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THE USE OF COGNITIVE STRATEGIES TO ATTENUATE TEST ANXIETY: ATTRIBUTION OF NORMALITY, SELF-INSTRUCTIONS AND DISTRACTION

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The Use of Cognitive Strategies to Attenuate Test Anxiety: Attribution of Normality, Self-Instructions and Distraction

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Three components of Wine's (1971a) Self-Instruction Training program were isolated in the present study and the efficacy of these elements in alleviating test anxiety in college students was assessed. The three treatment components were 1) rehearsal of attentional self-instructions, 2) an "attribution of normality" and 3) the distraction of the self-instructions. Test-anxious college students were given five hours of task practice in one of the following five conditions: 1) Attribution of Normality, Interpersonal Instructions, 2) Attribution of Normality, Self-Instructions, 3) Attention to Task, Self-Instructions, 4) Distraction, Pleasant Experience, 5) Standard Interpersonal Instructions. The results revealed that self-report measures of test anxiety decreased and performance measures increased from pre- to post-treatment for all give groups, suggesting that none of the experimental manipulations was effective. The failure of the treatment components to have any impact beyond that of repeated exposure to the test materials was discussed in terms of the methodology employed. Future research directions were also addressed.

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INTRODUCTION

ATTRIBUTION AND SELF-PERCEPTION THEORIES

Attribution theory is concerned with the processes by which an individual determines the causal relationships among behavior, behavioral consequences and the circumstances under which behavior occurs. The historical and theoretical foundations of attribution theory can be traced to The Psychology of Interpersonal Relations by Fritz Heider (1958). Heider was primarily interested in person-perception. That is, he formulated a motivational-drive model to account for how an outside observer perceives the causes of another individual's behavior. The writings of Heider, largely theoretical in nature, were reformulated into a more rigorous research-oriented theory by Jones and Davis (1965) and Kelley (1967) and conceptualized within an information processing paradigm. The tremendous amount of research facilitated by this reformulation and the wide scope and diversity of subject matter classified within the attribution model are reflected in the book Attribution: Perceiving the Causes of Behavior (Jones, Kanouse, Kelley, Nisbett, Valins & Winer, 1972).

One recent outgrowth of attribution theory is Bem's (1972) theory of self-perception. The theoretical structure of the latter is synonymous with attribution theory (Kelley, 1973). That is, the causal analysis proposed by Jones and Davis (1965) and Kelley (1967; 1973) by which we attempt to understand the behaviors of others can be applied when determining how we come to know ourselves. More specifically, Bem has proposed that we learn of our own attitudes and dispositions, at least in part, from self-observation.

Bem's theory of self-perception proposes two basic postulates: First, "Individuals come to 'know' their own attitudes, emotions and other internal states partially by inferring them from observations of their own overt behavior and/or the circumstances in which this behavior occurs." And second, ". . . to the extent that internal cues are weak or uninterpretable, the individual is functioning in the same position as an outside observer who must necessarily rely upon the same external cues to infer the individual's inner states: (Bem, 1972, p. 2). That is, Bem contends that we observe our behavior towards some entity, and based upon this self-observation we infer what our attitudes and beliefs are toward that entity. This process is especially influential when prior cues concerning that entity were weak.

This conceptualization of the process by which an

individual labels his internal states rests firmly upon a functional analysis of verbal behavior proposed by the "radical behaviorists" (Skinner, 1957). Skinner maintains that verbal statements of self-description, even of private internal states to which no one but the individual has access, are originally acquired through social interaction and are based upon public stimuli. This position, therefore, suggests that the evidential basis for the statement "I am hungry" is functually analogous to the third-person attribution "He is hungry" (Bem, 1972).

Empirical support for the basic proposition, that we infer our attitudes and beliefs from observing our overt behavior, was initially based upon Bem's "interpersonal simulation" studies which suggested a reformulation of cognitive dissonance theory (Bem, 1965; 1967; 1972). Bem's self-perception explanation to account for the cognitive dissonance phenomenon has generated a heated theoretical controversy. However, the crucial experiment unequivocally discriminating between cognitive dissonance theory and self-perception theory has not been performed. The two positions have reached an empirical and logical impasse with no resolution anticipated (Bem and Mc Connel, 1970). Hence the cognitive dissonance literature lends only indirect support to self-perception theory. Stronger evidence more directly supporting Bem's hypothesis can be derived from a bulk of experiments extending and expanding upon Schachter and

Singer's (1962) research on emotion. These studies suggest a corollary to Bem's basic premise, i.e. people infer their emotions, attitudes and beliefs from monitoring their autonomic behavior.

AUTONOMIC AROUSAL AS A SOURCE OF SELF-PERCEPTION

In the classic study by Schachter and Singer (1962), subjects were divided into four groups. One group, Epinephrine Informed, received an injection of epinephrine and was told that the drug would enhance autonomic arousal. A second group, Epinephrine Misinformed, received an epinephrine injection but was told to expect symptoms that are not consequences of the drug; while the third group, Epinephrine Ignorant, was injected with epinephrine and was not told of any side effects. Subjects in the fourth group were simply injected with a placebo. Following this procedure, subjects were placed into one of two emotion-provoking situations. In one condition, subjects were required to fill out a questionnaire which consisted of insulting questions. A confederate in the room, pretending to be taking the same questionnaire, expressed outrage concerning the nature of the questions. In the other, a confederate feigning euphoria was employed.

The major finding of the study was that subjects who were administered the epinephrine but were uninformed as to the drug's physiological effects (Epinephrine Misinformed

and Epinephrine Ignorant) responded in a more emotional manner in the two emotion-provoking situations than the Epinephrine Informed group and the placebo control. That is, the emotional state of the aroused, uninformed subjects more strongly reflected the emotion--either anger or euphoria--exhibited by the confederate than did the emotional state of the other subjects. Construed within Bem's framework, the findings suggest that the subjects informed as to the drug's effects attributed their physiological arousal to the drug, whereas uninformed subjects noted their physiological arousal and inferred that they were feeling either angry or happy based on the environmental cues. Subjects informed as to the drug's effects did not have to seek out an alternative explanation for their arousal.

Nisbett and Schachter (1966) in an interesting reversal of the above study attempted to determine whether subjects could be led to reattribute stimulus-produced arousal to an external, neutral source. In this investigation, subjects were asked to endure a series of steadily increasing electric shocks. They were to report when the shocks became too painful to tolerate. Half of the experimental subjects were given a placebo pill and told that the drug would cause hand tremor, palpitation and other indicators of autonomic arousal (the usual physiological effects of electric shock). The other half received the same inert

substance but were told that the pill would cause a different set of physical symptoms, not autonomic in nature. The investigators hypothesized that those subjects able to attribute their physiological arousal to the pill would tolerate more shock than those who could not attribute their hand tremors, palpitations, etc. to the drug. This hypothesis was confirmed. The subjects who were led to believe that their autonomic arousal was caused by the pill tolerated four times the shock intensity that the other subjects were willing to endure.

Two studies extending the reattribution paradigm to other emotions have confirmed the original results. In the first by Ross, Rodin and Zimbardo (1969) subjects were persuaded to shift the causal origin of their autonomic arousal from fear of electric shock to the presentation of a loud noise. This reevaluation resulted in a reduction in anticipated fear of the shock. In the second study, conducted by Beaman, Diener, Tefft and Fraser (1972) high test-anxious college students who attributed their autonomic arousal, while taking a test, to a pill, subsequently reduced their scores on a self-report measure of test anxiety. This reduction in test anxiety remained stable at a six-to-ten-day follow-up. These subjects also reported less physiological arousal during a test situation after the manipulation.

In an analogous manner, research concerning experimentally-induced pain has demonstrated that the pain that

an individual experiences is only partially determined by the pain-producing stimulus. For example, as was demonstrated in the Nisbett and Schachter investigation, altering an individual's perception of the causal origin of the pain can influence the degree to which that individual will rate the stimulus as painful. The significance of viewing oneself as the locus of causality--of choosing to endure the painful stimulus--has also been shown to be a crucial element in altering one's perception of pain. Zimbardo, Cohen, Weisenberg, Dworkin and Firestone (1969) have revealed that subjects who volunteered to continue participation in an experiment employing electric shock and given little justification for continuing rated the shocks as less painful than subjects not given the choice to continue. Bandler, Madaras and Bem (1968) and Corah and Boffa (1970) also demonstrated that subjects given the choice to escape from shocks rated the shocks as more painful than subjects who could not control their exposure to the shocks. In addition, Geer, Davison and Gatchel (1970) revealed that subjects led to believe that they had control over the duration of shock administration exhibited less autonomic responding to the shock than did subjects who believed that they had no control over the duration of the aversive stimulus.

The therapeutic implications of the perception of self versus external control were addressed by Davison and Valins (1969) in an analogue of psychoactive drug therapy.

It was their intention to explore a mode by which psychiatric patients could be weaned off tranquilizers. In this investigation, subjects were first asked to endure a series of steadily increasing shocks and to report when the shocks became too painful to tolerate. After this session, subjects were given a pill (a placebo) which they were informed might have an effect on skin sensitivity and then were asked to take the same series of shocks again. During this series, the intensity of each shock level had been halved so the subjects thought they endured twice the number of shocks as they had during the first session. At this juncture of the experiment, some subjects were informed that they had been in a control group and had received a placebo, whereas the others were not debriefed. It was postulated and found that subjects informed that the pill was a placebo would internally attribute their increased tolerance to shock and on a subsequent series of shocks would endure greater intensities of shock than subjects who attributed their behavior to an external source--the pill.

The far-reaching implications of such an attributional manipulation was demonstrated in a case study involving a patient suffering from chronic pain (Levendusky & Pankratz, 1975). This patient was unknowingly weaned off his pain medication in a gradual manner, while learning self-control techniques to combat the pain. That is, he learned to attribute the pain alleviation to the use of the self-control

procedures rather than the pill. When the patient was no longer physically dependent upon the drugs, he was debriefed. Although ethical issues involved in this case must be addressed, the procedure effectively eliminated the man's dependence upon the pain medication.

DISTRACTION

Concurrent research investigating methods to attenuate pain have focused upon the use of "cognitive strategies." In general, these studies incorporate the redirection of one's focus of attention via 1) instructions to reinterpret the noxious stimulus through imagery or 2) the provision of distracting stimuli.

The studies employing imagery and the reinterpretation of the painful stimulus were originally derived from research in hypnotically induced suggestion. Barber and Hahn (1962) compared the analgesic effects of hypnotically induced instructions as compared to instructions employed with subjects in the waking state. Both were demonstrated to be equally effective. That is, suggesting to subjects while under hypnosis or instructing subjects in a waking state to imagine that it was a hot day and that the 2° C water in which their hands were immersed was refreshingly cool, both resulted in equivalent decreases on the report of pain as well as several physiological correlates of pain.

