

A STUDY OF THE EFFECT OF A SUBLIMINAL STIMULUS
UPON ATTITUDES DEVELOPED TOWARD A CHARACTER
PORTRAYED IN A MOTION PICTURE FILM

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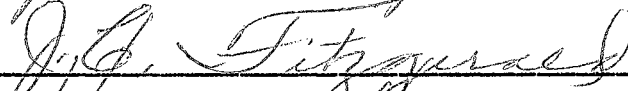
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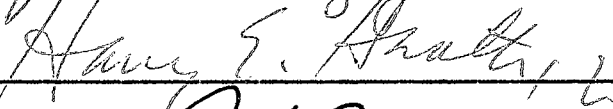
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CHAPTER I

STATEMENT OF THE PROBLEM

Introduction

Much effort has been expended in recent years to produce motion picture films that would effect a shift in attitudes, or a formation of new attitudes, among various segments of the general public. In the areas of automobile safety, mental illness, ethnic relationships, and patriotism, the extent of such film production has been prodigious. Practically all such films are of the persuasion or indoctrination type, intended to change and/or reinforce certain audience attitudes and opinions. By administering simple information tests, it is possible to establish that learning takes place during a showing. However, the findings of numerous studies indicate the ability of an attitude film to affect significantly an audience's salient beliefs (45), (75), (49), (56). Research data provide occasional indications of attitude shifts, but upon further testing at a time removed by five to nine weeks from the film viewing, the subjects had reverted to their original attitude-structure patterns. Thus, even when there were indications of attitude shifts, these were not permanent shifts or, as

one investigator reported, there were no shifts of "pure attitudes" (49). In fact, there is substantial evidence that when these films generate strong fears through emotional dramatics a boomerang or reversal effect (defensive avoidance) may occur, actually strengthening the individual's existing bias (17). As reported by Janis and Feshbach (38), "communications arousing a high degree of anxiety in the recipient tend to stimulate defensive reactions which interfere with the acceptance of the communicator's message."

This is not to say that films do not affect attitudes. However, conclusions from different studies are somewhat contradictory. They appear to be offsetting to the extent that there is room for considerable doubt as to the ability of films to permanently affect individuals' attitudes. The Payne Fund Studies have been the model for most research concerned with the effect of the motion picture on attitudes.¹ Although Hoban and Van Orner (33) refer to that portion of the studies conducted by Peterson and Thurston (57) as "classic," Sizemore (70, p. 19) perceptibly points out that:

Newer innovations in statistical models and

¹Organized research concerning the effects of motion pictures on attitudes of children can be said to have begun with the Payne Fund Studies in 1929. These consisted of a group of twelve studies designed to determine the influence of theatrical motion pictures on children who attended them (70).

designs render the techniques as obsolete. The films used were among the first used with sound; the mechanisms for production and for reproduction were crude by today's standards. Many of the subjects used were from areas in which motion pictures were rare and had a distinct novelty effect; contrast this with today's television consumption.

A comprehensive investigation by Sizemore (70, p. 27) of the effect of motion pictures upon viewer attitudes is summarized, in part, as follows:

- a. The message of the film is received and interpreted in terms of the viewer's predisposition (attitudes) toward the message.
- b. Films do not always change the attitudes of the viewer in the direction expected. If the social attitudes of the viewer's reference group are contrary to those portrayed in the film, the group's social attitude tends to be reinforced rather than modified.
- c. The influence of films on attitudes persists, though there is a tendency for the effect to diminish with the passage of time. However, it is possible for the effect of a film to increase with time, if the motion picture has special significance for a particular audience.
- d. Although group measurement of attitudes do not reflect any significant differences, individuals within the groups may change significantly. Positive and negative attitude changes within the group may be offsetting, thus yielding no statistical evidence of group change.

If people do throw up defense barriers when aware of being subjected to attitude-changing devices, as research indicates, then it seems that experimentation in effecting attitude change through experiences of which the subjects are unaware is logical and worthwhile. One such method

which may be effective in attitude manipulation without the awareness of viewers is subliminal stimulation.

The notion that one individual may influence the behavior of another without the latter knowing it has fascinated many. Interest in such a method of influencing behavior has been expressed by psychiatrists, politicians, advertisers, and, according to one writer, "passionate young men." As will be pointed out in the review of the literature, there is sufficient evidence that, under given circumstances, subjects' responses can be affected by subception.²

Purpose of the Study

As stated earlier, an effective means to influence behavior is the manipulation or modification of attitudes. Remmers (64, p. 3) states that "attitudes are theoretically a component of all behavior, overt, or covert." Stagner (74, p. 77), in emphasizing the importance of attitudes upon behavior, says "... it is agreed that attitudes not only determine the conclusions we derive from facts but also influence the very facts we are willing to accept." Allport (2) holds that "attitudes determine for each individual what he will see and hear, what he will think and

²Subliminal perception, subliminal motivation, subliminal stimulation and subception all refer to the same thing; the perception of stimuli without conscious awareness.

what he will do." Further, Levine and Murphy (41) in an experiment with pro- and anti-communist attitudes found that students with attitudes unfavorable to certain material learn it with greater difficulty than those whose attitudes are favorable.

With an abundance of evidence pointing to the functional relationship of attitudes to behavior, it is obvious why the production of so-called attitude films has reached such massive proportions. But, as was pointed out earlier, investigation has revealed that the effectiveness of such films leaves much to be desired.

There remains a need for effective attitude-changing techniques. When the child enters school he has had six years in which a myriad of attitudes have been formed through family, church, and community experiences. Remmers (64, pp. 4 and 5) emphasizes this when he says:

Attitudes will be modified, through learning, in accordance with his own goals and drives. This means that a person will acquire attitudes like his parents, his friends and the other primary groups of which he is a member. As the individual grows older, secondary groups with which he is associated will elicit certain attitudes.

It is no easy task to teach children who have acquired attitudes which inhibit learning. In many cases valuable time is spent overcoming attitude barriers so that learning may take place. Often as not, the barrier is never effectively removed so that adequate adjustment to school requirements is made. The ever-increasing drop out problem

is monumental evidence of the inability of many students to make this adjustment to school life.

If public school pupils are subject to attitude fixation and bias, how much more so are the teacher trainees? Students in our colleges have come through twelve years of public school work and many bring with them attitudes toward the teaching profession which make it virtually impossible to train them to be efficient, top-grade teachers.

With the possibility of subliminal motivation having a significant effect upon an individual's response to his environment, a study designed to investigate the feasibility of using subceptional techniques to influence attitudes seems worthwhile. Such an investigation is the objective of this dissertation.

The Problem

This study attempted to determine whether a shift or change could be effected in the attitudes of teacher trainees toward the character role of an educational administrator portrayed in a motion picture film. The change of attitude was attempted by introducing a specific subliminal stimulus during the viewing of the film. Also, an attempt was made to determine whether there would be a difference in attitude shifts between subjects who were tested immediately after the subliminal stimulus experience and those who were tested at a time removed by several days from the subliminal stimulus experience.

CHAPTER II

BACKGROUND FOR THE STUDY

This chapter is concerned with the review of selected research related to the process and phenomenon of subception. The research review will deal with (1) recent interest in subception, (2) history of subliminal studies, (3) visual thresholds and perceptual defense, (4) recent studies in subception, and (5) subception's effect upon dreams and imagery.

Recent Interest in Subception

The current attention to the value of subception in motivating and influencing behavior may be attributed largely to a recent announcement by a James M. Vicary. He reported that the presentation of a subliminal message during a commercial motion picture showing had drastically affected the behavior of the audience. Vicary (43) stated that he had flashed two messages --- "eat popcorn" and "drink Coca Cola" --- at speeds far too fast (1/3000th of a second) for anyone to observe and had caused increased sales of the two products by 18.1 per cent and 57.7 per cent, respectively. So shocking was the implication of the

announcement that within the following two months there were at least seven articles in the popular periodicals relating to the "utopian promise" or the "1984 threat" of the technique (18), (43), (15), (54), (67), (79), (81).

In view of the fact that Vicary's experiment was never published or described in detail as to research design, there is much skepticism among psychologists as to the validity of his proclaimed results.³

History of Subliminal Motivation Studies

Subception as a phenomenon is not new. As early as 1863 Suslowa carried out an experiment which, as reported by Baker (5), was concerned with the effect of electrical stimulation upon subjects' ability to make a two-point discrimination. He found that when the intensity of the electrical stimulation was so low that the subjects were not aware of its presence, their ability to discriminate between one- and two-point stimulation was somewhat increased.

The criterion of so-called "zero confidence" has been used by numerous experimenters to establish that discrimination of stimuli presented below the level of conscious awareness is possible.⁴ In 1884 Pierce and Jastrow (58)

³No academic journal has published the details of Vicary's experiment. It has been described sketchily by the popular press.

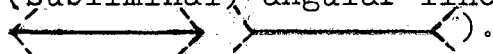
⁴Zero confidence refers to the fact that the subjects had no faith that their judgment or guesses were correct.

were able to show that subjects could discriminate differences between weights significantly better than chance would allow, even though the differences were so small they had no confidence whatsoever in their judgment. Sidis (69) in 1898 showed that subjects could reliably distinguish letters from numbers when the stimuli were presented at such a distance that the subjects were relying on pure guesswork for their judgments. Stroh, Shaw and Washburn (75) repeated Sidis' experiment using auditory stimuli and found evidence supporting his findings. The auditory stimuli were whispers presented at such a low level the subjects were not consciously aware that they were hearing anything. In further support of Pierce and Jastrow's conclusions, Baker (5) experimented with both visual and auditory stimuli in separate experiments. The auditory stimuli were Morse Code type dots and dashes. The visual stimuli were addition (+) and multiplication (x) signs. The subjects were to distinguish between the two stimuli in each experiment as they were presented at below conscious awareness. Baker claimed there was significant evidence of subliminal perception in both the auditory and visual experiments. His conclusion was that the threshold of unconscious awareness is lower than that of conscious awareness. Williams (87) gave credence to Baker's conclusions in an experiment in which he presented, on a screen, a series of 27 geometric figures at subliminal level and 108

figures at zero level (nonexistent). The subjects who reported that they were merely guessing on the identification of the 27 figures were correct at above chance frequency in their judgments. The judgments on the control group (the 108 figures) were not better than chance. Miller (51), in a 1939 experiment similar to Baker's, was able to show that subjects could discriminate geometric figures presented below their threshold of awareness, but their ability to discriminate was reduced as the stimuli were presented farther below the subjects' threshold of awareness. Blackwell (8), as did Miller, reported the increased unreliability of discrimination of stimuli presented at intensities progressively farther below the threshold. However, there are several other studies which show that subjects who have zero confidence in their judgments can discriminate reliably (although not perfectly) between stimuli (59), (83), (87).

There is another series of studies using variations of the Mueller-Lyer illusion which has further concluded that discrimination may take place without awareness.⁵ Dunlap (21), in an early experiment, found that subjects could discriminate line lengths although they reported that they could not "see" the subliminally projected angular line

⁵The Mueller-Lyer illusion involves the judgment of the length of visible lines which have imperceptible (subliminal) angular lines attached to them (i.e.,



extensions. Dunlap's experiment has been replicated, with most researchers attaining results which support the original conclusions (11), (34), (44). However, some have failed to corroborate Dunlap's findings (80).

Collier (16) and Perky (56) have executed experiments in which they showed that persons could be influenced in producing specific drawings, even though they were unaware that portions of the original drawing were presented subliminally.

