the task. They would not be motivated to enhance the desirability of the reading task. Thus, in the absence of incentive, their attitude toward the reading assignment would be more negative than that of the Choice-No Incentive group. These predictions were strongly suggested by the literature.

Predictions concerning the subjects who were given the incentive were more tenuous. Research data were not available to show whether "class credit" would be consistently as effective an incentive as monetary rewards have been. The research hypotheses assumed that the effects of class credit upon attitude change would be equivalent to the effects of monetary rewards.

Half of the subjects were told that they would receive class credit for doing the reading assignment. This
incentive should have reduced the dissonance of the subjects in the Choice condition because it provided justification for choosing to comply with the relatively undesirable reading activity. Thus subjects in the Choice-Incentive condition should not have been motivated to enhance their perception of the desirability of the reading assignment as much as subjects in the Choice-No Incentive group.

Subjects who were given the incentive and were given no choice should have had more positive attitudes toward the reading assignment than subjects who were given no choice or incentive, simply because there was more to be gained from the reading assignment in the No Choice-Incentive condition than in the No Choice-No Incentive condition. It followed that a significant interaction was expected between Choice and Incentive conditions on the measure of attitude. No significant main effects were predicted. If promising class credit were not equivalent to monetary rewards as an incentive, a different pattern of effects would be obtained. The incentive variable would have no affect upon subsequent attitudes toward the reading assignment. There would be no significant main effect of the incentive variable and no significant interaction. However, there would be a significant main effect of the choice variable. Both groups of subjects in the Choice condition would have been expected to show more positive attitudes toward the reading assignment than
both groups of subjects in the No Choice condition.

The measure of performance was the subjects' scores on a test of their comprehension of the reading assignment. The presence or absence of dissonance relative to doing the assignment does not carry direct implications regarding performance. Thus, the Choice conditions were not expected to affect performance on the reading task.

If promising class credit for doing the reading assignment were an effective incentive, then by definition, the incentive would motivate the subjects to perform better. Thus the subjects in the Incentive groups were expected to do better on the performance measure than subjects in the No Incentive groups.

The hypotheses for the two analyses follow. They are based upon the above rationale.

\[ H_1: \] Students who choose to do a reading assignment and students who are not given a choice will not differ significantly in their attitudes toward doing that assignment.

\[ H_2: \] Students who are promised course credit for doing a reading assignment and students who are not promised course credit will not differ significantly in their attitudes toward doing that assignment.

\[ H_3: \] There will be a significant interaction between choice and course credit conditions in their effects upon subsequent attitudes toward doing the reading assignment.
H₄: Students who choose to do a reading assignment and students who are not given a choice will not differ significantly in their comprehension of that reading material.

H₅: Students who are promised course credit for doing a reading assignment will comprehend that reading assignment significantly better than students who are not promised course credit.

H₆: There will be no significant interaction between choice and course credit conditions in their effects upon subsequent comprehension of that reading material.

Subjects

The subjects for this study were eighty boys in the seventh and eighth grades at a suburban junior high school. Only boys who had scored from the thirtieth to the ninetieth percentiles on the Reading Comprehension section of the Iowa Test of Basic Skills were included in the sampling population. Because one of the dependent variables was a reading comprehension measure, it was desirable to avoid large variances in reading comprehension skill. The greater the within-group variability due to differences in skill, the greater would be the error variance in the analysis. Generalizations from this study would apply to students within the mid-range of reading skill.

The subjects were assigned to the four experimental groups on a random basis. Three groups had ten seventh graders and ten eighth graders, and one group had nine seventh and eleven
eighth graders. It was assumed that the pre-experimental attitudes of students within the mid-range of reading skill were relatively homogeneous, and that random assignment assured that between-group variations in attitudes would be due solely to chance.

Instruments

The reading assignment was the Story Comprehension section of the Traxler Silent Reading Test, Form 1 (Traxler, 1934). The story was reproduced so that the assignment would not look like a test. The attitude scale developed for this study was printed at the end of the story.

Ten comprehension questions which were part of the test were reproduced separately. They were given to the subjects after they had read the story and completed the attitude measure. Thus, the comprehension questions would not affect the subjects' attitude ratings. The materials used appear in Appendix C.

Experimental Design and Method

The study followed a 2 x 2 factorial design which provides for two experimental variables. The two variables, choice and incentive, were independently assigned to four experimental groups.

The subjects were taken from their swimming classes
in small groups during a one-week period. The experimental instructions were read to them when they arrived at the experimenter's room. These instructions varied according to experimental condition as follows:

I have asked you here to do a reading assignment. This (hold up reading material) is the story that I want you to read. After you have finished the story there will be questions for you to answer about it.

(Incentive conditions only) I will give the results to your language arts teacher so that you will get credit for the assignment.

(Choice condition only) Now I don't want anyone to feel that he has been forced to do this. If you want, I will make out a pass so that you can go back to gym class.

Now I'll pass out the story. Please write your name on the front and read it at your own pace. At the end of the story you will find two questions. When you have answered them, give me back the story and I will give you some other questions to answer. Are there any questions about what you are to do?

The Choice condition allowed students to not participate, and twenty-two students chose to return to their swimming classes. Percentile scores from the Reading Comprehension section of the Iowa Tests of Basic Skills were available on all of the subjects. Means and standard deviations were calculated from these data in order to determine that the four experimental groups were similar in reading comprehension skill. Table 4 shows these data. The means ranged
TABLE 4

MEANS AND STANDARD DEVIATIONS
OF READING TEST PERCENTILE SCORES
FOR THE FOUR EXPERIMENTAL GROUPS

<table>
<thead>
<tr>
<th></th>
<th>CHOICE</th>
<th>NO CHOICE</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incentive</td>
<td>Mean = 59.30</td>
<td>Mean = 57.55</td>
<td>Mean = 58.42</td>
</tr>
<tr>
<td></td>
<td>S.D. = 20.25</td>
<td>S.D. = 20.28</td>
<td>S.D. = 19.76</td>
</tr>
<tr>
<td>No Incentive</td>
<td>Mean = 54.25</td>
<td>Mean = 55.70</td>
<td>Mean = 54.98</td>
</tr>
<tr>
<td></td>
<td>S.D. = 20.48</td>
<td>S.D. = 18.29</td>
<td>S.D. = 18.93</td>
</tr>
<tr>
<td>Total</td>
<td>Mean = 56.78</td>
<td>Mean = 56.62</td>
<td>Mean = 56.70</td>
</tr>
<tr>
<td></td>
<td>S.D. = 20.01</td>
<td>S.D. = 18.84</td>
<td>S.D. = 19.20</td>
</tr>
</tbody>
</table>
from 54.25 to 59.30. It may be noted that the mean scores for subjects in the Choice groups were very close to the mean scores of the subjects in the No Choice groups. Thus, there was no tendency to be left with better readers in the Choice groups due to poorer readers choosing not to participate.

