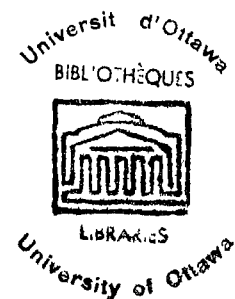


A Comparison of Three Cognitive Strategies
in the Experimental Reduction of Stress

Steven J. Stein

Thesis presented to the School of
Graduate Studies of the University
of Ottawa as partial fulfillment
of the requirements for the
degree of Master of Arts.

Ottawa, Canada, 1975



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ACKNOWLEDGEMENTS

This thesis was prepared under the supervision of Michel Girodo, Ph.D., Associate Professor of the Faculty of Psychology of the University of Ottawa. The writer wishes to express his gratitude for the availability, interest and advice of Professor Girodo.

The writer is also grateful to Wayne Pellegrini for his participation throughout the study. In addition, gratitude is expressed to Robert Schieman and Ed Achorn for their technical assistance with the physiological recording and computer programming. The writer also wishes to thank the friends and fellow students who tolerated him throughout the preparation of this study as well as all of the subjects who participated in the investigation.

Curriculum Studiorum

Steven J. Stein was born December 28, 1950 in Toronto, Ontario, Canada. He received the Bachelor of Science (4 year) degree from the University of Toronto, Toronto, Ontario, Canada in 1973. The title of his honours thesis was Physical Attractiveness and Manipulative Interpersonal Behaviour in Children.

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CHAPTER I

INTRODUCTION AND REVIEW OF THE LITERATURE

One of the earliest known proponents of the importance of cognitions in emotions was the philosopher Epictetus (1899), who, in the 1st century A.D. stated, "Men are disturbed not by things, but by the views they take of them." While the importance of cognitions in emotion has been empirically examined by a number of investigators in recent years, the problem in present day research is not merely to point out that cognition is central to emotion, but rather is to specify the nature of these cognitive processes and to understand their prior conditions. These processes, which determine various emotional responses, have been referred to by Richard Lazarus (1966; 1968; 1975; Lazarus, Averill and Cpton, 1970) as the appraisals and reappraisals of events. At present, four basic strategies have been employed in providing an empirical basis for a cognitive view of emotion or stress reactions. These can be subsumed under the general headings of: 1) Direct Manipulation; 2) Indirect Manipulation; 3) Inferences from Self-Report Data; and 4) Selection of Dispositional Variables.

Strategies for Studying Cognitive Events

Direct Manipulation: The first research strategy involves attempts at directly manipulating the cognitive events. The kind of manipulation used generally varies with the theoretical orientation of the investigator, with each investigator narrowing in on a particular aspect of the cognitive state. One of the pioneers in this type of research has been Richard Lazarus. In a series of studies commencing in 1964 Lazarus demonstrated how subjects' appraisals or interpretations of the events portrayed in a stressful motion picture when directly altered, produced differing stress response reactions. In the first study (Speisman, Lazarus, Mordkoff and Davison, 1964) a film entitled "Subincision" depicted crude genital operations among Australian aborigines. It was found that the stress-producing value of the film was enhanced with a "trauma" sound track and reduced with "denial" and "intellectualization" tracks. In a further study (Lazarus and Alfert, 1964) the approach was somewhat modified by transforming the sound tracks into orientation passages which were played before the subjects watched the film. The results were essentially the same as in the previous study. The

defensive strategies reduced the stressfulness of the film. Thus, it was concluded that one could "short-circuit" or reduce a subject's stress reaction, as measured by physiological parameters and through verbal report of "anxiety" felt. The principle of short-circuiting was then extended to another film dealing in wood-shop accidents (Lazarus, Opton, Nomikos, and Rankin, 1965). In this study the amount of stress experienced by the subject was reduced by informing him that the injuries suffered on the film were enacted rather than real. A further study (Folkins, Lawson, Opton, and Lazarus, 1968) demonstrated that the techniques used in desensitization therapy, which included relaxation and cognitive rehearsal, were also capable of lowering stress reactions. This was especially true with cognitive rehearsal, which involves working over an expected trauma through imagery and thought prior to exposure to the stressful event. An even more direct attempt to alter the subject's cognitions can be found in a study by Koriat, Melkman, Averill, and Lazarus (1972). Using the film with wood-shop accidents they asked subjects to watch the film while adopting two different attitudes. One time they were asked to involve themselves more fully

in the stressful episodes and another time to detach or distance themselves. Both autonomic as well as self-report measures indicated that subjects were capable of such self restraint and that these strategies were effective in increasing and decreasing arousal. Also, certain strategies were found to be used by many of the subjects to achieve detachment, while other tactics predominated in the effort to create emotional involvement.

These previous studies lend further support to the hypothesis that the same potentially disturbing movie event produces very different degrees of emotional disturbances in subjects depending on how it is interpreted, or, as Lazarus et. al. (1970) would phrase it, on the way in which the person appraises a particular event. Emotional appraisals, however, can be influenced by means other than the manipulation of ego-defenses and cognitive rehearsal. Another aspect of the cognitive process that has been investigated involves providing alternative interpretations for one's own reactions. In a series of studies carried out by Schachter and his colleagues (Nisbett and Schachter, 1966; Schachter, 1962) it was demonstrated that the specific emotion experienced

by an individual is not solely determined by his physiological state of arousal. An important aspect of the emotional process focuses on the manner in which the person interprets or labels this state and that this labelling process is influenced by what the person attributes as being the origin or source of this arousal.

Indirect Manipulation: In other studies, rather than directly manipulating the cognitive events, the focus has been on altering those variables on which cognitions depend. One example of these variables is the anticipation time. There is a general tendency for stress reactions to increase as the time of the stressful event draws near which can vary to a large degree depending on (a) the duration of anticipation (Breznitz, 1967; Nomikos, Opton, Averill, and Lazarus, 1968; Folkins, 1970), (b) prior experience in similar situations (Epstein, 1967), (c) individual differences in defensive style (Goldstein, Jones, Clemens, Flagg, and Alexander, 1965), and (d) the manner of coping during the anticipatory period (Cohen and Lazarus, 1973; Janis, 1958; 1971; Langer, Janis and Wolfer, 1975). Thus, it appears that the cognitive processes underlying emotion can be investigated by manipulating the anticipation of a stressful event.

In a study by Monat, Averill and Lazarus (1972) the effects of various conditions of uncertainty as a function of anticipatory stress reactions and cognitive coping responses were examined. The anticipatory period in this study was three minutes for all subjects. Subjects in the temporal uncertainty condition knew that a painful electric shock would occur, but did not know when. In the event uncertainty condition, however, the subject knew when, but not whether the shock would occur. In the various event uncertainty conditions subjects were told that there was a 100%, 50%, or 5% probability of receiving shock respectively. Thus, each subject experienced only one condition of uncertainty - that is, either temporal uncertainty - a 100% probable shock at time unknown, and event uncertainty - a 50% or 5% probable shock at time known, or relatively certain - a 100% probable shock at time known. There were three trials under each condition. Physiological recordings (heart rate and skin conductance) were taken continuously throughout the anticipatory period and retrospective self-report measures were obtained after each trial to allow assessment of appraisal and coping processes. The self-report measures of affect consisted of an adjective

check list, mood scores, and relaxation-tension measures. Intrapsychic coping was assessed in two ways. First, three statements descriptive of avoidance thoughts (eg. "I thought about things not related to this experiment, such as exams, movies, songs, etc.") and three statements descriptive of vigilant-like activities (eg. "I thought about the shock, how intense it would feel like, and so on."). Subjects used a 5-point scale to rate each statement according to the amount of time, ranging from "not at all" to "very frequently", that they devoted to the given cognitions during the first and second thirds of a trial, as well as just prior to the shock. Composite attention-deployment scores were derived from these scales. The study found that temporal uncertainty subjects demonstrated maximum affective disturbance (both physiological and cognitive) in the early part of the anticipatory period and thought less about the shock as time progressed. The subjects in the various event uncertainty conditions, that is, 100%, 50%, and 5% probability of shock, showed an opposite pattern of response in that maximum disturbance occurred in the latter part of the anticipatory period. Furthermore,

these subjects did not differ among themselves in terms of the degree of anticipatory stress reactions. Thus, the importance of cognitive appraisal and coping processes in influencing stress reaction patterns under various conditions of uncertainty has been well illustrated in the Monat, Averill and Lazarus (1972) study.

In a series of studies carried out by Janis (1958, 1971) and by Langer, Janis and Wolfer (1975) on surgical patients, the importance of developing relevant reassurances for coping with the stress of an operation was investigated. It was found that when people were exposed to severe stress, those who were most calm and confident about their invulnerability at the outset tended to become much more upset after the operation compared with those patients who had been part-time worriers beforehand. Upon further examination of the data, one factor that was found to be important in differentiating the patients that did not worry from those that were moderately worried concerned the amount of information given to patients about the operation prior to the operation. The patients who were in the low-fear group had little idea of what to expect, however, those

in the moderate-fear group had been far better informed. Janis (1971) explains his findings as follows:

If no authoritative warning communications are given and if other circumstances are such that fear is not aroused beforehand, the normal person will lack the motivation to build up effective inner preparation before the onset of the danger, and he will thus have relatively low tolerance for stress when the crisis is actually at hand. (p. 99)

Janis then advanced the concept of the "work of worrying", a theoretical construct that emphasizes the potentially positive value of anticipatory fear (Janis, 1958; 1971). The "work of worrying" is described as a psychological process that begins as soon as an individual becomes aware of signs of impending danger that might affect him personally. Thus, Janis (1971) suggested that if a normal person is given accurate prior warning of impending pain and discomfort, together with sufficient reassurances so that fear does not mount to a very high level, he is less likely to develop emotional disturbances than a person who is not warned.

Inferences From Self-Report Data: The third research strategy involves the making of inferences based on a

subject's self-report of his experiences. A number of studies, including some of those previously cited (Folkins, 1970; Monat, Averill and Lazarus, 1972; Lazarus, Speisman, Mordkoff, and Davison, 1962) have shown that it is possible to assess, through a subject's self-reports, not only the impact of a stressful emotional experience, but also the manner of thinking in which he has engaged during an induced stressor. Although there are a number of methodological problems inherent in the use of self-report data, they still have been shown to be of considerable value in research on stress and emotion (Lazarus, Averill and Opton, 1970). A concrete example of their application has been described in the Monat, Averill and Lazarus (1972) study referred to in the previous section.

Selection of Dispositional Variables: A final strategy that has been described by Lazarus et. al. (1970) involves the selection of subjects who differ in their emotional dispositions. Such dispositions have been presumed to be biological, cultural, or psychological in origin. In general, the research that has utilized such an approach most often has investigated defensive styles. The previously cited study by Speisman et. al. (1964) in which the prophylactic sound tracks reduced film-induced

stress reactions, two kinds of subjects had been selected for study. One group was characterized as having the disposition to cope with threat by denial while the other was inclined to use intellectualizing defenses. An interaction occurred between the effects of the defense-oriented sound tracks and these defensive dispositions. The deniers showed more stress reduction than the intellectualizers when the denial sound track was used, while the intellectualizers showed greater stress reduction when they heard the intellectualization sound track.