Although the experiments reported here may be somewhat weak in methodology, they do seem to bear out that behavior may be affected by subliminal stimulation. However, McConnell, Cutler and McNeil (47) reported that the results would require cautious interpretation since they seem to correlate directly to the subjects' attention and interest as well as their awareness of the general nature of the experiment. In view of the limited effect of subception upon behavior, McConnell et al., raised a question as to whether subception can produce any but the simplest modifications in behavior.

At this point the writer feels it necessary to discuss briefly two important elements that play influential roles in the degree, at least, if not the existence of the subception phenomenon.

Visual Thresholds and Perceptual Defense

No matter the degree to which subliminal stimulation may alter behavior, there is considerable evidence that the psychological as well as physiological states of subjects influence their recognition thresholds. This has important implications for the effect that subliminal stimulation may have upon the individual.

There is little doubt that physiological states such as fatigue or satiation have a direct effect upon the threshold at which an individual may perceive a stimulus (47). Further, there is recent evidence that psychological factors such as need, value, conflict, and defense also may have a significant influence upon thresholds. In two studies, Sanford (65), (66) showed that "hungry" (food deprivation) subjects produced significantly more "food-relevant" responses to neutral stimuli than subjects who were not hungry. McClelland and Atkinson (45), in a similar study, interpreted their results as supporting Sanford's.

Stimuli which are laden with emotional overtones tend to be more difficult to perceive. This appears to create a state of "defending against perception" because of taboo or unacceptable stimuli. The results of Bruner and Postman's (13) experiment seem to confirm the existence of the concept of perceptual defense. Their study, conducted in 1947, was concerned with ascertaining whether personality is a

partial determiner of visual thresholds. They gave a word association test to a group of subjects, and for each subject selected the six words which had the shortest and the six words which had the longest reaction time. They then presented these words to the subject at progressively longer exposure times with a tachistoscope, starting below threshold. A longer exposure time was necessary for correct identification of the emotionally loaded words as compared to the neutral words. This was attributed to a defense against the anxiety-laden stimuli. On the basis of these findings, the authors proposed three new basic constructs, one of which was perceptual defense; i.e., "the raising of the visual threshold for unacceptable stimuli" (53, p. 80).

There were other investigators as well who studied the concept proposed by Bruner and Postman. Ericksen (25) obtained higher thresholds for unacceptable stimuli than for neutral words. McGinnies and Sherman (49), working with schizophrenics and normals, found thresholds for taboo words to be higher in both groups of subjects than for neutral words. In finding similar results in their study, Aronfreed, Messick and Diggory (3) stated that their results clearly indicated "perceptual selectivity in the sense of discrimination against the unpleasant words by both sexes" (3, p. 250).

As with most new concepts in psychology, perceptual

defense has not gone unchallenged. Much criticism was directed at the type of stimuli the experimenters used. Critics held that the threshold at which a subject could recognize a stimulus word was influenced by the word length and word frequency (familiarity). McGinnies (50), Goldstein (31), and Howes and Solomon (36), (73) all concluded from separate studies that thresholds were raised with increased word length and lowered with word familiarity.

Another point of criticism was the subject-response method used in most perceptual defense studies. Usually, the subject was asked to repeat verbally the stimulus word when he recognized it. Critics maintained that subjects were reluctant to verbalize unacceptable or taboo stimuli. Whittaker, Gilcrist and Fisher (85) concluded from their study that anxiety-laden stimuli produced higher thresholds because of "conscious response suppression" rather than by the mechanism of perceptual defense. Cowen and Beier (19) also found subjects hesitant to report loaded words, thus confirming the studies of McGinnies and Whittaker et al.

Criticisms notwithstanding, experiments in perceptual defense have continued to be carried out. However, in view of the feasibility of stated criticisms, it behooves any investigator to consider some alternative explanations of the apparent phenomenon of perceptual defense.

Initial set or predisposition is one condition which

has been suggested as an explanation of perceptual defense (47). The amount of conscious awareness that subjects have of the nature of the study may cause them to be more alert or attentive, and possibly to receive cues during the experiment.

Another explanation of perceptual defense is asserted by Howie (37, p. 311) when he states:

It is one thing to say that a person may defend himself against perceptions. He can, of course, do that quite simply by shutting his eyes or stopping up his ears. It is quite another thing to claim as an integral principle of perceptual process a principle of perceptual defense.

In still a third explanation, four different studies by Dulaney (2), Pustell (61), Raskin (62), and Reece (63) paired negative or loaded stimuli with shock or threat of shock and found a raised threshold. They felt that the results could best be explained in terms of learning theory. In their experiments, Dulaney and Pustell produced lowered thresholds when subjects were rewarded for one group of stimuli. However, as Naylor and Lawshe (53, p. 87) point out:

It should be kept in mind that explaining the raising of thresholds in terms of learning does not necessarily destroy the notion that some form of subception is necessary to the process if the process does exist. Not all evidence for subception rests upon experimentation in the area of perceptual defense.

Recent Studies in Subception

With several studies pointing to the actuality of the process of perception without awareness, there was renewed

interest in its investigation. McGinnies (48) reasoned that if a person were able to raise his threshold of recognition to certain stimuli, he must also be able to discriminate at below an awareness level as to which stimuli should be more difficult to perceive. McGinnies measured the galvanic skin reflex (GSR) of subjects who had been exposed to neutral and anxiety-laden stimuli. He found that the pre-recognition GSR value for anxiety stimuli was significantly different than that obtained for neutral words. He considered his results to be evidence for perception without awareness.

In what is now considered a classic study of subception, Lazarus and McCleary (40) conducted an experiment much the same as McGinnies' but with more elaborate controls. Their stimuli were nonsense syllables. One-half of the stimuli were presented with a shock to condition a GSR to these syllables. Each subject was tested separately so that his individual threshold could be established, then all subsequent presentations were made at duration times below this threshold. In using such a device for measurement, they had eliminated any verbal response, consequently eliminating verbal-reluctance bias as an influencing factor. In doing so, they had controlled for the elements most widely criticized in subception studies: word frequency, word length, and verbal reluctance. Exposing both types of stimuli at subthreshold speeds, they obtained GSR values

for both shock and non-shock syllables. Those values obtained for the syllables which had been conditioned for shock were significantly (.01 level) higher than the neutral (no shock) syllables. The authors considered these results to be somewhat more substantial evidence for "perceptual activity" at a recognition level below consciousness.

Using controls much like those of Lazarus and McCleary, Taylor (77) carried out a study which was offered as further evidence for subliminal discrimination. His stimuli were six geometric figures flashed individually on a screen at below threshold level. One of the six figures was consistently followed (5 seconds delay) by a shock. Using a GSR device, he determined that the symbol which had been paired with shock subsequently produced a higher GSR value than those symbols which had not been paired with shock.

Naylor and Lawshe (53) report an experiment conducted by a Smith and Henricksen of the University of Oslo in which the latter researchers explored the perceptual process in subception. They projected a line drawing of a square on a screen at full recognition brightness. At below threshold level, they repeatedly flashed a series of line patterns. These line patterns, when viewed with the square, formed an optical illusion which made the combination of the two figures appear to be a trapezoid. The line patterns were flashed repeatedly at durations which

gradually approached the threshold level. Given a set of six figures from which to choose, the subjects consistently checked the trapezoid figure as the one which best matched the image they "saw" on the screen. The authors interpreted their results as evidence in favor of discrimination at below threshold level.

More recently there have been at least two studies of a somewhat different nature on subception. At the Research Center for Mental Health, New York University, there has been considerable research carried on with patients as subjects. In one study, Smith, Spence, and Klein (72) projected at full visible brightness an expressionless face. While the patients looked at the picture, the authors, by means of a tachistoscope, superimposed at subliminal level the words "angry" and "happy." The subjects were asked to report what expression the face portrayed. Seventeen of twenty subjects reported pleasant interpretations when the word "happy" had been superimposed. This was significant at the .001 level.

The same experiment was repeated by Bach and Klein (4) with a variation in the nature of the subliminal stimulus words. In the preceding study by Smith et al., the stimulus words were subliminally superimposed over the face by flashing for short durations. Bach and Klein superimposed the stimulus words "angry" and "happy" by projecting them continuously at such an impoverished light intensity as to

make them subliminal. The subjects were twenty-two graduate and undergraduate females. Sixteen reported the neutral face to be of a pleasant expression while "happy" was being presented. This was significant beyond the .05 level.

Another experiment very similar to the two just mentioned was one in which Eagle (22) attempted to influence the subjects' description of a drawing of a neutral figure by presenting simultaneously and subliminally two pictures as stimuli. These two subliminal drawings implicated the neutral figure in two emotion-laden situations, murder and giving. Rather than superimposing the subliminal stimulus pictures over the neutral figure, Eagle presented them tachistoscopically below awareness threshold immediately preceding the presentation of the neutral figure, thus obtaining a "masked" effect. The subliminal picture significantly affected the subjects' interpretation of the neutral figure. According to Eagle, the results point to the general conclusion that "stimuli can register without implicating awareness" and can "influence conscious cognitive behavior."

Proceeding somewhat further, Oxhandler (55), after experimenting with the possibility of imparting facts by injecting stimuli subliminally into the content of a film, concluded that there is a significant effect upon subjects viewing the film. While subjects viewed the film in question, two distinct facts (a date, and the name of a city

not referred to in the film) were flashed on the screen repeatedly at subliminal speeds. Responses of the subjects as compared to a non-stimulated group showed a significant difference for the subliminal stimulus.

Just as in the case of the earlier studies, these more recent experiments of the subception process have not gone unchallenged. One of the primary objections was that the subjects were consciously perceiving information from the stimulus when it was supposed to be subliminal in nature. Earlier, thresholds were discussed to some extent. Thresholds are merely statistical definitions, and the definition for an absolute threshold is that point at which the stimulus is correctly perceived no better than chance. This means that in a yes--no response situation the subject could see a certain stimulus forty-nine per cent of the time and still have that stimulus value considered as a threshold. As some researchers failed to define their experimental thresholds, partial information from the stimuli could account for the positive conclusions supporting the subception phenomenon.

Bricker and Chapanis (12) did an experiment in 1953 designed to show that, even when a stimulus is incorrectly perceived, the subject could still obtain partial information from it. They found that when they instructed their subjects to continue guessing until they correctly identified a stimulus word exposed for a duration below threshold,

fewer guesses were needed to correctly identify the word than would be expected on a pure chance basis. These authors used this information to criticize the Lazarus and McCleary study, as well as others, claiming that it was this partial information, not a process of subception, which caused the GSR responses they obtained. In a similar study, Murdock (52) obtained results which supported Bricker's and Chapanis' criticisms. After conducting three studies, Wiener and Schiller (86) stated that the stimulus, though below the reportable threshold, is nevertheless perceived and subjects respond to minimal cues. There have been others who have criticized not so much the possibility of perception without awareness as a distinct phenomenon, but the assumptions made regarding the interpretations of the results and their relationship to the experimental procedures (26), (35). Voor's (84) study resulted in criticism which is typical. He showed that there was a definite relationship between information received and GSR. He also found that when no information is obtained from the presentation, "indicated by verbal recognition scores below chance expectancy subception as measured by GSR fails to reach statistical significance."