Except for the instructions given, all of the experimental groups were treated alike. The reading assignment was passed out. The subjects read the story and filled out the attitude scale. The experimenter checked to see that the subjects' names were on their papers and that the attitude scales had been filled out before giving them the sheet of comprehension questions to answer. All of the subjects were fully cooperative. The attitude rating scale and the comprehension questions were scored, and these raw scores were the measures of attitude and performance used in the analysis.

Analysis

The two dependent variables were the subjects' attitude scores and their comprehension scores. A two-way analysis of variance with fixed effects was calculated from each set of data. The calculations were done in the manner prescribed by Guilford (1956, p. 296).

Three relationships were tested with each of the two dependent variables. (1) There might have been a significant
main effect relationship between Choice conditions and the dependent variable. (2) There might have been a significant main effect relationship between Incentive conditions and the dependent variable. (3) There might have been a significant interaction between the Choice and Incentive conditions. A criterion probability level of .05 was selected for determining whether a relationship was significant.
CHAPTER VII
RESULTS AND CONCLUSIONS

Analysis of Attitude Data

The first three hypotheses predicted the effects of Choice and Incentive variables upon the subsequent attitudes of the subjects toward doing the reading assignment. They predicted no significant main effects, but that a significant interaction between the two independent variables would be obtained.

Figure 1 displays the distributions of attitude scores obtained from the four experimental groups. The higher scores indicated more favorable attitudes. Table 5 shows the means and standard deviations for the four groups based upon the same data. The mean attitude score of 7.00 for the Choice-Incentive group was the highest. The mean attitude score for the Choice-No Incentive group was 6.30. The mean score for the No Choice-Incentive group was 5.75, and the mean score for the No Choice-No Incentive group was 5.25.

Table 6 shows the summary table for the analysis of variance calculated from the attitude scores. The predicted interaction effect was not obtained, nor was there a significant Incentive main effect. However, there was a highly
FIGURE 1

DISTRIBUTION OF ATTITUDE SCORES FOR THE FOUR GROUPS

Choice-Incentive

No Choice-Incentive

Choice-No Incentive

No Choice-No Incentive
<table>
<thead>
<tr>
<th></th>
<th>CHOICE</th>
<th>NO CHOICE</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incentive</td>
<td>Mean = 7.00</td>
<td>Mean = 5.75</td>
<td>Mean = 6.38</td>
</tr>
<tr>
<td></td>
<td>S.D. = 1.00</td>
<td>S.D. = 1.79</td>
<td>S.D. = 1.55</td>
</tr>
<tr>
<td>No Incentive</td>
<td>Mean = 6.30</td>
<td>Mean = 5.25</td>
<td>Mean = 5.78</td>
</tr>
<tr>
<td></td>
<td>S.D. = 1.76</td>
<td>S.D. = 1.45</td>
<td>S.D. = 1.64</td>
</tr>
<tr>
<td>Total</td>
<td>Mean = 6.65</td>
<td>Mean = 5.50</td>
<td>Mean = 6.08</td>
</tr>
<tr>
<td></td>
<td>S.D. = 1.44</td>
<td>S.D. = 1.61</td>
<td>S.D. = 1.62</td>
</tr>
</tbody>
</table>
significant main effect of the Choice variable ($F = 11.8456; p < .01$). Thus, the subjects who were given a choice had significantly more favorable attitudes toward the reading assignment than did the subjects who were not given a choice.

The relationships predicted by the first three experimental hypotheses were not confirmed. There was evidence of dissonance-mediated attitude change due to the Choice variable, but the Incentive variable had no significant effects upon attitude. Thus, both the Incentive and the No Incentive groups followed the pattern predicted for the No Incentive groups. The results were consistent with the relationships that were predicted if the promise of class credit were not an effective incentive (See page 47).

Analysis of Performance Data

The last three hypotheses predicted the effects of Choice and Incentive variables upon the subsequent comprehension of the reading assignment. They predicted that there would be a significant main effect of the Incentive variable, but there would be no significant main effect of the Choice variable and no significant interaction.

Figure 2 displays the distributions of raw scores for comprehension obtained from the four experimental groups. The higher scores indicated greater knowledge of what had
TABLE 6

ANALYSIS OF VARIANCE
SUMMARY TABLE
BASED ON ATTITUDE SCORES

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>Degrees of Freedom</th>
<th>Mean Square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choice</td>
<td>26.45</td>
<td>1</td>
<td>26.4500</td>
<td>11.8456*</td>
</tr>
<tr>
<td>Incentive</td>
<td>7.20</td>
<td>1</td>
<td>7.2000</td>
<td>3.2245</td>
</tr>
<tr>
<td>Interaction</td>
<td>0.10</td>
<td>1</td>
<td>0.1000</td>
<td>0.0448</td>
</tr>
<tr>
<td>Within Sets</td>
<td>169.70</td>
<td>76</td>
<td>2.2329</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>203.55</td>
<td>79</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* (p < .01)
FIGURE 2

DISTRIBUTION OF PERFORMANCE SCORES FOR THE FOUR GROUPS

Choice-Incentive

No Choice-Incentive

Choice-No Incentive

No Choice-No Incentive
been read. Table 7 shows means and standard deviations for the four groups based upon the same data. The Choice-Incentive group obtained the highest mean comprehension score of 6.65. The other three groups were very similar with means of 5.15 for the Choice-No Incentive group, 5.25 for the No Choice-Incentive group, and 5.55 for the No Choice-No Incentive group.

