STRESS INOCULATION IN RELATION TO WAR

ELIZABETH NAIR, B.Psych.

Thesis submitted to the University of Nottingham
for the degree of Doctor of Philosophy.

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FOR KARAN, VIKRAM AND SUNIL

CONTENTS

ABSTRACT

This study is primarily concerned with the possible use and effectiveness of stress inoculation as a psychological preparation for combat. Initial fieldwork, in the form of a review of current practices and their supporting rationales, was carried out in military establishments in three small countries with conscript armies: Sweden, Switzerland and Israel. Commanders, Chief Instructors of Officer Cadet Schools, and military psychologists were interviewed: questions focused on the role, nature and evaluation of stress-related training. These data allowed a cognitive-behavioural model of the soldier in combat to be established, which identified various interventions to improve functioning during that combat. Using this model, a form of stress inoculation was constructed based on the Israeli procedure of group emotional reconstruction (GER) and involving aspects of Swedish audio-visual stress training. Subsequently, four laboratory experiments were conducted which considered the effectiveness of this stress inoculation procedure using a simulated combat stress scenario. These experimental studies were conducted with pre-conscript males in Singapore. Singapore shares common characteristics, geographical, economic, political, demographic and military, with the three countries visited.

Several interesting findings emerged. First, although there was some evidence of a stress inoculation effect in terms of differences in the pattern of mood change across the treatment and test sessions (between GER and control conditions in the first two experiments), there was no persistent or lasting difference. It was concluded that the validity of the GER procedure for stress inoculation was not proved. Second, in several of the experiments, subjects' levels of arousal were observed to be reduced on exposure to "disturbing" stimuli and at times when their levels of stress remained high. It was suggested that this change from a high stress: high arousal experience (eg anxiety) to a high stress: low arousal experience (eg boredom) might reflect the subjects' use of cognitive disengagement as a coping strategy. Third, at the end of each test phase, subjects in the GER condition showed some evidence of cognitive disengagement in their mood response, except in the last experiment when they were required to complete a performance test. Finally, when the performance test was introduced in the test phase, it appears to have served as a distractor from the experience of stress for subjects in all conditions. The results are discussed in the light of the existing literature on stress inoculation, and recommendations for further research are presented.

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The US ARI (European Office) sponsored my attendance at the Fourth International Conference on Psychological Stress and Adjustment in Time of War and Peace, held in Tel Aviv from 8-12 January 1989. Later the University of Nottingham sponsored my attendance at the International Applied Military Psychology Seminar in Spiez from 1-5 May 1989. I was able to present my research findings at these international forums of military psychology.

Thanks are also due to the Ministry of Education in Singapore for agreeing to the conducting of the experiments in the Junior Colleges. The Principals of the various Junior Colleges were indeed gracious to permit the use of their premises and audio-visual equipment, and arranging for the students to attend the various sessions of the experiments. Thanks are also due to the young men who did the experiments as subjects for data collection. They are earnest young men, who deserve the best in military training when they enlist as conscripts in the years ahead.

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PREFACE

The soldier in a combat situation is subject to a number of different stressors and different types of stressors, threatening not only his performance and physical and psychological survival but also those of his comrades-in-arms. These threats are real and various estimates of the psychological effects of combat have been attempted. During the Second World War, Allied troops sustained psychiatric casualties in different engagements at a rate of between 8 percent and 54 percent of all battle casualties. In the case of the U.S. army, evacuations for psychiatric reasons during this conflict totalled 23 percent of all evacuations (Holmes 1985), and much later in 1983, Israeli forces in the Lebanon suffered psychiatric casualties at a similar rate of 23 percent of all casualties (Shalit 1985; Solomon, Benbenishty and Spiro 1986). Estimates of the attrition rates in a future high-intensity conventional war suggest that, during the first thirty days of combat, psychiatric casualties will occur at about this rate, 25 percent of all battle casualties. Chermol (quoted by Holmes 1985) predicts that sustained nuclear, biological and chemical operations would cause an increase to 33 percent or even 50 percent. Somewhat similarly, effects on performance have also been estimated. In a private communication, Breznitz (1986) spoke of studies on the effects of induced combat stress on performance conducted under simulated conditions with Israeli soldiers. The findings from these experiments appear to have supported earlier observations by Marshall (1956) on the behaviour of the American soldier in the trenches in Korea in 1950. According to Breznitz (1986), 50 percent of the soldiers studied failed to fire a single shot because they were scared. Furthermore, about 16 percent of those that did fire, never aimed. Every third soldier appears to carry the burden of combat performance.

The failure to act in any way when under stress has been explained by Mooney (1962), in terms of what appears to be general systems theory, as the result of either an extremely "closed" or conversely, an extremely "open" system. Any unexpected occurrence may throw the soldier's perceptual processes out of gear. The new situation may be incomprehensible to them and all confrontative reaction may be suspended until something else happens or a new perceptual hypothesis is developed which leads to some tentative action. Conversely, the situation may be fully understood, so well so

that all possible lines of action seem equally ineffective or tragic in their consequences. Again no reaction occurs. In contrast a strong emotional reaction to the situation may only cause interference with the possibility of any adaptive response (Meichenbaum 1985). Psychological preparation for combat stress could thus result in better survival and performance from the soldiers at the front, if it managed to overcome these types of reaction. Effectively, soldiers need to be prepared in terms of their anticipation and understanding and also in terms of their emotional and behavioural reactions. Research in this area may thus serve the dual purpose of promoting the health and safety of the relevant personnel, and also the effectiveness and deterrent and defensive values of the system they represent. The first point may assume even greater significance in the case of civilian soldiers, that is, national servicemen and reservists who form the majority of military personnel in countries with conscription.

The objectives of this thesis are two-fold:

a) to add to our existing body of knowledge relating to the psychological preparation for combat stress by developing a model for combat stress management through an analysis of the current practices of several different military organizations, and

b) to test the phenomenology of self-reported stress and arousal in relation to coping in the context of mental preparation for combat stress.

The thesis begins with an introductory chapter which presents a review of research findings and reports in relation to combat stress management and the psychological preparation for combat, in particular stress inoculation training. The roles of the processes of stress and arousal, and the operation of habituation and defence mechanisms as coping devices, are examined. The objectives of the thesis are elaborated in this chapter.

The literature on 'shell shock' and post-traumatic stress disorder (Foy, Sipprelle, Rueger and Carroll, 1984; Laufer, Brett and Gallops, 1985), has provoked many questions on how to proceed in order to reduce the psychiatric casualties of combat. There may be a multitude of different answers, but amongst these, the published military research, for example Shalit (1982a), points to the cohesive military group as being resistant to

stress under conditions of war. The leader of the group often appears to be the key figure, one who is in a position to influence the development of and to maintain the cohesiveness of his group (Gal 1985). It was therefore decided to review the ways in which three conscript armies had incorporated training for combat stress into their Officer Cadet courses. Such combat stress inoculation, in this context, refers to any specific training which prepares the soldier for better performing his duties under the stresses of combat, without succumbing as a psychological casualty either on the scene or subsequently.

The second chapter goes on to review findings from visits to the conscript armies in Sweden, Switzerland and Israel and a cognitive-behavioural model of the soldier in combat is put forward. This is based on an integration of a systems (information processing) approach with aspects of its social psychology. A leader and group unit, within essentially an information-processing model of the soldier in combat, is faced with the associated tasks of performing well and staying alive. Stodgill (1969a) described leadership as a working relationship among members of a group, in which the leader acquires status through active participation and demonstration of his capacity for carrying cooperative tasks through to completion. The extent to which the officers in the three conscript armies are prepared for the leadership role in the face of combat stress reactions was investigated. The data collected were considered in the context of organizational initiatives in this regard. The GER procedure used by the Israeli Defence Force and the audio-visual experiential stress training of the Swedish Defence Force were identified as useful devices with sufficient similarities to be incorporated into a stress inoculation procedure that could be investigated under laboratory conditions.

Subsequent to this review, the role of self-reported stress and arousal in a controlled program of stress inoculation were studied through a series of experimental investigations. These were conducted with the objective of understanding the mechanisms of the coping processes in a trauma-inducing situation. Attention was also paid to the deployment of "defence mechanisms" as coping devices in situations where the stressors were not within the individual's control. An interesting study of emotion-focused coping was conducted by Folkman and Lazarus (1980, 1985).

Chapter 3 deals with the methodological issues involved in the experimental studies of stress inoculation and the procedures used. The statistical analyses, and instruments of research are also described.

Chapter 4 presents the first experiment which involved the comparison of the inoculation condition (GER) with a control condition and an alternative treatment condition that underwent progressive relaxation. The results demonstrated immediate treatment effects on stress for the GER condition. In addition, it was shown that arousal for the inoculation group, tended to be lower post test compared to post treatment. However, there was also an interesting practical paradox in that at the end of the test session, the stress levels for all conditions were similar. It is likely that the stress inoculation effect was confounded by the experimental design. Subsequent chapters were devoted to resolving this issue. This was investigated by varying the nature of the GER procedure to make it more emotion-focused, and by varying the time interval between the treatment and test phases, in the next two experiments. The number of subjects in the GER and control conditions were also increased.

Chapter 5 reports on the second experiment which attempted to compare the effects of the GER and control conditions as in the first experiment, but using a larger sample in each condition. The qualitative nature of the GER procedure was strengthened to include an emphasis on personal involvement, and responses based on subjective likely response in a similar situation. Information about combat stress reaction symptoms and in particular its effect on military performance were quietly provided. The results suggested a stress inoculation effect but only in terms of the pattern of change in mood over the treatment and test sessions. There was no convincing evidence of the persistence of this effect. Interestingly, changes in arousal scores were also observed. It appeared that some subjects in a stressful situation were using 'mental disengagement' to cope with their experience.

Chapter 6 reports on the third experiment which introduced a longer interval of time between treatment and test phases, but using standard GER and the neutral control conditions. This time the personal involvement element was not highlighted in the discussion, to check for the effect on the stress and

arousal trends. The pattern was similar to that observed in the first experiment. Stress scores were affected at the treatment phase but were not significantly different after the test phase. There was evidence of the use of mental disengagement by subjects in both the conditions post test.

Chapter 7 reports on the final experiment which introduced a cognitive performance task at the test phase. There was also an alternative treatment condition in this experiment, one which viewed the same aversive war documentary as the GER condition, but who were then instructed to peruse magazines within the room, and not to engage in any conversation. The effect on subjects in the condition who read magazines was identical during the treatment phase, to that observed for subjects in the relaxation condition in the first experiment. Even though they had viewed the aversive war documentary, reading of magazines immediately after that resulted in a significant lowering of stress and arousal levels. The cognitive task at the test phase appears to have served as a distractor, and subjects in all the conditions obtained similar scores on stress, arousal and the cognitive task.