Although these critical studies seem to nullify those which resulted in positive evidence supporting subception, they themselves have to be interpreted with caution. These criticisms discredit the experimental techniques and

controls of subception studies rather than the subception phenomenon itself. Alternate explanations of the apparent subception results have, in the main, been based on partial information "leaks" or cues from the stimulus. Other studies have determined that the more closely related the subliminal stimulus is to the subject's strong need states, the lower the recognition threshold of the subject (30), (88), (46). However, McConnell, Cutler, and McNeil (47, p. 239) have pointed out:

... assurances that this technique can only remind a person of something he already knows or support a set of urges already in existence, but cannot establish a completely new set of urges or needs, are reckless assertions having no evidence to support them.

These same authors also hold that:

The argument that a great deal of our normal perception occurs on the fringe of conscious awareness and that subliminal events are no more effective than weak conscious stimuli, rests on opinion and not fact. The effect, on behavior, of stimuli which may possibly be inserted directly into the unconscious has yet to be explored (47, p. 240).

Subception, Dreams, and Imagery

At various times in this writer's review of the literature, there have been studies which present evidence supporting the hypothesis that subception has a significant effect upon subjects' dreams and imagery. Eagle (22) reports that in an early study Poetzl (1917) found that subjects having viewed a picture projected tachistoscopically

for 1/100 of a second were able the next day to draw and account for details in their dreams which had appeared in the projected picture and yet were not originally reported. In 1954, Fisher (27) repeated this experiment of Poetzl's and obtained essentially the same results. By carrying out more rigorously designed studies, Shevrin and Luborsky (68) and Fisher and Paul (28) obtained results which supported Poetzl's evidence, not only with dreams, but with mental images as well. Fisher and Paul's experiment was to determine if complex and organized subliminal visual stimuli would nevertheless be registered and proceed to influence cognition. Sixteen seniors in the graphic arts department of a school of design served as the subjects. Two subliminal stimuli were presented by means of a tachistoscope: (1) a blank slide and (2) a figured slide, in that order. The subjects were asked to pay particular attention to any dreams or mental images they might have that night and be prepared to draw them the next day. The same experiment was repeated five weeks later with the slides presented in reverse order, the figured slide and then the blank slide. Results showed both immediate and delayed effects on dreams in support of the hypothesis. In reporting a similar study, these same authors concluded that "subliminal visual registration is genuine phenomenon and subliminal visual stimulation may influence subsequent dreams and images."

Some subjects who participated in Oxhandler's (55)

study voluntarily reported impressions of the stimuli in dreams and images several days after the experiment. A search of the literature revealed no studies which either criticize or present evidence to the contrary of that reported in the above experiments on dreams and imagery.

Summary of Related Research

When considering the areas which are related to subception, such as perceptual defense and threshold levels, there is considerable research available for study. However, the choice of studies pertaining to subception specifically is somewhat limited (65). With the originally proposed construct of defensive avoidance by Postman, Bruner, and McGinnies (60) there was considerable interest generated, and follow-up studies resulted. Then, somewhat later, following Lazarus' and McCleary's (40) study of subception, there was a similar surge of interest in this phenomenon.

Most authors reported positive evidence in the area of perceptual defense. When subjects were subjected to subliminal stimuli, they tended to develop higher (less sensitive) recognition thresholds for the taboo or loaded words. However, these studies were criticized for inadequate controls on the following variables: word length, word frequency, and verbal reluctance. These criticisms were counter-criticized with claims that the theory was not

refuted solely because of questionable experimental procedures. Evidence for perceptual defense has been obtained when these variables were controlled (6).

Several studies were done in which substantial evidence supporting subception was reported. Because of the elaborate controls made in their study, Lazarus' and McCleary's (40) experiment has been the classic model. In using nonsense syllables and the galvanic skin response, they established evidence which supported the hypothesis that perceptual activity does take place below conscious recognition.

The primary objection to these studies in subception was that partial information from the stimulus was not adequately controlled and, therefore, became a factor in the experimental results. Counter-criticisms were again hurled based on the premise that non-acceptance of experimental design does not deny the theory. With several independent studies resulting in positive evidence in support of the existence of subception, many researchers agree with Adams (1) that discrimination without awareness can take place (7), (9), (10), (39), (49), (51), (71), (77).

Studies which are fewer in number, but more conclusive in results, point to strong evidence in support of the hypothesis that subception significantly affects dreams and mental images. No studies showing negative results were found in a search of the literature.

CHAPTER III

EXPERIMENTAL DESIGN AND PROCEDURE

In this chapter the general design of the experiment will be discussed. There will be a statement of the hypotheses, a description of the physical conditions of the experiment, and a discussion of the subjects, the stimuli, measuring devices, and statistical procedure.

General Design

The purpose of the study was to determine whether a shift in attitudes could be effected by using a subliminal message. The film "The Conference" was shown to all subjects. In addition to viewing the film, the experimental groups were subjected to a subliminal message which was aimed at affecting their attitudes toward the high school principal portrayed in the film. One of the two experimental groups was tested immediately following the film and the other experimental group was tested forty-eight hours after the film viewing.

The control groups viewed the same film, but did not experience the subliminal message. One control group was tested immediately following the film and the remaining

control group was tested forty-eight hours after the film viewing.

The Adjective Check List (32), which contains fifteen personality assessment scales known as Need Scales was used to determine the subjects' attitudes toward the target character in the film.

Three additional group measurements were made: (1) The American College Testing Program scores were taken from the subjects' personnel file, (2) the Social Class Value Orientation Inventory was administered, and (3) the size of the high school from which each subject graduated was determined (78), (76). This data was used in making a check for homogeneity of variances among groups.

Definition of Terms

Attitudes, as used in the hypotheses were defined as the subjects' responses to the Adjective Check List Need Scales. Attitude changes were defined as the Need Scale score differences existing between control groups and experimental groups.

Hypotheses to be Tested

This investigator attempted to test the following hypotheses:

Hypothesis I: There will be a significant difference in attitudes developed among teacher

trainees who view a film which contains a subliminal message and those who view the film without the subliminal message, both groups being tested immediately following the film.

Hypothesis II: There will be a significant difference in attitudes developed among teacher trainees who view a film which contains a subliminal message and those who view the film without the subliminal message, both groups being tested forty-eight hours following the film.

Hypothesis III: Attitudes of subjects who are tested forty-eight hours after the subliminal stimulus experience will be significantly different than the attitudes of those subjects tested immediately following the subliminal experience.

Experimental Variables

It would be meaningless to speak in the abstract of the effectiveness of subliminal stimuli. As was pointed out in Chapter II, there is conclusive evidence that physiological states such as fatigue or satiation have a direct effect upon a person's response to subliminal stimuli. There are recent studies which conclude that certain

psychological factors may also influence the effect of a subliminal stimulus (45), (65), (66). The nature of the stimulus itself may negate the intended product of the message (13).

This writer found virtually no studies reported which have attempted to determine the effect of a subliminal stimulus upon a mass audience.⁶ Almost all experiments have been carried out to gather evidence either in favor or against the existence of the subception phenomenon and have been done with small numbers of subjects. Even then subjects experienced the experimental treatment individually rather than as a group. However, the intended purpose of this study is not present further evidence supporting or rejecting the existence of the phenomenon, but to determine whether the methods used in such experiments may be effectively utilized in the normal educational process.

In the present experiment, a systematic effort was made to hold constant or control those variables which might affect the results. The two independent variables of the study were (1) the subliminal stimulus and (2) a time differential in administering the final test. The dependent variable was the Adjective Check List. The scores of the fifteen personality Need Scales of the Check List were

⁶There is one exception. Oxhandler (55) used a subliminal message in endeavoring to cause a class of students to learn facts not reported in a film which they viewed.

used in the statistical analysis.

Since primary group associations have such forceful influence upon the attitudes of individuals, it would appear essential to control or make allowance for social class values among the experimental groups. The Social Class Value Orientation inventory was used to measure attitude differences among groups.

It was deemed desirable to determine the differences among groups as to scholastic achievement. To assess the achievement level of subjects, the American College Testing Program examination scores were obtained from each student's personnel records.

Since the target character in the experimental film was a high school principal, it seemed logical that each subject's attitude toward his own high school principal might have a significant effect upon his assessment of the role portrayed in the film. It was reasoned that the normal amount of contact the high school student had had with his principal could be determined to a great extent by the size of the high school. In an effort to control for this variable the size of the high school from which each subject had been graduated was determined.

It would have been useful to match experimental groups on these three variables. However, to do this might have necessitated such a drastic reduction in the size of the sample used that the reliability of the results might have

been impaired. Therefore, the statistical differences between groups in respect to these three variables were determined by means of the F test of extreme variances of the American College Testing examination scores and the Social Class Value Orientation inventory. The chi square test of significance was used with the high school size variable.

In an effort to further eliminate bias and variables which might affect the results, other controls were applied to the sampling of subjects. These controls were:

1. To minimize fatigue as a variable, only students of Education 213 sections meeting at eight a.m., nine a.m., ten a.m., and eleven a.m. were used as subjects. All attitude testing over film content was done during these class periods.
2. Only undergraduate students were used as subjects.
3. No transfer students from other colleges or universities were used as subjects.
4. Only students who aspired to be teachers were used as subjects.

Subjects

Students enrolled in nine of eleven sections of Education 213 at Oklahoma State University during the Spring Semester of 1965 participated in this experiment. At the

beginning of the experiment, there were 243 subjects. Attrition (failure to see the film or to take the delayed test) and disallowance for one or more of the above cited controls reduced the final experimental population to 131 individuals. The distribution of the final experimental population is shown in Table I.

TABLE I
DISTRIBUTION OF SUBJECTS AMONG
THE FOUR EXPERIMENTAL GROUPS
(N = 131)

| Sex | Control Group I | Experim. Group I | Control Group II | Experim. Group II |
|--------|--------------------|---------------------|---------------------|----------------------|
| Male | 10 | 7 | 9 | 4 |
| Female | 34 | 26 | 23 | 18 |
| Total | 44 | 33 | 32 | 22 |

By using Fisher's and Yates' table of random numbers after Lindquist (42, pp. 24-26), individual subjects in each section were randomly assigned to one of two groups. One of these two groups in each section was assigned to an experimental group and the other was assigned to a control group.

It has been empirically established that fatigue has a significant effect upon individuals' sensitivity (threshold) to visual stimuli.⁷ Therefore, the nine class sections from which subjects were selected met in the mornings. The remaining two sections of Education 213 met in the afternoon and at night and were not used as subjects.

Because the film used in the experiment was about educational personnel involved in an educational situation, only students who planned to enter the teaching field were used as subjects. It was felt that these students would be more homogeneous in their attitudes toward school problems.

Due to these strenuous controls, the reader must exercise caution in applying the results of this study to a general teacher trainee population. Table II presents additional data in defining the subjects.

TABLE II
CHARACTERISTICS OF SUBJECTS (N = 131)

| | Mean | S.D. | Range |
|---------------------|-------|-------|-----------|
| Age (In years) | 20.11 | 1.05 | 18 - 26 |
| A.C.T. Raw Scores | 20.71 | 13.52 | 11 - 29 |
| S.C.V.O. Raw Scores | 29.18 | 11.77 | 25 - 33 |
| Size of High School | --- | --- | 36 - 3000 |

⁷See "Visual Thresholds and Perceptual Defense" section, Chapter II.