Table 8 shows the summary table for the analysis of variance calculated from the comprehension scores. No significant relationships were found, including the predicted main effect for the Incentive variable. Thus, the relationships predicted by the last three experimental hypotheses were not confirmed.

Conclusions

The six experimental hypotheses were developed with the assumption that the promise of course credit would have an incentive effect similar to that of monetary reward. This assumption was necessary because experimental evidence had not yet demonstrated that "course credit" was equivalent to monetary reward in its affects upon attitude and performance. Failure to confirm the fifth experimental hypothesis indicated that "course credit" did not significantly affect performance. The mean comprehension scores shown in
TABLE 7

MEANS AND STANDARD DEVIATIONS OF COMPREHENSION PERFORMANCE SCORES FOR THE FOUR EXPERIMENTAL GROUPS

<table>
<thead>
<tr>
<th></th>
<th>CHOICE</th>
<th>NO CHOICE</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incentive</td>
<td>Mean = 6.65</td>
<td>Mean = 5.25</td>
<td>Mean = 5.95</td>
</tr>
<tr>
<td></td>
<td>S.D. = 2.16</td>
<td>S.D. = 2.33</td>
<td>S.D. = 2.30</td>
</tr>
<tr>
<td>No Incentive</td>
<td>Mean = 5.15</td>
<td>Mean = 5.55</td>
<td>Mean = 5.35</td>
</tr>
<tr>
<td></td>
<td>S.D. = 2.14</td>
<td>S.D. = 2.32</td>
<td>S.D. = 2.14</td>
</tr>
<tr>
<td>Total</td>
<td>Mean = 5.90</td>
<td>Mean = 5.40</td>
<td>Mean = 5.65</td>
</tr>
<tr>
<td></td>
<td>S.D. = 2.23</td>
<td>S.D. = 2.27</td>
<td>S.D. = 2.24</td>
</tr>
</tbody>
</table>
TABLE 8

ANALYSIS OF VARIANCE
SUMMARY TABLE
BASED ON COMPREHENSION SCORES

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Squares</th>
<th>Degrees of Freedom</th>
<th>Mean Squares</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choice</td>
<td>5.00</td>
<td>1</td>
<td>5.0000</td>
<td>1.0503</td>
</tr>
<tr>
<td>Incentive</td>
<td>7.20</td>
<td>1</td>
<td>7.2000</td>
<td>1.5124</td>
</tr>
<tr>
<td>Within Sets</td>
<td>361.80</td>
<td>76</td>
<td>4.7605</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>390.20</td>
<td>79</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 6 did not even suggest an incentive effect. Thus it may be concluded that the promise of class credit was not an effective incentive.

It was predicted on page 47 that if offering "course credit" were not equivalent to a monetary incentive, only the main effect of the Choice variable upon attitude scores would be significant. This relationship is what the analysis found. Because "course credit" was not an effective incentive, it had no effect either as a main effect or as an interaction effect in combination with the Choice variable. It follows that the interaction predicted by the third hypothesis was not obtained.

The dissonance effect of the Choice variable upon attitude was obtained as a main effect of the Choice variable. Subjects who were given a choice in the matter of doing a reading assignment had a significantly more positive attitude toward doing that assignment than subjects who were not given a choice. This finding probably has practical significance as well as statistical significance. The effects of the Choice variable may be better seen by ignoring the insignificant Incentive variable and looking at the data divided into only two groups, Choice and No Choice. Only six subjects in the Choice groups gave negative attitude rating scores of four or less to the assignment, while 34 gave positive attitude rating scores of five or higher. In the No
Choice groups, 25 subjects gave negative attitude rating scores, while only 15 gave positive attitude rating scores. These data are presented in Table 9. Such a large difference in the number of subjects with negative attitudes toward doing an assignment suggests that the Choice variable has practical significance for attitude changes in the classroom.
TABLE 9

FREQUENCIES OF POSITIVE AND NEGATIVE ATTITUDE SCORES* FROM ALL SUBJECTS IN THE CHOICE AND NO CHOICE GROUPS

<table>
<thead>
<tr>
<th>GROUPS</th>
<th>POSITIVE SCORES</th>
<th>NEGATIVE SCORES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choice</td>
<td>34</td>
<td>6</td>
</tr>
<tr>
<td>No Choice</td>
<td>15</td>
<td>25</td>
</tr>
</tbody>
</table>

*Attitude rating scores of 4 or lower were considered to be negative, and rating scores of 5 or higher were considered to be positive.
CHAPTER VIII
DISCUSSION

Theoretical Implications

According to the theory of cognitive dissonance, individuals who choose to do a relatively undesirable task will experience cognitive dissonance and will tend to reduce their dissonance by enhancing their attitudes toward the task. The results of the current study supported the theory of cognitive dissonance. Students who chose to comply with the experimenter's assignment experienced cognitive dissonance. Their knowledge that they had chosen to do the reading assignment was dissonant with their feeling that they would have preferred going to swimming class. This dissonance was a drive stimulus which motivated these subjects to reduce their levels of dissonance by changing their attitudes about the relative desirability of doing the reading assignment as compared to going to swimming class. Dissonance reduction may have been evidenced by the adoption of a more positive attitude toward doing the reading assignment and/or by the adoption of a more negative attitude toward going to swimming class. Since only the former mode of dissonance reduction was of interest in this study, only the subsequent attitudes of the students toward doing the reading assignment were assessed. The attitudes of the students who were
given a choice were found to be more positive than the attitudes of those who were not given a choice.

Those students who were not given a choice as to whether to comply with the experimenter's assignment did not experience the dissonance created by the Choice condition. They did not choose to do a reading assignment which was contrary to their attitudes of preference for going to swimming class. Thus, they were not motivated to enhance their attitudes toward the assignment. Their assessed attitudes were found to be less positive than the attitudes of the students who were given a choice.

Choice conditions affect the presence or absence of cognitive dissonance, but incentive conditions are not an integral part of dissonance theory. Incentive conditions are only important in that they affect the relative attractiveness of the choice alternatives. For example, if the subjects in the current study had been offered $10 for doing the reading assignment, doing the assignment might have been more desirable than going to swimming class. Therefore, subjects who chose to do the reading assignment would not have experienced cognitive dissonance resulting from choosing a relatively undesirable alternative.