Chapter 8 offers a discussion of the experimental results. It spells out consistent findings across experiments and considers the different trends observed for stress and arousal with the different procedures. Implications of the results are discussed in the context of other research in the area. The thesis concludes with recommendations and covers the directions that the data indicates for further research.

The research undertaken in this thesis was described and discussed in some detail at the Fourth International Conference on Psychological Stress and Adjustment in Time of War and Peace held in Tel-Aviv from 8-12 January 1989, and would appear to have been, at that time, amongst the fore-runners in the field of combat stress inoculation. The cross-cultural study and the initial experiment were presented at the International Applied Military Psychology Seminar in Spiez from 1-5 May 1989. There were participants from the three countries studied, as well as from many other European countries, USA and Canada. The paper was well received at this open forum. There is currently much interest in this area, though little has been done in the way of concerted research efforts, and very little is available in the way of published reports in the open literature. However, as Hobfoll (1988)

underscores, the lack of research on stress and war does not in any way reflect the importance of this topic. It has been an interesting endeavour to enter virtually unexplored territory, and an effort that the researcher has found personally encouraging and fulfilling, in the light of its potential for practical application.

Elizabeth Nair
Nottingham and Singapore,
July, 1989.

CHAPTER 1. INTRODUCTION.

This introduction to the thesis proper is concerned with the scientific literature as it relates to combat stress inoculation. It was recognized at the outset that there is little that has been published in this area in the open literature, and in order to provide a more substantive base for the research, two decisions were taken. First, the issues of interest were very broadly defined, and second, some attempt was made to trace relevant information published by the "military establishment". The details of the search strategy are provided so that the reader may judge the validity of the original conclusion.

Topics included in the literature search.

The literature search initially focused on the general topics of stress, combat stress, stress inoculation and stress management in a military context. Reports on the role of leadership and group psychology in combat stress management were requested. The search was then broadened to include papers more generally concerned with cognitive-behavioural stress management, arousal and performance under stress. Attention was also paid to the literature on post traumatic stress disorder, and to reports dealing with the long term mental health and well being of soldiers of the United States.

Search Strategy.

The library research commenced with a series of literature searches using the DIALOG database, and these are described below. These were conducted between October 1986 and January 1989. British and U S sources were then contacted for access to the military literature, and arrangements were made to visit British and American Army research groups in the U K: Army Personnel Research Establishment, and the U S Army Research Institute (Europe). Together with existing text libraries and earlier searches conducted by the Stress Research Group, it was hoped that this would provide sufficient coverage of existing research on the subject.

(a) PSYCINFO, PsycALERT and NTIS.

The PSYCINFO database on psychology and related disciplines in the behavioural sciences was accessed, using the DIALOG Information Retrieval Service. This database is built up by scanning over 1,300 periodicals and technical reports worldwide to provide coverage of original research, reviews, discussion, theory, conference reports, dissertations, case studies, and descriptions of apparatus. PsycALERT was searched to access the very latest research in the field. This database draws material from the same 1,300 domestic and international journals and serial publications. Newly published material is later transferred to the companion file, PSYCINFO. The NTIS (National Technical Information Service) database consists of government-sponsored research and development. This database includes analyses prepared by federal agencies, their contractors or grantees. It is a listing of unclassified, publicly available, unlimited distribution reports. This was also accessed.

(b) SOCIOLOGICAL ABSTRACTS and SOPODA.

The SOCIOLOGICAL ABSTRACTS database was also accessed, using the DIALOG Information Retrieval Service. SOCIALOGICAL ABSTRACTS (SA) and its subfile, Social Planning/Policy and Development Abstracts (SOPODA), are produced by Sociological Abstracts, Inc., and correspond to the printed indexes of the same names. While contributions covered in both address the same substantive social problems, the result of research in SA is usually theoretical, or methodological, and related to the concerns of professional sociology, while the research in SOPODA focuses on finding solutions to the problems addressed. SOCIOLOGICAL ABSTRACTS staff screen approximately 1,600 journals and other sources published worldwide, for relevant material.

(c) MEDLINE and EMBASE.

MEDLINE (MEDLARS onLINE), is produced by U S National Library of Medicine (NLM), and is one of the major sources for biomedical literature materials. MEDLINE corresponds to three printed indexes: "Index Medicus", "Index to Dental Literature," and "International Nursing Index".

EMBASE, produced by Excerpta Medica, is an important comprehensive index of the world's literature on human medicine and related disciplines. About 300,000 records are added annually, over 60% of which contain abstracts. Each record is classified and indexed by medical research specialists, who assign terms and codes in accordance with a highly developed classification schedule and controlled vocabulary. EMBASE provides access to periodical journals from more than 3,500 primary journals from over 110 countries. An additional 1,000 journals are selectively screened for relevant articles.

Various library searches were also conducted for books on the subject. These included libraries in universities and organizations in the U K as well as abroad, including Israel, Sweden and Singapore. This total search strategy yielded many reports on the incidence and treatment of post traumatic stress disorder. However there appeared to be little published on programs or training designed to minimize the incidence or ameliorate the effects of combat stress leading to psychological casualties.

Research conducted by military establishments.

The U S Army Research Institute (Europe) was contacted. Research conducted at various military establishments in the U S is not available from generally published sources. However, the Chief of Research at ARI (London) was instrumental in acting as a link with the various centres in the U S to obtain copies of their research reports. Research reports were also obtained from FOA (Forsvarets Forskningsanstalt), the National Defence Research Institute in Karlstad, Sweden. Reports were also received from the Defence and Civil Institute of Environmental Medicine in Toronto, and from various other establishments of the Canadian National Defense. The Behavioral Science Department, Mental Health Department and Field Forces Headquarters of the Israel Defence Force also provided copies of research they had conducted. These reports pertained more to stress management training with non-clinical groups, and specific applications within a military context with a preventive perspective as far as combat stress reaction is concerned.

REVIEW OF LITERATURE.

This literature review deals with a range of issues from the general perspective of stress, stress management and stress inoculation, to their specific applications in the combat scenario. Three different levels of possible intervention are referred to in the review: prevention (stress inoculation); immediate management (of combat stress reaction, and field management principles for example, the role of activity, and the dissemination of information); and finally, the treatment of post traumatic stress syndrome cases. This model of intervention has been usefully applied to the management of "violence " in the workplace (Boot, Cox and Smith, 1987).

The review begins by looking at definitions of stress and sources of potential stressors in the combat situation. It then discusses the concept of stress inoculation, focusing on the process of cognitive restructuring. The term "combat stress inoculation" is then set out and its definition attempted.

1. STRESS: COGNITIVE AND EMOTIONAL.

Section 1 reviews the literature on the generic term "stress", as employed in the behavioural sciences. A cognitive and emotional perspective is adopted in this review. The following topics are discussed in sequence: an interactional model of stress; emotional concomitants of stress; conceptualizing coping under stress; measurement of stress; self-report mood inventory; and stress and arousal.

Selye (1974) defined stress as the nonspecific physiological response of the body to any demand made upon it, essentially a biological definition. Generally, such "biological" models have not proved as powerful as first hoped, and particularly in the occupational and clinical literature have been replaced by more "psychologically" orientated theories. Lazarus (1966) equated psychological stress with cognitive factors leading to the evaluation of threat. More recently, (Lazarus, 1988), has presented an approach to stress which is essentially transactional, process-orientated, contextual, and meaning-centred. As such stress is viewed as a process, rather than a static condition: it is a psychological state that changes over time and across

diverse encounters. This state reflects the transactions which occur between the person and their situation or environment. In his view, a transaction is stressful only when it is evaluated by the person as harmful, threatening or challenging to that person's well-being. He refers to this evaluation as appraisal, and considers that there are two basic kinds of appraisal: primary and secondary. Primary appraisal concerns whether or not the encounter has any personal significance. Secondary appraisal concerns the available coping options for dealing with the harm, threat, or challenge.

1.(1). Interactional model of stress.

Cox (1978) put forward an interactional model of stress, which takes into account and integrates its various physical, social and cognitive aspects. He attempts an all encompassing definition, essentially cognitive and evaluative, without losing sight of its physiological and psychological implications. Cox (1985) describes stress as an individual psychological state related to the person's perception of the (work) environment and their (emotional) experience of it. The stressful situation is described as one in which the person's resources are not well matched to the level of demand placed on them, and where there are constraints on how they can cope and little social support for coping (Cox 1987).

Cox (1987) has suggested that the process of cognitive appraisal offers a continual monitoring of at least four aspects of the person's interaction with their environment, and a continual evaluation of the balance between them. He argues that cognitive appraisal takes account of the person's perception of:

(1) the demands on them,

(2) their personal characteristics and coping resources - their knowledge, attitudes, skills and behavioural style,

(3) the constraints that they are under when coping, and

(4) the support they receive from others in coping.

This perspective on stress is more encompassing than many of the earlier models, in particular, in acknowledging the role played by constraints and social support.

1.(2). Emotional concomitants of stress.

In addition to its cognitive and perceptual elements, the state of stress is often defined by the person's experience of negative emotion (stress emotions: Kagan 1975), unpleasantness or general discomfort. Together these normally initiate a cycle of changes in the person's perceptions and cognitions, and in their behavioural and physiological function. Some of these changes are more controlled than others. Those that are deliberate attempts at mastering the problem situation, or attenuating the experience of stress have been termed coping (Lazarus, 1966). The success or failure of attempts to cope feeds back and influences the person's perception of their ability to cope and their overall appraisal of the stressful situation (Cox, 1987).

1.(3). Conceptualizing coping under stress.

Meichenbaum (1977, 1983) and Cox (1987) proffer the conceptualisation of stressful situations as problem situations and coping as a form of problem-solving behaviour. In this vein, Schonpflug (1983) argues that the experience of stress is, more precisely, related to failed problem solving. Thus, not every attempt at a solution will be successful, or success may be a matter of degree. Over reacting to such failure has been called 'catastrophizing' by Meichenbaum (1983), and said to serve no adaptive purpose. However, such failures could be viewed positively, as they may provide useful information: learning from experience. In reality, learning from experience may prove difficult for the following reasons, proposed by Einhorn and Hogarth (1981):

(1) one does not necessarily know that there is something to be learned,

(2) what is to be learned is not clear, and

(3) there is ambiguity in judging whether one has learned.

In addition, there are problems of channel capacity and situation specificity (Cox, 1987). Thus, the problem solver may be fully occupied with coping, and not have any spare cognitive capacity available for learning, or the emotion which is often associated with stress may interfere both with the learning process and with thought processes in general (Mandler, 1982). In addition, whatever is learnt may be specific to the stressful context in which learning

occurred.