Current research in this area has eliminated the

hypnotic component. The major emphasis of the research has focused upon determining the significant features of the imagery employed, i.e. what reinterpretation of the stimulus is most effective? For example, in studies employing cold water as the noxious stimulus, cognitive strategies such as instructing the subject to dissociate the cold from the pain and to focus attention on the cold was shown to be equal in effectiveness to the imaginal procedures employed in Barber and Hahn's 1962 study (Blitz & Dinnerstein, 1971). Furthermore, in experiments employing a heavy weight to one finger as the painful stimulus, coping strategies such as imagining the finger to be numb and insensitive or visualizing pleasant scenes (a day at Cape Cod, etc.) during the painful stimulation have been shown to be equally effective in alleviating the pain (Chaves & Barber, 1974).

Consequently, the crucial components of these imaginal procedures have yet to be determined because all have successfully attenuated the pain. Chaves and Barber (1974) have successfully isolated the client's expectancy of therapeutic gain and demonstrated that the benefits derived from these cognitive strategies cannot be attributed to the expectancy effects alone. Although expectancy did produce some attenuation of pain, the cognitive strategies employed were shown to be more effective and therefore involving more than placebo effects. These researchers have also speculated that the cognitive strategies employed in the research thus

far have entailed "goal directed fantasies" and have questioned if cognitive strategies not having this feature would be effective. Future research isolating this variable might prove important. However, the question remains, what does account for the effectiveness of these procedures?

One viable hypothesis is the view that the process of distraction is the crucial component. It should be noted that the second cognitive strategy employed in the Chaves and Barber (1974) investigation--the use of pleasant imagery unrelated to the noxious stimulus--is closely aligned with distraction, rather than serving as a reinterpretation of the painful stimulus. Several studies comparing a variety of distractors have demonstrated the effectiveness of this procedure in attenuating pain.

For example, white noise, the tape recording of an interesting story and the provision of a word association test, employed as distracting stimuli, have effectively reduced self-reported pain (Barber & Cooper, 1972). Similarly, Kanfer and Goldfoot (1966) reported in a study using a cold pressor as the noxious stimulus, the use of self-pacing with a clock, the presentation of slides and the verbalizing aloud of the experienced pain. The first two procedures which distracted the subject away from the pain were superior to the self-talking procedure which focused the subject's awareness onto the painful stimulus. Finally, Barber and Cooper (1972) in an attempt to explore distraction tasks

that could be used outside of the laboratory compared the effectiveness of listening to a tape recorded story and instructing an individual to add multiples of seven aloud or to count aloud. The first two procedures were equally effective whereas the counting was ineffective. The authors speculated that the effective distractor must be attention-demanding, that is, sufficiently engaging to keep attention away from the painful stimulus.

It is apparent that both approaches--the cognitive strategies and distraction procedures--redirect the focus of attention; the first to a reinterpretation of some aspect of the noxious stimulus, the second to stimulus unrelated to the painful source. Furthermore, the attribution manipulations are similar to the cognitive strategies, i.e. the self-perception manipulations employ a reinterpretation of the locus of causality of the pain. From the evidence presented it can first be argued that the process involved in the cognitive strategies and the distraction procedure can be explained as focusing attention away from the painful stimulus. Secondly, it is a reasonable extension to speculate that the attribution manipulation may also involve distraction elements.

Mischel and his colleagues in a series of studies exploring delay of gratification, have also demonstrated the powerful role of cognitive distraction techniques (Mischel, Ebbesen & Zeiss, 1972; Mischel, 1973). In the study by

Mischel, et al. pre-school children were first asked to choose between two rewards--a pretzel and a marshmallow--and were then informed that they could have the least preferred reward immediately or wait until the experimenter returned to the room and then be able to consume the more preferred treat. The children could terminate the delay at any time and would receive the less preferred reward. The effects of two distracting strategies on the length of time that the pre-schoolers would wait for the more preferred reward were compared. One group in this experiment was given an external distractor (a slinky) while the second group employed a cognitive distractor (the children were instructed to think about playing with toys and games, singing songs or anything fun). Both distractors were found to be equally effective in increasing delay of gratification time as compared to children who were instructed to focus their attention on the positive features of the preferred treat during the waiting period.

In a similar manner to the pain attenuation studies, these researchers then attempted to determine the crucial components of the cognitive transformations and found that instructing children to think of "fun" things (the cognitive strategy described above) while waiting were superior to instructing the child to think of "sad" thoughts (falling down and getting a bloody knee). The latter produced short time delays; equally as short as those found when the children

were instructed to focus their attention on the rewards. This study suggests that pleasant imagery may be easier to maintain than unpleasant thoughts and recommends the use of the former.

Finally, the distraction of attention hypothesis has been proposed to account for the effectiveness of systematic desensitization (Wilkins, 1971; Wilkins & Domitor, 1973; Yulis, Brahm, Charnes, Jacard, Picota & Rutman, 1975). Advocates of this proposition contend that Wolpe's (1958) claim that the effectiveness of systematic desensitization is due to reciprocal inhibition--the mutual antagonism between muscle relaxation and anxiety--is in error. They postulate, instead, that the critical variable in systematic desensitization is controlled attention shifts--the distraction of attention away from anxiety. In support of this hypothesis, Wilkins and Domitor, 1973, and Yulis et al. have empirically demonstrated that when attention distractors (auditory and/or imaginal) are used to replace relaxation in a standard systematic desensitization paradigm the modified systematic desensitization procedure is as effective as the standard procedure using relaxation. Hence it would seem that controlled attention shifts as opposed to the nature of the stimuli paired with the anxiety-provoking stimulus could be the critical variable in systematic desensitization.

These three threads of investigation suggest that attribution manipulations may serve to distract attention

away from anxiety. That is, the crucial component of the attributional change may not involve a cognitive alteration in perception of the anxiety but simply may provide a stimulus of distraction. However, the clinical applications of attribution theory focus on the importance of specific cognitive elements for understanding the attributional manipulations. Clinicians are emphasizing the significance of the altered cognitions, i.e. what does the client tell himself after an attributional change occurs.

ATTRIBUTION THERAPY: REATTRIBUTION, ATTRIBUTION OF NORMALITY AND COGNITIVE RESTRUCTURING

The first therapeutic application of the reattribution technique was conducted by Storms and Nisbett (1970) in an investigation concerning the treatment of insomnia. It was hypothesized that if insomniacs could attribute the arousal symptoms which occurred at night to a drug rather than to emotional thoughts (which the experimenters reasoned kept them awake), then their insomnia would be attenuated. All subjects were required to take a pill prior to going to bed. The pill was a placebo, but subjects were told that the drug produced alertness, palpitation and high body temperature (arousal symptoms characteristic of insomnia). On the nights when subjects took the pill, the insomniacs reported getting to sleep more quickly.

In informal conversation with the experimenters the

subjects in this study explained that they viewed their insomnia as suggestive of a more general pathology. It was speculated by the researchers that on the nights that the insomniacs took the pill they were able to attribute their arousal symptoms to the drug and therefore did not have to view these symptoms as evidence for their "abnormality." Consequently, they worried less and fell asleep more quickly.

Storms and Nisbett then suggested that several clinical problems such as insomnia, impotence, stuttering, extreme shyness or awkwardness in athletic situations might follow a three-step developmental sequence: 1) occurrence of symptoms, 2) worry about symptoms, and 3) consequent exacerbation of symptoms. They suggested that if clients suffering from these problems were to be given a pill to which to attribute their anxiety and arousal symptoms the second step could be eliminated and the cycle broken.

The deceptive nature of providing a patient with an artificial source to which to attribute his symptoms has some obvious ethical drawbacks when applied to the clinical setting. An insightful study by Svanum and Beaman (1975) suggests a second method of eliminating the worry component of the three-step process outlined by Storms and Nisbett. In the third experiment of a series designed to assess the effects of the presentation of information inconsistent with an individual's self-reported personal qualities upon later

personality assessment, Svanum and Beaman investigated the effects of an "attribution of normality." That is, high anxious subjects as measured by Speilberger's State-Trait Anxiety Inventory, who read a high anxious personality description and were informed that this statement was made by an "average" college student, significantly decreased their self-report of anxiety on subsequent personality inventories. It can be speculated that a major component of worry which leads to exacerbation of symptoms is an attribution of abnormality--a questioning of one's emotional stability. Hence, helping a client to view his symptoms as normal occurrences exacerbated by the worrying that these symptoms reflect some underlying pathology might be a useful therapeutic tool.

Davison (1969) comments upon this issue in his discussion of "assessment therapy." He suggests that reattribution can play a significant role during the initial interview when a behaviorally oriented therapist explains the psychological process presumed to underlie an individual's problems. That is, the client is told that although his behavior and feelings may appear odd, peculiar or crazy such behavior and feelings can be produced in "normal" people if they are subjected to certain environmental-developmental situations. And furthermore, the acquisition and maintenance of his deviant behaviors can be explained within the framework of general experimental psychology. Although Davison claims no

cures utilizing assessment therapy exclusively, it seems clear that the reattribution strategy can be used effectively to alleviate the patient's extreme worry about his symptoms.

Additional accounts of the use of "reattribution therapy" or "cognitive restructuring" in which the therapist helps the patient to alter his causal attributions by providing more reasonable explanations for his symptoms are largely anecdotal in nature (Rimm & Masters, 1974). However, two documented reports, the first involving the treatment of a paranoid schizophrenic (Davison, 1966) and the second, children having difficulties in math (Dweck, 1975) can be found in the literature.

Davison (1966) in a case study with a paranoid schizophrenic employed a reattribution approach which he labeled cognitive restructuring. The patient had been referred to Davison because he complained of "pressure points" over his right eye. He complained that they were caused by a spirit which helped him to make decisions. Davison suggested that the patient entertain an alternative explanation for these pressure points, i.e. that these sensations were a manifestation of becoming very tense in particular kinds of situations. Davison then attempted within the therapy room to enable the patient to see a causal relationship between tense situations and the occurrence of the pressure points. Relaxation training was employed. After one month, the

patient began referring to the "pressure points" as sensations, i.e. the paranoid verbalizations were eliminated. He was discharged from the hospital, and at a six-week follow-up the patient reported that he could control the sensations with relaxation and no longer worried about them.

Hence, Davison's cognitive restructuring appeared to eliminate the second step of the developmental sequence outlined by Storms and Nisbett by providing the patient with an alternative interpretation of his pressure points. Although the attributional approach was used in conjunction with relaxation training, it seems reasonable to conclude that elimination of his paranoid verbalizations was due to the former.

Dweck (1975) furthered the application of the reattribution technique to a grade school population of children having difficulties with math. More specifically, the children Dweck selected to work with had extreme reactions to failure, i.e. they virtually stopped responding after making an error. She labeled this reaction "learned helplessness," after Seligman and Mairer's (1967) usage. In an earlier study, Dweck and Repucci (1973) had found that such learned helpless children assumed less personal responsibility for their behavior than did "persevering" children (those who did not quit after meeting a failure experience). However, to the extent that the learned helpless children

did view themselves as the locus of causality, they tended to attribute their successes and failures to ability rather than effort. It was hypothesized by Dweck therefore that a treatment procedure which focused upon 1) helping the children to assume personal responsibility for their successes and failures and 2) altering their attribution of causality from ability to effort, especially regarding failure situations, would facilitate improved performance in arithmetic.