The Film

The film used in the study was "The Conference." It is one of a series which has been produced by the National Council on Educational Administration. The film is fifteen minutes in length and is a dramatization of an after-school conference involving a high school principal and two women teachers on his staff. The purpose of the conference is to bring about an understanding between the teachers, who are experiencing a strained relationship. One teacher is the foreign language department head and has approached the principal with several charges against the new and younger teacher. The charges range from failure to comply with routine procedure to unprofessional conduct. The episode develops with such emotional overtones that it is difficult for audiences not to become involved with the story. Because of this highly motivational characteristic of the film, the chance would be minimal that subjects would not be looking at the screen for an extended length of time and, thus, miss several presentations of the subliminal message. The film presents no narration or information either preceding or following the text of the film. Consequently, viewers had no opportunity to rely upon related commentary for their expressed attitudes toward the target character, the principal.

Measuring Instruments

In this section the three test instruments will be discussed. The first two were used to obtain data to be used in checking homogeneity of variances. The third instrument was used to determine the significance of experimental differences.

American College Testing Program Examination

This test is administered to the students during their senior year in high school and was used as a measure of scholastic achievement. Tiedman (78, p. 818) has the following to say about the instrument:

The ACT Exam is in four parts: English, mathematics, social studies, and natural sciences. Except for several information items in the tests of both social studies and natural science, the examination requires application of knowledge in a context similar to that in which a subject is presented in high school and college. This similarity persuades that the ACT program provides what it intends to provide, namely a basis for selection to college grounded in what a person has to do as a college student. . . . The composite scores of the ACT provides a good indication of scholastic aptitude for college work.

The ACT examination is beyond much question in its technical aspects. Design, items, accuracy, and speed of scoring, scales, norms, reports, and manuals -- the ACT program exemplifies excellence in each of these regards.

Tiedman reported that the correlation of the ACT scores with over-all college averages in the freshman year was 0.53. Correlation of the ACT scores with reported high school grades by the student was 0.61. Correlation

with student reported freshman grades in college was 0.68.

With the widespread use of the ACT program, the assumption is made by this writer that the ACT scores are adequate measures of scholastic ability.

Social Class Value Orientation Inventory

This scale was developed by Solomon Sutker, Ph.D., of the Oklahoma State University Sociology Department. This instrument is composed of thirty-three pairs of value statements. In each pair the respondent chooses the one with which he most nearly agrees. This instrument covers four dimensions: (1) time orientation, (2) control of destiny, (3) presentation of self, and (4) the social world. The score obtained indicates the respondent's orientation or agreement with middle-class values. Middle-class values are conceived to reflect future time orientation, planning, and effort in the control of destiny, controlled and socially conscious presentation of self and nonfamilistic social world. The lower class in contrast was conceived to reflect present time orientation, fatalism in control of destiny, uncontrol and unconcerned presentation of self and familistic social world (14).

As this inventory is a most recently developed instrument there is no validity coefficient available.

The Adjective Check List

This test was administered to all the subjects after the film presentation and was used to measure their assessments of the personality of the high school principal portrayed in the film. The instrument consists of a list of three hundred adjectives commonly used to describe the attributes of a person. The respondent is required to check the adjectives which describe the person being assessed. Fifteen Need Scales are available for use with the Adjective Check List. These fifteen variables are: (1) achievement, (2) dominance, (3) endurance, (4) order, (5) intraception, (6) nurturance, (7) affiliation, (8) heterosexuality, (9) exhibition, (10) autonomy, (11) aggression, (12) change, (13) succorance, (14) abasement, and (15) deference. The Manual defines these variables as follows:

- Achievement: To strive to be outstanding in pursuits of socially recognized significance.
- Dominance: To seek and sustain leadership roles in groups or to be influential and controlling in individual relationships.
- Endurance: To persist in any task undertaken.
- Order: To place special emphasis on neatness, organization, and planning in one's activities.

- Intraception: To engage in attempts to understand one's own behavior or the behavior of others.
- Nurturance: To engage in behaviors which extend material or emotional benefits to others.
- Affiliation: To seek and sustain numerous personal friendships.
- Heterosexuality: To seek the company of and derive emotional satisfactions from interactions with opposite sexed peers.
- Exhibition: To behave in such a way as to elicit the immediate attention of others.
- Autonomy: To act independently of others or of social values and expectations.
- Aggression: To engage in behaviors which attack or hurt others.
- Change: To seek novelty of experience and avoid routine.
- Succorance: To solicit sympathy, affection, or emotional support from others.
- Abasement: To express feelings of inferiority through self-criticism, guilt, or social impotence.

Deference: To seek and sustain subordinate roles in relationship with others (32, p. 7-9).

Each of these Need Scales contains adjectives from the instrument which are both indicative and contra-indicative of the attribute. Each indicative adjective checked by the respondent receives a single positive score. Each contra-indicative adjective is awarded a single negative score. The raw score for each scale is the algebraic sum of these two sets of adjectives.

The raw scores have been converted to standard scores. There are separate standard score tables for males and females.

Reliability. The reliability of the Adjective Check List Need Scales was estimated by the test-retest method. According to the Manual, four experimental samples were used to determine the coefficients (32, p. 13). The samples consisted of fifty-six college males and twenty-three college females tested ten weeks apart, one hundred adult males tested six months apart, and thirty-four medical school students tested five and one-half years apart. The coefficients resulting from the ten-week interval for the college males ranged from .54 to .85 with a mean of .73. Coefficients for the college women retest over the ten-week interval ranged from .45 to .90 with a mean of .72. The six-month check of adult males resulted in Need Scale

coefficients ranging from .33 to .75 with a mean of .55. The five and one-half year retest with medical students rendered a range of coefficients from .25 to .77 with a mean of .53. For a comparison of the consistency of reliability within any one scale throughout the four retest intervals, refer to Appendix A.

Validity. The research and analysis presented on the validity of the Adjective Check List is quite extensive and encompasses numerous publications, only one of which will be noted here. Preliminary versions of the Adjective Check List Need Scales were related to their counterparts on the Edwards Personal Preference Schedule (24). The rank order of needs as assessed by the Adjective Check List correlated .60 with the ranking given by the Edwards Schedule.

Experimental Procedures

The purpose of this section is to describe the procedure of the experiment, the physical conditions under which the experiment was carried on and the experimental treatments used.

Prior to the study a questionnaire was distributed among the subjects to determine their (1) age, (2) classification, (3) size of high school from which graduated, (4) college in which enrolled, and (5) whether they aspired to become teachers. This information was used for control purposes.

The subjects in each of the nine sections were randomly assigned to either a control group or an experimental group. The final experimental population consisted of 131 subjects. The distribution of subjects among the experimental groups is shown in Table I.

Physical Conditions of the Experiment

Two rooms adequate with reference to size, ventilation, and facilities for eliminating light were used for this experiment. The doors to each room were closed throughout the experiment, and a note was placed on the outside of the door to prevent interruptions. All of the control groups met in one of the two rooms and all experimental groups met in the other room. It is conceivable that the use of two rooms with different instructors may have introduced a variable which would affect the results. For all groups to have undergone the experimental experience in one room and with one experimenter would have required one-half of each section to be used as many as four different days. This would leave the section instructor with only one-half of his section for four class sessions (a two week period). Since the request for such numerous interruptions of class schedules was met with reluctance on the part of some of the six instructors involved and absolute refusal on the part of one, it became necessary to use two rooms, two experimenters and two copies of the film. Every effort was made to reduce the effect of this condition. The writer served as

one experimenter and was careful to brief the other experimenter as to the purpose of the experiment, directions to be given and procedure of film presentation.

The experiment was completed during five sessions over a two-day period. Those subjects who made up Experimental Group II and Control Group II experienced the differential time variable (delayed test). They responded to the Adjective Check List instrument forty-eight hours after the film showing, at their next class session. The schedule of groups participating in the experiment is presented in Table III.

TABLE III
TIME SCHEDULE OF EXPERIMENTAL GROUPS OF SECTIONS

| Section No. | Days Class Met | Time | Experimental Assignment |
|-------------|-------------------|------|----------------------------|
| 1 | Wed. and Fri. | 10 | Control I - Exp I |
| 2 | Wed. and Fri. | 10 | Control I - Exp I |
| 3 | Wed. and Fri. | 11 | Control I - Exp I |
| 4 | Tue. and Thu. | 10 | Control II - Exp II |
| 5 | Tue. and Thu. | 10 | Control II - Exp II |
| 6 | Tue. and Thu. | 10 | Control II - Exp II |
| 7 | Tue. and Thu. | 11 | Control I - Exp I |
| 8 | Tue. and Thu. | 11 | Control I - Exp I |
| 9 | Tue. and Thu. | 8 | Control II - Exp II |

Subliminal Message and Stimulus Projector

During the Spring Semester of 1964, a pilot study was carried out using two sections of Education 213 students as subjects. The purpose of the pilot study was to have the subjects make a personality assessment of the high school principal portrayed in the film to be used in the experiment. The assessment instrument was the fifteen Need Scales of the Adjective Check List.

The film was shown to the two sections and the Check List was administered immediately afterward. A sample of thirty-five respondents was selected randomly and their test results were used in the pilot study. The raw scores were converted to standard scores and the mean score was computed for each of the fifteen Need Scales. These mean scores are presented in Table IV. The table reveals that the two personality scales having the highest mean scores (Succorance and Autonomy) are attributes which bear contra-indicative connotations. Words on the Adjective Check List such as aloof, confident, independent, individualistic, and self-confident are included among both the indicative adjectives of Autonomy and the contra-indicative adjectives of Succorance. Upon further examination of the table, it is evident that this distinction is borne out, not only in these two Need Scales, but also in the personality scales receiving the six highest mean scores. Table V shows the intercorrelations of these six scales. Dominance, Autonomy,

and Exhibition are contra-indicative of Succorance, Abasement, and Deference.

TABLE IV
PILOT STUDY Z SCORES FOR THE NEED SCALES
OF THE ADJECTIVE CHECK LIST

| | Ach | Dom | End | Ord | Int | Nur | Aff | Het | Exh | Aut | Agg | Cha | Suc | Aba | Def |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Z = | 44 | 46 | 44 | 43 | 35 | 35 | 31 | 40 | 51 | 52 | 27 | 41 | 53 | 46 | 44 |

TABLE V
INTERCORRELATIONS OF THE NEED SCALES
RECEIVING THE SIX HIGHEST Z SCORES
IN THE PILOT STUDY

| | Autonomy | Exhibition | Dominance | Abasement | Deference |
|------------|----------|------------|-----------|-----------|-----------|
| Succorance | -.09 | -.04 | -.51 | +.40 | +.10 |
| Autonomy | | +.48 | +.32 | -.47 | -.65 |
| Exhibition | | | +.39 | -.48 | -.46 |
| Dominance | | | | -.56 | -.21 |
| Abasement | | | | | +.51 |

After examination of the various adjectives assigned

to these six Need Scales, it was decided that the word TIMID would be used as the subliminal message. TIMID fulfills the salient characteristics of an acceptable subliminal message as described in Chapter II; that is, (1) it is short, (2) it is a generally familiar word, and (3) it lacks ambiguity. Aside from these characteristics, TIMID is a word which could have maximum effect as the subliminal message. It is an indicative adjective assigned to both Abasement and Deference. Also, it is a contra-indicative adjective assigned to the Dominance, Exhibition, Autonomy, and Aggression Need Scales. The Aggression scale received a Z score of only 27 in the pilot study, but has the relatively high correlation with Abasement of +.56. Should the subliminal message TIMID prove effective in the experimental treatment, then one could expect to observe higher mean scores among the Abasement, Succorance, and/or Deference scales. Moreover, it would be logical to expect lower scores among the Autonomy, Dominance, Exhibition, and/or Aggression scales.