Folkman and Lazarus (1980) consider coping to be the cognitive and behavioural efforts a person makes to manage demands that exceed personal resources. They consider (Folkman and Lazarus, 1985) that coping has a profound effect on psychological stress and emotional states as a result of what it does to the appraisal process, which is the proximal cause of the stressful or emotional reaction. In problem-focused coping, efforts are directed at changing the environment. In emotion-focused coping, efforts are directed at regulating the emotional distress caused by harm or threat. Various strategies for this are described as avoiding thoughts about sources of distress and changing the meaning of what is happening or what will happen. These processes are referred to variously as denial, positive thinking, and distancing.

Horowitz (1979) observed that denial may serve two purposes. It may dampen ideas and feelings that would distract the person from action that was needed immediately. Second, it allows the person to adjust gradually to unpleasant information (loss of limb or disfigurement), a process called 'dosing'. As a temporary defence mechanism, denial is extremely important immediately after some stressful experiences. Warburton (1979) underscores that more research needs to be undertaken in therapeutic situations to understand in what circumstances the use of denial may be encouraged, and in what way it might retard recovery. Similarly, Horowitz (1979) considers that the other defence or control operations may aid or impair adjustment and a rational strategy for the treatment of stress disorders depends on obtaining an understanding of these control operations.

Janis (1971) hypothesized that when fear is strongly aroused but is not fully relieved by the reassuring statements contained in a persuasive communication, subjects will become motivated to ignore, minimize, or deny the importance of the threat. He referred to this as the defensive avoidance hypothesis. Carver, Scheier and Weintraub (1989) described mental disengagement as a coping device, particularly useful when the situation cannot be physically altered. Using alternative activities to take one's mind off a problem is seen as a tactic that reflects mental disengagement. Gal and Lazarus (1975) reviewed the adaptive potential of activity in stressful

situations. Activity in this context can provide: (a) a sense of mastery and control, (b) a means of attention diversion, and (c) a means of discharging energy generated by mobilization.

1.(4). Measurement of stress.

Cox (1985) argues that as stress is an individual psychological state there can be no direct physiological measures of stress. The measurement of stress must by definition focus on the individual's psychological state, as related to their perception of the environment and emotional reaction to it (mood).

This is supported by the position adopted by Bermond and Frijda (1987) that there is no solid evidence that the feedback of peripheral emotional responses necessarily induces or intensifies the emotional feeling. They conclude that emotional feeling is the result of central processes only, and that these central processes are induced by the appraisal and the perceived coping difficulty. The appraisal, among other things, is influenced by the hormonal state of the individual.

There appears to be an immediate response to the perception of a stressful situation in the form of a negative emotional (unpleasant) experience. There is however, no single diagnostic stress emotion, rather there is a variety and mixture of negative feelings (Kagan, 1975), probably reflecting individual disposition as well as situational factors. For an otherwise normal population, this reaction may be reflected in a general change in mood. This immediate response is of interest because it provides the person with a signal or criterion by which he can identify stressful situations and then monitor their own progress in dealing with them.

The logical (first) step is thus to ask the person about their emotional experiences or mood in relation to the situation at work. This means using state-dependent subjective data. The methods used to collect such data should be shown to be reliable, valid and fair. There is little reason why they should not be as reliable as performance or physiological measures, if employed properly under controlled conditions, and their validity and fairness can be tested in the same way as those of other types of measure. Together, these three criteria are of great importance and should be

evaluated for all methods of data capture, not only those which are subjective. The measurement of mood offers one direct method of tapping the individual's experience of stress.

1.(5). Self-report mood inventory.

A number of research studies on self-reported mood have now employed the stress-arousal checklist (SACL) developed by Cox and Mackay, originally published in the British Journal of Social and Clinical Psychology (Mackay, Cox, Burrows and Lazzerini, 1978). (See Chapter 3. Methods, for more detail on the SACL). The model of mood which underpins the SACL is two-dimensional. One dimension appears to relate to feelings of unpleasantness/pleasantness or hedonic tone, and the other to wakefulness/drowsiness or vigour. The first dimension has been termed stress and the other arousal. The reliability of the associated scales has proved acceptable (Cox and Mackay, 1985), and the utility and validity of the measures have been satisfactorily tested in a number of studies, for example, King, Burrows and Stanley (1983); Godwin (1985) and Ray and Fitzgibbon (1981). The SACL defines the experience of stress in terms of a number of commonly used mood-describing adjectives.

1.(6). Stress and arousal.

Mackay et al (1978) underlined the distinction between stress and arousal measures which arise from the Cox and Mackay model of mood. The stress factor was envisaged as an internal response to the perceived favourability of the external environment, the arousal factor as representation of ongoing autonomic and somatic activity. Cox, Thirlaway and Cox (1982) report that feelings of unpleasantness/pleasantness (stress) may partly reflect how appropriate the level of arousal is for a given situation, and the effort of compensating for inappropriate levels. Research by Godwin (1985) with Australian Antarctic expeditioners supports the finding of an orthogonal relationship between stress and arousal. Cox (1985) emphasizes that the notion of a stress state is different from that of an arousal continuum (wakefulness/alertness/vigour) and the two concepts should not be confused. Thus demand or challenge may be arousing but do not necessarily produce a state of stress. This distinction is of importance for the research

carried out and reported in this thesis.

1.(7). Other measures.

There is sometimes a naive expectation that the different responses to and measures of stress will be intercorrelated, and collectively, they should describe a general stress syndrome, demonstrable by factor analysis for instance. Repeated failure to demonstrate a tight pattern of intercorrelations has led many to reject stress theory. The reasons in fact for not expecting such intercorrelations relate to the nature of the measurement methods used and the temporal characteristics of the response systems. The reasons as itemized by Cox (1985) are:

(1) the nature of the measurements: snap shot, cumulative or continuous,

(2) the latency, amplitude and duration of the changes measured,

(3) the specificity and responsiveness of the underlying systems, and

(4) the dynamic nature of those systems.

This position encompasses the earlier laboratory observations made by Lazarus, Speisman, Mordkoff and Davison (1962) with regard to measures of autonomic nervous system activity as being independent of each other and the possibility that they are relating to different classes of psychological reaction. They also conclude that variability depends on the specific organ system or channel of reactivity being measured, and more importantly, the experimental conditions under which the measurement procedures have occurred.

Summary.

There has been prolific publication on the generic term "stress", in the last half century. Various definitions have been offered, and associated measuring instruments devised. In essence, the research has converged towards an eclectic approach, acknowledging the overall impact of external and internal processes, physical, mental and emotional, and most importantly, the part played by the individual's appraisal of their relationship with the total environment. The negative feelings that define the experience of stress, their effect on arousal, and their joint effects on

performance, are beginning to be appreciated in the occupational field (see Simpson, Cox and Rothschild 1974; Hockey and Hamilton, 1983; Hockey, 1983; Cox and Brockley, 1984). Reliable and valid measures of stress are required to assess individuals' state as a basis for designing and evaluating any stress related intervention.

1.1. STRESS INOCULATION: PREVENTION.

Section 1.1 reviews the literature pertaining to stress inoculation theory and research. Essentially, stress inoculation is defined as psychological preparation for stressful experiences which will reduce maladaptive reactions to those experiences. The section begins with disaster study reports, and moves on to procedures in stress inoculation, clinical applications of stress inoculation training, stress-inoculation in cognitive-behavioural modification therapy, applications beyond the clinical setting, and directions for stress inoculation research. This is followed with a review of the role of providing information, optimizing processing capacities, and the positive effects of providing stress inoculation. Finally there is a summary of the key variables for stress inoculation.

1.1.(1). Disaster studies and stress inoculation.

Wolfenstein (1957), in her review of disaster studies reports the impression that people who seemed to cope best and recover most quickly were those who received unambiguous warnings beforehand and who decided to take precautionary action on the assumption that they could be affected personally. She suggests that among people who deny that any protective measures are necessary up to the last moment, "the lack of emotional preparation, the sudden shattering of the fantasy of complete immunity, the sense of compunction for failing to respond to warnings" all contribute to the disruptive effect of an extreme event.

In his theoretical analysis of the psychological effects of preparatory information, Janis (1958), introduced the concept of "the work of worrying" to refer to the process of mentally rehearsing anticipated losses and developing reassuring cognitions that can at least partially alleviate fear or other intense emotions when a crisis is subsequently encountered. In his

view stress inoculation involves giving people realistic warnings, recommendations, and reassurances to prepare them to cope with impending dangers or losses. Any preparatory communication is said to enable a person to increase their tolerance for subsequent threatening events, as manifested by behavior that is relatively efficient and stable rather than disorganized by anxiety or inappropriate as a result of denial of real dangers. Janis (1985) reports that research with surgical patients indicates that preparatory information can inoculate people to withstand the disruptive emotional and physical impact of the severe stresses of surgery. Like people traumatized by an overwhelming wartime disaster, those who are not inoculated experience acute feelings of helplessness and react with symptoms of acute fright, aggrievement, rage, or depression.

For people who initially ignore or deny the danger, Janis (1971) considers the inoculation procedure to include three counselling procedures:

(1) giving "realistic information in a way that challenges the person's blanket immunity reassurances so as to make him aware of his vulnerability" and to motivate him "to plan preparatory actions for dealing with the subsequent crisis";

(2) counteracting "feelings of helplessness, hopelessness, and demoralization" by calling attention to reassuring facts about personal and social coping resources that enable the person "to feel reasonably confident about surviving and ultimately recovering from the impending "ordeal"; and

(3) encouraging "the person to work out his own ways of reassuring himself and his own plans for protecting himself."

Based on the surgery findings and earlier research from World War 11, Janis (1951, 1958), suggested that it should be possible to prevent traumatic reactions and to help people cope more effectively with any type of anticipated stress by giving them some form of "emotional inoculation" beforehand. Subsequently, Donald Meichenbaum (1977), called it "stress inoculation"

The term "stress inoculation" has been used in a clinical context by Donald Meichenbaum, especially in relation to training. He develops the concept by applying a medical model in that analogous to medical inoculation, stress inoculation training is designed to build "psychological antibodies," or coping skills, and to enhance resistance through exposure to stimuli that are strong enough to arouse defenses without being so powerful as to overcome them. In this way, the individual can (a) develop a sense of "learned resourcefulness" through experiencing success in coping with manageable levels of stress, and (b) build a prospective defence composed of skills and positive expectations that will help him deal effectively with even more stressful situations.

1.1.(2). Stress inoculation in cognitive-behavioural modification therapy.

Meichenbaum's particular form of stress inoculation is essentially based on a "cognitive-behavioural modification" form of therapy (Meichenbaum 1977; Meichenbaum and Turk, 1982a). Their procedures include three main steps.

(1) An initial educational phase, to help the clients reconceptualize their anxiety symptoms so that what they say to themselves when confronted with the phobic situation will no loger be self-defeating but will be conducive to effective action. A related goal is to enable the client to grasp a more differentiated view of anxiety as comprising both cognitive appraisals of threat and physiological arousal.