In the current study, the incentive employed was a promise of course credit. The fact that this incentive had no significant effects upon either attitude or performance suggests
that promising course credit is not equivalent to promising a monetary reward. The results showed that the promise of course credit did not significantly affect the relative attractiveness of the reading assignment or the subjects' performance on that assignment. The theoretical implication of this finding is that one may not be able to compare studies employing one type of incentive with studies employing another type without evidence that the two types of incentives are equivalent.

Experimental Implications

The procedure employed in the current study seemed to provide an adequate test for the experimental hypotheses. The attitude rating scale appeared to be quite satisfactory for assessing the students' attitudes toward doing the assignment. The experimental procedure successfully demonstrated an approach for testing dissonance-mediated attitude change in a practical school situation.

The failure to find incentive effects leads one to question whether this failure may be due to methodological inadequacies. The comprehension test seemed to be a satisfactory instrument for assessing the students' comprehension, and it was administered under good testing conditions. The reading and test questions were designed specifically for seventh and eighth grade students, and the comprehension scores obtained
indicated that the questions were at an appropriate level of difficulty. A more powerful test may have been obtained either by using a more homogeneous group in terms of reading ability and thereby reducing the error variance, or by statistically controlling for differences in reading ability by some procedure such as a treatments x levels design. However, the obtained differences between the means of the Incentive and No Incentive groups would not have approached significance even if the error variance were reduced by half. It does not seem likely that the failure to find incentive effects can be attributed to a lack of power in the statistical test.

The effectiveness of the incentive manipulation may be questioned. Perhaps incentive effects would have been obtained if the promise of course credit had been made in some other way. Several of the students asked their language arts teachers about their scores after the study. So there was at least some understanding of and interest in the promised course credit. The most likely reason for failing to find incentive effects seems to be that the promise of course credit is not an effective incentive in terms of the kinds of attitudes and performance assessed in this study.
Practical Implications

This study demonstrated cognitive dissonance effects in a practical school setting. It was a beginning step toward realizing the practical value of dissonance theory. Perhaps the implications of dissonance theory may be applied a little more confidently to the practical school situation in the future.

One implication of these findings for the teacher would be that students' attitudes may be enhanced by giving them more options or choices. Students who are allowed to choose their assignments will have more positive attitudes toward doing those assignments and toward school. This implication is consistent with the current trend toward allowing students to participate in determining what their educational experiences shall be. This trend should help to improve the affective outcomes obtained by schools, and it should be encouraged.

Another implication of the findings would be that there may be more effective incentives for classroom use than the so frequently used "course credit." The teacher should employ other incentives. Course credit may be a useful bookkeeping practice, but if it does not affect the students' performance, the practice of attempting to motivate students by offering course credit must be questioned.
Educational psychologists have been attempting to bring a variety of incentives back into the classroom. It is generally accepted that the most important kind of incentive is social. Social incentives are essential for socialization of the child, and they promote learning to work together. They should be employed frequently, and they should be available to all, regardless of the individual's level of attainment. Some examples are social recognition, praise, positive feedback, a smile, or a friendly touch.

In addition to the social reinforcers, teachers may employ more concrete incentives. For example, the child may be given checks on a record sheet, stars, tokens, or trading stamps. Such incentives are frequently used in conjunction with "performance contracts" in which the child and teacher agree upon a given reward for completion of a specified assignment. Concrete incentives may also be employed in order to eliminate undesirable behavior as in "behavior modification" programs. The teacher and child agree that for each specified period that the child does not display the undesirable behavior, a specified reward will be given. Skillful use of such "token" incentives can have a strong impact upon children's behavior.

Frequently, in order to make the "token" incentives valuable to the child, the tokens may be used by the child to buy something of value to him. For example, a given number of earned tokens may be traded in to the teacher for a toy, some
candy, or food item, or a period of "free play." Small rewards such as candy corn or M & M candies are also used in more restricted settings with children. Such direct, continuous reinforcement has not been demonstrated as a practical or desirable procedure for general classroom use. However, it is apparent that a wide variety of incentives are available, and teachers should make more effective use of them.

Suggestions for Further Research

The current study has verified the proposed relationship between a choice given to students and the students' subsequent attitudes. Educators could benefit from further study of the relationship between choice and attitude change. Similar studies may be done employing various kinds of choices in a variety of academic situations. Only with repeated study in a variety of situations will it be possible to establish the limits within which this relationship holds. There may even be some situations in which an inverse relationship between choice and attitude change will be found. Such an inverse relationship has been found under given laboratory conditions (Linder, Cooper, and Jones, 1967; Holmes and Strickland, 1970; Sherman, 1970).

A different approach to studying the relationship between choice and attitude change would be possible if an
instrument were developed to measure the amount of choice that a teacher provides. With such an instrument, a study could be made of the relationship between the amount of choice available in classrooms and the attitudes of the students in those classrooms. Developmental patterns might also be described. There may be some optimal amount of freedom of choice for each grade level.

The current study failed to obtain significant effects from the "course credit" incentive. The promise of course credit did not significantly affect students in terms of the two dependent variables. This surprising result suggests that the effectiveness of commonly used classroom incentives should be evaluated. Educators are aware that masses of students are disinterested in classroom learning. Part of the solution to this problem is the effective use of incentives that make learning activities more interesting and satisfying.

Finally, it would be very interesting to repeat the current study with monetary rewards for the incentive. The failure to verify hypotheses three and five has been attributed to ineffectiveness of the "course credit" incentive as compared to monetary reward. This explanation of the negative results would be confirmed if the hypothesized relationships were found using a monetary reward.
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APPENDIX A

MATERIALS USED IN THE PILOT STUDY
Have you ever paused to consider how much we owe to past generations for some of the ordinary, but very useful, things that we possess? For example, take writing. Writing is such a common, everyday activity with us that probably many of us have never wondered how this really wonderful art came to be. Yet man undoubtedly inhabited the earth for hundreds of thousands of years before he learned to record his thoughts in writing. To imagine the beginning of writing, you must think of a time when people lived under very primitive conditions. They were cave dwellers who lived in groups and communicated with a spoken language. They had learned to fashion rude tools, but of course they had none of the common writing materials known to us. This was the Paleolithic Period, or the Old Stone Age.