In her 1975 study, Dweck assessed the effectiveness of this attribution retraining program as compared to a success-only treatment group with learned helpless children. Training in both conditions consisted of 25 sessions in a 1-1 tutorial situation during which the children worked on a series of arithmetic problems. In the attribution group, failure experiences were programmed into each session, following which the tutor would inform the child that he failed becaused he did not try hard enough. In the success-only group, the children did not encounter failure. (Dweck viewed this group as similar to many programmed learning and behavior modification programs.) The results indicated that subjects in the attribution group 1) maintained or improved their performance on math problems and 2) increased the degree to which they attributed their failure to lack of effort as opposed to lack of ability. The success-only group continued to evidence the learned

helpless response after encountering failure and did not alter their attribution regarding the source of their failure.

COGNITIVE BEHAVIOR MODIFICATION (SELF-INSTRUCTION TRAINING)

The attribution therapies outlined in the previous section closely resemble cognitive-behavioral treatment approaches which emphasize the alteration of patterns of thinking in order to effect behavior change. A plethora of cognitive-behavioral approaches have emerged (see Mahoney, 1974, for a review); two of the most representative are Rational-Emotive Therapy (Ellis, 1962) and Self-Instruction Training (Meichenbaum & Goodman, 1971). Ellis contends that irrational beliefs are at the root of most psychological disturbances. Rational-Emotive Therapy, therefore, employs the use of logical arguments to challenge the irrational beliefs and replace these self-defeating thoughts with more adaptive ones. Although also focusing upon the modification of cognition, Meichenbaum and others employing Self-Instruction Training deemphasize the importance of isolating the self-defeating beliefs and, rather, train clients to emit adaptive self-statements.

The theoretical underpinnings of Self-Instruction Training were primarily derived from the writings of Luria (1961; 1969) and Vygotsky (1962). Luria described a

three-stage developmental sequence to account for the acquisition of behavioral control by private speech. Initially, the child's behavior is hypothesized to be governed by the speech of others. As the child begins to acquire language skills, his behavior comes to be controlled by overt self-talk. This self-talk fades and is believed to be internalized resulting in the final phase of covert speech, that is, behavior controlled by covert speech.

Empirical evidence demonstrating the self-directing function of speech on task performance has been drived from a number of sources (Bem, 1967; Birch, 1966; Lovaas, 1964; Mc Guigan, 1970; Meichenbaum, 1969a, 1969b). These pioneering studies led investigators to examine the clinical benefits that might accrue from explicitly training clients to talk to themselves in a self-guiding manner. For example, Geibink, Stover and Fahl (1968) taught emotionally disturbed boys more adaptive responses to frustration via self-instructions. And Palkes, Steward and Kahana (1968) and Palkes, Steward and Freedman (1972) employed self-instructions to facilitate the performance of hyperactive children on the Porteus Maze Test.

In 1971, Meichenbaum and Goodman employed a modeling and self-instruction rehearsal procedure with a population of impulsive pre-school children. This training procedure was deemed a particularly promising approach because impulsive children were found to be less able to control their

behavior via private speech than were reflective children (Meichenbaum & Goodman, 1969a). Training in self-guidance followed a five-step sequence in which the experimenter modeled the performance of a variety of tasks (one per training unit) while the child simply observed, followed by four trials in which the child performed the task, first with the aid of the model's instructions, next with the child verbalizing the instructions aloud, then self-instructing in a whisper and finally performing the task while covertly instructing himself. Following the treatment sessions, impulsive children trained in the self-instruction group performed significantly better on a series of performance measures as compared to two control groups.

In the second experiment of the Meichenbaum and Goodman (1971) study, the researchers attempted to isolate the crucial elements of the treatment package. This study revealed that behavioral rehearsal was the sine qua non of the training procedure. That is, observation of a model emitting self-instructions did not facilitate behavior change; it was necessary for the impulsive child to engage in self-instructions while performing the tasks.

Subsequent applications of Self-Instruction Training have incorporated a variety of procedures ranging from the strict adherence to the five-step process outlined by Meichenbaum and Goodman to merely instructing subjects to covertly talk to themselves with no checks on whether or not

the instructions were carried out and no controls on the specific content of the self-verbalizations. For example, Meichenbaum and Cameron (1973) trained hospitalized schizophrenics to self-instruct via a modeling and cognitive-rehearsal program analogous to the procedure used with impulsive children. The schizophrenics' performance on a variety of tasks was significantly improved following training in which they were taught to use self-instruction such as "pay attention, listen and repeat instructions, disregard distraction," as compared to controls who received practice on the tasks but no Self-Instruction Training. A much less structured procedure, also falling under the rubric of Self-Instruction Training, was employed to alleviate pre-surgery distress in hospitalized patients (Langer, Janis & Wolfer, 1975). In this investigation several procedures designed to reduce anxiety were compared. The most effective procedure was found to be a coping device by which patients were instructed to direct their attention away from the negative thoughts regarding the surgery and rather focus on the more favorable aspects of hospitalization.

Current research directions in the area of self-instruction have been aimed at 1) more rigorously defining the self-instruction package employed and attempting to isolate the active treatment components of this package (Robin, Armel & L'Leary, 1975), 2) attempting to determine the classes of target behaviors for which Self-Instruction

Training is most effective (Bornstein & Quevillon, 1976) and 3) examining the content of the self-instructions (Kanfer, Karoly & Newman, 1975; Hartig & Kanfer, 1973).

In the study by Kanfer, Karoly and Newman, the effectiveness of three different self-statements in helping dark "phobic" children cope with the dark were contrasted. One group of children was instructed to say, "I am a brave boy (girl). I can take care of myself in the dark." A second group was instructed to verbalize, "The dark is a fun place to be. There are many good things in the dark." The third group simply recited, "Mary had a little lamb its fleece was white as snow." The results revealed that the self-statements of the first group whose content focused on the active coping with the stressful situation was more effective than the self-instructions in the second group that emphasized the pleasant aspects of the dark. However, both were more effective than the group employing the nursery rhyme.

In the self-control study by Hartig and Kanfer (1973), five different contents of self-talk in a delay of gratification paradigm were compared. These researchers found no differences between one group of children instructed to state, "I must not look at the toy," a second group making the former statement and then focusing on the positive aspects of not looking at the toy, "I will be a good boy (girl)," and a third group making the original statement and then focusing on the negative consequences, "I will be a bad

boy (girl) if I look." All three groups were able to delay their gratification significantly longer than a group employing the recitation of the rhyme "Hickory, dickory, dock" and a group using no self-verbalizations.

It is clear that these two studies do not definitively answer the question on the importance of the content of the self-instructions. The use of the well-known nursery rhymes as controls does not rule out the possibility that self-instructions serve a distraction function. Although Kanfer et al. obtained differential results using two different self-instructions, the self-statement that proved less effective focused the subject's attention on the feared stimulus--the dark. Again, this finding does not eliminate the viability of the distraction hypothesis. Meichenbaum (1975) has emphasized the importance of the use of self-instructions that are not rote-memory-like. The distraction literature as well emphasizes the importance of employing attention-demanding cognitive strategies and of focusing attention away from the anxiety-engendering stimulus.

In addition to these varied applications, the usefulness of including self-instructions as an adjunct to several behavior therapy techniques has been investigated. Behavioral methods such as systematic desentization, modeling, anxiety relief and aversive conditioning have been modified to incorporate self-instructions into the treatment package (Meichenbaum & Cameron, 1974). Problems addressed via these

approaches included speech anxiety (Meichenbaum, Gilmore & Fedoravicius, 1971), phobias, lack of creativity and smoking (Meichenbaum & Cameron, 1974). Two of the most interesting studies exploring traditional behavior therapy approaches and Self-Instruction Training were concerned with the treatment of test anxiety (Wine, 1971b; Meichenbaum, 1972).

APPLICATION OF COGNITIVE MODIFICATION TO TEST ANXIETY

Research in the area of test anxiety reveals that, in general, highly test-anxious individuals perform more poorly in stressful, evaluative testing situations than do low test-anxious persons. When given achievement orienting instructions prior to a test administration, high test-anxious individuals have been shown to be more internally focused and hence less attentive to the task. The research indicated that under stressful testing conditions, high test-anxious individuals tend to 1) worry about their performance and that of others, 2) engage in excessive rumination over alternatives on the task, 3) engage in self-deprecatory thinking such as feelings of inadequacy, fear of loss of status or self-esteem and fear of punishment and 4) manifest heightened autonomic reactions (Wine, 1971b; Meichenbaum, 1972).

Liebert and Morris (1967) in their conceptualization

of test anxiety have proposed that there are two major components, worry and emotionality. The worry component is defined as cognitive concern regarding performance, while the emotionality aspect involves the physiological arousal experienced (anxiety). Based upon a series of studies relating worry and emotionality scores with performance expectancy, task performance and final examination grades, Morris and Liebert (1969) concluded that "it is worry, not 'anxiety,' which affects performance of intellectual-cognitive tasks and which interacts with the relevant variables of the test situation" (pp. 243-244).

Support for this assertion concerning the preeminence of cognitive variables in test anxiety can be derived from studies revealing the differential effects of instructions on performance. That is, although performance by test-anxious persons is debilitated under "ego-involving" instructions, high test-anxious subjects perform in a superior fashion to low anxious subjects when the instructions are not evaluative (Wine, 1971b).

A study by Sarason (1958) involving reassurance instructions further demonstrates the significant effects of instructions on the performance of test-anxious subjects. In his investigation the following pre-test instructions were given to high test-anxious subjects:

> Many people get unduly upset and tense because they do not learn the lists in just a few trials. If you don't worry about how you are doing but rather just

> concentrate on the list, you will find you learn much more easily. These kinds of lists are hard so it is no surprise or matter of concern if you progress slowly at first and make mistakes [p. 474].

These instructions facilitated the performance of high test-anxious subjects. It should be noted that these instructions incorporate an attribution of normality: "Many people get unduly upset and tense because they do not learn the lists in just a few trials," which may account for the effectiveness of these instructions in facilitating the performance of high test-anxious subjects. Wine (1971b) contends, however, that the inclusion of the instruction, "just concentrate on the list," facilitated the focusing of attention on the task and was the crucial component of the instructions.

Ignoring at present these differing interpretations of the instructions, this brief discussion of the test anxiety literature suggests that a treatment approach designed to diminish the worry component and enhance attention to the task would facilitate both decreases in test anxiety and increases in performance.

The cognitive modification package which Meichenbaum (1972) developed addresses these central issues. This procedure involved a three-step process. First, via group discussion test-anxious subjects gained "insight" into their self-verbalizations emitted prior to and during test taking. Second, the subjects were trained in relaxation and to emit

self-instructions to relax and to be task relevant. In the final step, subjects employed these self-instructions and relaxation techniques while visualizing the hierarchy scenes. That is, subjects were trained to use "coping imagery" in which they imagined themselves coping with their anxiety via slow deep breaths and self-instructions.