(2) The client is helped to develop a new set of coping techniques that modify distressing cognitions and physiological arousal by encouraging the use of coping skills in his own repertoire. He is given training in new "direct-action" skills, such as relaxation exercises that can be used to reduce emotional arousal in anxiety-provoking situations. A major goal of this phase is to prepare the client to react in a constructive way to early warning signs, before the full onset of the anxiety symptoms. Cognitive coping skills are discussed in collaborative exchanges designed to help the client work out his coping strategies. The counsellor gives suggestive examples of positive self-talk that might promote effective coping, such as "I can handle this situation by taking one step

at a time."

(3) The new coping skills are applied to a graded series of imaginary and real stress situations. The procedures are based on the pioneering work of Seymour Epstein (1967), who emphasized the importance of "self-pacing" and exposure to small doses of threat in the acquisition of coping skills for mastery of stress among men engaging in potentially dangerous activities like parachuting and combat flying. In the graduated practice phase of stress inoculation, the patient is given role-playing exercises and a series of homework assignments involving real-life exposures that become increasingly demanding.

Langer, Janis and Wolfer (1975) report that the positive effects of the cognitive coping techniques used with surgical patients may be at least partly attributable to attitude changes in the direction of increased self-confidence. The patients are encouraged to feel confident about being able to deal effectively with whatever pains, discomforts, and setbacks are subsequently encountered, which may help them to avoid becoming discouraged and to maintain hope about surviving without sustaining unbearable losses.

From the clinical research that has been done so far, it appears that a package treatment combining the various kinds of intervention that enter into this type of stress inoculation can sometimes be effective with some patients, but it is not yet known which interventions are essential and which are not (Meichenbaum and Turk, 1982b).

1.1.(3). Clinical applications of stress inoculation training.

Turk, Meichenbaum and Genest (1983) have reviewed the application of stress inoculation training in behavioural medicine. Medical populations to whom stress inoculation training has been applied include acute and chronic pain patients, and those suffering from a variety of medical problems like headaches, dysmennorhea, cancer, backaches, arthritis, and burns. In an anticipatory capacity, another major category to whom stress inoculation training has been applied are patients preparing for surgery and medical and dental examinations. A number of psychological techniques have been used

to teach medical patients coping strategies in order to reduce their preprocedural and preoperational anxiety and fear and their postoperative pain and suffering. As an illustration, Melamed and Siegel (1975) found that children who viewed a film depicting a peer coping with surgery demonstrated better preoperative and postoperative adjustment on a variety of measures than did control groups. Subsequent studies (Anderson and Masur, 1983), have suggested that coping models appear to be more effective than mastery or fearless models in reducing medically related anxiety.

Langer et al (1975) demonstrated a similar effect with adult surgery patients. They trained surgical patients to exercise cognitive control through selective attention, in order to distract themselves from negative aspects of surgery. Closely related to this is the work of Kendall (1983) and his colleagues in preparing patients for cardiac catherization. Their preventive program included pretreatment contact and presentation of the rationale of the program, followed by information concerning sensory, procedural, and coping response information. The latter was offered in the form of a self-disclosing coping model. These preliminary contacts provided the groundwork for the discussion and training of specific coping techniques such as relaxation, cognitive restructuring, and imaginal rehearsal. The training was tailored to the patient's particular coping style. Various potential internal and external stress cues were identified, so they could be used a signals to patients to employ their coping repertoires.

Meichenbaum (1985) emphasizes that any stress reduction intervention in a medical setting should be consistent with the transactional perspective, not only focusing on teaching patients coping skills, but also considering how aspects of their wider environment can be influenced, for example how administrative policies and interpersonal skills of communicating can be altered to reduce and avoid stress. Thus, systems-level interventions directed at medical staff like nurses, doctors and lab technicians is also advocated. Volicer and Bohannon (1975) have developed a hospital stress rating scale that provides an extensive list of hospital-related stress experience.

1.1.(4). Applications beyond the clinical setting.

There has been a wider application of stress inoculation training beyond the clinical setting to work with some professional groups like teachers, police officers, military recruit trainees and parachutists. However, some of the research is in unpublished reports (Meichenbaum 1985). Some elements of this concept have also been incorporated in the General Orders of the Israeli Defence Force as the process of cognitive restructuring that is institutionalized in a psychological debrief called group emotional reconstruction (GER), (Rogovsky and Baruch, 1983).

Specific occupational groups have been the recipients of SIT applications. These include work with nurses (West et al, 1984), police officers (Sarason et al, 1979), teachers (Forman 1982,1983), athletes (Smith 1980; Sipprelle 1967), scuba divers (Deikis 1982) and coaches (Smith, Smoll and Curtis, 1979). As an illustration, it was noted how coaches often use unclear instructions, verbal punishment, and infrequent praise, which result in a negative attitude in the athletes toward the coach, team mates, and themselves, and in turn, contribute to poorer performance. Thus, one way to reduce stress is to influence the way coaches interact with athletes. Smith et al (1979) used a cognitive behavioural approach to teach coaches how to model and use response-specific instructions coupled with positive feedback about the athletes' performances and more generalized encouragement.

1.1.(5). Directions for stress inoculation research.

In a summary evaluation report, Janis (1985) was of the view that the time has come to move on to a more sophisticated phase of research, to investigate systematically the conditions under which stress inoculation is effective. In this new phase of research, which has just recently begun, the investigators' primary purpose is no longer merely to evaluate the overall effectiveness of stress inoculation procedures, to find out if one or another compound treatment program is successful in building up tolerance for one or another type of stress, rather, the purpose is to find out which are the effective components of the stress inoculation treatments that have been found to be at least partially successful in past research and to determine the conditions under which each component has a positive effect on stress tolerance.

1.1.(6). Role of providing information.

All the research cited above shows at least two common elements in stress inoculation techniques:

(a) provision of information about "stressful" events and

(b) opportunity to discuss events and personal reactions with "informed" others.

One component of standard stress inoculation procedures consists of information about means for dealing with the anticipated stressful event, providing people with more adequate coping skills. One of two different kinds of coping recommendations are often included. The first is problem-focused coping (Folkman and Lazarus, 1980). This pertains to plans for action that will prevent or reduce objective damage that might ensue if the anticipated stressful events occur. The second, termed emotion-focused coping, involves cognitive coping devices, including attention-diversion tactics, mentally relaxing imagery, and the replacement of self-defeating thoughts with reassuring and optimistic self-talk, all of which can prevent or reduce excessive anxiety reactions. Work with medical and surgical patients has shown that a combination of predicting the adverse events that would be experienced with recommending coping actions proved to be the maximally effective form of stress inoculation (Johnson and Leventhal, 1974).

Over and beyond the coping recommendations themselves, reassuring social support may be needed to build up the patients' self-confidence and hope about surviving intact despite whatever ordeals are awaiting them (Caplan and Killilea, 1976).

According to a number of laboratory investigations, a person's degree of behavioural control is increased by reducing uncertainty about the nature and timing of threatening events (Ball and Vogler, 1971; Averill 1973; Seligman 1975). Several experiments indicate that people are less likely to display strong emotional reactions or extreme changes in attitude when confronted with an unpleasant event if they were previously exposed to a preparatory communication that accurately predicted the disagreeable experience (Epstein and Clark, 1970; Janis, Lumsdaine and Gladstone, 1951;

Lazarus and Afert, 1964; Staub and Kellett, 1972). These experiments show that advance warnings and accurate predictions can have an emotional dampening effect on the impact of subsequent confrontations with the predicted adverse events. Predictability may therefore be a crucial component in increasing stress tolerance. This hypothesis implies that when a person is given realistic preparatory information about the unpleasant consequences of a decision, he will be more likely to adhere to the chosen course of action despite setbacks and losses (Janis 1985). Janis further postulates that if future research verifies the hypothesis that predictability is a variable crucial to increasing stress tolerance, a subsidiary variable to be considered will be the vividness of the perceptual information that is presented, which might make images of expected stressful events more available, in the sense that Tversky and Kahneman (1973, 1974) use that term. Psychodramatic role playing, films, and other vividness enhancing techniques might increase the effectiveness of stress inoculation procedures by increasing the availability of realistic images of the predicted stressful events.

1.1.(7). Optimizing processing capacities.

Warburton (1979) suggests that as we come to understand the way in which we process information and develop integrated cognitive models as Rabbit (1979) suggests, then we can train people to optimize their processing capacities. When the changes that occur with information overload are understood, this will enable designing of tasks to allow for the inevitable shift in the balance of cognitive abilities that occurs with high levels of stressors.

Janis and Mann (1977) describe several basic patterns of coping with realistic threats derived from an analysis of the research literature on how people react to emergency warnings and public health recommendations. They postulate that under conditions in which people are aware of serious risks for whatever alternative actions are open to them, there are three main coping patterns, each of which is assumed to be associated with a specific set of antecedent conditions and a characteristic level of stress:

1. Defensive avoidance. Here the decision-maker evades the conflict by procrastinating, shifting responsibility to someone else, or constructing wishful rationalizations that bolster the least objectionable alternative by minimizing the expected unfavourable consequences and remaining selectively inattentive to corrective information.

2. Hypervigilance. Here, the decision-maker searches frantically for a way out of the dilemma and impulsively seizes on a hastily contrived solution that seems to promise immediate relief, overlooking the full range of consequences of his choice because of emotional excitement, repetitive thinking, and cognitive constriction (manifested by reduction in immediate memory span and by simplistic ideas). In its most extreme form, hypervigilance is referred to as "panic".

3. Vigilance. The decision-maker here searches painstakingly for relevant information, assimilates it in an unbiased manner, and appraises alternatives carefully before making a choice.

Defensive avoidance and hypervigilance may be adaptive, though they generally reduce one's chances of averting serious losses. They are therefore regarded as defective patterns of decision-making. Vigilance generally leads to careful search and appraisal, effective contingency planning, and the most adequate psychological preparation for coping with unfavourable consequences that might otherwise induce postdecisional regret and backsliding. According to Janis and Mann (1977), the vigilance pattern occurs only when three conditions are met: The person must (1) be aware of serious risks for whichever alternative is chosen; (2) hope to find a satisfactory alternative; and (3) believe that there is adequate time to search and deliberate before a decision is required. If the second condition is not met, the defensive avoidance pattern occurs, if the third condition is not met, the hypervigilance pattern occurs. In order to prevent defensive avoidance, preparatory communications are needed to meet the second of the three essential conditions for promoting a vigilant coping pattern.

1.1.(8). Mechanisms underpinning stress inoculation.

Closely related to patients' attitudes of self-confidence and hope are their beliefs about being able to control a stressful situation. Stress inoculation may change a patient's expectations of being in control of a dangerous situation, both with regard to the external threats of being helpless to prevent physical damage and the internal threats of becoming panic-stricken and losing emotional control. The stress inoculation procedure used with surgical and medical patients typically include statements designed to counteract feelings of helplessness and to promote a sense of active control (Turk 1978). Janis (1985) postulates that perhaps many of the preparatory communications used for purposes of stress inoculation have essentially the same effect on the patients' perceived control over distressing environmental events, which could increase their self-confidence and hope.