As was reported in the review of literature, the most significant argument proposed to refute the subception studies was one in which it was held that the effect observed was a psuedo-subliminal effect and could, by experimental replication, be attributed to partial recognition of the "subliminal" stimulus itself. When the stimulus is

presented at statistical threshold level, partial recognition might very well be an explanation of the subception effect.⁸ To minimize the partial recognition probability in this experiment, the brightness level of the subliminal stimulus was to be established near the absolute threshold.⁹

Six students were asked to serve as subjects of a second pilot study. The purpose being to determine the minimum level of brightness at which the stimulus could be consciously perceived. They were informed of the nature and identity of the subliminal stimulus which was to appear on the screen while they viewed a motion picture film. Except for the word used as the subliminal message, all conditions of this pilot study were identical to those of the final study. Whereas, TIMID was to be used in the final study, BOSSY was used as the subliminal message in this trial experiment.

The subjects were asked to "watch for" the flashing of the message and raise their hand each time they were aware of its presence on the screen. They were not required to

⁸Statistical threshold level is that level of stimulus presentation at which the presence of the subception message may consciously be observed as much as forty-nine per cent of the time. Statistical threshold represents the maximum possible level of brightness at which the subliminal stimulus may be presented.

⁹Absolute threshold, as used herein, is defined as that level of stimulus presentation at which the presentation of the subception message will not be consciously observed at all. Absolute threshold represents the minimum possible level of brightness at which the subliminal stimulus may be presented.

identify the word, but only to signify that it was being flashed on the screen. By means of a tachistoscope, the brightness of the stimulus word was gradually increased until all of the six subjects were perceiving the presence of the stimulus word each time it was flashed. The resulting tachistoscope setting was recorded for use in the next phase of this study.

Another section of twenty-eight students made up the group of subjects used in a third and final trial experiment. The conditions of this phase of the trial experiment were identical to the second pilot study, except that these subjects were not informed of the presence of the subliminal stimulus. They were told only that they were to view the film, and a brief description of the setting of the film story was given. During the showing of the film, the experimenter flashed the subliminal word on the screen at approximately sixty second intervals (16 times). The first brightness level setting on the tachistoscope was the same as that setting recorded at the completion of the first phase of the trial experiment. At the completion of the first showing of the film, the experimenter asked if anything occurred during the showing of the film which seemed foreign or unrelated to the film text. Several subjects responded in the affirmative, but only three indicated that they "saw something flashed on the screen several times." Since these three subjects represented ten per cent of the

total group, it was decided that this brightness level would be acceptable as the "near absolute" threshold level to be used in the experiment.¹⁰ The tachistoscope setting was noted for future references. This concluded all pre-experimental studies.

For both the pilot study and the final experiment, the projector used in flashing the subliminal message was a modified $3\frac{1}{4}$ " by 4" lantern slide projector. The projector's lamp and reflecting mirror were removed and in their place a small forty watt-second, electronic strobe unit was installed. By operating a punch-button micro-switch, the strobe unit could be flashed as frequently as once every four seconds. The duration of the flash is rated by the strobe manufacturer as $1/650$ th of a second.

A tachistoscope which contained an adjustable shutter and aperture was mounted on the front of the projector's lens barrel. The shutter was left in the "open" position and the intensity of the flash was controlled by the adjustable aperture.

The stimulus word TIMID was printed on a card and photographed. The negative of the photograph was used as the slide for the projector. This allowed a white word with a totally opaque background to be flashed on the projection screen. The size of the projected word was

¹⁰The experimenter fully expected to be forced to repeat this phase of the study several times until an acceptable threshold level was established.

determined by placing both projectors in position and projecting a grid on the screen from the stimulus projector. By counting grid squares on the screen, an acceptable dimension of the word TIMID was ascertained.¹¹

In order to minimize the chances of subjects noticing and becoming curious about the presence of the stimulus projector, a simple, wooden box was made to cover it. The end of the box at the tachistoscope position was removable. This permitted the experimenter to expose the lens after the room was darkened and to cover it before the lights were turned on at the film's end. This insured the concealment of the stimulus projector while subjects were passing in and out of the projection room.

The stimulus projector and box were placed on the projection stand and the motion picture projector was placed on top of the box. This appeared as though the box was being used simply to raise the motion picture projector above the heads of the subjects. Both projectors were situated well behind the back row of subjects. From all indications, the concealed projector was completely unnoticed.

Specific Treatments

Control Group I and Experimental Group I were shown

¹¹By "acceptable dimension" is meant a size which was easily readable from the rear of the room.

the film, "The Conference." Control I viewed the film without the subliminal stimulus and Experimental I viewed the film with the subliminal stimulus. Both groups responded to the Adjective Check List (dependent variable) immediately following the film. The pre-film instructions were as follows:

The film you will see this morning is a dramatization of a conference between a high school principal and two of his teachers. The purpose of the conference is to find a solution to a problem that exists between the two teachers. We want you to pay particular attention to Mr. O'Shea, the principal, and give us your opinion as to the type person you think he is.

The room lights were immediately extinguished and the pre-threaded projector was turned on. The correct volume level of the film's sound had been pre-determined so there was no adjusting necessary during the showing of the film.

Approximately two minutes after the beginning of the film, the emotional tenor of the dramatization began to intensify. It was not until these two minutes had elapsed, during the Experimental Group showing, that the flashing of the stimulus message was begun. The projectors had been positioned so that the stimulus word would appear on the screen one-half way between the center of the film's picture and the bottom of the picture. This allowed the projected word to usually fall in the dark area of the film's picture. In an effort to insure the association of the word TIMID with the target character, Mr. O'Shea, the word was flashed on the screen only when he was isolated on the

screen or when he was talking. The word was flashed thirteen times during the showing, at an average of sixty-second intervals.

After the film was over, the following instructions were given to the subjects:

I am going to hand each of you a packet of materials. The packet contains four separate items. The first thing I want you to do, while I am passing them out, is to go through and put your name on the first sheet of each item.

When the experimenter had completed distributing the questionnaires, further instructions were given as follows:

I want to point out that these are not tests. There are no right or wrong answers. All we want is your opinion.

The first item is a two-page check list of 300 adjectives. I want you to go through and mark all the adjectives which you feel describe Mr. O'Shea. The result of this check list has nothing to do with you as a student. We are interested only in getting an idea as to how different persons see Mr. O'Shea. You may mark as many words as you want so long as you feel they pertain to Mr. O'Shea.

I want to call your attention to the question at the end of the check list. Be sure you answer this question.

The remaining two items in your packet either have simple instructions or are self-explanatory. When you have finished one item move right on to the next. You will find that they are not difficult and you will finish in a surprisingly short time. When you have completed all of the items, lay them here on the table and you may leave.

Are there any questions? (Pause) All right. You may begin.

The two items that each subject filled out after the Adjective Check List were the Social Class Value

Orientation inventory and a short data sheet which can be used in evaluating the results of the Social Class Value Orientation inventory. These two items are included as Appendix B and Appendix C.

At the end of the Adjective Check List, the respondent was asked to answer the following question:

Did anything occur during the screening which appeared foreign or unrelated to the film?

This question was aimed at determining whether the subject had been consciously aware of the subliminal message being flashed on the screen. Those students who made any kind of reference to the intermittent flashing were disallowed as experimental subjects. Since the question did result in answers by a few subjects which indicated they were aware of a word being flashed on the screen, the assumption was made that the question was adequate in identifying conscious awareness of the stimulus by the subjects.

Control Group II and Experimental Group II also were shown "The Conference." Control Group II viewed the film without the subliminal stimulus. Experimental Group II viewed the film with the subliminal stimulus. Both groups responded to the Adjective Check List during their next regular class period (forty-eight hours later). The purpose of the delayed test was to determine the effect of the second independent variable, the differential testing time. The pre-film instructions were identical to those given to Control Group I and Experimental Group I. The procedure of

projecting the film and subliminal stimulus was the same.

Upon completion of the film and subliminal stimulus experience, the following instructions were given:

During class on (Thursday) (Friday) of this week, you will be asked to express an opinion about the film. This will not be a test, but a simple check list of your opinions about the film. It will take about ten minutes and will require little effort on your part.

Now, I am going to pass out a packet of materials to each of you. The packet contains two separate items. The first thing I want you to do when you receive them is to go through and put your name on the first sheet of each item.

After the distribution of the packets was completed, further instructions were given as follows:

I want to point out that these are not tests. There are no right or wrong answers. All I want is your personal opinion.

The first sheet is a fact sheet. The next item has simple instructions and requires that you mark or check the statements as to how you feel about them. When you have finished one item, move right on to the next. You will find that they are not difficult and you will finish in a surprisingly short time. When you have completed all of the items, lay them here on the table and then you may leave.

Are there any questions? (Pause) You may begin.

The fifty-minute class period proved to be ample time to show the film and administer the testing instruments. In none of the sessions was there need for any subject to feel pressed for enough time to complete the instruments.

During the Thursday and Friday class periods, the experimenter went to each of those sections participating in Control Group II and Experimental Group II and

administered the Adjective Check List. The instructions given at that time were as follows:

On (Tuesday) (Wednesday) you viewed the film entitled "The Conference." At that time, we asked you to pay particular attention to Mr. O'Shea, the principal portrayed in the film. I am going to pass out to each of you a list of 300 adjectives. The first thing I want you to do is put your name on the first page.

After the Adjective Check Lists had been distributed, the following instructions were given:

I want you to read down the list of adjectives and mark those which you feel describe Mr. O'Shea. The result of this check list has nothing to do with you as a student. We are interested only in getting an idea as to how different people see Mr. O'Shea. You may check as many as you want so long as you feel they pertain to Mr. O'Shea.

I want to call your attention to the question at the end of the check list. Be sure you answer this question. When you have finished, raise your hand and I will take your paper.

Are there any questions? (Pause) You may begin.

It required no more than eighteen minutes of this class session for all the subjects of the section to complete the check list.

Summary

One-hundred-thirty-one students enrolled in nine sections of the foundations of American education course at Oklahoma State University were the subjects for the experiment. The students of each section were randomly assigned to one of four groups: Control Group I, Experimental Group

I, Control Group II, Experimental Group II. Each of these four groups was shown the film, "The Conference." As they viewed the film, both experimental groups were subjected to the word TIMID being subliminally projected on the screen. This subliminal message was aimed at affecting their attitudes toward the high school principal portrayed in the film. The control groups received no subliminal message.

To determine whether the experimental treatment produced a significant difference between groups, the subjects made a personality assessment of the high school principal portrayed in the film by responding to the Adjective Check List. Control Group I and Experimental Group I responded to the check list immediately following the film. Control Group II and Experimental Group II were administered the same test forty-eight hours later.

The subjects' American College Testing Program score was recorded, the Social Class Value Orientation inventory was administered and the size of the high school from which each subject graduated was determined. This data was used in computing the statistical tests necessary in checking for homogeneity of variances among the four groups.

The experimental results are reported in the next chapter.

CHAPTER IV

FINDINGS OF THE STUDY

This chapter will present the findings of the statistical tests used to determine the significance of the results of this investigation. The .05 level of confidence was used to determine significance on all tests.

Tests of Homogeneity

In determining the homogeneity of variances between groups, the F test of extreme variances as explained by Garrett (29) was used with the Social Class Value Orientation inventory and the American College Testing Program scores. Of this F test, Garrett (29, p. 286) states:

A simple check on the equality of sample variances is to calculate the sum of the squares for each group separately, divide by the appropriate degrees of freedom and test the largest variance against the smallest variance using the F test. ... If the observed F is not significant, it may be assumed that the variances of the four groups will not differ significantly.