The results indicated that this cognitive modification procedure was significantly more effective than standard systematic desensitization in reducing test anxiety as measured by an analog test situation employing Raven's Matrices (1956) and Brown's (1969) Digit Symbol Test, self-report measures of test anxiety and GPA. Furthermore, only the cognitive modification group changed its perception of anxiety from debilitative to facilitative. That is, via the treatment procedure these subjects relabeled their arousal as a cue to be task relevant, rather than as an indicator of impending failure.

Wine (1971a) also explored the applicability of self-instructional training for the attenuation of test anxiety in a sophisticated design comparing three treatment packages. In the first treatment group, Attentional Training, subjects were given a treatment rationale that attributed a test-anxious individual's poor performance on tests to the fact that such people engaged in self-evaluative worrying that distracted their attention away from the task. The goal of treatment was to train the test-anxious individuals

to focus their attention onto tasks. In order to achieve this aim, videotapes of models demonstrating inappropriate and appropriate self-talk procedures for dealing with test anxiety plus actual practice in the six treatment sessions was employed. The second treatment package incorporated all of the components of the Attentional Training group plus deep muscle relaxation training. The final group, Self-Attending, was informed that treatment would facilitate self-awareness and an understanding of the origins of the test anxiety. These subjects worked on the same practice tasks as the first two groups during the six sessions, but were instructed to attend to how they were feeling during the test taking.

The results revealed that the Attentional Training group and the Attentional Training Plus Relaxation group were equally effective in decreasing test anxiety as measured by self-report inventories and facilitating performance on Brown's Digit Symbol Test and the Wonderlic (1959) Personnel Test. That is, the inclusion of relaxation training did not enhance treatment effectiveness. The Self-Attending group did not change significantly on any of the outcome measures. Wine concluded that her results confirm that test anxiety can be defined attentionally and that her procedure offers a viable alternative to the use of systematic desensitization.

THEORETICAL RATIONALE FOR COGNITIVE BEHAVIOR MODIFICATION

Meichenbaum (1975) in an attempt to explain why the cognitive behavior modification procedures are effective offers three probable explanations. First, he contends that self-instructions function in a similar manner to interpersonal instructions. That is, instructions a) initiate performance, b) direct attention to the task, c) clarify the performance requirements of a task and d) limit one's response repertoire in the situation via instructions not to make certain responses. Second, self-instructions direct attention to the task as a continual process, not just once at the beginning of a task as in interpersonal instructions. And third, self-instructions can facilitate an attributional change regarding physiological state. Finally, Meichenbaum concluded that in order for Self-Instruction Training to be successful, the self-instructions must be specific, not too general or rote-memory-like and the self-statements must be employed in the problem situations; simply saying them to self is not sufficient.

Chapter 2

RATIONALE OF PRESENT STUDY

The present study was designed to extend the work of Meichenbaum (1972) and Wine (1971a, 1971b) in the area of test anxiety and to explore in greater detail Meichenbaum's (1975) theoretical rationale for the efficacy of his Self-Instruction Training procedure. Wine (1971a) demonstrated the usefulness of a Self-Instruction Training program for the alleviation of test anxiety. Although Wine's treatment procedure also included a comprehensive treatment rationale, group discussion sessions in which subjects explored their mutual thoughts, feelings and reactions to tests and the employment of videotaped models, the treatment component deemed most crucial by Wine was the rehearsal of self-instructions to attend to the task while engaged in the analogue testing situations. Hence this component was isolated in the present investigation and the efficacy of this procedure was compared with two additional components of Wine's treatment package, postulated by the present author to be potential change agents, the first the "attribution of normality" and the second, distraction.

It can be argued that an essential feature of the group discussions in Wine's study was an "attribution of normality." The subjects were encouraged to explore their mutual thoughts, feelings and reactions toward test taking during the group meetings. It can be speculated that these subjects learned that their responses to tests were not unique and came to view their anxiety as "normal." Two empirical investigations have revealed that labeling anxiety as normal can effectively reduce anxiety. Sarason (1958) demonstrated that test-anxious subjects given reassurance instructions which described anxiety reactions to the test materials as common, performed in a superior fashion to those test-anxious subjects not provided with these instructions. In 1975, Svanum & Beaman demonstrated that high anxious subjects led to believe that high levels of anxiety were typical of the average college student lowered their subsequent self-report of their anxiety.

Normality therefore was incorporated into the present work and its impact was assessed in two treatment groups. A deceptive manipulation was applied to both groups in which subjects were given a set of high test-anxious statements and informed that the statements represented the profile of an "average" college student's responses to the Test Anxiety Questionnaire. The first group, Attribution of Normality, Interpersonal Instructions, was then given the task instructions and reminded that anxiety was a normal reaction to

test taking and not to worry about being anxious. The second group, Attribution of Normality, Self-Instructions, was instructed to employ this attribution of normality within the self-instruction paradigm. Subjects were instructed to tell themselves that anxiety was a normal reaction to test taking and not to worry about being anxious when they noticed themselves becoming anxious in the analogue testing situations. These two groups were designed to assess the differential effects of interpersonal instructions concerning the attribution of normality compared to the repeated exposure of this suggested reattribution through self-instructions.

It was also hypothesized that self-instructions serve a distraction function. The literature in the areas of pain perception, delay of gratification and systematic desensitization suggest that self-instructions can be regarded as attention demanding thoughts that distract attention away from anxiety and therefore facilitate performance. The distraction literature would suggest that employing any cognitive strategy (except an unpleasant cognitive transformation [Mischel, Ebbesen & Zeiss, 1972]) would be equally effective in attenuating anxiety. Hence a distraction group, Distraction, Pleasant Experience, was included to assess the effectiveness in alleviating test anxiety by instructing subjects to summarize a pleasant

experience into a short phrase and silently verbalize that phrase when experiencing anxiety.

Finally, a control group, Standard Interpersonal Instructions, was included in order to assess the effects of repeated exposure to the test materials. This group was not provided with any instructions designed to help the subjects cope with anxiety.

In summary, it was predicted that the treatment procedure which would have the greatest effects on all seven dependent measures would be the Attribution of Normality, Self-Instructions group. This group differed from the others because it offered 1) a self-perception change, suggesting that high test anxiety is a "normal" reaction, which was hypothesized to lower self-report measures of test anxiety and 2) a method by which to cope with anxiety in the testing situations (Self-Instruction Training). The two other groups employing cognitive coping strategies, the Attention to Task, Self-Instructions group and the Distraction group, were expected to follow the Attribution of Normality, Self-Instructions group in effectiveness, but were not expected to differ from one another. These two groups were viewed as analogous in that they provided a means by which to distract the subject from his anxiety. The least effective treatment group was predicted to be the Attribution of Normality, Interpersonal Instructions group because it offered only a self-perception change and

no method by which to cope with the anxiety in the testing situation. However, all four treatment groups were predicted to be significantly greater in effectiveness as compared to the Standard Interpersonal Instructions group.

Chapter 3

METHOD

SUBJECTS

The subjects were drawn from 430 introductory psychology students who had completed Mandler and Saranson's (1952) Test Anxiety Questionnaire (TAQ). The 75 subjects (18 males, 57 females) used had scored in the top 25% of the distribution, which was the operational definition of high test anxiety. The subjects were ranked ordered according to their scores on the TAQ and 15 subjects were randomly assigned according to a blocked design to each of the five groups. The following five groups were included in the study:

1) Attribution of Normality, Interpersonal Instructions
2) Attribution of Normality, Self-Instructions
3) Attention to Task, Self-Instructions
4) Distraction, Pleasant Experience
5) Standard Interpersonal Instructions

DEPENDENT VARIABLES

Assessment of treatment effectiveness was determined by the administration of pre- and post-treatment self-report and performance measures. Three self-report measures of test anxiety were employed. The first, Mandler and Saranson's (1952) Test Anxiety Questionnaire, a 37-item survey, was used to select subjects as well as to assess treatment effectiveness. Alper and Haber's (1960) Achievement Anxiety Test (AAT), a 19-Likert-type-item scale composed of two subscales--Facilitating Anxiety (AAT: FA) and Debilitating Anxiety (AAT: DA), was included to measure changes in self-report of debilitating and facilitating test anxiety. The Debilitating Anxiety subscale correlates .64 with the Test Anxiety Questionnaire. The third paper and pencil inventory, the Liebert and Morris (1967) Worry and Emotionality Scale (W/E), a 10-item scale composed of a five-item Worry Scale (W/E: W) and a five-item Emotionality Scale (W/E: E), was included to measure these components as experienced immediately before a testing situation. The performance measures employed included alternate forms of the Digit Symbol Test (D.S.) by Brown (1969) and the Abstract Reasoning subtest (ABR) of the Differential Aptitude Test (DAT), forms L and M. Boor and Schell (1967) demonstrated that performance on digit symbol tasks is significantly lowered by high levels of anxiety. The Abstract

Reasoning subtest was included in an attempt to explore the use of a test longer than the Digit Symbol Test which could allow greater use of the cognitive coping strategies taught in the various treatment groups.

In addition to these dependent variables, the Check on Manipulations questionnaire was administered to subjects during the training sessions in order to ascertain the clarity of the instructions given and to determine if the cognitive strategies had been employed. Also at post-assessment the Credibility Check was administered. This questionnaire was patterned after a set of questions constructed by Borkovec (1972) and was designed to determine the believability of the manipulations employed, primarily the instructions to use the cognitive strategies. One question was also included to assess if subjects believed that anxiety was a normal reaction to the taking of tests. Copies of all assessment measures (except the subtests of the DAT) can be found in the Appendix.

Pre-treatment assessment on the TAQ and AAT was conducted five weeks prior to the commencement of the five treatment sessions. Pre-treatment assessment of the W/E and the two performance measures was conducted during the week before the treatment sessions began. Post-treatment assessment was conducted within the two weeks following the fifth treatment session except for four subjects who were tested four weeks following the fifth treatment

session (two subjects in Group 3 and one subject each in groups 4 and 5).

PROCEDURE

The TAQ and AAT were administered to 430 students enrolled in an introductory psychology class. The top 25% on the TAQ were defined as high test anxious. A notice inviting these high test-anxious students to participate in an experiment that would fulfill all of their experimental hour requirements plus enable them to earn additional experimental credits was posted. The experiment was described as a study assessing college students' performance on a variety of tasks. Subjects who responded to the notice were instructed to attend the first experimental meeting on one of two dates the following week.

At these first meetings, subjects were given "ego-involving" instructions similar to those employed in previous research (Meichenbaum, 1972). The following instructions were given:

> You will be taking two tests today. The first, an Abstract Reasoning Test; the second, a Digit Symbol Test. Both of these measures assess general intelligence and are highly correlated with academic success in college.