Skills-Oriented Behaviour Change

In most of the previously discussed laboratory experiments the relevance of these investigations to clinical problems of anxiety may, at first glance, be open to question. However, experimental and clinical efforts to apply much of the laboratory work on cognitions and emotions to psychotherapy involves a skills-oriented approach to therapy. This has been advanced by a number of researchers, most notably, Meichenbaum (1974), whose approach involves teaching the client cognitive, behavioural, and interpersonal skills by self-instructional (self-talk) training and then providing opportunities for

applying this training either within the therapy setting or in real-life situations. The client is taught a set of self-statements or coping responses that can be applied in a variety of settings. Thus, the focus of the therapy is to have the client become a better problem-solver so that when he is confronted by stress-inducing situations in the future he will be better able to handle them adequately. He is taught new skills through the techniques of behavioural and semantic therapies which may include modelling, cognitive-behavioural-imaginal rehearsal, rational analysis, information learning and other similar techniques.

Meichenbaum (1974) compares this approach to the learning of such motor skills as driving a car. At first the driver goes through a conscious mental checklist, sometimes aloud, which includes control or the shifting of attention away from anxiety-engendering thoughts, verbal and imaginal rehearsal, cognitive self-guidance, and sometimes appropriate self-reinforcement, especially when driving a stick-shift car. Thus, with repetition and growing proficiency, the driver's cognitions become automatized and the cognitive-behavioural sequence becomes automatic.

If this is an accurate analogy, then a training procedure that makes the various steps explicit would facilitate the development of self-control and result in behaviour change. Meichenbaum and his associates (Meichenbaum, 1973; Meichenbaum, 1974; Meichenbaum and Cameron, 1974) have shown that a cognitive self-guidance treatment program is helpful in teaching both attentional controls and general self-control to such varied populations as hyperactive impulsive school children (Meichenbaum and Goodman, 1971), institutionalized adult schizophrenics (Meichenbaum and Cameron, 1973), and high test anxious college students (Meichenbaum, 1972).

Meichenbaum's cognitive self-guidance treatment generally consists of having the therapist articulate his thinking patterns aloud (modelling), then asking the client to overtly and subsequently covertly rehearse the modelled self-statements. Meichenbaum (1974) describes the logic of this procedure:

...if the therapist can perform a task that the client cannot perform, then he should introspectively determine the thoughts, strategies, rules, etc., that he (the therapist) is employing to do the task. These cognitions can be translated

into explicit self-statements to be modelled for and then rehearsed by the client. The therapist attempts to teach private speech or thinking styles by means of small steps and successive approximations. (p. 14)

The treatment, then, consists of the following steps: The therapist first performs a task while thinking aloud as the client observes. This is referred to as the modelling phase. The client is asked to perform the task again while instructing himself out loud. The client performs the task once again while whispering and then finally he performs the task while instructing himself covertly. The verbalizations and images that the therapist models and the client rehearses as outlined by Meichenbaum (1974) include: 1) questions about the nature of the task; 2) answers to these questions in the form of cognitive rehearsal and planning; 3) guidance of performance by self-instruction; 4) coping self-statements to deal with frustrations, uncertainty, and anxiety; and 5) self-reinforcement. Thus, Meichenbaum trains the client to develop a new cognitive approach or learning set in which he can size up the demands of a task, to cognitively rehearse and "psyche himself up", guide his

performance by self-instructions, and finally, to appropriately reinforce himself.

There are a number of examples of skills-oriented treatment programs in the literature, however, the one of interest to the present thesis is the one developed by Meichenbaum (1973; 1974, Note 1; Meichenbaum and Cameron, Note 2) called Stress Inoculation Training (SIT). Meichenbaum (1974) describes the training as designed to accomplish three goals. First, the client is to be educated about the nature of stress or fear reactions. Second, the client is to rehearse various coping behaviours, and finally the client is to be given an opportunity to practice his new coping skills in a stressful situation.

In the educational phase of the SIT procedure, the client's anxiety is defined in terms of Schachter's model of emotion (Schachter and Singer, 1962). The client is told that his fear or anxiety involves two major elements, one being heightened arousal which is manifested through physiological signs such as increased heart rate, sweaty palms, and body tension. The other involves a set of anxiety-engendering thoughts and images. It is suggested that treatment would be directed towards helping the

client control his physiological arousal by learning how to physically relax and how to replace his self-statements with more productive ones. These self-statements are presented in Appendix A. In Meichenbaum's studies these statements were generated in collaboration with the client. Thus, the client helped generate a list of statements and was given the opportunity to "try on" various self-statements, picking for rehearsal those that "worked for him". Once the coping skills have been mastered the client is given an opportunity to apply them in a stress-inducing situation that involves a stressor unrelated to the presenting problem.

Meichenbaum (1974, Note 1) has suggested the use of such a technique for prophylactic purposes. This is seen as one method of helping people deal with the increased demands put upon them to deal with stress in everyday situations. He compares arming the client with a defense that can be used against anxiety with the medical inoculation against disease. Meichenbaum (1974) states:

The underlying principle in all these situations is that a person's resistance is enhanced by exposure to a stimulus that is strong enough to

arouse the defenses but not so powerful as to overcome them. An examination of the way this principle is applied by social psychologists and physicians may suggest methods for refining and improving stress inoculation... Presumably, the more varied and extensive the training, the greater the likelihood the client will develop a learned set, a general way of talking to himself in order to cope. (p. 16)

Thus, the importance of the things a person says to himself when faced with a forecoming stressor is emphasized in the stress inoculation technique. Meichenbaum compares his preparatory approach to a stressor with the cognitive process of the "work of worrying" which has been described by Janis (1958, 1971). The cognitive-behaviour modification approach suggests that clients can be taught how to worry in a constructive fashion. The "work of worrying" according to Meichenbaum (1975) can be translated into sets of self-statements and images which can be rehearsed by the client and may be viewed as imagery rehearsal or muted role taking.

The present study was designed to gain a better understanding of some of the previously described methods

of anxiety reduction. An attempt was made to compensate for some of the methodological shortcomings of some of the earlier studies in a number of ways. For example, the early film studies carried out by Lazarus and his associates have recently come under criticism by Holmes and Houston (1974; Burish, Bloom, Houston, and Holmes, Note 3). These authors pointed out the failure of the experimenter in these early studies to acknowledge to the subjects in the denial conditions (as was done with the comparison groups) that the situation was stressful and then instructing the subjects to reduce their stress by using denial. As well, the redefinition (denial and intellectualization) manipulation reduced the stress in the situation for (on behalf of) the subjects rather than encouraged the subjects to use the reappraisal for themselves to cope with the stress. That is, in the reappraisal conditions, the experimenter told the subjects that the situation was not stressful, thereby changing the stimulus situation, rather than acknowledging the stress but asking the subjects to deal with it by attempting to redefine it. In the present investigation, all subjects, with the exception of Control subjects, were informed as to the stressful nature of the film they were about to view

beforehand. Also, two groups of subjects were presented with coping strategies and were instructed to use them in order to deal with the stressful film. The present study also investigated kinds of cognitions subjects made during a 10 minute period prior to their viewing of the film (preparing for a stressor).

An attempt was made to examine the effects of three cognitive strategies on the anticipation of a stressful event and on the actual experiencing of the event. The amount of information preparing subjects for the exposure to a stressful film was varied as well as the kind of preparatory material presented. Two groups of subjects were presented with what was described as an effective technique for coping with the stressful nature of the film. One group was given a series of statements to learn similar to those used by Lazarus in his studies in which the stress was "short-circuited". Basically, these statements reflected the use of the cognitive techniques of rationalization, denial and intellectualization to cope with the stressful film. A second group was given statements such as those used by Meichenbaum in his studies which focused more on controlling the person's arousal as opposed to reconceptualizing the stimulus properties of the

stressful event itself. The lists of statements given to each of these two groups of subjects are found in Appendices B and C. A third group was only informed as to the nature of the film that was viewed with the stressful aspects of the film highlighted. Finally, a control group was told nothing about the nature of the film that was to be viewed. All groups were asked to wait for a 10 minute period prior to the film under the guise that the equipment was to be calibrated. This waiting period was designed to assess the subjects anticipatory anxiety for the 10 minute period prior to the film. Thus, the present investigation examined the effects of three modes of preparation on the cognitive and physiological levels of arousal while anticipating and while viewing the stressful film.

On the basis of the literature reviewed and the theories advanced a number of hypotheses were formulated.

- 1) It was hypothesized that the film itself and anticipating the film are two stressful events. Predictions derived from this hypothesis were formulated in terms of: (a) subjects informed about the impending stressful film would show higher levels of anxiety while waiting for the film

compared with subjects not similarly informed (Control), and (b) throughout the viewing of the film, subjects in the Control Condition should show a significant increase in anxiety while viewing the film compared with subjects provided with either preparatory information or cognitive coping strategies.

2) It was hypothesized that subjects given information concerning the stressful nature of the film to be presented, but given no cognitive reappraisal information would display the greatest amount of arousal upon receiving the initial instructions regarding the film. This hypothesis was derived from what would be predicted from previous research where it was found that anticipating a stressor is stress provoking (Folkins, 1970; Janis, 1958; 1971; Langer, Janis and Wolfer, 1975; Monat, Averill and Lazarus, 1972). Subjects provided with a strategy to cope with their internal state as well as subjects provided with a strategy to cope with stressful elements of the film would show lower levels of self-report anxiety compared with subjects not provided with such strategies.

- 3) It was hypothesized that subjects given information concerning the impending stressful film would show the highest level of arousal while waiting to view the film compared with subjects who had been given this information but who had also been provided with a strategy designed to help them cope with the stress associated with waiting for the film.
- 4) No specific predictions were made concerning the relative efficacy of using internal arousal strategies as opposed to reconceptualizing the film strategies; however, it was postulated that if one of these two strategies was found to be more effective in coping with the stressful film this relative efficacy should not be at the expense of one group of subjects paying less attention to the film. To the extent that "controlling internal arousal" subjects were found to cope better with the stressful film compared with "reconceptualizing the film" subjects, it was hypothesized that subjects induced to control their internal arousal would recall less of the film compared with "film reconceptualization" subjects. It was also hypothesized

that subjects using either coping strategy would fair much better than either Information or Control subjects.

5) The purpose of the experiment was also designed to explore the extent to which different kinds of "work of worrying" could facilitate coping with a stressor. In this connection, it was hypothesized that to the extent that subjects made more anxiety related thoughts during the waiting period compared with irrelevant or non-anxiety thoughts,-- that these subjects would (a) show higher amounts of self-report of anxiety as well as higher levels of physiological arousal throughout this anticipation period, and (b) that consistent with the "work of worrying" hypothesis, the higher the level of self-report anxiety and physiological arousal during the wait period, the less the subjective report of anxiety experienced and physiological level of arousal witnessed during the film.

METHODSubjects

Forty female subjects from undergraduate classes at the University of Ottawa volunteered for the present study. These ranged in age from 18 to 35 years.

Experimental Procedure

The subjects were randomly assigned to one of the four experimental conditions. Upon entering the experimental room all subjects were greeted by one of two experimenters and were asked to be seated in a comfortable chair. They were then asked to listen to a short preamble thanking them for their agreement to participate in the study and informing them of the physiological measures to be taken. These introductory remarks are presented in Appendix D.