To arrive at the observed F, the following formulae were used:

$$\text{Variance} = \frac{\text{Sum of Squares}}{\text{Degrees of Freedom}}$$

$$F = \frac{\text{Largest Variance}}{\text{Smallest Variance}}$$

The chi square test was used with the size-of-high-school data. Van Dalen and Meyer (82, p. 330) have the following to say about the chi square test:

The basic notion underlying the chi square technique, stated in terms of the null hypothesis, is that the observed frequencies in a category are a chance departure from the hypothetical or expected frequencies for the category. These expected frequencies are derived from any definition one might want to give the null hypothesis. ...

$$X^2 = \text{Sum of } \frac{(O - E)^2}{E}$$

where O = observed frequency in category
E = expected frequency.

The groups were determined homogeneous with the Social Class Value Orientation inventory and the size-of-high-schools data, but in the case of the American College Testing Program scores, a significant F value was obtained.

Table VI presents the pertinent data resulting from the F test used with the Social Class Value Orientation inventory scores. The largest variance (Control I) was tested against the smallest variance (Experimental I). The appropriate degrees of freedom for the numerator of the F test are 43, and for the denominator 32. By interpolation, these degrees-of-freedom produced an F value of 1.97 at the .05 level (23, p. 371). The obtained F value of 1.50 did not equal or exceed this value so it was not significant. The groups are homogeneous on the basis of the Social Class Value Orientation scores.

TABLE VI
TABLE OF SOCIAL CLASS VALUE ORIENTATION
F TEST OF EXTREME VARIANCES DATA

| Groups | df | Sum of Squares | Variances | Extreme Variances | F |
|------------|----|----------------|-----------|-------------------|-------|
| Control I | 43 | 157.90 | 3.67 | 3.67 | 1.50* |
| Experim I | 32 | 78.06 | 2.44 | 2.44 | |
| Control II | 31 | 89.97 | 2.90 | | |
| Experim II | 21 | 74.59 | 3.25 | | |

*1.50 failed to reach the 1.97 value necessary for significance.

In determining homogeneity of variances among groups, the chi square test was used with the high-school-size data. The categories used in determining high school size were based on the Oklahoma State University Department of Education school classification. When the state classification was used for tabulating the frequencies observed, a four by six contingency table resulted. Tabulation of frequencies in this table failed to produce any observed frequencies in one cell and only one frequency in two other cells. Consequently, the state school classification was condensed to three categories which produced a three by four contingency table. The results derived from the frequency tabulation are shown in Table VII.

TABLE VII
CHI SQUARE TABLE OF OBSERVED FREQUENCIES
FOR THE HIGH SCHOOL SIZE DATA

| H.S. Size | Control I | Experim. I | Control II | Experim. II | Totals |
|------------|--------------|---------------|---------------|----------------|--------|
| 0 - 450 | 21 | 13 | 16 | 11 | 61 |
| 451 - 1500 | 14 | 5 | 9 | 7 | 35 |
| Over 1500 | 9 | 15 | 7 | 4 | 35 |
| Totals | 44 | 33 | 32 | 22 | 131 |

$\chi^2 = 9.041$ and is not significant at the .05 level of confidence.

The chi square test produced a value of 9.041 which falls short of the 11.070 required for significance at the .05 level. The groups, therefore, were homogeneous on the basis of high school size.

In using the subjects' American College Testing Program scores for homogeneity, a significant F value was obtained. As may be observed in Table VIII, the same procedure was used for testing the largest variance (Experimental I) against the smallest variance (Experimental II). The appropriate degrees of freedom are 32 (largest variance) and 21 (smallest variance). By interpolation, these degrees of freedom produced an F value of 2.30 at the .05 level of confidence. The F value obtained by the variance

test was 3.42 which exceeds the .01 level. Thus, the groups were found to be heterogeneous on the basis of using the American College Testing Program scores as a control variable.

TABLE VIII
TABLE OF AMERICAN COLLEGE TEST SCORES
F TEST OF EXTREME VARIANCES DATA

| Groups | df | Sum of Squares | Variances | Extreme Variances | F |
|------------|----|----------------|-----------|-------------------|-------|
| Control I | 43 | 632.64 | 14.71 | | 3.42* |
| Experim I | 32 | 552.24 | 17.26 | 17.26 | |
| Control II | 31 | 400.22 | 12.91 | | |
| Experim II | 21 | 105.82 | 5.04 | 5.04 | |

*Significant at the .01 level.

Test of Significance of the
Experimental Treatment

The pre-experimental decision was made that had the check for homogeneity indicated no significant variances among groups the analysis of variance statistic was to be employed to determine the significance of the independent variables. Because the groups proved unequal on

the American College Testing Program scores, the analysis of covariance was used in an effort to adjust for the initial group differences. Garrett (29, p. 295) states the following concerning this statistical test:

Analysis of covariance represents an extension of analysis of variance to allow for the correlation between initial and final scores. Covariance analysis is especially useful to experimental psychologists when for various reasons it is impossible or quite difficult to equate control and experimental groups at the start: a situation which often obtains in actual experiments. Through covariance analysis one is able to effect adjustments in final or terminal scores which will allow for differences in some initial variable.

Most authors (including Garrett), in explaining the application of the analysis of covariance, let the covariate score or initial score represent a pretest score. In the present study, the experimenter deemed it best not to determine the effect of the independent variables (subliminal stimulus and test-time differential) by the pretest method. It was reasoned that had the film been shown to obtain a pretest score, the chance was too great that subjects would establish a set or a disposition of attitude toward the target character which would nullify any possible effect of the independent variables. For this reason, the covariate (initial score) used was the score made by each subject on the American College Testing examination. The final scores (post test) were the scores of the fifteen Need Scales of the Adjective Check List.

The F ratios which are extracted from the analysis of

covariance for all but two of the fifteen Need Scales failed to equal or exceed that value necessary to show a significance between the group means. Table IX presents the pertinent data resulting from the fifteen covariance tests.

TABLE IX
ANALYSIS OF COVARIANCE DATA FOR THE AMERICAN COLLEGE
TEST AND THE ADJECTIVE CHECK LIST OF THE
FOUR EXPERIMENTAL GROUPS

| Test Group | Initial Test Mean (ACT Test) | Initial Test S.D. | Final Test Mean (ACL Test) | Final Test S.D. | F Ratio Between Groups |
|--------------------|---------------------------------------|-------------------------|-------------------------------------|-----------------------|------------------------------|
| Achievement | | | | | |
| Control I | 20.41 | 3.80 | 46.73 | 9.51 | .24 |
| Experim I | 21.15 | 4.10 | 46.03 | 9.81 | |
| Control II | 19.84 | 3.55 | 48.13 | 11.05 | |
| Experim II | 21.91 | 2.19 | 47.59 | 11.43 | |
| Dominance | | | | | |
| Control I | 20.41 | 3.80 | 48.93 | 7.68 | .39 |
| Experim I | 21.15 | 4.10 | 47.39 | 10.11 | |
| Control II | 19.84 | 3.55 | 49.34 | 11.11 | |
| Experim II | 21.91 | 2.19 | 49.77 | 10.59 | |
| Endurance | | | | | |
| Control I | 20.41 | 3.80 | 46.41 | 8.37 | .11 |
| Experim I | 21.15 | 4.10 | 46.60 | 9.36 | |
| Control II | 19.84 | 3.55 | 48.50 | 9.34 | |
| Experim II | 21.91 | 2.19 | 50.36 | 12.42 | |
| Order | | | | | |
| Control I | 20.41 | 3.80 | 46.93 | 11.22 | .38 |
| Experim I | 21.15 | 4.10 | 45.09 | 11.16 | |
| Control II | 19.84 | 3.55 | 47.44 | 12.62 | |
| Experim II | 21.91 | 2.19 | 48.23 | 11.47 | |

TABLE IX (Continued)

| Test Group | Initial Test Mean (ACT Test) | Initial Test S.D. | Final Test Mean (ACL Test) | Final Test S.D. | F Ratio Between Groups |
|-----------------|---------------------------------------|-------------------------|-------------------------------------|-----------------------|------------------------------|
| Intraception | | | | | |
| Control I | 20.41 | 3.80 | 39.86 | 12.33 | .57 |
| Experim I | 21.15 | 4.10 | 37.24 | 11.05 | |
| Control II | 19.84 | 3.55 | 40.38 | 13.72 | |
| Experim II | 21.91 | 2.19 | 41.32 | 15.36 | |
| Nurturance | | | | | |
| Control I | 20.41 | 3.80 | 37.59 | 9.15 | 1.09 |
| Experim I | 21.15 | 4.10 | 34.91 | 8.33 | |
| Control II | 19.84 | 3.55 | 39.50 | 10.56 | |
| Experim II | 21.91 | 2.19 | 38.27 | 13.18 | |
| Affiliation | | | | | |
| Control I | 20.41 | 3.80 | 33.07 | 10.54 | 7.95* |
| Experim I | 21.15 | 4.10 | 29.85 | 7.07 | |
| Control II | 19.84 | 3.55 | 34.44 | 9.96 | |
| Experim II | 21.91 | 2.19 | 33.95 | 11.45 | |
| Heterosexuality | | | | | |
| Control I | 20.41 | 3.80 | 39.07 | 8.04 | .51 |
| Experim I | 21.15 | 4.10 | 38.88 | 5.30 | |
| Control II | 19.84 | 3.55 | 40.97 | 8.80 | |
| Experim II | 21.91 | 2.19 | 40.05 | 6.62 | |
| Exhibition | | | | | |
| Control I | 20.41 | 3.80 | 52.05 | 6.27 | .26 |
| Experim I | 21.15 | 4.10 | 51.21 | 9.16 | |
| Control II | 19.84 | 3.55 | 50.66 | 7.25 | |
| Experim II | 21.91 | 2.19 | 52.36 | 6.66 | |
| Autonomy | | | | | |
| Control I | 20.41 | 3.80 | 51.86 | 9.75 | .45 |
| Experim I | 21.15 | 4.10 | 52.03 | 10.40 | |
| Control II | 19.84 | 3.55 | 49.56 | 9.51 | |
| Experim I | 21.91 | 2.19 | 52.50 | 10.46 | |
| Aggression | | | | | |
| Control I | 20.41 | 3.80 | 62.75 | 10.92 | .52 |
| Experim I | 21.15 | 4.10 | 64.30 | 11.42 | |
| Control II | 19.84 | 3.55 | 60.66 | 10.25 | |
| Experim II | 21.91 | 2.19 | 62.05 | 11.74 | |

*Significant at the .01 level of confidence.