The subjects were then asked to fill out the W/E scale prior to taking the two tests. Immediately following this survey, the Abstract Reasoning and Digit Symbol Test were administered.

Seventy-five subjects completed the first assessment session and agreed to participate in the remainder of the study. These subjects were blocked according to their scores on the TAQ and then were randomly assigned to the five groups.

Subjects met in their respective groups and participated in five one-hour training sessions. The tasks administered during the five training sessions were identical for each group. The subjects were given "ego-involving" instructions prior to the administration of the tests each session. In addition, prior to the test administration during session three, subjects were informed that as a whole this group was doing more poorly than typical college students elsewhere in order to increase anxiety. This was done because self-report measures (W/E) from the previous session had shown that the subjects were experiencing low levels of anxiety. All subjects completed the following tests and scales in the order presented:

1) Worry and Emotionality Scale
2) Subtest Differential Aptitude Test
    a) Session 1 DAT: Verbal Reasoning, form L
    b) Session 2 DAT: Numerical Reasoning, form L
    c) Session 3 DAT: Mechanical Reasoning, form L
    d) Session 4 DAT: Space Relations, form L
    e) Session 5 DAT: Verbal Reasoning, form M

3) Digit Symbol Test (alternate forms)

4) Check on Manipulations

Additional instructions presented to subjects were different for each group. The instructions for group 1, Attribution of Normality, Interpersonal Instructions, and group 2, Attribution of Normality, Self-Instructions, included an attribution of normality manipulation. The subjects in group 2, Attribution of Normality, Self-Instructions, group 3, Attention to Task, Self-Instructions, and group 4, Distraction, Pleasant Experience, were instructed to employ cognitive coping strategies.

ATTRIBUTION OF NORMALITY MANIPULATION

At the beginning of session one, the subjects in groups 1 and 2 were given a profile of an "average" college student's responses to the Test Anxiety Questionnaire that they took in their psychology class (see Appendix A). This profile of statements contained a series of high test-anxious responses. The subjects were asked to read these statements silently. During the remaining sessions, subjects were reminded that test anxiety was a normal reaction to the taking of tests and so not to worry about it.

COGNITIVE COPING STRATEGIES

Following the "ego-involving" instructions and prior to the test administrations, subjects in groups 2, 3 and 4

were instructed to employ a cognitive coping strategy each time they noticed themselves becoming anxious while taking the tests. The subjects in group 2, Attribution of Normality, Self-Instructions, were given the following instructions regarding the cognitive strategy:

> During the test taking when you notice yourself becoming anxious, simply remind yourself that anxiety is a normal reaction to test taking. That is, silently say to yourself that anxiety is a normal reaction to test taking and so not to worry about being anxious.

The subjects in group 3, Attention to Task, Self-Instructions, were given these instructions regarding the cognitive strategy:

> During the test taking when you notice yourself becoming anxious, simply tell yourself to stop being anxious and to attend to the task at hand. That is, silently say to yourself to pay attention to the task you are working on.

The subjects in group 4, Distraction, Pleasant Experience, were given the following instructions regarding the cognitive strategy:

> During the test taking when you notice yourself becoming anxious, simply summarize a pleasant personal experience into a short phrase and silently verbalize this phrase to yourself.

The subjects in group 5 did not receive any instructions in addition to those common to the other four groups.

Within two weeks after training session five, all subjects (except four who were tested four weeks after the final treatment session) were administered the post-test

assessment measures. All subjects completed the Test Anxiety Questionnaire, the Achievement Anxiety Test, the Worry and Emotionality Scale, the Abstract Reasoning Test (alternate form), the Digit Symbol Test (alternate form) and the Credibility Check.

During the final assessment session, subjects were debriefed as to the deceptions employed in the study and asked not to discuss the experiment with anyone until the following quarter.

Chapter 4

RESULTS

SUBJECTS

A total of 75 subjects were rank ordered according to their scores on the Test Anxiety Questionnaire and then were assigned to each of the five groups in a blocked design, 15 subjects per group. Twelve subjects failed to complete all sessions of the study and were dropped from the analysis. Fourteen subjects completed the experiment in group 1, Attribution of Normality, Interpersonal Instructions (2 males and 12 females), and group 5, Standard Interpersonal Instructions (1 male and 13 females). Group 2, Attribution of Normality, Self-Instructions, and group 3, Attention to Task, Self-Instructions, both contained 12 subjects (1 male and 11 females). Eleven subjects in group 4, Distraction, Pleasant Experience (7 males and 4 females), completed the experiment.

A 1 x 3 analysis of variance was performed on each of the five post-session self-report ratings assessing the use of the cognitive strategies by subjects in groups 2, 3 and 4 (Check on Manipulations). No differences between the use

of cognitive strategies were found. The largest F value was 1.593, p 20; the other four F values were less than one. Average use of the cognitive strategies per session ranged between 2.11 and 2.94, indicating that subjects employed the strategies less than "sometimes" when experiencing anxiety.

A 1 x 3 analysis of variance, performed for each item of the post-treatment Credibility Check assessing the believability of the cognitive strategies, revealed no signigicant differences between the groups. The largest F value was 1.465, p .20. Thus, all groups employing the cognitive strategies found them to be equally credible procedures. A 1 x 5 analysis of variance, performed on the question assessing the normality of test anxiety, revealed that the subjects in all groups were equally as likely to believe that test anxiety was normal. The F value was 0.57, p .20.

DEPENDENT VARIABLES

Test Anxiety Questionnaire

A 5 x 2 (Groups x TAQ) analysis for repeated measures was performed on the TAQ scores. A summary of the results of this analysis is presented in Table 2. Due to the violation of the assumption of homogeneity, subjects were discarded to produce equal sample size (n = 11) for the analysis. A significant difference was obtained from

pre-test to post-test (F = 13.850, df = 1/50, p .01), indicating that test anxiety scores did decrease following the five training sessions. However, the nonsignificant F ratio obtained for the AB interaction indicated that decreases occurred in all five of the experimental conditions. Newman Keuls analysis revealed no significant differences between groups at pre-treatment and no significant differences at post-treatment.

Achievement Anxiety Test:
Debilitating Anxiety

A 5 x 2 ANOVA for repeated measures using equal sample size was performed on the Debilitating Anxiety scores. The results of this analysis are presented in summary Table 3. A significant decrease in Debilitating Anxiety scores was not found. Newman Keuls analysis revealed that none of the groups differed at pre-treatment on their Debilitating Anxiety scores nor were there group differences at post-assessment.

Achievement Anxiety Test:
Facilitating Anxiety

A summary of the results of the 5 x 2 ANOVA for repeated measures using equal n's for Facilitating Anxiety is presented in Table 4. A significant change in Facilitating Anxiety scores following the experimental manipulations was not found. Multiple comparisons of the groups at pre- and post-treatment using the Newman Keuls revealed

that group 2, Attribution of Normality, Self-Instructions, and group 5, Standard Interpersonal Instructions, were significantly different from one another at pre-treatment. (Subjects in group 2 reported more facilitating anxiety than subjects in group 5.) The remaining groups did not differ from 2 and 5 nor from one another. At the post-assessment there was no difference between groups 2 and 5 and the Facilitating Anxiety scores for all of the groups were equivalent.

Worry and Emotionality Scale: Worry

The results of the 5 x 2 ANOVA performed on the Worry Scale are summarized in Table 5. A statistically significant F ratio was obtained from pre-test to post-test (F = 59.447, df = 1/58, p .01), indicating that scores on the Worry Scale did decrease following the experimental manipulations. A nonsignificant F ratio obtained for the AB interaction reveals that this decrease in Worry scores did not differ between groups. Newman Keuls analysis of the group means at pre-treatment revealed that group 2 was significantly greater than groups 1 and 4, but did not differ from the remaining groups. At post-treatment assessment group 2 was significantly greater than groups 3 and 5 and again did not differ from the remaining groups. That is, with the exception of group 2, all groups were equivalent to one another at pre- and post-assessment.

Worry and Emotionality Scale: Emotionality

The results of the 5 x 2 ANOVA performed on the Emotionality Scale are depicted in Table 6. A significant F ratio was obtained from pre- to post-test ($F = 18.294$, $df = 1/58$, $p < .01$), revealing a significant decrease on the Emotionality scores after the experimental manipulations. The nonsignificant F ratio obtained for the AB interaction revealed that this decrease was not different for all groups. Multiple comparisons of the means at pre-test using the Newman Keuls test revealed no significant difference at pre-test. Newman Keuls analysis at post-test also revealed no significant differences between the post-treatment means.

Abstract Reasoning Test

A summary of the 5 x 2 ANOVA performed on the Abstract Reasoning Test is presented in Table 7. A significant F ratio was obtained from pre-test to post-test ($F = 8.452$, $df = 1/58$, $p < .01$), indicating that scores on the Abstract Reasoning Test improved after the experimental manipulations were implemented. The nonsignificant AB interaction reflects that this improvement was not different for all groups. Newman Keuls analysis of the Abstract Reasoning Test group means revealed that none of the groups differed from one another at pre-test and none of the means differed at post-test.

Digit Symbol Test

The results of the 5 x 2 ANOVA performed on the Digit Symbol Test are summarized in Table 8. A significant F ratio was obtained from pre-test to post-test ($F = 31.903$, $df = 1/58$, $p < .01$), indicating an increase in performance on the Digit Symbol Test following the five training sessions. The nonsignificant AB interaction reflects that this improvement was not different for any of the groups. Newman Keuls analysis of the Digit Symbol Test revealed no significant differences between groups at the pre-assessment nor were differences found at the post-assessment.