Prior to any experimental manipulations, silver-plated electrodes were attached to the wrists and to the left ankle to measure heart rate. The subjects were assured that no harm would result from the reading apparatus. Beckman electrode paste was applied liberally to act as an interface between each electrode and the

subject's skin. The leads for heart rate were connected to a heart rate two digital pulse converter which is an electrophysiological amplifier of the heart rate signal (QSR wave). The signal from the amplifier was recorded on the A. R. Vetter FM tape recorder (Model A). The tape was travelling at a speed of 1 7/8 inches per second.

Subjects were told to remain as quiet and still as possible while a three minute base-line measure was taken. They were then asked to fill out the Self-Report of Anxiety Inventory (SRAI) questionnaire designed to obtain estimates of their subjective level of anxiety or arousal (Appendix E). The next part of the taped instructions was then presented. The content of the tape varied according to each of the four treatment conditions.

Film Self-Talk Condition: This group was first given information as to the stressful nature of the film they were about to view. The film used in the present study was the same safety workshop film entitled "It Didn't Have To Happen" that was used by Lazarus and his associates (Lazarus, et. al., 1965; Folkins, et. al., 1968; Koriat, et. al., 1972). Subjects were given some of the gory details concerning the content of the film ("In the second accident the worker has his middle finger

torn from his hand ..."). They were then given an orientation to the film similar to the type used by Lazarus and his associates focusing mainly on how they were to view the film. They were presented with rationalization, denial, and intellectualization passages that appraised the stressful nature of the film. The taped set of instructions is presented in Appendix F. Subjects were instructed to reconceptualize the three accidents of the film into three separate components. They were told to focus on certain aspects of the film production ("This is a Canadian Production"), the unrealistic nature of the props ("What appears as blood is really red dye"), the seemingly suspenseful nature of the film ("We know an accident is going to come"), and the actors' attempts to simulate real accidents ("Watch the unconvincing way the shipping clerk simulates pain and dying"). The subjects were then given a list of self-statements that was devised from the taped instructions (Appendix B). They were instructed to memorize 10 of the statements within the next few minutes. Following this, subjects were tested on the number of statements they memorized. The SRAI was then readministered. Subjects were then told to wait for 10

minutes while the monitoring equipment was being calibrated.

Arousal Self-Talk Condition: This group was given the same information concerning the stressful nature of the film as the previous group. However, instead of following this with a film orientation, they were given a rationale and orientation similar to the one used by Meichenbaum and his associates focusing mainly on dealing with their reactions to the stress film. A copy of the instructions given this group appears in Appendix G. These subjects were requested to break down the psychological component of their arousal into four distinct parts: preparing for the stressor ("Make a plan to deal with how you may feel during the stressful film"), confronting and handling the stressor ("Just try to 'psych' yourself up"), coping with feelings of being overwhelmed ("When your fear rises, just pause"), and finally, rewarding self-statements ("You handled it just fine"). The subjects were then given a list of the self-statements to memorize (Appendix C) and the number of statements learned was tested shortly after. They were asked to fill out the SRAI once again and then were told to wait for 10 minutes while the monitoring

equipment was being calibrated.

Information About Film Condition: This group was given only the information about the stressful nature of the film that was given to the previous two groups. They were then asked to fill out the SRAI and wait for the 10 minutes before the film. The instructions are presented in Appendix H.

Control Condition: This group was only given irrelevant information in the form of a description of the VTR equipment that was being used and were not informed as to the stressful nature of the film they were about to view. The instructions presented to this group can be found in Appendix I. The nature of the equipment was described to this group ("The monitor has a 19 inch screen and contains various adjustment knobs and, as can be seen, is portable"). They were then asked to fill out the SRAI and wait for 10 minutes before the film was started.

Heart rate was monitored throughout the 10 minute waiting period. Immediately after the 10 minutes subjects were readministered the SRAI asking them to rate their mood during the 10 minute period. Following the 10 minute wait period subjects in the Film and

Arousal S-T groups were then instructed to make use of the self-statements throughout their viewing of the film. The 13 minute film was then presented to the subjects. Heart rate was recorded throughout their viewing of the film. Following this, a series of self-report questionnaires, including the SRAI, were administered to the subjects. Afterward, another three minute heart rate base period was recorded.

Dependent Measures

Self-Report Anxiety Inventory (SRAI): The present study utilized the Self-Report Anxiety Inventory (SRAI) as a criterion measure of anxiety. The original SRAI consists of four 11-point scales anchored at each end. The utility of this scale was based on previous research (Girodo, 1974; Roehl, Note 4) which focused on the measurement of anxiety. The SRAI was designed to measure two components of anxiety (cognitive and somatic) after the symptom clusters of Buss (1962). In the original inventory, two scales measured cognitive components of anxiety through self-evaluation of (a) worry and apprehension and (b) anxiety and nervousness. In the same way, two scales measured somatic components of anxiety through self-evaluation of (a) calmness and

relaxation and (b) tenseness and trembling.

In the study by Roehl (Note 4) the four individual scales were correlated with composite mean anxiety scores. Statistically significant correlation coefficients ranged from .89 to .97. Inter-item correlations were also computed and found statistically significant ranging from .79 to .97. A split-half reliability coefficient of .97 was obtained, after correction with the Spearman-Brown formula. An estimate of reliability (internal consistency) of .97 was obtained using the Flanagan formula.

In the present investigation the questionnaire presented to the subjects consisted of 11 items in order to disguise the nature of the inventory. Five of these items were used to form a composite mean anxiety score. The scales in the present study were (a) worry and apprehension, (b) calmness and relaxation, (c) tenseness, (d) jitteryness, and (e) how at ease they were. The five individual scales were correlated with composite mean anxiety scores. Statistically significant correlation coefficients were obtained ranging from .64 to .95.

Attention-Deployment: In order to more closely examine the patterns of cognitions during the 10 minute

waiting period an Attention-Deployment Scale (Appendix J) was administered to subjects at the end of the film. This scale consisted of eight 5-point Likert items measuring the frequency to which the subject had a particular type of thought or cognition ranging from "not at all" at one end to "very frequently" at the other. The scale was adapted from the one described by Lazarus and his associates (Monat, Averill and Lazarus, 1972; Averill and Rosenn, 1972). In the previous studies the scale was divided between items that represented avoidant-like and vigilant-like thoughts which formed an overall composite score of avoidance-vigilance.

Film Questionnaire: In order to assess the degree to which subjects were paying attention to the film they were administered a questionnaire which asked for specific details dealing with the content of the film. This questionnaire has been presented in Appendix K.

Cognitive Coping Techniques: After viewing the film all subjects were asked to report what they were saying to themselves while viewing the film ("List below all the things you were saying to yourself while viewing the stressful parts of the film."); what other techniques they may have used to help them deal with the stress.

("Sometimes people use techniques for dealing with stress, such as imagining, thinking of something else, tensing, etc. If you did so, please indicate what these were."); and the percentage of time they used these other techniques ("What percentage of the time did you use these other techniques? 0% to 100%"). The subjects in the two treatment groups that used self-talk were questioned as to how often they used the learned statements ("What percentage of the time did you use the self-talk that you memorized? Circle to the nearest ten percent."); how effective they found them ("How effective did you find the self-talk in helping you cope with the stressful portions of the film? Not too effective - 0, to very effective - 10"); why they thought, if they did, that the statements were useful ("When you were making the statements throughout your viewing of the film, please indicate below why, if you think making these statements helped you cope with the film."). The subjects in Self-Talk Conditions were also asked to report the number of times they rehearsed any of the memorized statements during the 10 minute waiting period ("We are also interested in finding out if, during the ten-minute waiting period before the film, you were rehearsing any of the items that you

memorized. If so, please specify which ones and indicate beside each one the number of times you repeated these to yourself."). These questionnaires are presented in Appendix L.

Physiological Measure: Heart rate was recorded continuously throughout four time periods of the experiment: 1) during a 3 minute base period after hearing the first taped preamble; 2) during a 10 minute waiting period preceding the film; 3) throughout the viewing of the film; and 4) during a 3 minute base period following the film.

RESULTSSubjective Measures of Anxiety

Before examining the SRAI scores, a series of t-tests were carried out in order to find out if there were any inter-experimenter differences in the scores. There were no significant differences in SRAI scores between experimenters within any of the conditions.

The SRAI was examined using a 4 (Treatment Condition) X 4 (Period) analysis of variance. Significant main effects for Conditions and Periods were obtained: Condition $F(3, 144) = 8.63, p < .001$; Period $F(3, 144) = 10.19, p < .001$. The two-way analysis of variance is summarized in Table 1. The mean scores on the SRAI for each of the Conditions during the four treatment periods are illustrated in Figure 1.

A simple main effects analysis was used to detect any differences between the groups of subjects in their SRAI scores during each of the treatment periods. There were no significant differences in anxiety scores among the groups at the base period, $F(3, 144) = 1.07, n.s.$ Upon receiving the

Table 1
 Summary of Two-Way Analysis of Variance
 on SRAI Scores
 for Treatment Conditions vs. Time Periods

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Time Period (A)	3	1106.24	10.19***
A at b ₁	3	116.40	1.07
A at b ₂	3	438.80	4.04*
A at b ₃	3	198.50	1.83
A at b ₄	3	517.40	4.76*
Condition (B)	3	937.31	8.63**
B at a ₁	3	790.36	7.28**
B at a ₂	3	358.20	3.30
B at a ₃	3	171.40	1.58
B at a ₄	3	120.10	1.11
A X B	9	111.27	1.02
Error	144	108.59	