People in the Old Stone Age did not write in the sense that we use the term writing now, but there is evidence that they did make crude drawings. In the cave of Altamira in the northern part of Spain, there are pictures of many kinds of animals that have not inhabited that country for thousands of years. These pictures must certainly have been drawn by ancient man. In other caves in Spain and in southwestern France, there are similar drawings made by cave men. Furthermore, the handles of some of the tools used by the cave men are carved in the shape of animals.

If these drawings and carvings were merely decorations they could not be called writing, but many people believe that some of these were intended as records of hunting seasons or as messages to their gods. If they are records or messages, they are really a kind of writing.

Regardless of the purposes of the earliest drawings that have been found, it is known that as time went on men did actually use pictures to communicate with each other. We do not know, however, the name of the man who first sent messages by means of pictures nor when he lived.
years ago. It may have been invented several times and in different places.

True picture writing belongs largely to the age when men used stone for tools
and had not yet learned the use of metals. In some parts of the world, men
passed out of the Stone Age long ago; in other parts, they were in it until
recent times. The Indians, for example, were still living in the Stone Age
when white men came to America. They were also using true picture writing.
Some of the best examples of picture writing to be found anywhere have been left
by the Indians.

All known writing started from picture writing. Perhaps you have seen
in a museum samples of Egyptian or other hieroglyphic writing. This hieroglyphic
writing was sometimes cut into stone, but it was more often written in ink on
papyrus, a kind of paper made from the pith of plants. The outstanding fact
about all hieroglyphic writing is that it is made up of recognizable pictures.
Birds and other animals, human beings, and parts of the landscape can be distin-
guished. However, hieroglyphic writing is not real picture writing because you
cannot read it simply by recognizing the pictures. Some of the pictures stand
for words or sounds that have little to do with the objects represented. Hierogly-
phic writing grew out of picture writing, but it represents a more advanced stage
than picture writing.

You have no doubt seen Chinese writing on laundry marks, signs in
front of Chinese stores, or on packages of firecrackers. As in the case of
hieroglyphic writing, the characters in Chinese writing are made up of ancient
pictographs. It is true that Chinese characters look very little like the
objects for which they stand, but they have been slowly changed from the ancient
pictures through several thousand years of use. Simple pictographs form only
a small part of Chinese writing. Many symbols are pictures which stand for
words that have nothing to do with the objects pictures.

Another kind of writing that you may have seen in books dealing with
the history of ancient people is "cuneiform" or "wedge-shaped" writing. The
little lines which make up the symbols of this writing look like tiny wedges. The people who used cuneiform writing were the Sumerians, the Babylonians, and the Assyrians. They used small clay bricks for writing "tablets" and drew lines with a small stick or rod, known as a stylus. The later cuneiform symbols do not look like pictures at all, but if one compares the earliest known forms he can see the actual pictures changing to the wedge-like symbols.

Even our own alphabet started from pictographs. If you know the origin of the letters of our alphabet you may still see the traces of pictures in the forms of the letters. Our letter "A", for example, developed from the drawing of the head of an ox. Now, of course, the letter has nothing to do with oxen.

Pictograph writing was a great help to people when they had no other way of writing and it was fairly satisfactory for a simple message or record. Objects that can be seen can be shown very well with pictographs. But, as people became more civilized and came to settle in villages and towns, they began to need to write about business matters, affairs of government, social relationships, and many other things that could not be expressed with simple pictographs. So they gradually adopted the practice of using pictures and symbols that grew out of pictures for ideas that were not related in a direct and natural way to the pictures. For example, the Chinese came to write the idea "bright", or "full of light", by drawing the sun and the moon in one picture. Signs or pictures used to express ideas in this way are called "ideograms" or "ideographs." The word "ideograph" comes from two words meaning idea and writing. Egyptian hieroglyphic, Chinese, and Cuneiform writing made use of ideographs.

The use of symbols to express ideas quite different from the symbols themselves was a great advance over simple picture writing, but even pictures and ideographs used together could not express all that needed to be said in writing. So someone began the practice of breaking what was to be written up into syllables and using pictures and signs to stand for these syllables.
One could, for instance, write the word "began" with the picture of a bee and the picture of a gun. This was such a useful invention that the people of Egypt, China, and the Tigris-Euphrates region soon learned to write letters, state papers, and even long books in this way. But their systems of writing were very complicated because a great number of signs were required and the same word was not always written in the same way. In spite of its clumsiness, however, syllabic writing is still used in China. Most other peoples have gone a step further and have adopted writing by means of the alphabet.

The germ of the idea of alphabetic writing is found in some ancient writings. The Egyptians learned very early to use certain pictures or signs much as we use the letters of the alphabet. Some of their symbols were used to stand for single sounds, just as the letters of our alphabet do. But, although the Egyptians worked out many letter signs, the idea seems never to have occurred to them that they might use only the letter signs and drop the rest of their complicated system of writing.

It remained for the Seirites, a desert people employed by the Egyptians, to work in their mines on the peninsula of Sinai, to perfect the alphabet. When the Seirites came into contact with the civilization of Egypt they learned, among other things, about the Egyptian system of writing. Now, the Seirite foremen of the mines had to make extensive use of writing in the exact reports which the Egyptians demanded of them. It was probably in connection with these reports that the Seirites improved upon the Egyptian writing by inventing the alphabet. The word "alphabet" comes from "alpha" and "beta", the first two pictures in the Seirite list of symbols. They represented, respectively, an ox and a house. They became our first two letters, A and B.

The Seirite alphabet consisted of twenty-one symbols. Nearly all these symbols were borrowed from Egyptian hieroglyphics. Not many inscriptions written in this first alphabet have been found. The first one was discovered on Sinai in 1868; from time to time since that date a few others
have been found. The Seirites used the alphabet only for their simple needs. It was not until it was taken over by other people that its possibilities were fully realized.