Table 1

Group Means of Pre- and Post-Treatment Scores

	Group	Pre-	Post-		Group	Pre-	Post-
TAQ	1	25.7143	23.5000	AAT: DA	1	32.4545	33.1818
	2	26.333	20.8333		2	33.4545	31.5455
	3	26.2500	22.4167		3	31.7273	31.7273
	4	25.9091	23.4545		4	34.7273	30.1818
	5	25.8571	23.7857		5	30.1818	31.0000
AAT: FA	1	22.0000	22.4545	W/E: W	1	11.4286	8.5000
	2	23.0000	21.5455		2	14.6667	11.4167
	3	21.6364	22.4545		3	13.2500	8.0000
	4	22.3636	22.0000		4	11.4545	9.6363
	5	18.9090	22.6364		5	13.2857	8.2143
W/E: E	1	8.7857	7.2143	ABR	1	39.5714	41.7143
	2	10.4167	8.0833		2	39.1667	39.3333
	3	7.6667	5.7500		3	41.7500	42.5833
	4	7.9091	6.4546		4	40.0909	43.6364
	5	8.6429	6.9286		5	39.3571	43.2857
D.S.	1	67.0000	73.5000				
	2	70.2500	76.4167				
	3	62.0833	71.7500				
	4	64.4545	73.1818				
	5	63.7143	70.1429				

Table 2

Summary of Analysis of Variance for Test Anxiety Questionnaire

Source	SS	df	MS	F
Between Subjects				
Experimental conditions (A)	7.4000	4	1.8500	0.050
Subj. W. Groups	1862.820	50	37.2564	
Within Subjects				
Trials (B)	201.827	1	201.827	13.850**
AB	11.0364	4	2.7591	0.189
B. x Subj. W. Groups	728.636	50	14.5727	
Total	2811.7294	109		

** p .01

Table 3

Summary of Analysis of Variance for Achievement Anxiety Test: Debilitating Anxiety

Source	SS	df	MS	F
Between Subjects				
Experimental conditions (A)	70.0545	4	17.5136	0.339
Subj. W. Groups	2581.91	50	51.6382	
Within Subjects				
Trials (B)	26.5091	1	26.5091	1.010
AB	113.764	4	28.4409	1.084
B. x Subj. W. Groups	1311.73	50	26.2345	
Total	4103.9676	109		

Table 4

Summary of Analysis of Variance for Achievement Anxiety Test: Facilitating Anxiety

Source	SS	df	MS	F
Between Subjects				
Experimental conditions (A)	35.5818	4	8.8955	0.213
Subj. W. Groups	2088.82	50	41.7764	
Within Subjects				
Trials	11.1364	1	11.1364	0.5183
AB	82.4545	4	20.6136	0.960
B. x Subj. W. Groups	1073.91	50	21.4782	
Total	3291.9037	109		

Table 5

Summary of Analysis of Variance for Worry and Emotionality Scale: Worry

Source	SS	df	MS	F
Between Subjects				
Experimental conditions (A)	139.462	4	34.8655	1.305
Subj. W. Groups	1549.25	58	26.7112	
Within Subjects				
Trials	434.571	1	434.571	59.447**
AB	52.4318	4	13.1080	1.793
B. x Subj. W. Groups	423.997	58	7.3103	
Total	2599.7118	125		

** p .01

Table 6

Summary of Analysis of Variance for Worry and Emotionality Scale: Emotionality

Source	SS	df	MS	F
Between Subjects				
Experimental conditions (A)	88.5943	4	22.1486	1.201
Subj. W. Groups	1069.95	58	18.4473	
Within Subjects				
Trials	101.341	1	101.341	18.294**
AB	2.8606	4	0.7151	0.129
B. x Subj. W. Groups	321.298	58	5.5396	
Total	1584.0439	125		

**p .01

Table 7

Summary of Analysis of Variance for Abstract Reasoning Test

Source	SS	df	MS	F
Between Subjects				
Experimental conditions (A)	128.913	4	32.2283	1.102
Subj. W. Groups	1695.96	58	29.2407	
Within Subjects				
Trials (B)	146.794	1	146.794	8.452**
AB	66.8546	4	16.7137	0.962
B. x Subj. W. Groups	1007.35	58	17.3681	
Total	345.8716	125		

**p .01

Table 8

Summary of Analysis of Variance for Digit Symbol Test

Source	SS	df	MS	F
Between Subjects				
Experimental conditions (A)	713.668	4	178.417	1.146
Subj. W. Groups	9026.04	58	155.621	
Within Subjects				
Trials (B)	1730.87	1	1730.87	31.903**
AB	61.9130	4	15.4783	0.285
B. x Subj. W. Groups	3146.72	58	54.2538	
Total	14679.2110	125		

**p .01

Chapter 5

DISCUSSION

The major hypotheses of the present study were not confirmed. Scores on the Test Anxiety Questionnaire (TAQ) and Worry and Emotionality Scale decreased from pre- to post-treatment for subjects in the four treatment groups (groups 1-4). A significant increase in performance by these groups on the Abstract Reasoning Test and the Digit Symbol Test was also found at post-assessment. However, all treatment groups were also equivalent to the control group, suggesting that simply repeated exposure to the anxiety-arousing materials could have accounted for the decreases in anxiety and increases in performance. The nonsignificant results for the Achievement Anxiety Test on both the Debilitating and Facilitating scales indicate that neither repeated exposure to the anxiety-arousing materials nor any of the cognitive strategies influenced how the subjects construed their anxiety as measured by these subscales. The failure of the experimental manipulations to have any impact on the self-report or performance measures of test anxiety necessitates scrutiny of the methodology employed in the present study.

One might argue that the test anxiety levels of the subjects employed in the present study were not sufficiently high to be successfully influenced by the manipulations. Subjects were drawn from a population of students enrolled in an introductory psychology class where participation in experiments was required. They were selected on the basis of their scores on a self-report measure, the TAQ, and were labeled as test anxious if their scores fell within the top 25% of the class. In the studies by Meichenbaum (1972) and Wine (1971a), subjects were recruited via an advertisement for a treatment designed to help alleviate test anxiety, thus attempting to reduce the gap between analogue and clinical research. In addition, the subjects in Wine's study had to meet predetermined cut-off scores on the self-report measures. Subjects falling below these criteria were not used. Despite this major difference in the procedure for subject selection, a comparison of the mean pre-treatment scores on the self-report scales employed in the present investigation with those used in Meichenbaum's and Wine's research revealed that all subjects were very similar on their self-reports of test anxiety. The mean pre-treatment scores on the Debilitating Anxiety Scale for the present investigation was 32.51 as compared to 34.63 in Meichenbaum's study and 35.38 in Wine's investigation. The mean pre-treatment scores on the Facilitating Anxiety Scale were respectively 21.40, 19.12 and 21.58. (Mean

scores for the TAQ could not be compared. Meichenbaum did not use the TAQ in his study, while Wine employed a shortened version of the TAQ, the Test Anxiety Schedule.) The only difference noted was on the Digit Symbol Test. Although not a measure of test anxiety, digit symbol tests have been shown to be negatively correlated with measures of anxiety. The mean pre-treatment score for the present study was 65.50 as compared to 54.73 in Meichenbaum's investigation and 52.41 in Wine's research.

Given that the subjects selected were comparable to test-anxious subjects in past research, it is necessary to determine if sufficient anxiety was generated during the five treatment sessions and at the post-treatment assessment period. The purpose of the practice sessions for groups 2-4 was to provide subjects with an opportunity to learn to cope with anxiety by using the cognitive strategies. If no anxiety was generated by the ego-involving instructions and the experimental tasks, this learning could not take place. Similarly, it was important that at post-treatment anxiety be generated in order that the cognitive strategies be employed. The ego-involving instructions used in this study were patterned after Meichenbaum and the tasks used were similar to those employed by Wine. However, as was noted in the Methods Chapter, responses on the Worry and Emotionality Scale revealed that by session two subjects were no longer experiencing anxiety when

confronted with the experimental tasks. Although self-reported anxiety was raised by the experimenter informing the subjects that they as a whole were doing more poorly than other students had done in the past, the effectiveness in arousing anxiety to a significant level during the experimental sessions must be questioned. Since all of the sessions, including post-assessment, were conducted by one experimenter, subjects may have become accustomed to the investigator and habituated to the impact of the ego-involving instructions and the test administration. Meichenbaum employed different experimenters to administer pre- and post-assessment hence eliminating the habituation to experimenter problem, while Wine was the sole experimenter in her study. A direct comparison of the present investigation with the studies by Wine and Meichenbaum cannot be made because neither investigation employed a comparable check to determine if anxiety was aroused during the treatment phase.

One important difference between the present work and the studies by Meichenbaum and Wine is that the latter were described as treatments for test anxiety, while the former was billed as an experiment investigating student performance on a variety of tasks. It is conceivable that this differing set made all of the experimental manipulations less credible and consequently less effective when viewed in the context of an experiment. Although the Credibility

Check administered at the post-assessment period revealed that subjects viewed all three cognitive strategies as equally credible procedures which might be helpful to individuals who experienced anxiety when taking tests, this information does not reveal if these procedures would have been more believable had they been introduced as a treatment for test anxiety.

In the present investigation, group 3, Attention to Task, Self-Instructions, was patterned after the Attentional Training group in Wine's study. This treatment group contained the element deemed as most crucial--the rehearsal of the cognitive self-statements to attend to the task while actually engaged in test-taking behavior. It is conceivable that the treatment rationale provided by Wine--that test-anxious individuals perform poorly on tests because they do not focus their full attention on the task at hand but rather engage in self-evaluative worrying--made the use of the cognitive strategy seem more reasonable than the experimental instructions which simply informed the subjects that this cognitive strategy would help them to perform better.

The results of the present investigation could also suggest that Wine's conclusion that the rehearsal of the cognitive strategy was the treatment component responsible for change is in error. This element was isolated in the present study and it produced no measurable effects beyond

the effects of repeated exposure to the tasks. It is therefore possible that the other components in Wine's treatment package--videotaped models employing the cognitive strategy in testing situations and group discussions in which subjects explored the negative self-statements that they employ while taking tests and thinking about tests--may have been the causal agents.

The believability of the attribution of normality manipulation used in the present study must also be addressed. Subjects in this study, aware that they were in an experiment, may have discounted the information provided to them regarding the normality of anxiety reactions to tests. The same one-page sheet describing the "typical" college student may have proved to be a compelling document if given to subjects under the guise of treatment. It is also possible that this manipulation was too blatant, the one-page description too obviously "rigged," causing the manipulation to be ineffective. It should be noted that although neither researcher was deliberately trying to manipulate normality, the group discussion employed in the work by Meichenbaum and Wine contained a subtle manipulation of normality. That is, during the group meetings, participants were encouraged to talk about their thoughts and feelings toward test taking. Subjects learned that their reactions were not unique; they came to view their reactions as very common (normal). Perhaps a more subtle

manipulation of normality would have proved more effective in the present work.

It can also be argued that the attribution of normality was a component of all five groups and that this factor accounted for the uniform decreases in anxiety and increases in performance. The instructions for the use of the cognitive strategies in groups 2-4 began, "If you notice yourself becoming anxious, . . ." suggesting that this was a common reaction. Also, all five groups filled out the Worry and Emotionality Scale at the end of each session, again emphasizing that all subjects should be experiencing some anxiety. Support for this contention can be derived from the post-treatment Credibility Check which revealed that all subjects were equally as likely to regard anxiety as a normal reaction to test taking. However, because this question was only assessed at post-treatment, subject endorsement of this belief cannot be unequivocably attributed to having participated in the experiment. It is equally as likely that the subjects viewed anxiety as a normal reaction to test taking prior to their participation in this study. If the latter is true, then the attribution of normality was something obvious to all and unnecessary to state. This would suggest that the effectiveness of the cognitive manipulation of normality is dependent upon subjects having a previous perception that their reactions are abnormal.

The distraction manipulation used in group 4, in which subjects were instructed to summarize a pleasant experience into a short phrase and to say this phrase to themselves when confronting anxiety, may, like the other cognitive strategies, have suffered from a lack of believability. Wine did not have a comparable condition to group 4 in her study, nor did she employ a no-treatment control group. The group to which she compared the Attentional Training and Attentional Training plus Relaxation groups was the antithesis of the distraction group used in this study. That is, in Wine's third experimental condition, subjects were instructed to focus on their anxiety reactions and negative self-statements when working on the tasks during the practice sessions. This Self-Attending group was shown to be less effective than the Attentional Training groups and Wine concluded that the attention to task self-instructions was the crucial change agent. However, the question of whether the attention to task self-instructions is effective because it directs attention to the task or away from anxiety remains to be addressed.