Another psychological component that may contribute to the positive effects of stress inoculation is the heightening of commitment. Research on commitment indicates that each time a person is persuaded to announce his intentions to an esteemed other, such as a professional counsellor, they become anchored to the decision not just by anticipated social disapproval but also by anticipated self-disapproval (Janis and Mann, 1977). Thus when patients are induced to acknowledge that they are going to have to deal with anticipated losses, this is tantamount to making more elaborated commitment statements to a counsellor. The stabilizing effect of commitment, according to Kiesler's (1971) research, is enhanced by exposure to a mildly challenging attack, such as counter propaganda that is easy to refute. A stress inoculation procedure for medical treatments or surgery might serve this function by first calling attention to the obstacles and drawbacks to be expected (which is a challenging attack) and then providing impressive suggestions about how those obstacles and drawbacks can be overcome (which may dampen the challenging attack sufficiently to make it mild). Along with inducing increased commitment, stress inoculation tends to build up a sense of personal responsibility on the part of the patient.

For certain types of persons, stress inoculation has been found to have no effect and occasionally even adverse effects. Janis and Mann (1977) postulate a theoretical model of coping patterns on the basis of which they

state that certain people can be expected to be highly resistant to communications that attempt to induce the conditions that are essential for a coping pattern of vigilant search and appraisal. When opportunities for stress inoculation are made available, personality factors may play a role in determining who will choose to take advantage of those opportunities and who will not. A study by Lapidus (1969) of pregnant women indicates that when preparatory information about the stresses of child-birth is offered free of charge, passive-submissive women who are most in need of stress inoculation are unlikely to obtain it if it is left up to them to take the initiative. A similar point is made by Howarth and Dussuyer (1988) and is referred to as the 'helping paradox' by Nadler and Fisher (1986). On various indicators of field dependence-independence, cognitive control, and flexibility, the pregnant women who chose to participate in a program that offered psychological preparation for childbirth differed significantly from those who chose not to participate. The participants were more field-independent and displayed stronger tendencies toward active mastery of stress than the non-participants, many of whom showed signs of strong dependency and denial tendencies.

On the basis of work with female rape victims, Kidder, Boell and Moyer (1983) caution that in terms of preventive efforts, care must be taken that clients hold realistic assumptions. Prevention or treatment programs that nurture false hopes or provide an illusion of control when in fact little control is evident, can make participants more vulnerable to the deleterious aftereffects of victimization if indeed a trauma occurs.

1.1.(9). Key variables for stress inoculation.

Janis (1985) summarizes the key variables for stress inoculation, suggested by theory and prior research, as the following: (1) increasing the predictability of stressful events, (2) fostering coping skills and plans for coping actions, (3) stimulating cognitive coping responses such as positive self-talk and reconceptualization of threats into nonthreatening terms, (4) encouraging attitudes of self-confidence and hope about a successful outcome with related expectations that make for perceived control, and (5) building up commitment and a sense of personal responsibility for adhering to an adaptive course of action.

Summary.

The foregoing section has reviewed the literature on stress inoculation. The major work has been in the clinical field, in applications with individual patients. The main components include an educational phase with provision of relevant background information of what to expect in an anticipated trauma-inducing situation. This is followed by a skill-acquisition phase where specific coping behaviour is conceptualized and the details worked out. The final phase is a test and practice phase, where individual patients practice their newly acquired coping skills. There has been little in the way of conclusive or comprehensive evaluative work, particularly for individual components of the total stress inoculation package. There is a need for evaluative research to assess the relative impact of each of the components and its individual contribution to the total effectiveness of a program of stress inoculation. There is also a need to develop further, and assess the impact of stress inoculation procedures applied in a group context. This is particularly relevant in the face of cost-effectiveness of large-scale inoculation programs to meet the needs of large numbers of the population who may face specific stressors in the nature of their work environment, or in the face of an anticipated eventuality of a natural or man-made crisis incident.

1.2. STRESS INOCULATION IN TREATMENT PROCEDURES.

Although stress inoculation has been defined and developed as a procedure to psychologically **prepare** people for dealing with later stressful experiences, its methods have also been applied to the treatment of trauma. Section 1.2 reviews the use of stress inoculation procedures in treating extreme stress reactions as a result of trauma. It presents the application of cognitive-behavioural therapy with adult and child victims of rape and terrorist attacks. It also reviews applications of the process of "redefinition of belief systems" to enable or facilitate coping.

1.2.(1). Cognitive-behavioural therapy with victims of rape and terrorist attacks.

Stress inoculation training has been applied to "victim" populations such as rape victims and victims of terrorist attacks on a limited basis, for example, Veronen and Kilpatrick (1983), Ayalon (1983). The therapist in this context, allows clients to express and re-experience their feelings of shock, confusion, anger, depression, helplessness, fear, and anxiety, within a presumably supportive relationship.

Meichenbaum (1985) emphasizes however that the re-experience of traumatic events in an emotionally supportive environment is not in itself therapeutic. This is an important point. It is not just the discharge of emotions (catharsis) that is beneficial; the trainer has to use the clients' re-experience as a means of achieving a more adaptive appraisal of what happened to them and to help them regain a sense of self-efficacy (control) and enhance their self-esteem.

For example, Ayalon (1983) has described how this can be achieved by means of play and fantasy in cases of victimized children. In these cases, a variety of verbal and nonverbal devices can be used to enable victimized children to discuss, reenact, and reappraise traumatic experiences. Group discussion, drawing pictures, role-playing helpers and victims, puppet and fantasy play have been used in this context to facilitate such reappraisal. Ayalon (1983) also advocated the wider use of the school and the peer group to foster coping skills.

1.2.(2). Redefinitions of belief systems to enable coping.

Janoff-Bulman and Frieze (1983) noted that being a victim can threaten the assumptions and expectations clients hold about themselves and the world. The clients' belief in personal invulnerability, their perceptions of the world as meaningful and comprehensible, their assumptions that other people can be trusted, and their views of themselves as being competent and worthwhile persons, can be severely challenged. Self-questioning, feelings of insecurity, unworthiness, weakness, and perceptions of threat and danger might be evident (Meichenbaum 1985). The world might be viewed as threatening, and

the likelihood of a future recurrence of the trauma seen as high. Victimized clients often report that the way they see the world has changed in a major way. They can feel less trusting, experience feelings of fear and vulnerability, and feel that they can no longer control what happens in their lives. Cognitive restructuring procedures are useful in helping such victims reestablish a coherent and 'positive' conceptual system. The stress inoculation treatment is designed to help clients incorporate their experiences as victims (Meichenbaum 1985). For example, clients are made aware that they tend to be sensitized to react in a stressful manner to later milder stressors, if these show parallels with the original traumatic experiences. Forewarned clients can better understand and handle such reactions. Within this framework, intrusive repetitive thoughts can be viewed as a means of seeking meaning, of trying to sort out painful events, rather than as symptoms of maladaptive behaviour.

Taylor, Wood and Lichtman (1983) have applied stress inoculation training to help clients redefine the way they 'view' their reactions to trauma as well as the act of trauma itself. Two particular strategies or processes appear to have been used: (a) social comparison and (b) selective attention, for example, they might compare themselves with less fortunate others; they might create hypothetical "worst" scenarios of what could have happened; they might selectively focus on one aspect of the stressful event and view it in a more favourable light; or they might manufacture normative standards of adjustment that make their own adjustment appear exceptional. Essentially, it is how they appraise their victimization that influences how well they will function and survive psychologically. Both the trainer and the client have to determine when such processes of adjustment are adaptive or maladaptive.

2.1. COMBAT STRESS: SOURCES AND EFFECTS.

Section 2.1 reviews the literature on the combat scenario, combat as a source of stress, and the nature and symptoms of combat stress reactions.

2.1.(1). The combat scenario.

Stouffer et al (1949), in *The American Soldier: Combat and it Aftermath - Studies in Social Psychology in World War II, Volume 2* write that ground warfare requires the maximum of physical and emotional endurance. Particularly in the infantry, the most numerous group involved in fighting on the ground, the use of psychomotor skills are secondary to the more cognitive ones of observation and manoeuver, and these in turn are often subordinate to the issue of sheer endurance. Combat scenarios are almost infinitely varied, and there are literally thousands of perceptible combinations of important variables. Stouffer et al (1949) produced the following list of combat variables (pp.66), seen in Table 1.1.

Table 1.1 gives some indication of the large number of possible combinations of combat variables. However, within this, certain broad types of scenarios were observed to recur often enough to make them generally relevant to understanding the context of combat behaviour. Stouffer et al (1949) describe seven: (1) the classic picture of an advancing army fighting along an organized but flexible front; (2) infiltration warfare, where the opposing forces were often so intermingled that a front could hardly be said to exist;

	Variables in combat
1.	Terrain (jungle, plain, forest, open areas or cities and towns, fortified positions, level or hilly or mountainous, etc.)
2.	Climate and weather (all degrees of temperature, moisture, variability or monotony, etc.)
3.	Adequacy of supply (ammunition, food, water, clothing, shelter, equipment of all kinds).
4.	Adequacy of replacement system.
5.	Competence of leadership.
6.	Adequacy of troops' training.
7.	Adequacy of medical attention.
8.	Type and intensity of enemy resistance, including : a. Weapons used (tanks, artillery, planes, Infantry weapons). b. Intensity and duration of fire. c. Tactics (flanking attacks, frontal assaults, infiltration, night vs. day actions, etc.) d. Morale of enemy force (easy surrender or fanatical resistance).
9.	Types and numbers of supporting and cooperating arms (planes, artillery, tanks, heavy weapons, reconnaissance units, rifle companies, etc.)
10.	Adequacy of communication within the unit and with other units.
11.	Goal of the unit's mission, including : a. Defense against local counterattack. b. Defense against large-scale attack. c. Raid or reconnaissance in force to gain information and/or take enemy position and/or do specified damage to the enemy. d. Patrolling to explore enemy deployment or to take prisoners. e. Local attack with specified objectives. f. General attack, aimed at large-scale maneuvers.
12.	Success of antecedent action and prospects for success in ensuing mission.
13.	Duration and severity of combat without a rest.
14.	Casualties incurred.
15.	Anticipated duration of action; anticipated length of the war.

Table 1.1. A non-exhaustive list of variables in combat.

(3) assault on fortified positions which put a premium upon technical knowledge and skill; (4) assault on defended beaches or across defended water barriers; (5) defending a position against heavy enemy attack; (6) retreat following an enemy breakthrough; and (7) holding action, where the mission might be merely to hold a stable front, during intervals between more vigorous types of action.