TABLE IX (Continued)

| Test Group | Initial Test Mean (ACT Test) | Initial Test S.D. | Final Test Mean (ACL Test) | Final Test S.D. | F Ratio Between Groups |
|------------|---------------------------------------|-------------------------|-------------------------------------|-----------------------|------------------------------|
| Change | | | | | |
| Control I | 20.41 | 3.80 | 41.50 | 6.51 | .34 |
| Experim I | 21.15 | 4.10 | 41.12 | 6.32 | |
| Control II | 19.84 | 3.55 | 40.81 | 8.90 | |
| Experim II | 21.91 | 2.19 | 39.45 | 6.11 | |
| Succorance | | | | | |
| Control I | 20.41 | 3.80 | 49.98 | 7.53 | 1.49 |
| Experim I | 21.15 | 4.10 | 53.91 | 9.83 | |
| Control II | 19.84 | 3.55 | 52.97 | 8.41 | |
| Experim II | 21.91 | 2.19 | 51.77 | 9.12 | |
| Abasement | | | | | |
| Control I | 20.41 | 3.80 | 46.98 | 8.75 | 3.84* |
| Experim I | 21.15 | 4.10 | 49.81 | 9.99 | |
| Control II | 19.84 | 3.55 | 54.16 | 8.99 | |
| Experim II | 21.91 | 2.19 | 50.45 | 7.94 | |
| Deference | | | | | |
| Control I | 20.41 | 3.80 | 43.82 | 8.82 | .61 |
| Experim I | 21.15 | 4.10 | 43.78 | 10.34 | |
| Control II | 19.84 | 3.55 | 46.50 | 9.14 | |
| Experim II | 21.91 | 2.19 | 44.41 | 10.23 | |

*Significant at the .01 level of confidence

The thirteen Need Scales having insignificant F's were Achievement, Dominance, Endurance, Order, Intraception, Nurturance, Heterosexuality, Exhibition, Autonomy, Aggression, Change, Succorance, and Deference.

Significant F values were obtained on the scores of the Abasement and Affiliation Need Scales. These F values

indicate only that the final corrected means in the case of these two Need Scale scores, differ significantly among the four groups. The task remains to determine which group means differ significantly. With four groups there are six possible combinations for each Need Scale:

The Mean of Control Group I with the Mean of
Experimental I

The Mean of Control Group I with the Mean of
Control II

The Mean of Control Group I with the Mean
of Experimental II

The Mean of Experimental I with the Mean
of Control II

The Mean of Experimental I with the Mean
of Experimental II

The Mean of Experimental II with the Mean
of Control II.

The possibility exists that only one pair of means differ. On the other hand, all pairs of means may differ. To find which of the six possible pairs of groups would result in significant differences, it was necessary to apply the t test.

Hypothesis I and Abasement Scores

To have rejected or confirmed Hypothesis I it was necessary to determine the effect of the subliminal stimuli

upon the subjects' expressed attitudes represented by the scores which were obtained immediately after the film presentation. In the case of the thirteen Need Scales with non-significant F 's, it was clear that there was no significant effect. But, in the case of Abasement and Affiliation, the possibility existed that the independent variable may have been effective in causing an attitude difference. Of the six possible pairings of group means the Control Group I versus Experimental I combination would satisfy the stated conditions of Hypothesis I.

As stated before, the t test was applied to determine the significant difference of these individual group pairings. The t test in the analysis of covariance statistic was based upon the means of the sum of the squares of the variances of the Abasement scores after they had been adjusted for any variability contributed by the initial scores of the American College Testing examination. The formula used in obtaining this t value was one which Garrett (29, p. 302) presents:

$$t = \frac{D}{S.E.D}$$

where D = the difference between the two adjusted means of the appropriate pair of groups
 $S.E.D$ = the standard error of the difference between the group means.

Table X reveals that the t value resulting from the comparison of Control I and Experimental I adjusted means is 1.43. The obtained t of 1.43 is a result of the comparison of two

groups unequal in N size, necessitating the use of two sets of degrees-of-freedom values. Consequently, the significant \underline{t} value cannot be read directly from the \underline{t} table. To determine the correct \underline{t} value to use in determining the significance of the computed \underline{t} test, the experimenter made use of an approximation of the appropriate \underline{t} which is suggested by Edwards (23). The approximate value of \underline{t} significant at the .05 level may be determined by the following formula:

$$t_{.05} = \frac{(S_{\bar{x}_1}^2)(t_1) \text{ plus } (S_{\bar{x}_2}^2)(t_2)}{S_{\bar{x}_1}^2 \text{ plus } S_{\bar{x}_2}^2}$$

where $S_{\bar{x}_1}^2$ = standard error of the mean of group one

$S_{\bar{x}_2}^2$ = standard error of the mean of group two

t_1 = the \underline{t} value at .05 level for the degrees of freedom of group 1

t_2 = the \underline{t} value at .05 level for the degrees of freedom of group 2 (23, p. 107).

In the case of Control Group I versus Experimental Group I, the corrected \underline{t} of 2.03 was determined. The obtained \underline{t} of 1.43 fails to equal or exceed 2.03. It can be said that the adjusted means of the Abasement scores of Control I and Experimental I do not differ significantly.

TABLE X
RESULTS OF THE t TEST OF THE ADJUSTED MEANS
OF THE ABASEMENT NEED SCALE

| Group Comparisons | Adjusted Means Differences | t |
|-------------------------|-------------------------------|---------|
| Control I vs Experi I | 2.97 | +1.43* |
| Control II vs Experi II | 3.28 | -1.30** |
| Experi I vs Experi II | .81 | + .33 |

*+ indicates the difference reflected by the t value is in the direction of the expected experimental effect.

**- indicates the difference direction is reversed from that of the expected effect.

Hypothesis II and Abasement Scores

To test Hypothesis II, it was necessary to determine the effect of the subliminal stimulus upon attitudes when the Adjective Check List was administered forty-eight hours after the film showing. Control Group II versus Experimental Group II was the pairing which fulfilled the conditions of this hypothesis. Applying the t test to this combination in the same manner as explained above for Control I and Experimental I, a t of 1.30 was obtained (See Table X). As before, the approximate t value was computed for the .05 level and determined to be 2.06. The obtained t of 1.30 again failed to reach the necessary 2.06 level and the

difference between the adjusted means of Control II and Experimental II was not significant.

Hypothesis III and Abasement Scores

Experimental Group I versus Experimental Group II met the conditions of the third hypothesis. Table X shows a t of .33 was obtained from the appropriate adjusted means, which falls far short of the 2.03 necessary for significance. The difference between the two means was not significant.

Because the original F value on the Abasement Scores indicated that significant differences did exist between some mean scores, it may be assumed that the differences existed between pairs of mean scores which are not pertinent to the study. (This, in fact, is the case. The t values were computed for the three unrelated group pairings and they did reveal significant differences between two of the three.)

Affiliation Scores

Because the original F value obtained from the analysis of covariance with the Affiliation data indicated significant differences between the group means, it became necessary again to apply the t test. The procedure of computation was identical to that carried out with the Abasement Scores.

In Table XI, it is once again evident that the differences between the adjusted means fail to reach a .05 level of significance in each of the three pertinent group pairings.

TABLE XI
RESULTS OF THE t TEST OF THE ADJUSTED MEANS
OF THE AFFILIATION NEED SCALE

| Group Comparisons | Adjusted Means Differences | t |
|-------------------------|----------------------------|-------|
| Control I vs Experi I | 3.40 | -1.62 |
| Control II vs Experi II | 1.06 | - .41 |
| Experi I vs Experi II | 3.85 | +1.56 |

The t test applied to Control I versus Experimental I resulted in a t of 1.62 with 2.03 needed for a significant difference at the .05 level of confidence. Control II versus Experimental II resulted in a t of .41, falling far short of the 2.05 needed for significance. And in the case of Experimental I and Experimental II, a t of 1.56 was obtained when 2.04 was required for significance. As in the Abasement scores, the significant F obtained from the analysis of covariance of the Affiliation scores was a result

of significant differences existing between group combinations which were not pertinent to the hypotheses being tested.

Summary

In determining homogeneity of variances among the four experimental groups, no statistically significant differences at the .05 level were evident when the appropriate tests of homogeneity were applied to the Social Class Value Orientation scores and the size-of-high-school data. However, in the case of the American College Test scores, heterogeneity of variances was indicated. Because of the unequal groups on the basis of American College Test scores, the analysis of covariance statistical test was used in an effort to adjust for the initial differences of the groups.

F values of thirteen of the fifteen Need Scale scores of the Adjective Check List failed to indicate significant differences at the .05 level. The remaining two Need Scale Scores, Abasement, and Affiliation, had F values which indicated significant differences among the group means. When the t test was applied to determine if significant differences existed between the adjusted mean scores of the three pertinent pairings of groups, the resulting t values in each case failed to reach the .05 level of significance.

CHAPTER V

SUMMARY AND CONCLUSIONS

This chapter will summarize the investigation, make interpretations based on the statistical findings and recommend further investigation of the subception technique.

Summary

Since the turn of the century, there have been several studies done in the area of subliminal stimuli, particularly as an explanation of the perceptual defense concept. With the announcement in 1957 of a successful attempt to effect a behavioral change in an audience by means of a subliminal message, interest has been considerably intensified in the subception concept. As a result of the concentration of research in the field, there have been different interpretations made of the various findings. Generally stated, these interpretations contend either (1) that the subception phenomenon does actually exist and can be demonstrated by the presentation of subliminal stimuli, or (2) that the findings of replicating studies indicate the subception phenomenon is a result, mainly, of the subjects receiving cues or partial information at

the conscious level from the so-called subliminal messages.

With the possibility of manipulating a person's behavior with a message transmitted at below the conscious awareness threshold, many implications have been suggested. Popular indictments of the phenomenon usually have revolved around charges of "brain-washing" and persuasion without defense. The Federal Communications Commission (81) banned the use of subliminal messages on television immediately following Vicary's (18) announcement of successfully affecting a theater audience's behavior for commercial purposes.

Aside from the popular interest and commercial value of the subception concept, the possibility of such a method of learning has been of no little concern to psychologists and educators. Research evidence indicates that motion picture films, referred to as attitude films; that is, films produced with the aim of changing attitudes, have very little affect upon attitude shift. Audiences seem to resist attitude change when they are aware of a deliberate attempt to change their attitudes. It seems that an investigation of the possibility of causing attitude shift by means of a method which involves unawareness on the part of the subjects is logical. Subception is one such method. The purpose of this study has been to determine the effect of one method of subliminal stimulus presentation upon the attitudes developed by student teacher trainees toward a

high school principal as portrayed in a motion picture film.

A second independent variable, which consisted of a time differential in administering the Adjective Check List (dependent variable), was included in the study. The inclusion of this variable was prompted by a suggestion in the literature that the effect of subliminal stimuli becomes more pronounced after the subjects have had an opportunity to sleep between the stimulus experience and the assessment of effect.

The four groups of subjects were randomly selected from nine sections of a beginning education course at Oklahoma State University. Two of the groups were designated Control Group I and Experimental Group I. The remaining two groups were Control II and Experimental II. All four groups viewed the fifteen-minute film, "The Conference." During the showing, both experimental groups were subjected to a subliminally flashed message on the screen. As a result of a pre-experimental study, the one word message was TIMID. The message was presented thirteen times during the film showing and was aimed at causing the subjects to favor the Need Scales bearing an "inferiority" connotation in assessing the target character in the film. Control Group II and Experimental Group II were administered the Adjective Check List (15 Need Scales) forty-eight hours after the stimulus experience.

Interpretations

Three types of data were gathered to be used as control variables: (1) the scores on the subjects' American College Test, (2) the scores on the Social Class Value Orientation inventory, and (3) the size of high school from which each subject was graduated. In an effort to determine homogeneity of variances of the four groups, the F test of extreme variances was used with the two test scores. The chi square test was used with the high-school-size data. The statistical analysis resulted in values which supported homogeneity on the Social Class Value Orientation inventory and high school size, but the groups were declared unequal on the basis of a significant F with the American College Test scores

To adjust for the unequal groups, the analysis of covariance statistic was used to test the following experimental hypotheses:

Hypothesis I: There will be a significant difference in attitudes developed among teacher trainees who view a film which contains a subliminal message, both groups being tested immediately following the film.