* $p < .01$

** $p < .001$

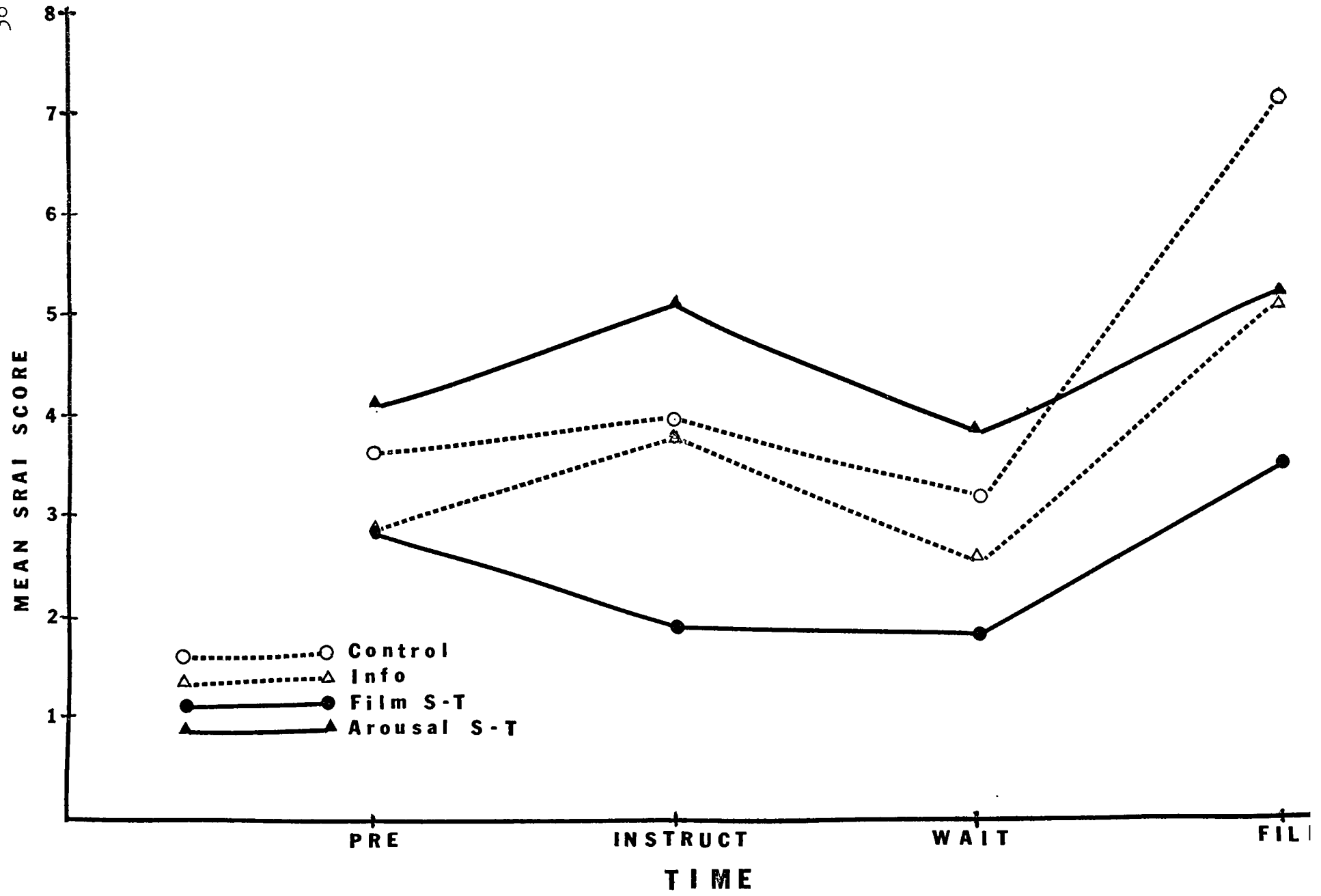


Figure 1

various experimental instructions a significant difference in SRAI scores, $F(3,144) = 4.04$, $p < .01$ was obtained. The differences between the means for this assessment period were examined using the Duncan Multiple Range Test¹(Duncan, 1955) and showed that the Film S-T subjects were significantly less anxious on this measure than all of the other treatment conditions, $p < .05$.

There were no significant differences between treatment groups in SRAI scores during the 10 minute waiting period, $F(3,144) = 1.83$, n.s. Due to the special interest in the "worry" component during the 10 minute wait period a one-way analysis of variance was carried out on this particular item of the SRAI. Significant differences were obtained in the amount of "worry and apprehension" reported by subjects during this period, $F(3, 36) = 2.93$, $p < .05$. Comparisons between the mean scores (Duncan Multiple Range) showed that Arousal S-T subjects reported significantly more "worry and apprehension" compared with Film S-T subjects. The summary of this analysis of variance is presented in Table 2.

The fourth treatment period, assessing anxiety

¹ Note: For Duncan Multiple Range the Mean Square from the oneway ANOVA's in Tables 3. and 5 was used.

Table 2
 Summary of One-Way Analyses of Variance
 for "Worry and Apprehension" Item of SRAI
 During the Four Time Periods

	Source	<u>df</u>	<u>MS</u>	<u>F</u>
Base Period	Between	3	11.63	2.12
	Within	36	5.48	
	Total	39		
Post Instruction Period	Between	3	24.43	3.93*
	Within	36	6.21	
	Total	39		
10 Minute Wait Period	Between	3	9.69	2.93*
	Within	36	3.30	
	Total	39		
Film Period	Between	3	22.07	2.48
	Within	36	8.88	
	Total	39		

* $p < .05$

during the film, revealed significant differences in SRAI scores between groups, $F(3, 144) = 4.76$, $p < .01$. While Film S-T and Info subjects did not differ from each other, both of these groups of subjects obtained lower scores than subjects in the Control group, $p < .05$. The analyses of variance of SRAI scores for these treatments are summarized in Table 1.

The change scores between the base period and post instruction period, the post instruction and 10 minute wait period, and the 10 minute wait period and film period were then examined between the groups. It was found that there was a significant difference, $F(3, 36) = 5.27$, $p < .005$, in the amount of change in SRAI scores from the base period to the post instruction period. A Duncan Multiple Range Test revealed that the Film S-T Condition subjects increased their SRAI scores less than Info, $p < .01$, Arousal S-T, $p < .01$, and Control, $p < .05$, Condition subjects. Thus, these latter three groups showed a comparatively greater increase in SRAI scores than the Film S-T group subjects following the instructions. Furthermore, when comparing the amount of change from the post instruction period to the 10 minute period, there was no significant difference in

Table 3
 Summary of One-Way Analyses of Variance
 for SRAI Scores Across Treatment Conditions
 at Each Time Period

	Source	<u>df</u>	<u>MS</u>	<u>F</u>
Base Period	Between	3	116.37	1.30
	Within	36	89.47	
	Total	39		
Post Instruction Period	Between	3	438.83	4.49**
	Within	36	97.80	
	Total	39		
10 Minute Wait Period	Between	3	198.53	2.17
	Within	36	91.39	
	Total	39		
Film Period	Between	3	517.4	3.32*
	Within	36	155.7	
	Total	39		

*p < .05

**p < .01

the amount of change in SRAI scores among the groups, $F(3, 36) = 2.24$, n.s. In comparing the SRAI scores from the 10 minute waiting period to the film period there was significant overall change in SRAI scores, $F(3, 36) = 4.23$, $p < .025$. Again, considering the period from the 10 minute waiting period to the film period, the Arousal S-T Condition subjects produced less of an increase in their SRAI scores than subjects in the Control group, $p < .01$; and the Film S-T subjects increased less than the Control subjects, $p < .05$. A summary of these analyses of variance is presented in Table 4.

Each group was then examined individually to assess changes in SRAI scores across different assessment points. For Control subjects an overall significant difference in anxiety scores throughout the four treatment Periods, $F(3, 144) = 7.28$, $p < .001$, was obtained. The differences between the mean scores were examined through a series of correlated t-tests. The Film Period showed a higher SRAI score compared with the Base Period, $t(9) = -4.54$, $p < .001$, and the Instruction Period, $t(9) = -3.80$, $p < .005$, and the 10 minute waiting Period, $t(9) = -5.43$, $p < .001$.

Table 4
 Summary of One-Way Analyses of Variance
 for SRAI Change Scores Across Treatment Conditions

	Source	<u>df</u>	<u>MS</u>	<u>F</u>
Base Period to Post	Between	3	202.09	5.27**
Instruction Period	Within	36	38.35	
	Total	39		
Post Instruction Period	Between	3	70.47	2.24
to 10 Minute Wait Period	Within	36	31.52	
	Total	39		
10 Minute Wait Period	Between	3	326.2	4.23*
to Film Period	Within	36	77.05	
	Total	39		

* $p < .025$

** $p < .005$

Thus, the film was anxiety provoking for subjects in the Control group.

The Info subjects revealed an overall significant difference between the SRAI means, $F(3,144) = 3.30$, $p < .025$. For these subjects it was found that the Base Period SRAI score was lower than the SRAI scores for the Instruction Period, $t(9) = -2.30$, $p < .05$ and the Film Period, $t(9) = -2.72$, $p < .05$. Thus, the information about the nature of the film alone created an increase in self-report anxiety. The mean SRAI score for Info subjects at the Instruction Period was significantly greater compared with their SRAI scores for the 10 minute wait period, $t(9) = 3.96$, $p < .005$, suggesting that the increase in self-report anxiety due to the information given about the film dissipated during the 10 minute waiting period. Compared with the 10 minute waiting period, the SRAI score during the film was significantly greater, $t(9) = -4.36$, $p < .005$, again substantiating the stressfulness of the film.

The Film S-T subjects showed no significant changes in SRAI scores throughout the four assessment periods, $F(3,144) = 1.58$, n.s. The Arousal S-T subjects likewise showed no significant overall change in mean SRAI scores

throughout the assessment periods, $F(3,144) = 1.11$, n.s. However, upon comparing the SRAI scores of Arousal S-T subjects between time periods with correlated t -tests some interesting differences were found. Compared with the Base Period, the SRAI scores obtained by these subjects during the Film Period were significantly higher, $t(9) = -2.61$, $p < .05$. Also, these subjects' SRAI scores were significantly lower during the 10 Minute Wait Period compared with the Instruction Period, $t(9) = 3.26$, $p < .02$. The analyses of variance for the different treatment groups have been summarized in Table 1'.

Attention Deployment

In the present study a post hoc analysis of the Attention-Deployment scale was carried out in order to more accurately understand the relationships between the items of the scale. Among 80 subjects who completed the scale there were found to be significant inter-item correlations among three sets of items. The first set contained items that represented what Lazarus referred to as a reflection of avoidant thinking. These items consisted of cognitions that were unrelated to the experimental situation and therefore will be referred to as irrelevant to the anxiety event. This included the

Table 5
 Summary of One-Way Analyses of Variance
 for SRAI Scores Across Time Periods
 Within Each Treatment Condition

	Source	<u>df</u>	<u>MS</u>	<u>F</u>
Control	Between	3	790.36	6.69**
	Within	36	118.10	
	Total	39		
Information About Film	Between	3	358.23	3.65*
	Within	36	98.08	
	Total	39		
Film Self-Talk	Between	3	171.37	1.03
	Within	36	167.09	
	Total	39		
Arousal Self-Talk	Between	3	120.1	2.35
	Within	36	51.09	
	Total	39		

* $p < .025$

** $p < .005$

items: "I thought about things not related to the experiment, such as exams, movies, songs, dates, sex, etc.; I thought about what I would do once the experiment was over." The second set of items, referred to as "relevant to the anxiety producing event", and consisting of such items as: "There was really nothing to worry about, the movie wouldn't be that bad; I thought about how stressful the film would be; I thought about my reactions to the film, eg. anxiety, fear." The third set of items were "relevant to the experimental situation itself", and consisted of such items as: "I thought about how much longer it would take before the film would begin; I thought about what the experimenter was doing; I thought about what the experiment was all about." The inter-item correlations within each of the scales ranged from .22 to .79 ($p < .05$). Table 6 summarizes the Pearson r results.

The results from the attention-deployment categories were analysed through a series of one-way analyses of variance across Condition. Significant differences occurred in the frequency of "relevant anxiety" cognitions, $F(3, 36) = 4.30, p < .02$. Upon examining the mean scores by way of Duncan's Multiple Range it was

Table 6
 Pearson Product-Moment Correlation Coefficients
 Among Items of Attention-Deployment
 for 80 Subjects

Item No.	1	2	3	4	5	6	7	8
1								
2	-.14							
3	.33**	-.11						
4	-.20*	.47**	-.01					
5	-.13	.47**	-.02	.79**				
6	-.10	-.01	.03	.17	.17			
7	.05	-.03	-.15	-.12	-.17	.38**		
8	-.04	.07	.05	.08	.02	.22*	.48**	

*p < .05

**p < .005

found that the frequency of the "relevant anxiety" thoughts were lower in the Control and Info Condition subjects than in the Arousal S-T Condition subjects, $p < .05$. Thus, subjects in the Arousal S-T group spent a greater amount of time making anxious statements about things relevant to the film compared with the Control and Info subjects. It should be remembered, however, that the Control subjects were not aware of the nature of the film during the 10 minute waiting period. An analysis of the "irrelevant anxiety" items yielded no significant differences between the groups, $F(3, 36) = .08$, n.s. There was a significant difference in the reported frequency of "experiment relevant" thoughts, $F(3, 36) = 3.95$, $p < .02$. Comparisons between the means revealed that the Info and Arousal S-T subjects thought less frequently of experiment relevant thoughts than the Control subjects, $p < .05$. These analyses are summarized in Table 7 and Figure 2.