Each scenario would engender different types of stresses. Apart from the various combat variables and scenarios, the event of combat in itself is a major stressor, and the next section expands on this aspect.

2.1.(2). Combat as a source of stress.

One of the all-pervading qualities of combat is that it is a source of stress to those directly and indirectly involved.

	Types of stress
1.	Threats to life and limb and health.
2.	Physical discomfort - from lack of shelter, excessive heat or cold, excessive moisture or dryness, inadequacy of food or water or clothing; from insects and disease; from filth; from injuries or wounds; from long-continued fatigue and lack of sleep.
3.	Deprivation of sexual and concomitant social satisfactions.
4.	Isolation from accustomed sources of affectional assurances.
5.	Loss of comrades, and sight and sound of wounded and dying men.
6.	Restriction of personal movement - ranging from the restrictions of military law to the immobility of the soldier pinned down under enemy fire.
7.	Continual uncertainty and lack of adequate cognitive orientation.
8.	Conflicts of values a. between the requirements of duty and the individual's impulses toward safety and comfort b. between military duty and obligations to family and dependents at home, to whose well-being the soldier's survival is important c. between informal group codes, as of loyalty to comrades, and the formal requirements of the military situation which may sometimes not permit mutual aid. d. between previously accepted moral codes and combat imperatives.
9.	Being treated as a means rather than an end in oneself; seemingly arbitrary and impersonal demands of coercive authority; sense of not counting as an individual.
10.	Lack of "privacy"; the incessant demands and petty irritations of close living within the group.
11.	Long periods of enforced boredom, mingled with anxiety, between actions.
12.	Lack of terminal individual goals; poverty and uncertainty of individual rewards.

Table 1.2. Stressors in combat.

Stouffer et al (1949) list the main sources of stress in combat, not necessarily in order of importance (pp. 77). This is reproduced at Table 1.2. The types of stress operative in any context would depend to a large extent on the specific scenario arising from various combat variables (see Table 1.1). In Stouffer et al's (1949) survey of combat infantrymen in Italy, 10 percent of the sample had seen less than 3 months of combat, and 54 percent 6 months of combat or more. Of these men, 87 percent said they had seen a close friend killed or wounded in action, and 83 percent said they had seen "a man's nerves crack up" at the front. Indications are that the effect of these streses are cumulative.

Not all the stressors listed in Table 1.2 are operative for all groups or individuals and in the Stouffer et al (1949) study, some combat soldiers never experienced certain of them. Depending upon circumstances, the intensity of any particular stress also varies greatly. However, fear of injury or death is potentially present among all combat personnel. Overall, combat as a prime occasion for deliberate risks to life and limb imposed severe stress, involving deep anxieties and primitive threats to personal integrity. In combat, the recurring evidences of death, destruction, and mutilation were observed to impose a sapping emotional drain upon the typical American soldier (Stouffer et al, 1949).

On modern battlefields, the noise of shells and small-arms fire is punctuated by the distinctive sounds of mechanised warfare - the squeaky rattle of tank tracks above the rumble of engines, the metallic clang of APDS rounds hitting armour, the "whup-whup-whup" of helicopters and the reverberating boom of high-performance aircraft. Holmes (1985) reports that several Falklands veterans remarked on the fact that the worst place to be during an air attack on the fleet was below decks. Not only was the noise amplified, but there was no way of knowing what threat it portended. It was infinitely preferable, although actually more dangerous, to be up on deck, watching the Argentinian Skyhawks as they ran the gauntlet of gun and missile fire.

2.1.(3). Combat stress reactions.

This section reviews the literature on the more immediate stress reactions to combat. These overlap to some extent with the delayed stress reactions more

correctly labelled as post traumatic stress disorder (PTSD). The latter is reviewed in Section 2.3 of this chapter.

Bar-On, Solomon, Noy and Nardi (1986) reviewed the literature on psychiatric casualties in World War I (Grinker and Spiegel, 1945; Menninger 1948), World War II (Mullins and Glass, 1973), the Vietnam War (Figley 1978), and the Arab-Israeli War of 1973 (Adler 1975; Arieli 1974; Sohlberg 1975). They also investigated the frequencies of symptoms reported by Israeli soldiers in the Lebanon War. A frequency table of most frequently reported symptoms is reproduced as Table 1.3, with the permission of the authors.

To compare the clinical picture in the five wars studied, the eight most frequently reported symptoms are identified in Table 1.3 by the letter X. Interestingly, for the Vietnam War, only five symptoms appear to meet the report's criterion of frequency. There are also four symptoms mentioned in the final study, Bar-On et al (1986), which are listed above (see 15, 17, 19 and 24), but were not amongst the most frequently reported for any of the five wars. Some of the more interesting symptoms mentioned in Table 1.3 are described in a little more detail below.

In discussing these symptoms, Bar-On et al (1986) describe fears (4) as either well-defined, war-related phobias (for example, fear of touching weapons) or diffuse feelings of intense panic. Social detachment (5) refers to both physical and affective withdrawal from others. Conversion reactions (6) cover the gamut of limb paralysis, blindness, deafness, aphonia, and fainting. Psychomotor disturbances and disorders (11) are equally distributed between mild agitation and moderate psychomotor retardation, with the former frequently turning into the latter, but not the reverse. Disturbing dreams and memories (12) were vivid, war-related, upsetting experiences and were a major cause of sleep disturbance. Flashbacks were a frequently reported phenomenon in which one relived traumatic experiences, "seeing, hearing and even smelling the battle scene as if it were really happening all over again."

Symptom	1982	1973	1968	1941	1919
1. Anxiety	X	X		X	
2. Depressive affect	X	X			X
3. Sleep disturbance	X	X		X	
4. Fear	X	X			X
5. Social detachment	X		X		
6. Conversion reactions	X	X		X	X
7. Crying	X				
8. Decreased appetite	X			X	
9. Headache				X	
10. Exhaustion				X	
11. Psychomotor disorder		X			X
12. Dreams and memories	X			X	
13. Tremor					X
14. Poor concentration					X
15. Poor communication					
16. Dissociative states	X				X
17. Irritability					
18. Aggressive behaviour			X		
19. Poor memory					
20. Noise sensitivity					X
21. Discipline problems			X		
22. Substance abuse			X		
23. Gastrointestinal				X	
24. Guilt feelings					
25. Constricted affect			X		

Table 1.3. Symptoms of combat stress reactions in different wars.

Impairment in communication (15) took the form of slow or of rapid speech, and of mumbling and stuttering. Stuttering, like enuresis, was usually a reactivation or exacerbation of earlier existing problems in childhood. Dissociative states (16) ranged from verbalizations (for example, "It didn't happen to me ") to disoriented, even bizarre behaviour (for example, rolling on the floor and talking to a dead friend while going through the motions of trying to put together the pieces of the friend's dismembered body). The other behaviours listed in Table 1.3 are self-explanatory.

Flight Behaviour.

Bar-On et al (1986) suggest that just as fighting behaviours follow patterns established by military and societal training, the military establishment also defines the various categories of *flight* behaviour and has established its

response to each, according to its wider objective. It understands that life-threatening situations lower the response threshold for flight reactions for all soldiers. Accordingly, it sets up a series of checks and balances, so as to permit evacuation, hopefully temporary (from the army's point of view), from the combat zone to a designated few men for prescribed reasons only. Bar-On et al (1986) contend that the dominant clinical picture of each war is best understood in terms of the nosological label in use at the time and the "exit ticket" required for evacuation from the combat zone. They suggest that an implicit understanding prevails in any given war between symptom presenters and symptom evaluators.

Thus in World War I, the exit label was "shell shock". The requisite behaviours for this diagnosis reflected the consequence of this shock: tremor, noise sensitivity, and poor concentration, symptoms that were not cited for high frequency in any other war. In World War II, the term "combat exhaustion", or the colloquial term "battle fatigue", was used to refer to combat stress reactions. Incapacitated soldiers went to "exhaustion units" for treatment. The label included such psychosomatic symptoms as physical exhaustion, gastrointestinal discomfort, and headaches, symptoms not noted in any other war. There were other symptoms associated with fatigue that were noted in other wars, for example, sleep disturbance and decreased appetite.

This nosological label had gone out of use by the time of the Vietnam War. One of the few diagnoses in the psychiatric diagnostic manual in use at the time, DSM II (American Psychiatric Association, 1968), that appeared acceptable to the military authorities to release men from duty was "transient adjustment reaction of adult life". This diagnosis appeared sufficiently benign and reversible so that the soldier was not stigmatized by the label. From the military point of view, the term did not imply that fear, cowardice, or poor motivation was a sufficient cause for even a temporary release from one's military duties. The authors argue that it is therefore not surprising that conduct and character disturbances, reflected in antisocial and/or aggressive behaviour and in substance abuse, were the major symptoms cited. The exit ticket from the combat zone in the Vietnam War was more likely to be disciplinary rather than psychiatric.

The two Israeli wars, the October 1973 Yom Kippur and the 1982 Lebanon War, were similar in terms of expressed symptoms and differed drastically from the other wars. Notwithstanding widespread use of the term "helem krav" or battle shock, combat stress reactions were defined in mental health terms as transient psychiatric phenomena. Exit criteria in the two Israeli wars were more "psychiatric" in character than those of the other wars, and gave prominence to fear, anxiety, and depression. The authors contend that if these were made freely available as exit criteria in the other three wars, the number of combat stress reactions would have soared. They consider that the Israel Defence Force has been able to acknowledge these widespread reactions as a basis for exit behaviour because of strong societal and military pressures on soldiers to conduct themselves well in combat. Since the wars conducted by Israel are regarded as wars of national survival or national consensus, most Israeli soldiers regard those who are evacuated for nonphysical injuries as objects of sympathy or alternately scorn, but not envy. This accounts for the relatively low percentage of psychiatric casualties in Israeli wars in spite of the wide latitude of the symptoms in the exit criteria, and the high percentage of soldiers with acute combat stress reactions returning to their units.

There are alternative explanations for the similarities and differences in the clinical picture of the five wars, and the explanations are not mutually exclusive. Considering that verbal concepts affect our selective attention and our interpretation of what we see, it is not surprising that evaluators seeking to confirm or reject a hypothesis of combat stress reaction in a given case may overestimate the frequency of confirming symptoms and underestimate the frequency of symptoms that are not criterial. Similarly, soldiers unable or unwilling to persist in the combat soldier role select those features of the symptom panorama that constitute even a temporary respite from a situation they have come to regard as intolerable. Awareness of the label effect may enable psychiatric policymakers to select those labels and descriptors that best serve the interests of the armed forces and of the soldiers themselves and may enable evaluators to achieve greater objectivity, comprehensiveness, and veridicality in their observations and diagnoses.

Summary.