Finally, the treatment versus experimental focus which has been explored in the above paragraphs may also alter the "set" by which subjects fill out self-report measures. Mischel (1968) addresses the often ignored point that objective tests--despite their standardization,

reproducibility and test-retest reliability--are highly subjective. Individuals administered a self-report inventory are asked to ". . . extrapolate extensively from behavior, to go far beyond direct behavior observation, and to supply subjective inferences about the psychological meaning of behavior" (p. 60). It can be argued that subjects in the present study when taking the self-report measures initially construed the items in terms of their anxiety to tests in general. Following the five experimental sessions their answers may have been viewed in terms of the tests taken during the practice sessions. In the studies by Wine and Meichenbaum due to the treatment focus the test anxiety questions may have been construed within the larger context at both administrations.

The results derived from the self-report measures of anxiety present one additional problem which necessitates comment. As was stated in the first paragraph of this chapter, subjects' scores on the Test Anxiety Questionnaire decreased from pre- to post-assessment, whereas the Debilitating and Facilitating Anxiety subscales did not change. This is a curious finding due to .64 correlation between the TAQ and the Debilitating Anxiety Scale. The test-retest reliabilities for these two measures are .91 (Mandler & Cowen, 1958) and .87 (Alpert & Haber, 1960) respectively. These scores reveal that both scales are equally reliable measures of test anxiety and suggest either

that participation in this study differentially affected subject responses to these scales or that the present results represent a chance fluctuation which is spurious.

Future work should be directed toward ascertaining the contributions of the various components of Self-Instruction Training programs. The treatment components in the self-instruction package employed by Wine included the use of videotaped models, a discussion group in which common concerns about tests were explored plus the rehearsal of the self-instructions in a testing situation. Although Wine emphasized the importance of the self-instruction component, the other components merit experimental investigation as well. More specifically, the significance of the group discussion with particular emphasis upon the attribution of normality within this discussion should be explored. It will be important to ascertain if the normality manipulation is only effective when subjects, prior to treatment, view their behavior as abnormal. Further exploration of the importance of the content of self-statements employed and the rationale provided for the use of the cognitive strategy should be conducted. A question addressed but not answered in this study--do self-instructions simply serve as distractors away from anxiety--remains to be investigated.

Chapter 6

SUMMARY

The present study incorporated research from three diverse areas of experimental investigation: 1) the clinical implications of attribution and self-perception theories, 2) Self-Instruction Training and its applicability to the alleviation of test anxiety and 3) distraction as employed in pain attenuation work, delay of gratification and in systematic desensitization. The primary purpose of this investigation was to extend the work of Meichenbaum (1972) and Wine (1971a, 1971b) in the area of test anxiety and to explore in greater detail Meichenbaum's theoretical rationale for the efficacy of the Self-Instruction Training procedure.

Three components of Wine's (1971a) treatment package were isolated and the efficacy of these elements in alleviating test anxiety in college students was assessed. The first component deemed by Wine to be the crucial element of change was the rehearsal of self-instructions to attend to the task by the subjects when experiencing anxiety in testing situations. The second component was the "attribution of normality" postulated by the present author to be

an essential feature of the group discussions in Wine's study and a potential agent of change. The third isolated component was the distraction function of the self-instructions. It was hypothesized that the self-instructions were attention-demanding thoughts which distract the person away from his anxiety, thus allowing him to focus on the test questions.

High test-anxious undergraduates, selected on the basis of their scores on Mandler and Sarason's (1952) Test Anxiety Questionnaire, were assigned to one of the following five groups:

1) Attribution of Normality, Interpersonal Instructions
2) Attribution of Normality, Self-Instructions
3) Attention to Task, Self-Instructions
4) Distraction, Pleasant Experience
5) Standard Interpersonal Instructions

All subjects participated in five one-hour training sessions during which they were administered a series of subtests from the Differential Aptitude Test (DAT). The subjects were given "ego-involving" instructions concerning these tasks which were designed to engender anxiety in the subjects.

Additional instructions presented to subjects were different for each group. The subjects in groups 1 and 2 were exposed to an "attribution of normality" manipulation.

Subjects were provided with a written statement which contained a series of high test-anxious responses and were informed that this represented the "average" college student. The subjects in groups 2, 3 and 4 were instructed to employ cognitive strategies each time they noticed themselves becoming anxious while taking the DAT subtests. The subjects in group 2 were instructed to covertly verbalize the statement that anxiety is a normal reaction to test taking. The cognitive strategy for group 3 was the attention-to-task self-instruction as used by Wine. And in group 4, subjects were instructed to summarize a pleasant personal experience into a short phrase and to verbalize this phrase covertly. Finally, the subjects in group 5 did not receive any instructions in addition to those common to the other four groups.

Assessment of treatment effectiveness was determined by the administration of pre- and post-treatment self-report measures. The three self-report measures employed were the 1) Test Anxiety Questionnaire, 2) Achievement Anxiety Test (Alpert & Haber, 1960) and 3) Worry and Emotionality Scale (Liebert & Morris, 1967). The performance measures used were alternative forms of Brown's (1969) Digit Symbol Test and alternate forms of the Abstract Reasoning Test from the DAT.

It was predicted that all treatment groups (groups 1-4) would be more effective in alleviating test anxiety than

the control group (group 5). In addition, it was predicted that the most effective treatment procedure would be group 2, Attribution of Normality, Self-Instructions. The other two groups employing cognitive strategies, groups 3, Attention to Task, Self-Instructions, and group 4, Distraction, Pleasant Experience, were predicted to be equal to one another in effectiveness and group 1, Attribution of Normality, Interpersonal Instructions, least effective.

None of the hypotheses of the study was confirmed. The results revealed that none of the groups differed from one another at post-test on any of the dependent measures. A significant decrease in self-reported test anxiety and increases in performance were found for all groups.

The failure of the experimental manipulations to have any impact on the dependent measures was discussed in terms of the methodology employed. The adequacy of the selection procedure for obtaining highly test-anxious subjects was evaluated and found to be acceptable. The procedures employed to engender anxiety during the training sessions were viewed as inadequate. The believability of the attribution manipulation and the use of the cognitive strategies was addressed. It was suggested that the experiment may have lacked credibility because the study was described as an experiment rather than a treatment. It was furthermore argued that the attribution of normality may

have been a component of all five treatment groups or subjects may have believed that test anxiety was normal prior to the commencement of the training sessions. It was postulated that the attribution of normality manipulation may only be effective when subjects believe prior to treatment that their responses are abnormal. Finally, it was suggested that future research be directed toward ascertaining the contributions of the various components of Self-Instruction Training programs.

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APPENDIX A

ATTRIBUTION OF NORMALITY STATEMENT

The typical student at the University of Montana is very concerned about his performance in college, especially on tests. While taking tests he often finds that he is continually comparing himself with others, thinking that they are much brighter than he. He is convinced that he is doing poorly on the exam. Furthermore, while taking tests the typical student thinks about the grade he will receive on the test and often begins to ask himself if he will ever make it through college. Then he begins to think of the consequences of failing--what will happen if he blows this test, what will happen if he flunks out of college? He often forgets facts that he has studied and knows when he is in the testing situation and freezes up. Physiologically, the typical college student notices his heart beating very fast while taking an important exam and finds that his hands and arms tremble. Often, the student finds that he doesn't enjoy eating right before an important exam and sometimes will have an upset stomach after an exam or feel somewhat depressed. One of the things that the typical student dreads most are pop quizzes. The usual reaction is panic. Time limits are also viewed as

increasing the pressures on the student while taking an exam. Finally, most students feel that the University ought to recognize that students are nervous about tests and that this affects their performance. In summary, studies nationwide at other universities have confirmed these results, suggesting that Montana students are quite similar to all college students concerning their attitudes about and reactions to tests.

APPENDIX B

TEST ANXIETY QUESTIONNAIRE

DIRECTIONS: This survey contains a list of statements concerning attitudes and feelings about tests. Read each statement and indicate whether you believe that it is true or false by filling in the appropriate place on the answer sheet. If the statement is true fill in the first space next to the number of the item; if the statement is false, mark the second space. It is most important that you carefully and honestly answer each item. Please do not leave any item blank, as then the test cannot be scored.

T 1. I seem to defeat myself while working on important tests.

T 2. While taking an important exam I find myself thinking of how much brighter the other students are than I am.

T 3. The harder I work at taking a test, or studying for one, the more confused I get.

T 4. As soon as an exam is over I try to stop worrying about it, but I just can't.

T 5. If I were to take an intelligence test I would worry a great deal before taking it.

T 6. During exams I sometimes wonder if I'll ever get through college.

T 7. I would rather write a paper than take an examination for my grade in a course.

T 8. I wish examinations did not bother me so much.

T 9. I think I could do much better on tests if I could take them alone and not feel pressured by a time limit.

T 10. Thinking about the grade I may get in a course interferes with my studying and my performance on tests.

T 11. If examinations could be done away with I think I would actually learn more.

F 12. On exams, I take the attitude, "If I don't know it now, there's no point worrying about it."

F 13. If I knew I was going to take an intelligence test, I would feel confident and relaxed beforehand.

F 14. I really don't see why some people get so upset about tests.

T 15. Thoughts of doing poorly interfere with my performance on tests.

F 16. I don't study any harder for final exams than for the rest of my course work.

T 17. Even when I'm well prepared for a test, I feel very anxious about it.

T 18. I don't enjoy eating before an important test.

T 19. While taking an important examination, I perspire a great deal.

T 20. Before an important examination I find my hands or arms trembling.

T 21. During course examinations, I find myself thinking of things unrelated to the actual course material.

F 22. I seldom feel the need for "cramming" before an exam.

T 23. The University ought to recognize that some students are more nervous than others about tests and that this affects their performance.

T 24. I get to feel very panicky when I have to take a surprise exam.

T 25. During tests, I find myself thinking of the consequences of failing.

T 26. It seems to me that examination periods ought not to be made the tense situations which they are.

T 27. After important tests I am frequently so tense that my stomach gets upset.

T 28. I start feeling very uneasy just before getting a test paper back.

T 29. I dread courses where the professor has the habit of giving "pop" quizzes.

T 30. I freeze up on things like intelligence tests and final exams.

T 31. Getting a good grade on one test doesn't seem to increase my confidence on the second.

T 32. I sometimes feel my heart beating very fast during important tests.

T 33. After taking a test I always feel I could have done better than I actually did.

T 34. I usually get depressed after taking a test.

T 35. I have an uneasy, upset feeling before taking a final examination.

F 36. When taking a test, my emotional feelings do not interfere with my performance.