Some years after the Seirites invented the alphabet, Egypt became torn with internal strife, and the work in the mines on Sinai was not kept on. So the Seirites, who could not make a living in that desert region after the closing of the mines, departed from Sinai, taking their new invention with them.

Some of the Seirites went south and settled in South Arabia, where the letters of their alphabet underwent certain changes so that they could more easily carve them into the hard stone of that region. They also added seven letters to the alphabet to provide for some sounds not included in the original alphabet. One present day country, Ethiopia, uses an alphabet that came from this South-Arabian alphabet. Other Seirites went northeast and settled in Palestine, or in some of the old cities such as Damascus, or near the sea at Tyre and Sidon. Still others became desert traders. The people with whom they came in contact learned the alphabet from them, and gradually it was carried over a large part of the civilized world. The Aramaeans, to whom the Seirites brought the alphabet carried it eastward as far as India. The Phoenicians, some of whom were descendants of the Seirites, learned the alphabet and, because they were great traders, carried it to many other peoples, among whom were the Greeks. The Phoenicians and the Aramaeans used the alphabet for simple business records and inscriptions on tombstones.

The Hebrews were the first people to use the alphabet for more important records. Their Old Testament was written with it. In the Far East, the Hindus produced many books with it.

Up to the time the Greeks learned the alphabet from the Phoenicians, it was made up entirely of consonants. The Greeks added the vowel sounds. They regarded the alphabet as merely signs representing sounds rather than as pictures of things.
The Greeks passed the alphabet on to the Latins who simplified and improved it. The Latin alphabet was carried throughout Europe and to America.

Thus, from its small beginning among the Seirite workmen, the alphabet has gradually assumed a more and more important place in the affairs of men, until today it stands as one of man's greatest and most remarkable inventions. It is, perhaps, man's most important tool, but excellent though it is, it is possible that someone now in school will some day find a way to improve it still further.

Please answer the following questions by circling the number of the correct answer.

How difficult do you think this reading is for a fifth grade class?

1. More simple than average
2. Average
3. A little more difficult than average
4. Much more difficult than average
5. So difficult that many would not understand it.

To which of the following students would reading of this level of difficulty most likely be assigned?

1. Fifth graders
2. Junior high school students
3. High school Freshmen and Sophomores
4. High school Juniors and Seniors
5. College students
Directions: Place the number of the word or phrase which should complete each of the following sentences in the blanks before the numbers of the sentences.

Example:

3. This is a test in (1) arithmetic (2) spelling (3) reading (4) geography.

1. People in the Old Stone Age (1) did not know how to write or draw (2) made crude drawings (3) had a crude alphabet (4) left many written records.

2. Simple picture writing began perhaps (1) 3,000 years ago (2) 10,000 years ago (3) 100,000 years ago (4) 1,000,000 years ago.

3. This story states that pictures of animals made thousands of years ago have been found in a cave in (1) Spain (2) England (3) America (4) Africa.

4. Hieroglyphic writing (1) is the least advanced stage of writing (2) is the same as picture writing (3) grew out of picture writing (4) uses an alphabet.

5. When the white man came to America the Indians (1) could not write at all (2) used picture writing (3) used syllable writing (4) had a crude alphabet.

6. The outstanding fact about hieroglyphic writing is that (1) it is cut in stone (2) it can be read very easily (3) it is the most ancient writing (4) it is made up of recognizable pictures.

7. Cuneiform writing was made on (1) bricks (2) stone (3) papyrus (4) tree bark.

8. Signs or pictures used to express ideas not related in a direct and natural way to the pictures are called (1) pictographs (2) alphabetic writing (3) ideographs (4) inscriptions.

9. People began to discard pictograph writing when they (1) began living in caves (2) began to make records on papyrus (3) came to settle in villages and towns (4) decided to invent an alphabet.

10. Syllable writing is (1) more advanced than writing with ideographs (2) less advanced than writing with ideographs (3) about as advanced as alphabetic writing (4) less advanced than pictographic writing.

11. Syllable writing is used today in (1) India (2) Russia (3) Arabia (4) China.

12. The alphabet was invented by the (1) Seirites (2) Egyptians (3) Phoenicians (4) Babylonians.
13. The first alphabet consisted of (1) consonants and vowels (2) consonants (3) vowels (4) pictographs.

14. The Seirites (1) conquered the Egyptians (2) were conquered by the Egyptians (3) were descendants of the Egyptians (4) were employed by the Egyptians.

15. The alphabet was probably invented in connection with (1) the reports of generals about their victories in war (2) the writings of ancient scholars (3) the reports of foremen about their work (4) the inscriptions on the tombs of kings.

16. The people who invented the alphabet left the region in which they lived and took their alphabet to other parts of the world because (1) they were driven out (2) the mines in which they worked were closed (3) they were nomads who did not like to stay in one place very long (4) the pastures for their flocks were used up.

17. Traders who did a great deal to spread the alphabet to Europe were the (1) Phoenicians (2) Aramaeans (3) Hebrews (4) Greeks.

18. The first people to use the alphabet for more important writing than business records and tombstone inscriptions were the (1) Seirites (2) Aramaeans (3) Hebrews (4) Greeks.

19. The Greeks (1) passed the alphabet on to the Latins unchanged (2) simplified it (3) improved it (4) completely revised it.

20. For the art of writing we are indebted to (1) a small group of men (2) scholars (3) one nation (4) many different peoples.
APPENDIX B

MATERIALS USED IN THE INSTRUMENT DEVELOPMENT
Have you ever paused to consider how much we owe to past generations for some of the ordinary, but very useful, things that we possess? For example, take writing. Writing is such a common, everyday activity with us that probably many of us have never wondered how this really wonderful art came to be. Yet man undoubtedly inhabited the earth for hundreds of thousands of years before he learned to record his thoughts in writing. To imagine the beginning of writing, you must think of a time when people lived under very primitive conditions. They were cave dwellers who lived in groups and communicated with a spoken language. They had learned to fashion rude tools, but of course they had none of the common writing materials known to us. This was the Paleolithic Period, or the Old Stone Age.