It is acknowledged without any reservations in the general literature, that the combat scenario is one of extreme stress. It is deemed to be of a more severe nature than a crisis created by a natural disaster. The soldier is in a situation where the general norms of societal living are completely undermined. Thus, it now becomes incumbent on him to kill if so required under orders from his seniors. His norms of reference for acceptable behaviour become confused, and difficult to reestablish and stabilize. Coupled with the mental and emotional pressures that this elicits, is the continued physical discomforts that he has to endure, in various forms. It is therefore not surprising that a considerable number of soldiers develop and manifest stress reactions in various forms and at different levels of intensity. The history of combat stress reactions as documented points out different labels that were used over the years to describe the psychological stress reactions of combat soldiers, arguably seen as manifestations of desired "exit" behaviour.

2.2. COMBAT STRESS MANAGEMENT.

Section 2.2 reviews the literature pertaining to combat stress management. The primary role of maintaining a sense of control, and four theoretical models of coping and helping are presented. The effect of social support, and recommendations for war-related stress management are presented.

2.2.(1). Maintaining a sense of control.

Milgram (1986) argues that what sustains us from day to day is (1) a set of beliefs about the constancy and efficacy of our control systems, and (2) a corresponding set of beliefs about the constancy and predictability of the laws of nature and of human behaviour that determine the external world in which our control systems function. A catastrophic external stressor would threaten these set of beliefs, and undermine the basis for our existence and any enjoyment we might derive from our lives. Enhancement or restoration of the belief in one's control abilities is not a matter of minor consequence and has a direct effect on rehabilitation because of the importance of these control abilities to a person. Lazarus (1966) speaks of two kinds of coping

behaviour, outer-directed to solve the pressing external problem at hand, and inner-directed so as to sustain oneself during the lengthy coping period. These coping behaviours correspond to the two kinds of control: control over events and control over self.

Outer-directed coping behaviours may contribute to an enhancement of the belief that one is in control of events, and by implication in control of oneself. However inconsequential or ineffective certain behaviours may be in fact, they may be effective at least for the short haul in permitting the individual to function and sustain a sense of perceived control of the problem and of oneself, until more effective options become available. Gal and Lazarus (1975) have shown that any activity regarded as problem-oriented reduces the deleterious effects of a chronic stress situation.

2.2.(2). Models of coping and helping.

Brickman (Brickman et al 1982) described four classical models of coping and helping. In any given model, responsibility for current incapacity of the coper is attributed either to the coper himself (internal attribution) or to helpers or circumstances beyond the coper's control (external attribution). Similarly, responsibility for the coper's recovery may also be attributed to the coper himself or to helpers and helping institutions. Milgram (1986) has reinterpreted and assigned names for the four models as follows: moralistic model, medical model, incompetent muddler model and mastery of adversity model. Figure 1.1 depicts the psychological locations of these four positions.

In the moralistic model, the coper is held responsible for his reactions and his initiatives. He is responsible for any stress reaction that he experiences because of personal inadequacies and is also responsible for shaping up. The diametrically opposed model is the medical model, named after the typical doctor-patient relationship in which the patient is not held responsible for his illness or for his recovery. Milgram (1986) considers that new approaches in medical practice where the patient may be held responsible for his illness

FIGURE 1.1. MODELS OF COPING AND HELPING.

INTERNAL ATTRIBUTION FOR INCAPACITY

EXTERNAL ATTRIBUTION FOR INCAPACITY

INTERNAL ATTRIBUTION FOR RECOVERY	**moralistic model :** coper is held responsible for his incapacity and his recovery	**incompetent muddler model :** personal incompetence led to incapacity, requires help for recovery of health
	mastery of adversity model : coper is not responsible for his incapacity, but only he can effect his own recovery	**medical model :** not personally responsible for present health or recovery

EXTERNAL ATTRIBUTION FOR RECOVERY

because of substance abuse or improper life-style and may be required to assume responsibility for his own recovery, is still the exception rather than the rule. In the incompetent muddler model of coping and helping, it is considered that the individual gets into an unfortunate predicament because of personal incompetence in some areas of life functioning, but can only extricate himself with the help and direction of others. In the mastery of adversity model, the coper is not held responsible for the adverse situation in which he finds himself or for his current incapacity. However, only he can resolve his current predicament by selecting the direction and initiating the steps to recovery with the judicious use of helpers. Milgram (1986) emphasizes that lack of consensus is the rule when copers and helpers apply their own personal models of coping and helping to combat stress reactions.

2.2.(3). Appropriate models for coping and helping.

Milgram (1986) recommends the mastery over adversity model and the medical model of coping and helping, as the most appropriate for war-related stress situations. These two models share an external attribution of responsibility for the individual's predicament and thereby seeks to absolve him of blame, shame, guilt, and inferiority feelings by emphasizing the extenuating circumstances of the stress situation. It is efficacious for the soldier showing a combat stress reaction to put responsibility for his current incapacity on forces beyond his control, but to retain responsibility for recovery. A given soldier may also recover rapidly, if he follows the advice and guidance of the authorities, especially if they are attempting to restore his autonomous functioning.

2.2.(4). Contribution of social support.

National consensus that a given war is legitimate and that sacrifices made in the conduct of war are appreciated by society is a major source of support for people attempting to cope with loss (Shalit 1985; Milgram 1986). It is very difficult for them to cope with an irretrievable loss that is unappreciated or even castigated. Milgram (1986) emphasizes that appreciation and castigation are not abstract concepts, but are attitudes that become manifest in concrete behaviours: statements and personal anecdotes presented in the mass media, in popular novels and movies written about the war, in periodic

memorial ceremonies, and in other rituals.

2.2.(5). Recommendations for war-related stress management.

The following recommendations are put forward by Milgram (1986) with regard to war-related stress management efforts: (1) that helpers clarify in advance their own implicit coping and helping models as they approach afflicted people; (2) they determine the models being used or requested by these people; (3) they develop intervention strategies that take into consideration discrepancies in attributional models that inevitably appear between copers and helpers and among helpers; (4) that helpers not interpret the behaviour of copers exclusively in terms of their own norms for "normal" or constructive behaviour; and (5) that helpers treat with respect the interpretations that people make about their personal tragedies and their efforts to transcend them. Specifically, depending on the needs of the individual case, he advocates either a medical model or a mastery of adversity attributional model for the coper and helper, in the context of war-related stress management.

Summary.

It is part of a normal developmental cycle of a new area of investigation that there is theory and conceptualization. In the field of combat stress management, the theorizing is beginning to take some coherent structure. The general acknowledgement of the importance of a sense of personal control even to a limited extent, and an understanding of the dynamics of the helper-coper interaction and mutual expectations, are fundamental underlying psychological phenomena. It should be conceptually possible to test the efficacy of the theory in laboratory and in vivo contexts in battlefields of the world, however, such research is not to be found in the literature. This is an area which has not had the benefit of applied research to underpin albeit recent theoretical conceptualizations.

2.3. DELAYED COMBAT STRESS REACTION: PTSD.

Section 2.3 reviews the literature pertaining to post traumatic stress disorder (PTSD). It begins with a general overview, followed by an analysis of

developments towards medical recognition of post traumatic stress disorder and its polymorphic characteristics. The aftermath for Vietnam veterans, research on predispositions to post traumatic disorder, and finally an account of aspects to consider in a diagnosis of post traumatic disorder are set out.

2.3.(1). Overview.

Most of the literature on post traumatic disorder originates from work conducted with Vietnam war veterans. The authors are psychologists, psychiatrists and mental health personnel including social workers. Many are of a case study orientation conducted within a clinical context. A number are longitudinal in nature, stretching over several years but the perspective remains micro rather than macro and often the author or therapist concerned first saw the patients several years after the onset of symptoms. However, research conducted within the Israel Defence Force after the Lebanon War is more immediate in identifying and following through cases. Larger numbers have been incorporated in the sample size and matched control groups have been established for comparison purposes.

2.3.(2). Towards recognition of PTSD.

Remarque (1929), among the concluding lines of his classic novel of wartime experience, "All Quiet on the Western Front", wrote:

"Had we returned home then, out of the suffering and strength of our experiences we might have unleashed a storm. Now if we go back we will be weary, broken, burnt out, rootless, and without hope. We will not be able to find our way any more....."

This was written of the 1914-1918 war during the course of which the term 'shell shock' was abandoned in favour of the term 'war neurosis' (Fairbairn, 1952). This change of terminology indicated a recognition of the fact that the "weary, broken, burnt out, rootless" men, whom Erich Maria Remarque described with such painful clarity, were suffering from symptoms that were essentially of psychological and not of neurological origin. Boulanger (1985) comments that mental health professionals who treated combat veterans in hospitals, clinics, and their private offices after World War II, after Korea, and most recently after Vietnam, would not deny the psychological nature of

the problems, but failed to agree on the etiology or natural course of reactions to severe trauma. Boulanger (1985) reports that it has taken almost two-thirds of a century for the recognition that shell shock is a psychological rather than a physiological disorder to be officially integrated into psychiatric nosology. Kardiner (1969), in his chapter on war neuroses wrote:

"In general there is a vast store of data available ..... but it is hard to find a province of psychiatry in which there is less discipline than this one. There is practically no continuity to be found anywhere, and the literature can only be characterized as anarchic. Every author has his own frame of reference - lengthy bibliographies notwithstanding".

Boulanger (1985) suggests that one of the reasons underlying the failure to reach a consensus until 1980 is due to the commonly held belief that the etiology of pathology lies not in adult but in childhood traumas. To argue that trauma in adult life can have profound and long-lasting psychological consequences even among individuals who were previously normal is to contradict this developmental theory. Paradoxically, Freud (1961) considered the "dark and dismal subject" of traumatic neuroses to be a separate phenomenon from neuroses whose foundations lie in childhood. In "Beyond the Pleasure Principle", he treats the nightmares that almost always accompany traumatic neuroses as entirely separate phenomena from normal wish fulfillment dreams. He argues that nightmares that follow trauma represent the psyche's repeated attempts to master a situation that has overwhelmed the defenses.

2.3.(3). Polymorphic characteristics of PTSD.

Boulanger (1985) itemizes the more immediate factors that have obscured the diagnosis of post traumatic stress disorder as: the timing of the onset of symptoms, the duration of the symptoms, and finally the nature of the symptoms themselves. Thus, not only can the onset of symptoms be delayed, but once established the symptoms themselves can last indefinitely. World War II studies have documented cases of "gross stress reaction in combat" lasting five, ten, fifteen, twenty and even thirty years.

2.3.(4). The Vietnam experience.