Pearson product-moment correlations were carried out between the "relevant anxiety" scores and the total scores on the SRAI, as well as on the "worry and apprehension" item of the SRAI for both the 10 minute

Table 7
 Summary of One-Way Analyses of Variance
 Across Treatment Conditions
 for Attention-Deployment Subscales

	Source	<u>df</u>	<u>MS</u>	<u>F</u>
Cognitions Relevant to Anxiety Situation (Film)	Between	3	6.20	4.30*
	Within	36	1.44	
	Total	39		
Cognitions Irrelevant to Anxiety Situation	Between	3	.11	.08
	Within	36	1.35	
	Total	39		
Cognitions Relevant to Experimental Situation	Between	3	3.74	3.95*
	Within	36	1.95	
	Total	39		

* $p < .02$

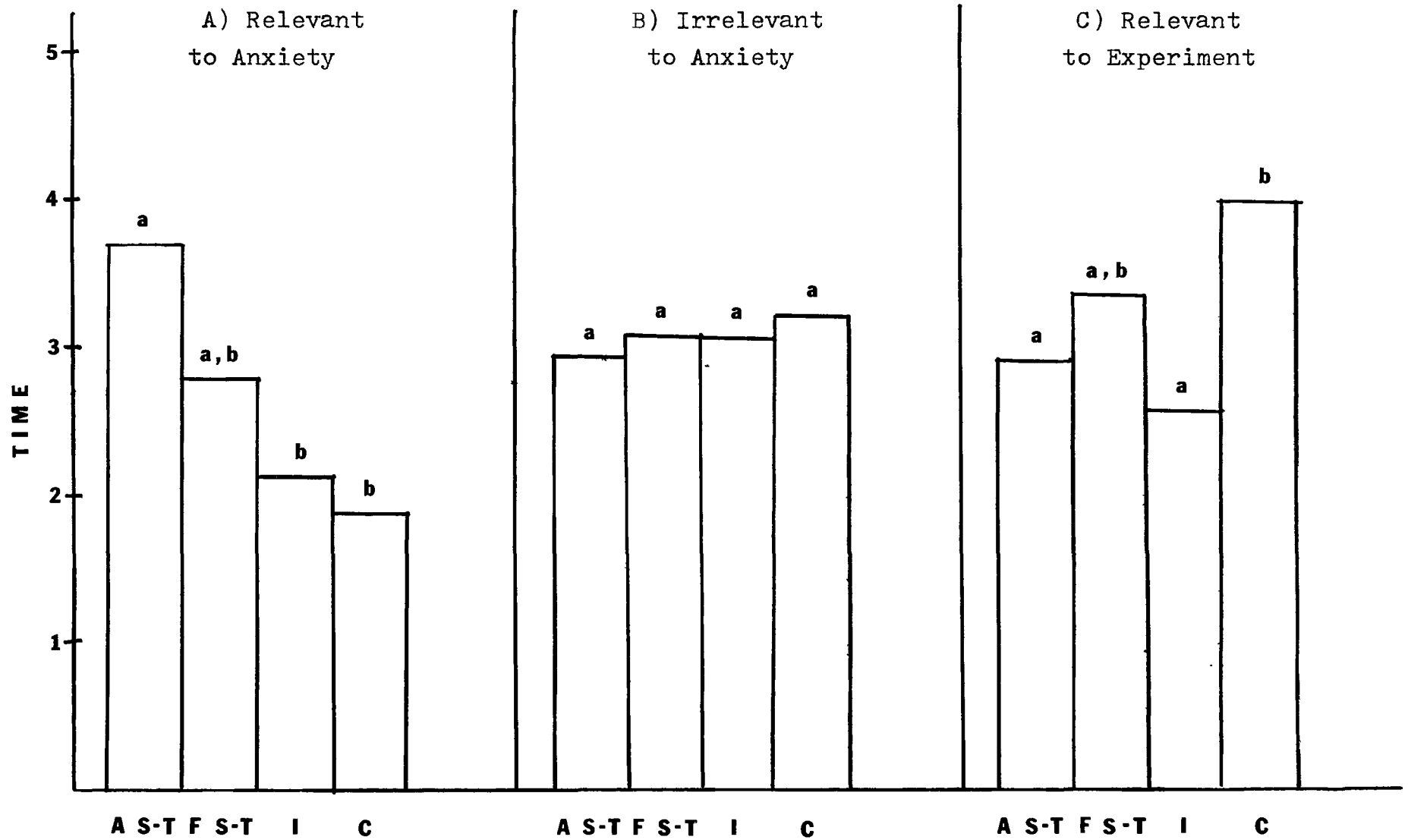


Figure 2

Mean Scores on Subscales of Attention-Deployment Scale

wait period and the film period. The amount of worry experienced by all subjects was positively correlated with the amount of "relevant anxiety" cognition during the 10 minute wait period ($p < .01$). When the individual groups were examined Info subjects showed significant positive relationships ($p < .05$) between their amount of "relevant anxiety" cognitions and their SRAI scores as well as "worry and apprehension" scores during both the wait period and the film. Subjects in the Arousal S-T group displayed a significant positive correlation ($p < .05$) between the amount of worry and their "relevant anxiety" cognition during the wait period; however, there was a significant negative correlation ($p < .05$) between the amount of "relevant anxiety" thoughts during the wait period and worry scores during the film for the Arousal S-T subjects. These analyses are presented in Table 8.

Film Questionnaire and Cognitive Coping Techniques

A one-way analysis of variance yielded no significant differences in amount of information remembered by subjects about the film, $F(3, 36) = 1.25$, n.s. A t -test revealed no significant difference in the frequency with which the subjects in the two S-T groups

Table 8
 Pearson Product-Moment Correlations
 between "Relevant Anxiety" Cognitions
 and both SRAI Total Scores and "Worry and Apprehension" Item
 during the 10 Minute Wait Period and Film Period

Condition	SRAI	SRAI	"Worry"	"Worry"
	Wait Period	Film Period	Wait Period	Film Period
Control	-.01	-.31	.31	-.21
Info	.65*	.61*	.62*	.79**
Film S-T	.17	-.17	.07	-.13
Arousal S-T	.35	-.46	.56*	-.62*
Total	.26	-.17	.39**	-.17

(40 Subjects)

* $p < .05$

** $p < .01$

used the statements they memorized, $t(18) = -.22$, n.s. There were no differences in the perceived effectiveness of the statements, $t(18) = .13$, n.s. There were also no differences between the S-T groups in the percentage of other techniques used, $t(18) = -.19$, n.s., nor in the number of statements rehearsed during the 10 minute waiting period, $t(18) = -.73$, n.s.

The reasons subjects in the self-talk conditions gave for the effectiveness of the self-statements they memorized were then examined. Two raters familiar with the nature of the experiment independently rated the subjects' responses into one of the following six possible categories: 1) statements served as a distraction, 2) they helped through rationalization, denial, intellectualization, or being more objective, 3) they helped generally (unspecified), 4) they helped through self-persuasion by having the subject believe the nature of the arousal self-talk statements, 5) they helped because of both 1) distraction and 4) persuasion and/or 2) rationalization, intellectualization, etc., and 6) the statements did not help at all. The raters agreed on 79% of the category placements. Disagreements between judges were resolved by having them discuss the

reasons for their choice and then come to a second decision. The number of subjects falling into each of the categories is presented in Table 9. Because of the small numbers in each of the cells, Fisher's Exact test was applied individually to each pair of cells between subjects. No significant differences were found on the number of subjects falling into any of the categories.

The number of learned self-statements reported to have been made during the film by subjects in the self-talk conditions was then counted. A t-test between the two groups revealed no significant differences in the number of the respective self-statements made by subjects, $t(18) = .775$, n.s.

Heart Rate²

Heart rate was fed into a Band Pass filter with an upper frequency limit of five beats per minute and lower frequency limit of .065 beats per minute. The data were then passed through a function generator and finally fed into a digital computer (PDP8/1) yielding the following information: a) a beat by beat heart rate in which the

²Due to equipment failure heart rate data was not obtained for two Film S-T subjects, one Info subject and one Control subject.

Table 9
 Number of Subjects
 Giving Each of the Various Reasons
 for the Effectiveness of Self-Talk

Condition	Distraction	Helped, Rationalize, Denial, etc.	Helped (General)	Self-Persuade, Believed	Both 1+4 &/or 2	Did Not Help
Film Self-Talk	0	6	1	0	0	3
Arousal ¹ Self-Talk	0	3	1	2	1	2

¹One subject in this condition did not respond to the question.

time between each beat was converted into beats per minute, and b) an average heart rate over a 20 second interval. The heart rate program that was used in the computer analysis is presented in Appendix M. Heart rate was collected during twenty-nine 20 second time intervals; two 3 minute base periods, one before and one after treatment; and 23 treatment periods (ie. periods while subjects were anticipating the stress and watching the stress film). These 20 second intervals were collapsed into 1 minute intervals. Thus, there were three intervals during the base periods, 10 during the waiting period and 13 during the film. The mean heart rate was examined for Conditions during each of these periods.

In order to rule out the frequently found influence of basal levels on the magnitude of responses given in later periods (ie. the "law of initial values"; Lacey, 1956; Wilder, 1962), a base-free measure of change was desirable (Benjamin, 1967; Tucker, Demarin and Messick, 1966). Therefore, "residualized" scores (cf. Cronbach and Furby, 1970) were calculated for the heart rate responses obtained during the treatment periods based on the technique described by Burish, Bloom, Houston,

and Holmes (Note 3; Holmes and Houston, 1974; Burish, Note 5). A residualized score consisted of the difference between the obtained score during the treatment period and the score predicted by linear regression from the respective base level score. Described in another way, residualized scores are scores which have been adjusted for base level values.

The heart rate responses were examined through two separate two-way analyses of variance. First the 10 minute wait period was examined by a 4 (Condition) X 10 (Period) analysis of variance. The Film Period was then analysed by a 4 (Condition) X 13 (Period) design.

During the Wait Period there was a significant main effect for Conditions, $F(3, 27) = 7.04$, $p < .001$. A one-way analysis of variance was carried out in order to examine the differences between groups, $F(3, 356) = 7.56$, $p < .001$. In order to study the differences between group means, Scheffe Simultaneous Confidence Intervals were examined. It was found that the Film S-T subjects had higher heart rates during this period than Control and Info subjects ($p < .05$) and Arousal S-T subjects had higher heart rates than Control ($p < .05$) and Info ($p < .06$) subjects.