People in the Old Stone Age did not write in the sense that we use the term writing now, but there is evidence that they did make crude drawings. In the cave of Altamira in the northern part of Spain, there are pictures of many kinds of animals that have not inhabited that country for thousands of years. These pictures must certainly have been drawn by ancient man. In other caves in Spain and in southwestern France, there are similar drawings made by cave men. Furthermore, the handles of some of the tools used by the cave men are carved in the shape of animals.

If these drawings and carvings were merely decorations they could not be called writing, but many people believe that some of these were intended as records of hunting seasons or as messages to their gods. If they are records or messages, they are really a kind of writing.

Regardless of the purposes of the earliest drawings that have been found, it is known that as time went on men did actually use pictures to communicate with each other. We do not know, however, the name of the man who first sent messages by means of pictures nor when he lived.
Simple picture writing, or pictography, began perhaps ten thousand years ago. It may have been invented several times and in different places. True picture writing belongs largely to the age when men used stone for tools and had not yet learned the use of metals. In some parts of the world, men passed out of the Stone Age long ago; in other parts, they were in it until recent times. The Indians, for example, were still living in the Stone Age when white men came to America. They were also using true picture writing. Some of the best examples of picture writing to be found anywhere have been left by the Indians.

All known writing started from picture writing. Perhaps you have seen in a museum samples of Egyptian or other hieroglyphic writing. This hieroglyphic writing was sometimes cut into stone, but it was more often written in ink on papyrus, a kind of paper made from the pith of plants. The outstanding fact about all hieroglyphic writing is that it is made up of recognizable pictures. Birds and other animals, human beings, and parts of the landscape can be distinguished. However, hieroglyphic writing is not real picture writing because you cannot read it simply by recognizing the pictures. Some of the pictures stand for words or sounds that have little to do with the objects represented. Hieroglyphic writing grew out of picture writing, but it represents a more advanced stage than picture writing.

You have no doubt seen Chinese writing on laundry marks, signs in front of Chinese stores, or on packages of firecrackers. As in the case of hieroglyphic writing, the characters in Chinese writing are made up of ancient pictographs. It is true that Chinese characters look very little like the objects for which they stand, but they have been slowly changed from the ancient pictures through several thousand years of use. Simple pictographs form only a small part of Chinese writing. Many symbols are pictures which stand for words that have nothing to do with the objects pictures.

Another kind of writing that you may have seen in books dealing with the history of ancient people is "cuneiform" or "wedge-shaped" writing. The
little lines which make up the symbols of this writing look like tiny wedges. The people who used cuneiform writing were the Sumerians, the Babylonians, and the Assyrians. They used small clay bricks for writing "tablets" and drew lines with a small stick or rod, known as a stylus. The later cuneiform symbols do not look like pictures at all, but if one compares the earliest known forms he can see the actual pictures changing to the wedge-like symbols.

Even our own alphabet started from pictographs. If you know the origin of the letters of our alphabet you may still see the traces of pictures in the forms of the letters. Our letter "A", for example, developed from the drawing of the head of an ox. Now, of course, the letter has nothing to do with oxen.

Pictograph writing was a great help to people when they had no other way of writing and it was fairly satisfactory for a simple message or record. Objects that can be seen can be shown very well with pictographs. But, as people became more civilized and came to settle in villages and towns, they began to need to write about business matters, affairs of government, social relationships, and many other things that could not be expressed with simple pictographs. So they gradually adopted the practice of using pictures and symbols that grew out of pictures for ideas that were not related in a direct and natural way to the pictures. For example, the Chinese came to write the idea "bright", or "full of light", by drawing the sun and the moon in one picture. Signs or pictures used to express ideas in this way are called "ideograms" or "ideographs." The word "ideograph" comes from two words meaning idea and writing. Egyptian hieroglyphic, Chinese, and Cuneiform writing made use of ideographs.

The use of symbols to express ideas quite different from the symbols themselves was a great advance over simple picture writing, but even pictures and ideographs used together could not express all that needed to be said in writing. So someone began the practice of breaking what was to be written up into syllables and using pictures and signs to stand for these syllables.
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APPENDIX C

MATERIALS USED IN THIS STUDY
It was winter in the far north. A wasteland of rocks and ice and snow stretched for many miles in every direction. The black-violet sky above contained many brilliant stars and a frost-white moon. On the earth below, a great white bear wandered restlessly through the night in search of something to eat. This unending search for food was the price that Nanook, a she-bear of the Arctic, paid for life. The half-grown cub who followed her whimpered hungrily in his throat from time to time, for it had been more than a day since he had eaten.

At his cry, the grim mother checked her stride; but even as she stopped, her nostrils caught the faint, unmistakable scent of warm flesh and blood. Swinging her long, pointed head to one side, she moved silently, on paws padded with thick white hair, toward a hummock of new-fallen snow. Just as she reached it, the little hillock exploded like a bomb and out whirred a pair of ptarmigan, birds like the ruffed grouse of lower latitudes, but white as the snow in which they had hidden. Before they had freed themselves from the snow, the great ice-bear struck them down. A moment later a cloud of feathers was all that was left of them, and the bears wandered on through a country desolate as the surface of the burnt-out moon.

Hours later, as the two reached a plateau high above the confusion of ice and rock, there came to the straining nostrils of the leader a sweet, farm reek as of cattle, and scattered black figures showed dimly against the snow. At the sight and scent, the huge bear shot forward like a sprinter from his mark. As she charged, a score of sturdy, wide-horned little bulls swung to meet her, with the swift discipline of a musk ox herd. They had short legs, hair so long that it trailed on the snow, and all the swift alertness of mountain sheep. Behind the bulls was an inner circle of cows, and within this circle were a dozen frightened calves. So swiftly had the trained herd acted, that by the time
the bear reached them, she was confronted by an unbroken circle of sharp curved horns.