T 37. During a course examination, I frequently get so nervous that I forget facts I really know.

(A respondent will score one point for each item marked as indicated, T (true) and F (false). The maximum score on the TAQ is 37.)

APPENDIX C

ACHIEVEMENT ANXIETY TEST

Directions: This scale deals with your feelings about a variety of scholastic situations. Read each statement and decide to what extent it applies to you. Circle the number in the appropriate column under the heading which best describes the frequency you experience the feeling described by the statements. Do not ponder the questions; work as rapidly as possible since your first impression is usually accurate. Answer every item.

		almost never	rarely	occasionally	often	almost always
D	1. Nervousness while taking an exam or test hinders me from doing well.	1	2	3	4	5
F	2. I work most effectively under pressure, as when the task is very important.	1	2	3	4	5
D	3. In a course where I have been doing poorly my fear of a bad grade cuts down on my efficiency.	1	2	3	4	5
	4. I have a good appetite.	1	2	3	4	5
D	5. When I am poorly prepared for an exam or test, I get upset, and do less well than even my restricted knowledge should allow.	1	2	3	4	5

		almost never	rarely	occa-sionally	often	almost always
D	6. The more important the examination, the less well I seem to do.	1	2	3	4	5
	7. I spend more than ten minutes a day reading the newspaper.	1	2	3	4	5
	8. I think about what I will be doing ten years from now.	1	2	3	4	5
F	9. While I may (or may not) be nervous before taking an exam, once I start, I seem to forget to be nervous.	1	2	3	4	5
D	10. During exams or tests, I block on questions to which I know the answers, even though I might remember them as soon as the exam is over.	1	2	3	4	5
F	11. Nervousness while taking a test helps me to do better.	1	2	3	4	5
F	12. When I start a test, nothing is able to distract me.	1	2	3	4	5
	13. I spend an hour a day talking with my friends about topics other than those covered in my classes.	1	2	3	4	5
F	14. In courses in which the total grade is based on one exam, I seem to do better than other people.	1	2	3	4	5
D	15. I find that my mind goes blank at the beginning of an exam, and it takes me a few minutes before I can function.	1	2	3	4	5

		almost never	rarely	occa-sionally	often	almost always
F	16. I look forward to exams.	1	2	3	4	5
D	17. I am so tired from worrying about an exam that I find I almost don't care how well I do by the time I start the test.	1	2	3	4	5
D	18. The pressure on an exam causes me to do worse than the rest of the group under similar conditions.	1	2	3	4	5
F	19. Although "cramming" under pre-examination tension is not effective for most people, I find that if the need arises, I can learn material immediately before an exam, even under considerable pressure, and successfully retain it to use on the exam.	1	2	3	4	5
	20. I enjoy playing practical jokes.	1	2	3	4	5
F	21. I enjoy taking a difficult exam more than an easy one.	1	2	3	4	5
	22. I tell the instructors in my classes my feeling about how they conduct their classes.	1	2	3	4	5
D	23. I find myself reading exam questions without understanding them, and I must go back over them so that they will make sense.	1	2	3	4	5
F	24. The more important the exam or test, the better I seem to do.	1	2	3	4	5

			almost never	rarely	occa-sionally	often	almost always
	25.	I find myself wishing that I could get a decent paying job instead of being a student.	1	2	3	4	5
D	26.	When I don't do well on a difficult item at the beginning of an exam, it tends to upset me so that I block on even easy questions later on.	1	2	3	4	5

(All statements preceded by a "D" represent items on the Debilitating Anxiety Scale. All statements preceded by an "F" represent items on the Facilitating Anxiety Scale. The statements not preceded by a "D" or an "F" are filler items. A respondent's score on each scale is determined by adding up the circled numbers which correspond to the statements.)

APPENDIX D

WORRY AND EMOTIONALITY SCALE

SELF-REPORT QUESTIONNAIRE

Name _____

Date _____

Directions: Read each of the following statements carefully. In the space before each item indicate how you feel, at this moment, about taking these ability tests. Use the following numerical scale:

1. The statement does not describe my feeling, condition, etc.
2. The feeling, condition, etc. is barely noticeable.
3. The feeling, condition, etc. is moderately intense.
4. The feeling, condition, etc. is strong.
5. The feeling, condition, etc. is very strong.

W I do not feel very confident about my performance on these tests.

E I am so nervous that I cannot remember facts which I really know.

E I feel my heart beating fast.

W I feel I may not be as well prepared for these tests as I could be.

E I am so tense that my stomach is upset.

W I am worrying a great deal about these tests.

E I have an uneasy, upset feeling.

W I find myself thinking that the other students who have taken these tests are probably much brighter than I am.

W I am thinking about the consequences of doing poorly on these tests.

E I feel very panicky about taking these tests.

(All statements preceded by a "W" represent items on the Worry Scale. All statements preceded by an "E" represent items on the Emotionality Scale. A respondent's score on each scale is determined by adding up the selected numbers which correspond to the statements.)

APPENDIX E

CHECK ON MANIPULATION

Name _____

Date _____

1. I would like to assess how clear the instructions were that I gave you prior to the test administration. Write down everything you remember about those instructions.

2. I would like to assess whether or not you used the cognitive strategy described in the instructions. First describe that cognitive strategy.

   Second, if you became anxious while taking the tests did you use the cognitive strategy described? Circle the appropriate number.

1	2	3	4	5
Never				Always

3. We sometimes find that students differ on the exact techniques they use to take a test. Are there any special techniques that you use that you think may help your performance?

(Question 2 was administered to groups 2-4 only.)

APPENDIX F

CREDIBILITY CHECK

DIRECTIONS: For each of the following questions, a 10-point scale has been provided. Please look closely at the ends of each scale. You are to circle the number which best represents your answer to each question.

1. How reasonable did the pre-testing instructions to employ the cognitive strategy seem to you?

1	2	3	4	5	6	7	8	9	10
Extremely Unreasonable				Moderately Reasonable				Extremely Reasonable	

2. How confident are you that this cognitive strategy would be effective in helping students overcome their anxiety while taking tests?

1	2	3	4	5	6	7	8	9	10
Extremely Unconfident				Moderately Confident				Extremely Confident	

3. How confident would you be in recommending the use of this cognitive strategy to a friend who was extremely anxious about taking tests?

1	2	3	4	5	6	7	8	9	10
Extremely Unconfident				Moderately Confident				Extremelv Confident	

4. How successful do you feel this cognitive strategy would be in decreasing a different fear; for example, strong anxiety about making speeches?

1	2	3	4	5	6	7	8	9	10
Extremely Unsuccessful				Moderately Successful				Extremely Successful	

5. How confident are you that most college students experience anxiety when taking tests? That is, they worry excessively about their performance and experience physiological symptoms such as rapid heart beat, trembling hands and sweating while taking exams.

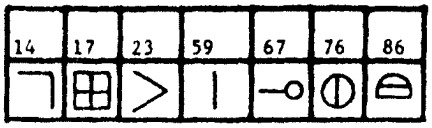
1	2	3	4	5	6	7	8	9	10
Extremely Unconfident				Moderately Confident				Extremely Confident	

(Questions 1-4 were administered to groups 2-4 only. Question 5 was administered to all groups.)

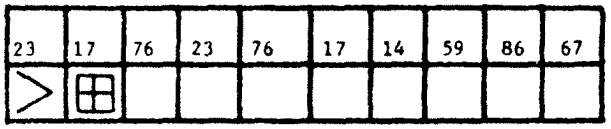
APPENDIX G

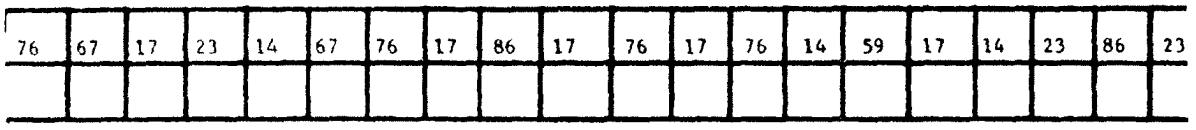
DIGIT SYMBOL TEST (ALTERNATE FORMS)

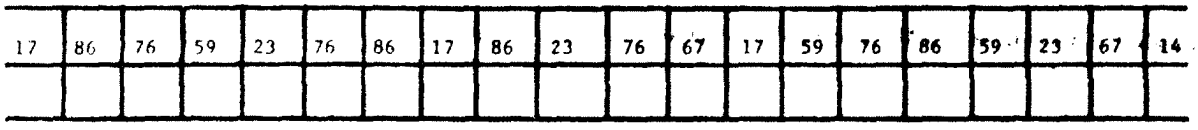
CODE

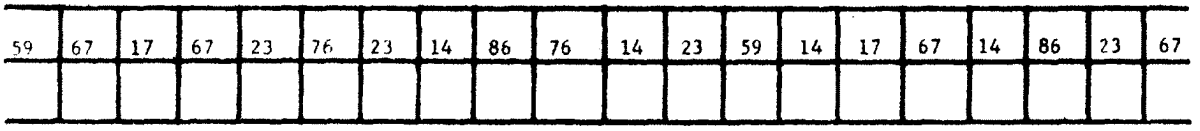


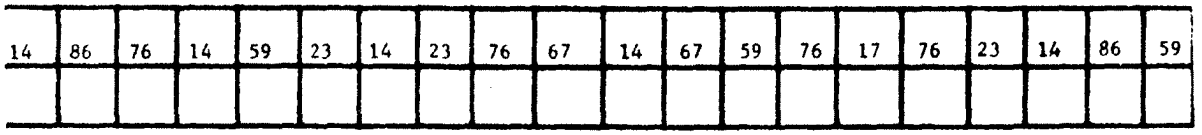
PRACTICE

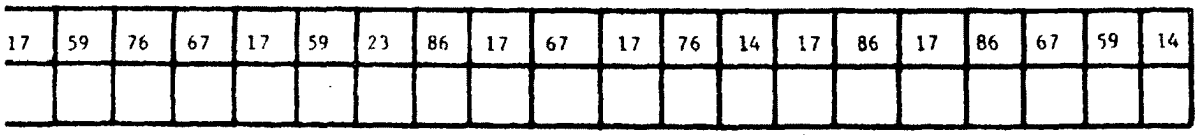


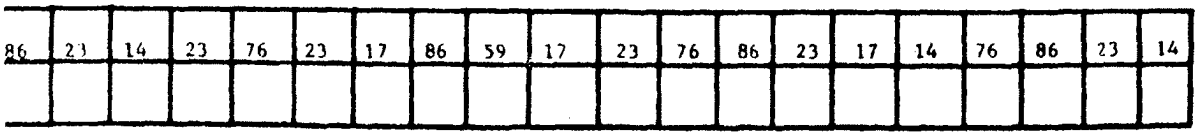












CODE

25	36	48	62	69	72	91
						

PRACTICE

25	62	91	69	36	72	69	72	36	48
									

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25	91	48	91	36	25	72	69	25	72	25	91	48	91	62	36	91	36	25	62