The analysis of variance during the film period yielded no significant differences between groups. A series of one-way analyses of variance were carried out at the times during the film throughout which each of the three accidents occurred. The accidents happened within the second, eighth, and tenth minutes of the film. There were no significant differences found between groups at any of the points following the accidents, $F(3, 32) = .083, .10, \text{ and } .137, n.s.,$ respectively. A one-way analysis of variance was then carried out on the change scores between each of the 13 time periods during the film. A significant difference in the change of heart rate between the sixth and seventh minute of the film was found between groups, $F(3, 32) = 2.98, p < .05.$ A comparison between means (Duncan Multiple Range) found that Arousal S-T subjects showed a greater increase in heart rate at this point than Film S-T subjects ($p < .05$). Also, at this point, Control and Info subjects tended to increase more in physiological arousal than Film S-T subjects ($p < .1$). A series of correlated t -tests were carried out between the sixth and seventh minute for each of the treatment conditions. It was found that Arousal S-T subjects were the only ones

to significantly change in physiological arousal during this time. These subjects increased significantly in their heart rate scores, $t(9) = -3.05$, $p < .02$.

During the second accident, between the eighth and ninth minute, there was an overall significant difference in the change of heart rate between treatment Conditions, $F(3,32) = 4.10$, $p < .02$. Comparisons between the mean change scores (Duncan Multiple Range) revealed that Info subjects showed a greater increase in heart rate than Control, Arousal S-T, and Film S-T ($p < .05$) subjects. The amount of change within each group was examined through a series of correlated t -tests between each group's heart rate scores at the eighth and ninth minute. It was found that Info subjects significantly increased in heart rate during this time period, $t(8) = -3.97$, $p < .005$. The analyses of variance for the heart rate scores are summarized in Tables 10 and 11, and the mean residualized scores are plotted in Figure 3.

In order to compare the overall arousal level of subjects in each of the Conditions during the waiting periods and the film periods, correlated t -tests were carried out between the mean heart rate score during the waiting period and the mean heart rate score during the

Table 10
 Summary of Two-Way Analyses of Variance
 on Heart Rate
 for Treatment Conditions vs. Time Periods

	Source	<u>df</u>	<u>MS</u>	<u>F</u>
10 Minute	Condition (A)	3	174.31	7.04*
Wait Period	Time Period (B)	9	0.00	0.00
	A X B	27	10.53	.43
	Error	320	24.76	
Film Period	Condition (A)	3	12.39	.35
	Time Period (B)	12	0.00	0.00
	A X B	36	17.09	.48
	Error	416	35.73	

*p < .001

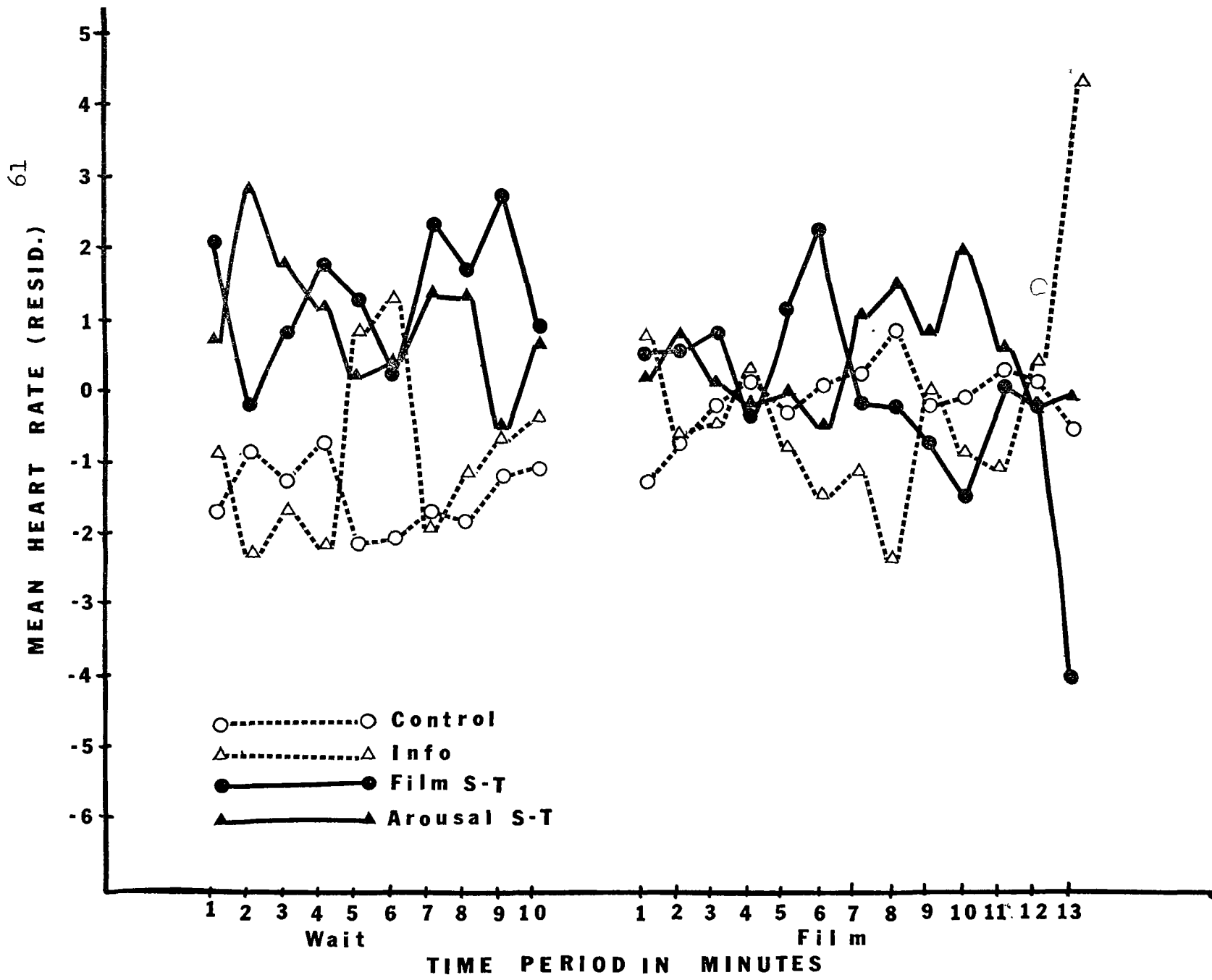


Figure 3

Mean Residualized Heart Rate Scores for Subjects During Wait and Film Periods

Table 11
 Summary of One-Way Analyses of Variance
 for Heart Rate Change Scores
 During the Sixth and Eighth Minutes of the Film

	Source	<u>df</u>	<u>MS</u>	<u>F</u>
Sixth Minute Period	Between	3	26.98	2.98*
	Within	32	9.04	
	Total	35		
Eighth Minute Period	Between	3	25.67	4.10**
	Within	32	6.26	
	Total	35		

* $p < .05$

** $p < .02$

film period. No differences for any of the four conditions were obtained, Control, $t(8) = -1.22$, n.s.; Info, $t(8) = -.51$, n.s.; Film S-T, $t(7) = 1.90$, n.s.; Arousal S-T, $t(9) = .24$, n.s.

DISCUSSION

The results of the present experiment are consistent with a number of the hypothesized effects while a number of the stated hypotheses were not confirmed. With respect to hypothesis 1, which predicted the film would be stressful, it was found that both anticipating the film (Info subjects) and being exposed to the film (Control subjects) were separate stressful events. The manner in which the stress manifested itself, however, as well as the duration of the stress, needs some clarification. While subjects responded with increased levels of self-report anxiety after being told they were about to view a stressful film, this subjective measure of anxiety appears to decline and anxiety seems to dissipate over time, at least as far as a 10 minute wait period is concerned. What is interesting is that while Info subjects reported increasing subjective reports of anxiety, their physiological levels of arousal immediately following the information about the film instructions was not significantly different from subjects who were not anticipating a stressful film. Still with the first hypothesis it was found that being exposed to a stressful film was anxiety-producing. Again, we find that

this anxiety manifests itself only in terms of the subject's subjective report and not in terms of their actual physiological state of arousal.

The second hypothesis of the experiment was also confirmed. While subjects given information concerning the threatening nature of the film increased in their subjective reports of anxiety immediately after receiving such information, subjects who were given the same information but were also induced to believe they had a control strategy either in terms of focusing on internal levels of arousal or focusing upon reconceptualizing the nature of the film, coped much better with the stress of being given the information. This coping effect was evident only in terms of their subjective reports of anxiety since the heart rate data is not available at this point, thus we can only comment upon the self-report of anxiety measures. Still considering the effects of being exposed to information, but now considering the effect of waiting for a stressor, it was found that subjects in the various treatment groups did not differ in their subjective reports of anxiety during this 10 minute wait period; however, in terms of physiological levels of arousal, subjects instructed in the use of self-talk (either Arousal S-T or Film S-T) were significantly higher

in their heart rate measures during this 10 minute wait period compared with subjects in the Information and Control groups. These results appear puzzling at first glance. However, it should be pointed out that numerous other studies have failed in the attempt to find significant relationships between physiological arousal and subjective reports of anxiety. Some possible explanations for this in the present investigation will be presented later.

If we examine the kinds of thoughts that subjects were having during this 10 minute wait period by looking at the Attention-Deployment Scale data, interesting patterns of results emerge. It was found that subjects in the Arousal S-T group spent a larger amount of time thinking anxiety relevant thoughts compared with subjects in Information and Control groups. Also, Film S-T subjects tended (but not significantly so) to spend a higher amount of time making anxiety relevant thoughts. These data suggest that focusing one's attention upon anxiety relevant features, such as one's internal state may produce increased levels of physiological arousal. However, there may be a qualitative difference in the kinds of specific anxiety relevant thoughts made by Film S-T and Arousal S-T subjects. High positive correlations were obtained during the 10

minute wait period between the amount of "anxiety relevant" thoughts and the degree of worry and apprehension" reported by Info and Arousal S-T subjects. One of the reasons why subjects in the Film S-T group decreased in their SRAI scores from the base period to the instruction period may be because they felt confident in their ability to control their arousal reaction while exposed to the film; alternatively, it may be that subjects in this group perceived the film to be possibly less stressful in view of the fact that they were told that actors were simulating poorly and that the quality of the film was inadequate, less than believable, etc. It should be remembered that Film S-T subjects reported that they were less worried than Arousal S-T subjects during the wait period. Thus, it appears that being given a strategy to use and anticipating the stressor produces higher levels of physiological arousal, but no differences in self-report of anxiety. This is not consistent with predictions that were made concerning the utility of being equipped with a cognitive strategy compared with not having such a strategy available when one is anticipating a stressor.

For the next hypothesis it was found that during exposure to the stressful film, subjects given a film self-

talk strategy or an arousal self-talk strategy coped much better with the stressful film than subjects in the information and control groups who were not equipped with such a strategy. It was found, that subjects in these two self-talk groups did not differ overall with respect to the relative merits of either focusing on the film as a source of arousal to reconceptualize or focusing upon internal states as a response reaction to reconceptualize. It was found also that focusing on internal states did not, at least in the present experiment, detract subjects from the source of the stressful information. Subjects in all treatment groups did not differ in their recall of the content of the film, and this suggests that subjects, regardless of treatment conditions, paid equal attention to the film in spite of their use of strategies while exposed to the film. It is also interesting that self-talk subjects did not differ in the reasons why they felt their self-talk strategy helped them cope with the film. Both groups used the same number of statements and did not differ in the degree to which they believed the technique was effective.