Hungry as she was, with a whimpering cub at her flank, the gaunt bear stopped—as well she might, for not even the grim white wolf, the craftiest of arctic hunters, can penetrate the defense of a musk ox herd. Around and around the bristling hedge of horns she paced, but there was never a break in the threatening circle. With little grunts of defiance the veteran fighters of the herd, who had faced danger many times before, heartened the younger cows and the trembling calves behind them, and everywhere their front remained unbroken. Once or twice the bear rushed forward, as if intending to charge in spite of all consequences, on the chance that some over-enthusiastic bull would leave the safety of the circle and meet her half-way. Again turning her back, she retreated slowly as if in sudden terror, hoping to be pursued, but the herd paid no attention to any such simple stratagems. Only a line of lowered glaring eyes and a ring of fatal horns confronted her until at last, with many a backward glance, she lurched away, followed by her cub, in search of easier prey.

Disappointed by the musk oxen, the bear peered into every nook and cranny as she moved across the frozen wilderness hunting for food. Her course led her at last through a maze of basalt boulders, ice-blocks and pans toward a stretch of open sea. As she approached that lonely water under the orange glare of the Northern Lights, her keen ears caught the tiny tinkle of breaking ice where the black water close to the shore had begun to skim over in the cold. At the sound, the bear crouched low, with the cub imitating her every moment. In the dim light, a long dark shape floundered awkwardly up on the shore. There poised where he could see all about him and shoot down into the water at the first sign of danger, lay a huge harp seal—the "saddleback" of the sealers. This was an old bull who weighed all of 300 pounds. He had a dingy, white body blotched with black, and was far larger than the spotted leopard seal, the ringed seal, or even the gray-bearded seal.
Without a sound, the white bear disappeared in the dark like a ghost, while her cub crouched behind a hillock of ice. Making a long detour, the fierce huntress reached the shore at a point hidden by heaped masses of ice from the sight of the seal and, slipping soundlessly into the water, swam far out, only her black muzzle showing above the surface. When at last she reached a point in the bay opposite the place where the saddleback was, she swam toward the shore, silent as a shadow.

The great seal lay with his back to the water, continually testing the air with his sensitive nostrils and ready at the first sight, sound, or scent of danger to rush into the water. Wary as he was he suspected no danger from the open sea which he had just left. Suddenly, his keen ears caught the sound of dripping water and a little grating noise at the edge of the shore, which might have been made by floating ice. However, the motto of the wise seal is: "Make sure!" As for the unwise, they are dead, victims of their own imprudence.

Wherefore, this one, at the first slight sound behind him, swung around, only to see a vast shape creeping toward him. At the sight, the seal hurled his mottled bulk toward the open water. Swift as he was, the white death below was swifter. Even as the saddleback reached the water, the fierce muzzle of the bear shot forward like a striking snake and gripped the seal's round head. Despite the bear's weight, the rush of the saddleback carried her down into the black water. Few land animals, indeed, would dare the depths with such a swimmer. Maddened by hunger, however, the bear paid no attention to the odds of the water that were against her, but sank her teeth deeper and deeper through the seal's thick pelt. A moment later, pushing the lifeless body of her prey before her, she swam slowly up through ten feet of black water laced and lit by the phosphorescence of arctic seas. Then she landed and without effort swung the body of the seal out upon the rock, and hissed sharply through the still air. At the
sound her hungry cub hurried from his hiding place so fast that he rolled over
and over down the slope like a ball, nor ever stopped until he joined her in
a feast of rich, pure, life-giving seal meat.

When at last they were both full-fed, the old bear dragged the carcass
along the shore and hid it in a cave near the top of an ice-cliff which jutted
out over the water. There, curled up together, the two slept, plunged in
that snug content which food and warmth bring.

Please answer the following questions by circling the number of the correct
answer.

Please rate the story that you have just read according to how well you liked
reading it.

1. I strongly disliked reading it.
2. I disliked reading it.
3. I neither liked nor disliked reading it.
4. I liked reading it.
5. I liked reading it very much.

Please indicate how you would feel about reading a similar story next week.

1. I would be strongly opposed to doing it.
2. I would prefer not to do it.
3. I wouldn't care.
4. I would like to do it.
5. I would like to do it very much.
Directions: Place the number of the word or phrase which should complete each of the following sentences in the blanks before the number of the sentences.

Example:

3. This is a test in (1) arithmetic (2) spelling (3) reading (4) geography.

1. The cub whimpered because (1) he was cold (2) he was tired (3) he was hungry (4) he was lost (5) he was afraid.

2. The first kill the bear made was (1) a pair of ruffed grouse (2) a pair of ptarmigan (3) a white rabbit (4) a young deer (5) a musk ox.

3. When the bear caught sight of the musk oxen she (1) stopped and watched them (2) rushed at them at once (3) approached them cautiously (4) tried to creep up to them (5) made a wide detour around them.

4. As soon as they saw the bear, the little bulls (1) swung to meet her (2) rushed at her (3) scattered in all directions (4) set up a loud bellowing (5) deserted the cows and calves.

5. The bear retreated from the musk oxen as if in terror because she (1) was afraid of the bulls (2) wanted them to think she had gone away (3) was anxious for the safety of her cub (4) hoped to be pursued (5) was in playful mood.

6. After the bear left the musk ox herd, she moved (1) out upon the open plain (2) toward a range of mountains (3) along a river (4) down a narrow gorge (5) toward the open sea.

7. When she heard the tinkle of breaking ice, the bear (1) crouched low (2) ran toward the sound (3) looked all about her (4) sniffed the air (5) pushed the cub to safety.

8. As the bear crept upon the seal, the cub (1) followed behind her (2) stood at a distance and watched (3) crouched behind some ice (4) whimpered in anxiety (5) began to howl.

9. The seal was prepared for an attack from (1) any side (2) the land (3) the open sea (4) any direction except the south (5) the north and east.

10. When the seal went down into the water, the bear (1) was obliged to loosen her grip (2) sprang after him (3) found the odds too much for her (4) sank her teeth deeper into the seal (5) swam toward him.
APPENDIX D

RAW DATA
### RAW DATA FOR THE CHOICE-INCENTIVE GROUP

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The dissertation submitted by Merlyn S. Swanson has been read and approved by members of the Department of Foundations, School of Education.

The final copies have been examined by the director of the dissertation and the signature which appears below verifies the fact that any necessary changes have been incorporated and that the dissertation is now given final approval with reference to content and form.

The dissertation is therefore accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

1/12/72  
Date

Signature of Advisor

Samuel T. Mayo