Hypothesis II: There will be a significant difference in attitudes developed among teacher trainees who view a

film which contains a subliminal message and those who view the film without the subliminal message, both groups being tested forty-eight hours following the film.

Hypothesis III: Attitudes of subjects who are tested forty-eight hours after the subliminal stimulus experience will be significantly different than the attitudes of those subjects tested immediately following the subliminal experience.

The F values on thirteen of the fifteen Need Scales of the Adjective Check List failed to indicate statistical significance in the case of all three hypotheses. However, on the Abasement and Affiliation Need Scales both F values exceeded that necessary for significance at the .05 point. The significant F's on these two sets of scores indicated that significant differences existed between one or more pairs of mean scores. The t test was applied to determine which of the six possible pairings of groups resulted in significant differences between the mean scores. To test Hypotheses I, II, and III, it was necessary to compare (1) Control Group I versus Experimental Group I, (2) Control Group II versus Experimental Group II, and (3) Experimental

Group I versus Experimental Group II, respectively. The t values resulting from these three pairings of groups on both the Abasement and Affiliation data, in all cases failed to reach that necessary for significance at the .05 level. The significant differences indicated by the initial F values fell between groups that were not pertinent to the present study.

There is insufficient evidence from the data of this investigation to infer that either a subliminal stimulus or a subliminal stimulus and a delayed assessment is efficacious in affecting attitudes as measured by the Need Scales of the Adjective Check List. As a result, the three experimental hypotheses may be rejected.

Conclusion

The results of this study seem to support research evidence that the subception effect which planned subliminal stimuli often produces is a result of partial (conscious) information being received from the stimulus message itself. This is not to say that this study refutes the existence of the subception phenomenon, for it does not. It was not a study designed to add additional evidence to the already discriminating research that exists. The purpose of the study was to determine whether a technique of subliminal presentation could, in a classroom situation, cause a shift in subjects' attitudes.

As was emphasized earlier in this dissertation, a salient determinant of the success or positive evidence resulting from a subception study is the suitable selection of a threshold level for the subliminal stimulus presentation. It was an objective of the experimenter to use a stimulus-brightness level near the absolute (or zero) level. This would have minimized the possibility of the subjects' consciously perceiving the stimulus and receiving a cue or partial information from it. The high threshold level selected for this study may very well be a factor which affected the statistically non-significant results. In discussing the evidence of the possible presence of the subception phenomenon, one must be discreet in defining the threshold level at which the stimulus is presented.

Recommendations

In view of the fact that, to the educator, the effect of subception may be of more concern than the phenomenon itself, the writer suggests that the present study be replicated several times with the stimulus threshold being lowered during each succeeding experiment. The purpose would be to determine whether the subception effect could be obtained before the stimulus presentation became so bright that it was unquestionably superliminal.

A second method of subliminal presentation has been used by researchers and may prove to be more effective in

producing the subception effect. Rather than intermittently flashing the stimulus on the screen, the message is projected continuously at an impoverished light level. Perkey (56) relates that with this method a surprisingly bright image may be attained gradually without the subjects being aware of its presence. The principle underlying the cogent results from this method of stimulus presentation is related to the "latent image" effect. The mind seems to build up or retain the image of the stimulus message after its actual presentation. The writer recommends that the present study be replicated using this method of stimulus presentation.

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APPENDIX A

TEST-RETEST CORRELATIONS FOR ADJECTIVE CHECK LIST
NEED SCALES OVER VARYING INTERVALS OF TIME

| Need Scale | 10 weeks College Males (N = 56) | 10 weeks College Females (N = 23) | 6 months Adult Males (N = 100) | 5½ years Medical Students (N = 34) |
|-----------------|--|--|---|---|
| Achievement | .81 | .74 | .60 | .52 |
| Dominance | .76 | .79 | .66 | .65 |
| Endurance | .74 | .47 | .57 | .55 |
| Order | .63 | .57 | .40 | .39 |
| Intracception | .71 | .46 | .37 | .37 |
| Nurturance | .85 | .84 | .37 | .37 |
| Affiliation | .81 | .84 | .33 | .54 |
| Heterosexuality | .66 | .75 | .41 | .50 |
| Exhibition | .68 | .85 | .75 | .77 |
| Autonomy | .79 | .81 | .68 | .63 |
| Aggression | .80 | .90 | .62 | .60 |
| Change | .69 | .78 | .55 | .31 |
| Succorance | .54 | .45 | .45 | .25 |
| Abasement | .70 | .69 | .68 | .51 |
| Deference | .77 | .83 | .72 | .60 |

APPENDIX B
SOCIAL CLASS VALUE ORIENTATION INVENTORY

Number _____

Your Name _____

Directions

This form asks you about a number of your beliefs and opinions. It is not a test. There is no "right" or "wrong" answer. The best answer to each statement is your personal opinion. There are 33 pairs of statements. Each pair makes up one item. Read both statements (a) and (b) and then decide which one of the two statements you most nearly agree with. Circle the letter of the statement with which you most nearly agree. Thus, in the following example, if you agree mostly with (a) mark your answer sheet:

- (a) Money is made to be spent and not saved.
- b. It is better to save money than to spend it.

On the other hand if you agree more with (b), circle it instead. Always select the statement which comes closest to showing how you feel about the matter. Answer all items.

1. a. I would like to get more than a high school education.
b. A high school education is enough for me.
2. a. Nowadays, with world conditions the way they are, the wise person lives for today and lets tomorrow take care of itself.
b. A person should not only keep in mind what is happening today, but he should plan for tomorrow as well.
3. a. I don't mind jobs with long working hours if it means I have a chance to get ahead.
b. I don't like jobs with long working hours, even if it means extra pay.
4. a. A young fellow who is in love and hasn't graduated from high school should marry now rather than wait to complete high school.

APPENDIX B (Continued)

Number _____
Page 2

Your Name _____

4. b. A young fellow who is in love and not yet graduated from high school should complete high school before he gets married.
5. a. My parents have told me that a high school education is enough for me.
b. My parents have always encouraged me to try to get a college education.
6. a. If a person can get a good job after high school, it seems foolish to go on to college.
b. Nowadays you need a college degree to get a really good job.
7. a. Money is made to spend, not to save.
b. The money I save gives me at least as good a feeling as things I buy.
8. a. Today a man has a better chance than his father had to move up in the world.
b. Today a man has about the same or poorer chance as his father had to move up in the world.
9. a. Planning only makes a person more unhappy since plans hardly ever work out anyhow.
b. A smart person usually tries to plan his life in order to give it better direction.
10. a. It is silly for a teen-ager to put money into a car when the money could be used to get started in business or for an education.
b. If a teen-ager has money and wants a car, he should buy it rather than put his money into education and things like that.
11. a. A person should try to use his imagination when doing a job.
b. It isn't necessary to go "all out" when doing a job.
12. a. It is generally better to take a job that is available right away than take the time to get training for securing a better job in the future.
b. It is generally better to take the time to get training for better jobs in the future than it is to take a job that is available right away.

APPENDIX B (Continued)

Number _____
Page 3

Your Name _____

13. a. Right now, "getting ahead" is more important than "getting by" because I think I have a good opportunity to get ahead.
- b. Right now, "getting by" is more important than "getting ahead" because it isn't too likely that I will get ahead.
14. a. A person should be realistic and aim only as high as he thinks he can succeed.
- b. If you aim high, even though you don't succeed, you will do better than if you don't aim high.
15. a. If a person plans ahead and works hard, he is bound to be rewarded by success in one way or another.
- b. Luck is about the only thing that will get a person anywhere these days because jobs and opportunities to advance are so scarce.
16. a. I like to belong to organizations because they provide a chance to feel close to people.
- b. One important reason I don't belong to organizations is that they can't give me what I want.
17. a. What was good enough for my parents is good enough for me.
- b. I want to do better than my parents.
18. a. The majority of people one meets can be trusted.
- b. Most people, except one's relatives, are not to be trusted, -- they may cheat and take advantage of you.
19. a. It tends to clear the atmosphere "to fight it out" in an angry argument.
- b. It is preferable to let one's temper quiet down before settling an angry argument.
20. a. I wouldn't care to take a job, even if it meant I could get ahead, if it caused me to lose contact with most of my present friends.
- b. I would take a job that let me get ahead, even if it meant I would have to give up most of my present friends.

APPENDIX B (Continued)

Number _____
Page 4

Your Name _____

21. a. A man shouldn't fight unless he absolutely is forced into it.
b. Any male who refuses a fight isn't much of a man.
22. a. People who can't leave their hometowns to take a job are hard for me to understand, because I would.
b. If I have to leave my hometown to get a job, I'd rather not get the job.
23. a. When a man is born, the success he's going to have is already in the cards, so he might as well accept it and not fight against it.
b. A person has to be willing to work and fight for what he wants, even if the odds seem against him.
24. a. I usually feel shy when I am around people I don't know.
b. I usually feel at ease when I am around people I don't know.
25. a. I would not mind living away from my relatives if I can get a good job.
b. I would be unhappy living away from my relatives.
26. a. A person should control his feelings as much as possible.
b. It is good for a person to let go rather than to bottle up feelings.
27. a. A good friend can be rated as being as close as one's immediate family.
b. Even a best friend is never as close as one's immediate family.
28. a. There is no point for people like me to read the newspapers to find out what's going on because the world is too complicated for me to understand.
b. People ought to keep up on what is happening in the world by reading the newspapers.
29. a. A job should offer some prestige as well as pay.
b. It doesn't matter what kind of work a person goes into as long as the pay is good.

APPENDIX B (Continued)

Number _____
Page 5

Your Name _____

30. a. People should not worry about how clean and neat their appearance is.
- b. It is important for a person to be as clean and neat in appearance as possible.
31. a. No matter what kind of job a person has he ought to know how to use good English.
- b. I don't know why you have to take English in school if you want to be a mechanic or beauty operator.
32. a. When I say I think a person is honest, I most nearly mean that I can trust him.
- b. When I say I think a person is honest, I most nearly mean that he tells the truth.
33. a. Teenagers have to be careful about the behavior of the crowd they go with, because of their reputations.
- b. As long as a teenager behaves all right, the behavior of his or her crowd does not make much difference.

APPENDIX C
SOCIAL CLASS VALUE ORIENTATION

Number _____

Age _____ Sex _____ Have you ever lived on a Farm? _____

Where were you born (check one):

- On a Farm
- In open country but, not on a Farm
- Village of 2500 or less
- Town of between 2500 and 10,000
- City of 10,000 to 50,000
- City of 50,000 or more

Is your father living? _____ What is (was) your father's
(Be somewhat precise)
occupation? _____

Check the highest amount of education of your

- | Father | Mother |
|---|---|
| <input type="checkbox"/> Grade School (1-6) | <input type="checkbox"/> Grade School (1-6) |
| <input type="checkbox"/> Jr. Sr. High (7-12 Non-graduate) | <input type="checkbox"/> Jr. Sr. High (7-12 Non-graduate) |
| <input type="checkbox"/> Hi School graduate | <input type="checkbox"/> Hi School graduate |
| <input type="checkbox"/> College (1-4 Non-graduate) | <input type="checkbox"/> College (1-4 Non-graduate) |
| <input type="checkbox"/> College graduate | <input type="checkbox"/> College graduate |
| <input type="checkbox"/> Post graduate | <input type="checkbox"/> Post graduate |

VITA

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