The heart rate data obtained during the viewing of the film offers even more puzzling prospects to explain

anxiety levels while exposed to the stressor. There were two periods throughout the exposure to the film in which subjects in various groups differed in their heart rate. There was a significant increase in heart rate for subjects in the Arousal S-T group at minutes six and seven (immediately between accident one and accident two). If one interprets these results as real differences, and not as simple spurious effects associated with multiple analyses at various points, it is possible to interpret these results in the following manner: since this heart rate effect occurs after exposure to the first accident, changes in heart rate may be a reflection of the extent to which subjects felt they could subsequently control their anxiety after having been exposed to the stressor for the first time. Thus, Arousal S-T subjects may have in fact failed to control their arousal upon exposure to the stressor.

The increased heart rate for subjects in the Information group at the time of the second accident (minute eight and nine) offers even more puzzling data to interpret. Since the second accident is generally seen as being the most stressful period in the film, one could think that this represents the most stressful event subjects were exposed to throughout the film period and that it is in this period

that subjects should best indicate the manner in which they coped with a severe stressor. If it is assumed that the reason why Film and Arousal S-T subjects did not increase in heart rate was due to the fact that they were exercising a cognitive strategy, then subjects in the Information group increased in heart rate as a result of direct exposure to a stressor. However, this does not explain why Control subjects failed to increase in heart rate as well since they too were not exposed to a cognitive strategy for their use. These results appear difficult to explain in a convincing manner in the absence of additional data and checks.

In terms of the "work of worrying" hypothesis specified by Janis and elaborated upon by Meichenbaum, the results of the present experiment offer some suggestions as to the processes which may be responsible for facilitating coping with a stressor. In terms of the period of time allocated for the "work of worrying", the 10 minute wait period provided ample opportunity for anticipation, preparation, rehearsal, or a variety of other strategies or thoughts to occur. On the basis of the Attention-Deployment Scale, it appears as if focusing upon anxiety relevant thoughts while waiting for a stressor may

be partially related to the physiological level of arousal witnessed at the same time. While there is no information concerning the specific nature of the thoughts engaged in by the subjects during this waiting period, ie., whether they mentally rehearsed the strategy or whether they prepared themselves consciously for the film, suffice it to say that thinking anxiety relevant thoughts as well as experiencing a significant increase in physiological level of arousal could be enough to prepare the individual for the stressor and to assist him to cope with it adequately. An interesting finding was the difference between Info and Arousal S-T subjects in the relationship between their "relevant anxiety" thoughts and the amount of worry they reported during the film. It seems as though the anxiety thoughts made by Arousal S-T subjects may have been of a specific nature that would be related to a decrease of anxiety during the stressful event, whereas the anxiety relevant thoughts made by Info subjects (although they were fewer than the amount made by Arousal S-T subjects) were of a nature that was positively related to worry and apprehension during the stressful film. On the other hand, it is possible that the reason why the two self-talk groups coped better with the stressful film has nothing to do with their

physiological level of arousal prior to the film or their attention-deployment during the 10 minute wait period. Conceivably, the use of those strategies during the film could have been sufficient to assist the subjects in coping with the stress of the film and this, without the supposed assistance of the "work of worrying" the subjects allegedly underwent during the 10 minute wait period.

While the present study has provided some support for the concept of the "work of worrying" although this concept was not shown to be a sufficient explanation for adequate coping with a stressor. Subjects taught to deny and intellectualize the nature of an impending stressor reported themselves to be significantly less worried while anticipating the stressor than subjects told how to deal with their internal arousal. Both of these groups of subjects displayed a high level of physiological arousal during this time. As previously mentioned there may be several possible explanations for the discrepancy between physiological arousal and subjective reports of anxiety during the waiting period. While it is beyond the scope of the present investigation to provide any definitive explanations for why this occurred, several hypotheses can be presented. For example, the self-reports of anxiety

could have been made consistent with the physiological arousal levels were it not for the demands of the experiment. This is especially true for subjects that were given the self-talk coping strategies who may have been simply responding to the demand characteristics of the experiment and "role playing" the low level of self-report anxiety. In regard to this question, it should be noted that Houston and Holmes (1975) recently found that subjects who were stressed with the threat of shock and instructed to role play being calm were able to simulate the self-reports (viz., the Affect Adjective Check Lists) but not physiological responses (viz., pulse rates and skin resistances) compared with subjects who were not stressed. Rather than simulating the responses of non-threatened subjects, the physiological responses of subjects attempting to role play being calm were like those of threatened subjects. With these findings in mind, it appears less likely that the physiological results of the present experiment could be attributed to the demand characteristics of the experiment whereas the subjective reports could more likely be so inferred. It is less probable that self-reports of Control and Info subjects were due to demands since they were not exposed to a strategy (ie. techniques to help them cope with the film). There is

no guarantee, however, that these demand characteristics have this kind of effect upon self-reports under conditions other than anticipating a stressor or being threatened by seeing or being exposed to a stressor since none of the subjects in the Houston and Holmes (1975) study actually received the shocks. Conceivably, one could place more faith on subjective reports of anxiety associated with direct exposure to a stressor as opposed to the threat of anticipating a stressor.

Another possible explanation for the low self-reports of anxiety during the waiting period is that subjects may have simply become bored during the long interval.

Another interesting finding in the present investigation focuses on the efficacy of the strategy which involved anticipating the stress with a high level of physiological arousal while denying any anxiety and continuing to deny it throughout the stressful event. This appears to be consistent with other studies supporting the finding that denial and intellectualization type strategies seem to be the best method to deal with ambiguous types of stressors in both experimental and real life situation (Holmes and Houston, 1974; Houston and Holmes, 1975; Burish et. al., Note 3; Houston, Note 6). These

studies support the use of avoidant thinking in situations where the stressor is non-ambiguous (ie. when a sample electric shock is given to subjects before they are told to expect more shocks).

It is important to remember that the present findings are somewhat limited in that they are based on a single exposure to a vicarious stressor and the degree to which the present findings will generalize to other "real-life" situations remains to be explored. Further studies would prove useful if they examined the effectiveness of these kinds of coping techniques in other stressful situations such as pre-surgery, pre-dental visits, before examinations, and other real life stressors. Future studies could also explore further the role played by the "work of worrying" in anticipating a stressor. This could be done by providing subjects with a distractive task during the wait period, or by eliminating this period altogether. Further attempts could also be made in terms of finding more specific methods with which to assess the cognitive strategies used by subjects while waiting as well as relating these to the subjects' abilities to cope with one or more stressors cognitively, behaviourally, and physiologically. The after effects of the various coping

strategies (ie. at some time following confrontation with the stressor) would also provide interesting information with respect to the utility of the various kinds of strategies. It appears then, that there is much work to do in terms of being able to provide people with adequate methods with which to cope with stressful situations in their lives as well as to provide psychologists with an adequate explanation for the effectiveness of these methods.

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Examples of Coping Self-Statements Rehearsed
In Stress Inoculation Training

Preparing For a Stressor

What is it you have to do?

Just think about what you can do about it. That's better than getting anxious.

No negative self-statements; just think rationally.

Don't worry; worry won't help anything.

Maybe what you think is anxiety is eagerness to confront it.

Confronting and Handling a Stressor

Just "psych" yourself up - you can meet this challenge.

Don't think about fear; just think about what you have to do. Stay relevant.

This tenseness can be an ally, a cue to cope.

Relax; you're in control. Take a slow deep breath.

Ah, good.

Coping with the Feeling of Being Overwhelmed

When fear comes, just pause.

Label your fear from 0 to 10 and watch it change.

You should expect your fear to rise.

Don't try to eliminate fear totally; just keep it manageable.

You can convince yourself to do it. You can reason
your fear away.

Reinforcing Self-Statements

It worked; you did it.

It wasn't as bad as you expected.

You made more out of the fear than it was worth.

Your damn ideas - that's the problem. When you control
them, you control your fear.

You did it!

Appendix B

Sample List of Self-Statements

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Accident 1

1. This is a Canadian Production.
2. People don't wear hats like that today.
3. The workers are merely actors.
4. What appears as blood is really red dye.
5. The actor's hand does not really go into the machine.
6. Notice the quick cut to another scene.

Accident 2

1. They're even using French Canadians.
2. The high pitched sound sure is irritating.
3. The second actor does not really lose his finger here.
4. Dark liquid spurts from behind the finger.

Accident 3

1. Look at the short hair.
2. The sound of machines plus suspense used are good devices.
3. We know an accident is going to come.
4. Those are old machines. Not as big as the ones today.
5. Notice that the board is not seen penetrating the oncoming actor.
6. Watch the unconvincing way the shipping clerk feigns pain and dying.

Sample List of Self-Statements

Preparing for the Stressor

1. Make a plan to deal with how you may feel during the stressful film.
2. Think about what you have to do.
3. No negative self-statements, just think positively.
4. Don't worry, worry won't help anything.

Confronting and Handling the Stressor

1. Just try to "psych" yourself up.
2. One step at a time, you can handle the situation.
3. You're watching the film but you're in control.
4. You expected some anxiety, but you're in control.

Coping with Feelings of Being Overwhelmed

1. Keep the focus on the present, what is it you have to do?
2. Don't try to eliminate the anxiety entirely, just keep it manageable.
3. When your fear rises, just pause.
4. Label your fear from 0 to 10 and watch it change.

Rewarding Self-Statements

1. Good, you did it, the self talk works.
2. It's all over and it wasn't that bad after all.
3. You probably made more out of your fear than it was worth.
4. You handled it just fine.

Appendix D

Preamble Given to Subjects

Thank you for agreeing to participate in this experiment. This study is concerned with the way in which people watch a film. Prior to our giving you more detailed information we would like to obtain measures of your skin resistance and heart rate and give you some brief questionnaires. These are designed to assess your mood and disposition at the present time. Please sit still while the monitoring equipment is being calibrated.

Appendix E

Mood Assessment Scale

Please circle the number which best describes how you felt overall during the past ten minutes.

Calm and relaxed	0	1	2	3	4	5	6	7	8	9	10	Not calm and relaxed
happy	0	1	2	3	4	5	6	7	8	9	10	sad
not worried and apprehensive	0	1	2	3	4	5	6	7	8	9	10	worried and apprehensive
weak	0	1	2	3	4	5	6	7	8	9	10	strong
not restless or irritable	0	1	2	3	4	5	6	7	8	9	10	restless or irritable
friendly	0	1	2	3	4	5	6	7	8	9	10	unfriendly
not distractible	0	1	2	3	4	5	6	7	8	9	10	distractible
not tense	0	1	2	3	4	5	6	7	8	9	10	tense
not frustrated	0	1	2	3	4	5	6	7	8	9	10	frustrated
not jittery	0	1	2	3	4	5	6	7	8	9	10	jittery
not at ease	0	1	2	3	4	5	6	7	8	9	10	at ease

Instructions for Film S-T Subjects

The film you are going to see is about 13 minutes long. This film depicts serious bodily injuries that can occur when men are careless with heavy-duty machinery in a wood-working shop. The workers in the film become victims of their own lack of attention and of the indifference of others who fail to use the safety equipment which is required when working with high speed machinery. The partial loss of limbs and life is clearly illustrated. The first accident involves a worker who loses the tips of his fingers when a guard is ignored. A second worker forgets to use the safety guard and his middle finger is torn from his hand. And finally, the last accident is caused by a third worker whose mistake is unfortunate not in that he himself is injured but rather in that he causes the death of the shipping clerk who gets a board through the stomach and ends up bleeding on the floor. Pay close attention to the film as once it is completed you will be asked some questions concerning the film.

The purpose of this portion of the experiment is to allow you the opportunity to get a notion of the

content of the film and to assess the nature of the film realistically. You will thus be given a realistic way of how to view the film. Of course it should be pointed out that in safety films such as this they would not create real accidents and purposely injure someone. The film is designed to induce as much stress as possible in workers in order to try and prevent serious industrial accidents. In that light we would like you to view the film more realistically in terms of how it was made, its content, and the technical aspects and procedures of the film.

As you know this film will depict three accidents. You will find it helpful if we break down for you the accidents into three separate episodes. The workers in the film you are about to see are merely actors. None of the actors actually experience any pain or physical harm during the film. In fact, what appears to be blood is merely ketchup. The accidents are so well simulated that you would almost think that they were taking place. In fact they are not real. You might want to notice the film production methods of the '50's for instilling fear into the minds of potentially careless workers. Notice the stilted and stylistic methods of production. For instance, one

worker, seemingly protected in his working clothes, negligently operates his machine. This portion of the film depicts the worker as he pushes the piece of lumber into the teeth of the machine. We can guess that it is only a matter of moments before his hand slips. However, you will notice that his hand doesn't go into the cutting teeth of the machine, but that there is a cut-away and in the next scene we see mangled fingers. Through film editing a red dye that looks like ketchup is draped over the edge of his fingers.

The second technique for making the film even more disturbing is depicted in the second accident. The audio portion of the film, such as the grinding sound of the machine, is used to increase anxiety and stress before the second accident. If you pay close attention to the film you will see that his hand slowly approaches the high pitched grinding blades and after the supposed accident takes place what appears as blood, which in reality is a dark coloured liquid, spurts from the back of his middle finger. The camera crew and director have spent hours in creating, along with expert film editing and simulation, this particular scene. The viewer is then forced to spend a good deal of time just watching the dark liquid. In the final accident

Appendix F (con't.)

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the producers use the sound of the machines plus suspense to increase anxiety. We know that an accident is coming but we are not sure of what it will be. In this final accident the element of ~~surprise~~ is used to shock us - the shipping clerk in a carefully contrived scene appears to be impaled by a piece of lumber from a worker's machine. Notice an unconvincing and almost humorous bit of acting by a worker who holds his hand to his mouth and runs off stage. Also observe the unconventional way the shipping clerk simulates pain and dying. The piece of lumber is carefully placed as though through his side with an appropriate amount of ketchup coming out of his mouth.

In order to get you to perceive the film more realistically we want you to clearly understand the way in which the film was made and the context in which it is to be viewed. The experimenter will give you a list of itemized statements. These statements refer to the description previously given. Please learn and memorize these by heart. The experimenter will give you 2 or 3 minutes to learn these before the experimenter obtains a test of how well you've learned them. Please sit quietly for 10 minutes while the equipment is being calibrated again. After this we will show you the film.

Instructions For Arousal S-T Subjects

The film you are going to see is about 13 minutes long. This film depicts serious bodily injuries that can occur when men are careless with heavy-duty machinery in a wood-working shop. The workers in the film become victims of their own lack of attention and of the indifference of others who fail to use the safety equipment which is required when working with high speed machinery. The partial loss of limbs and life is clearly illustrated. The first accident involves a worker who loses the tips of his fingers when a guard is ignored. A second worker forgets to use the safety guard and his middle finger is torn from his hand. And finally, the last accident is caused by a third worker whose mistake is unfortunate not in that he himself is injured but rather in that he causes the death of the shipping clerk who gets a board through the stomach and ends up bleeding on the floor. Pay close attention to the film as once it is completed you will be asked some questions concerning the film.

Numerous well-controlled studies have demonstrated the importance of controlling what we say to ourselves. When we speak to ourselves we influence how we react

to things. If we speak or make negative statements we make things worse. When we say positive things we cope better - especially with stress and fear. Self-talk or self-verbalizations has been the focus of much well documented research and today there is convincing evidence to suggest that you can control your reactions to things if you learn to control what you say to yourself. If you talk positively you can cope better; if you talk negatively you make things worse for yourself.

The purpose of this portion of the experiment is to provide you with a way of becoming aware of the things you say to yourself that create anxiety in situations such as watching stressful films. Anxiety is, more often than not, the result of self-verbalizations and internalized sentences which are emitted while thinking about the stressful situation. For instance, before giving a speech in public, a person may tell himself things like "What if I forget what I'm supposed to say?", "What if I stutter?", or "What if I draw a blank?", all of which are statements that will increase anxiety. If, however, one repeated to oneself more positive self-statements, one would be less likely to feel as much anxiety brought on and maintained than he would if he used negative self-statements. What you

tell yourself is going to influence how, or the way in which you feel.

Research has shown that anxiety or fear seems to involve two major elements, the first physiological and the second more psychological. The physiological component includes various body reactions while the psychological aspect involves a set of fear-inducing thoughts and images. We often interpret how we feel on the basis of how we see ourselves reacting internally. We have to learn to control these interpretations and inferences by talking positively about our reactions. While watching a stressful film it is generally useful to break down the experience of facing a stressor into four manageable parts. The first stage is preparation for the stressful event. For example, at this point you can begin to think about what it is that you have to do, or you can think about making a plan to deal with how you may possibly feel during the stress. By thinking about what you have to do you can avoid needless worry and anxiety. The second part involves directly handling the stress and your reactions. During this period you can try and "psych" yourself up by convincing yourself that you can cope with and tolerate the stress film. By taking it one step at a time you can reason your fear away and handle the situation. The feelings of tensehess

you may have can be used as a cue to cope. What you experience as anxiety or fear is usually eagerness in anticipating the stressor. You can think about what you have to do and not about your fear. Remember, you are in control. The third stage involves coping with feelings of being overwhelmed. Once again, it is important to focus on the present and what it is you have to do to handle your reactions. It is expected that your fear will rise, so it is not necessary to eliminate your fear entirely but rather to keep it manageable. In fact, when your fear rises, just pause. Label it from 0 to 10 and watch it change and this will help you handle your reactions better. The final stage in encountering a stressful event involves the reinforcing aspect. At this point, after having viewed the film you will realize that it wasn't as bad as you had expected and that you probably made more out of your fear than it was worth. You will have discovered that your ideas are really the problem because when you control your ideas and thoughts and what you say to yourself you control your reactions to the stress. Then you can be pleased with the way you handled the stress inducing film.

The experimenter will give you a series of self-statements that are associated with coping with a

stressor. We'd like you to learn these statements by heart. The experimenter will give you 2 to 3 minutes to learn these before the experimenter obtains a test of how well you've learned them. Please sit quietly for 10 minutes while the equipment is being calibrated again. After this we will show you the film.

Instructions For Info Subjects

The film you are going to see is about 13 minutes long. This film depicts serious bodily injuries that can occur when men are careless with heavy-duty machinery in a wood-working shop. The workers in the film become victims of their own lack of attention and of the indifference of others who fail to use the safety equipment which is required when working with high speed machinery. The partial loss of limbs and life is clearly illustrated. The first accident involves a worker who loses the tips of his fingers when a guard is ignored. A second worker forgets to use the safety guard and his middle finger is torn from his hand. And finally, the last accident is caused by a third worker whose mistake is unfortunate not in that he himself is injured but rather in that he causes the death of the shipping clerk who gets a board through the stomach and ends up bleeding on the floor. Pay close attention to the film as once it is completed you will be asked some questions concerning the film. Please sit quietly for 10 minutes while the monitoring equipment is again being calibrated.

Instructions For Control Subjects

The film you are going to see is about 13 minutes long. The film you are about to see has been video-taped and will be displayed on the TV monitor which is connected to a video-tape recorder. The video recording was specially made at the communication services of the University of Ottawa. The university has telecine facilities available to students in order to put films on video-tape. The Sony monitor and video-tape recorder before you were also provided by the university. Although the Sony video-tape recorder is one of the best available the imperfections in the tele-cine reproduction process prevent the film from being recorded perfectly. The monitor has a 19 inch screen and contains various adjustment knobs and, as can be seen, is portable. The wire cables in the rear are audio and visual lines connected to the video-tape recorder. The video-tape recorder itself is a complicated piece of machinery but is easy to run. The video-tape can easily be fitted into the machine. Some of the features of the video-tape recorder include the possibility of dubbing films and using a video camera to make live films. There is a meter for the sound level to assist in making recordings. Without such equipment the present experiment would not have been possible. Pay close attention to the film as once it is completed you will

be asked some questions concerning the film. Please sit quietly for 10 minutes while the monitoring equipment is again being calibrated.

Attention Deployment Scale

Please circle the number on the scale which best represents the amount of time that you spent thinking about the following, during the ten minutes before you viewed the film:

I thought about things not related to the experiment, such as exams, movies, songs, dates, sex, etc.

Not at all - 1 2 3 4 5 - Very frequently

There was really nothing to worry about, the movie wouldn't be that bad.

Not at all - 1 2 3 4 5 - Very frequently

I thought about what I would do once the experiment was over.

Not at all - 1 2 3 4 5 - Very frequently

I thought about how stressful the film would be.

Not at all - 1 2 3 4 5 - Very frequently

I thought about my reactions to the film, e.g., anxiety, fear.

Not at all - 1 2 3 4 5 - Very frequently

I thought about how much longer it would take before the film would begin.

Not at all - 1 2 3 4 5- Very frequently

I thought about what the experimenter was doing.

Not at all - 1 2 3 4 5 - Very frequently

I thought about what the experiment was all about.

Not at all - 1 2 3 4 5 - Very frequently

FILM QUESTIONNAIRE

1. The name of the film is
" _____."
2. The film was produced by

3. _____ is on the band saw.
4. Wilson's job was to _____.
5. The name of the worker weaving a hat is _____.
6. At what time was Bob's child born? _____
Was it a boy or a girl? _____
7. The name of the worker with his middle finger missing is _____
_____.
8. Len Richie was working on the _____.
9. How many of Len Richie's fingers were cut? _____
10. Who in the film was weaving a tie? _____
11. In the last accident, which side of Bob is struck by the piece of
lumber? _____
12. The rip saw turns at a speed of _____ feet per second.
13. Blood drips out of the right/left side of Bob's mouth? _____
14. What is the name of the guard that Len Richie failed to use?

15. The worker in the second accident was working on a machine called a
_____.

16. What was the joke that one of the workmen cracked during the lecture by the foreman?
17. What were the 2 advantages given for raising the rip saw higher from the cutting table?
- a) _____
- b) _____
- _____
- _____
18. What percent of the worker's salary is given when he goes on "compensation" following an injury?
19. What was the number stamped on the front of one of the workers' overalls? Guess if you can't remember.
20. Which worker was wearing a moustache?

- a) What percentage of the time did you use the self-talk that you memorized? (Circle to the nearest ten percent)

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

- b) How effective did you find the self-talk in helping you cope with the stressful portions of the film?

Not too effective 0 1 2 3 4 5 6 7 8 9 10 Very effective

When you were making the statements throughout your viewing of the film, please indicate below why you think making these statements helped you cope with the film.

Appendix L (con't.)

We are also interested in finding out if, during the ten-minute waiting period before the film, you were rehearsing any of the items that you memorized. If so, please specify which ones and indicate beside each one the number of times you repeated these to yourself.