Compared with the three to ten percent psychiatric battlefield casualties in World War II and the slightly less than four percent in Korea, in Vietnam in 1968, only one percent of the troops was evacuated for psychiatric reasons. The military establishment offered a number of reasons for this low incidence of psychiatric casualties: limited tours of duty, frequent rest and recreation, treating combat soldiers quickly near the frontlines and reintegrating them into their units as soon as possible. Concurrently, mental health practitioners in America were beginning to see a pattern emerging among the Vietnam veterans they treated. The pattern of symptoms, which seemed to occur independent of personality type (Boulanger 1985), included intrusive recollections of traumatic events in the form of dreams, nightmares, and occasionally, flashbacks, which are dissociative states during which the individual behaves as if he were reexperiencing the traumatic event. There were symptoms of excessive autonomic arousal, hyperalertness, exaggerated startle reactions, difficulty falling asleep, and the feeling of being on the verge of losing control. In conjunction with these anxiety-related symptoms were symptoms more commonly related to depression, including a general diminished responsiveness to the world, referred to as "psychic numbing". The veteran felt detached from others, had difficulty maintaining close interpersonal relationships, lost interest in normal activities, and felt that life had lost its meaning. Often the veteran was quite unaware of the syndrome and of its origin in the traumatic experience of combat.

Shatan (1973) described the "Post Vietnam Syndrome" as bearing the hallmarks of mourning, frustrated and grief impacted; frustrated and impacted because the military discourages both grief and intimacy. Without working through their unconsummated grief, it deprived their present of meaning.

Boulanger (1985) reports that the slight difference in the pattern of symptoms between the acute and chronic phases of post traumatic stress disorder reveals that in the immediate or acute reaction to traumatic stress, the more subdued symptoms like loss of interest and depression are paramount. As time goes by, a chronic reaction emerges in which irritability,

startle reactions, and intrusive recollections of the trauma become more pressing. The revised criteria for post traumatic disorder in DSM-III (1987) does not distinguish between acute and chronic post traumatic disorder nor does it allow for a latent stress reaction.

2.3.(5). Predisposition to PTSD.

Boulanger (1985) found in her comparative study of Vietnam war veterans that men from unusually stable family backgrounds have a higher stressor tolerance than men from average families. The former tended to develop stress reactions only in response to heavy combat; the latter reacted more often under relatively low levels of stress. Men from unusually unstable families tended to show traumatic stress reactions not simply to combat but also to the stressors of everyday life. These findings are interpreted to mean that every man has his breaking point, the breaking point being contingent not only on the severity of the stressor but also on the level of stability that existed in the respondent's family of origin.

While veterans with post traumatic stress disorder frequently report the use of alcohol as "self-medication" to control anxiety or insomnia or see it as comforting in dysphoria, there is not necessarily any clear relationship between alcoholism and an affective stress response.

2.3.(6). Diagnosis of PTSD.

There have been several accounts on diagnosing post traumatic stress disorder, based on DSM-III criteria (Hillas and Cox, 1986; Cox 1988). In an earlier report, Arnold (1985) cautioned that the signs and symptoms of post traumatic stress disorder must be sought for proper diagnosis, as they are often not readily apparent. The three cardinal features of the diagnosis are:

1. history of trauma,
2. reexperiencing of trauma and,
3. avoidance phenomena.

History of trauma.

Experiences to take into account in tracing a history of trauma are: those grossly at variance and incongruous with one's previously established self-concepts, values, world concepts, and basic mental schema for being in the world. These traumatic experiences also have a shocking and unexpected quality, an unendurably prolonged quality, or both.

Reexperiencing of trauma.

Reexperiencing of trauma occurs in various states of consciousness, with varying degrees of intensity. This phenomenon is usually repetitive, is not voluntarily controllable, is emotionally painful, and either exactly or closely reproduces actual traumatic experiences in whole or in part. Conscious recall of trauma varies. Dreams are another common form of reexperience. The usual history is of wakening from a dream which reenacts the trauma, evoking strong emotions which would have been appropriate reactions to the traumatic experience itself, usually rage, terror, or grief. Others report waking in terror without recalling the dream itself, sometimes in the act of committing violence on someone else in the bed. When reexperiences in dreams are intense, there is frequently a history of insomnia as well, which develops in an attempt to avoid the dreadful dreams. Less often reported or clearly diagnosed is reexperiencing in a dissociative state. These episodes may last up to several hours. At times, the reexperiencing consists of sudden "pangs" of emotion which are not accompanied by specific experiential representations either as memories or dreams. Usually the feelings are ones which bring tears and a tight throat, but they may be of fear or anger.

Avoidance phenomena.

Avoidance phenomena, the third cardinal feature of post traumatic disorder, may also be subtle and easily missed. Objectively, these may appear as remoteness of attitude, as though preoccupied, bored, or disinclined to interaction with others. Spouses and family members may consider the behaviour "cold", mechanical, and lacking in affection, and they often feel rebuffed. In some veterans, the outward appearance may be of a "dropped-out" life-style or, conversely, of a dedicated workaholic. Subjectively, the

patient describes an inability to feel emotion, especially toward those who are closest, or an inability to express emotions which are felt. Other veterans express difficulty concentrating or remembering current information. These cognitive difficulties represent distressful impairments of the capacity to appreciate the essential qualities of experience. Arnold (1985) suggests that avoidance phenomena can occur in two ways. During or immediately after a traumatic experience, a period of "numbing" occurs, in which there is diminished feeling, diminished awareness of experience, and diminished capacity for other than mechanical activity. Later, after reexperiencing begins (hours, months, or years later), avoidance alternates with reexperiencing, apparently with a frequency and to a degree which allows the reexperiencing to be tolerated.

It is postulated that as long as the impact of the trauma is unresolved and its significance is not integrated into the whole being of the veteran, the affective response to the stress is incompletely discharged and continues to control behaviour, outside of awareness. Epidemiological research reports suggest that depression in post traumatic stress disorder may be a manifestation of grief, or an expression of guilt (Laufer 1985). Arnold (1985) advises that a clear picture of the patient's self-perception and identity should be developed as well as an understanding of how the world is perceived. The clinician is cautioned that it is important to recognize a pervasive sense of betrayal and feelings of bitterness, fearfulness of a hostile and threatening world, or disengagement from an environment with which there is no sense of connectedness.

Summary.

There has been prolific and often vitriolic publication on the subject of post traumatic stress disorder over the last two decades. Most of them are based on clinical work with Vietnam veterans. Mainly, there are individual case analyses, with more recent research assuming an epidemiological dimension. The work on Israeli post traumatic stress disorder incidence is structured, with comparison matched control groups, though in all cases, the analyses has been post-hoc rather than predictive.

For conclusions drawn to be validated, there is a need for hypotheses to be made and predictive strength established in laboratory experiments if not in actual combat scenarios. There is a vacuum in this area of psychological research. Until such data is accumulated, there is no evaluative data available for investigation into the relative contributions of any measures proposed or implemented on an organizational level.

3. COMBAT STRESS INOCULATION.

The preceding section reviewed the research in the field of combat stress management and treatment. The main thrust of this thesis is the preventive role of stress inoculation in relation to war, and it is to this subject that the review now returns, having considered the literature on the aftermath of combat stress reaction. Section 3 reviews the literature on the habituation effect on the fear response following several experiences of a combat situation, in the absence of traumatic exposures. A detailed definition of combat stress inoculation is then attempted.

Habituation of the fear response.

Rachman (1978) observes that there are relatively low correlations between subjective fear, physiological disturbance, and avoidance behaviour. He also cites evidence that the physiological aspects of fear are most susceptible to habituation training, and predicts that the strength of the reaction will decline as combat experience increases, provided the soldier succeeds in avoiding traumatic exposures (pp.64-65).

Janis (1951) in reviewing studies on fear reactions of civilians exposed to air war during World War 11, encountered indications that realistic warnings and gradual exposure to stress stimuli might have positive effects as "psychological preparation for withstanding the emotional impact of increasingly severe air attacks" (pp. 151). Rachman's review of the evidence from wartime research emphasises the unexpectedly high level of stress tolerance displayed by heavily bombed people in England, Germany, and Japan during World War 11. He wrote that "some of the strongest evidence pointing to the tendency of fears to habituate with repeated (nontraumatic) exposures to the fear-provoking situation, comes from these (World War 11)

observations of people exposed to air raids" (pp. 39).

Definition of combat stress inoculation.

The term "combat stress inoculation" refers to any preparatory psychological process by means of which extreme reactions to the stresses inherent in a combat scenario are ameliorated. Learning is the person's intuitive realization of experience within a particular situation under varying conditions of urgency. Training by contrast is our deliberate management of the situation in which the person is involved, or our involving of him in surrogate situations, both designed to accomplish for him an adaptive realization of experience (Mooney 1962). This is the central aim of combat stress inoculation training. Subjects are "prepared" by training in the perceptual skills of recognizing elements of the combat scenario and in coping with their impact. The overall aim is that their reaction to later stressful combat experiences will be more adaptive (in terms of their survival or performance) and that adverse emotional reactions will be reduced. Inoculated subjects will thus demonstrate a different pattern of reaction to combat than non inoculated subjects, and these differences will persist at least in the medium term.

Summary.

There is next to no research on the subject of combat stress inoculation. The only data available is based on observations of naturally occurring phenomena in times of war.

CONCLUSION.

It was recognized at the outset that there is little in the published literature pertaining directly to the topic of combat stress inoculation. As such, a broad based literature search was conducted to include general topics of stress, combat stress, stress inoculation and stress management in a military context.

Researchers in the field of "stress" have generally come to acknowledge the part played by the individual's appraisal of their relationship with the total

environment. The negative feelings that define the experience of stress, their effect on arousal, and their joint effects on performance, are beginning to be appreciated in the occupational field.

The major work in stress inoculation has been in the clinical field, in applications with individual patients. The main components include an educational phase with provision of relevant background information of what to expect in an anticipated trauma-inducing situation. This is followed by a skill-acquisition phase where specific coping behaviour is conceptualized and the details worked out. The final phase is a test and practice phase, where individual patients practice their newly acquired coping skills.

In the stress management literature, there is general acknowledgement of the importance of a sense of personal control even to a limited extent, and an understanding of the dynamics of the helper-coper interaction and mutual expectations, as fundamental underlying psychological phenomena. There is a pressing requirement for experimental and in vivo testing, before their efficacy is fully appreciated and incorporated in general practice with clinical and non-clinical groups.

Stress inoculation training procedures have been applied to a limited extent in therapy with victims of rape and terrorist attacks. The strategies of social comparison and selective attention have been deployed mainly to help clients redefine the way they "view" the trauma, as well as the act of the trauma itself.

The numerous variables in combat, the sources of stress in combat, and combat stress reactions in its diverse manifestations are well documented in the literature. There is some theoretical conceptualizations pertaining to appropriate models for coping and helping in the context of combat stress management, and the contribution of social support. There is a dearth of applied research.

The literature search has yielded a proliferation of reports pertaining to post traumatic stress disorder. It has reached a status of morbid fascination, with regurgitations of old tunes sung untunefully, "a lot of sound and fury", unfortunately, signifying very little. Single case study reports abound in the

literature, on the basis of which, many generalizations are drawn, often invalid in a wider epidemiological context.

There has become a growing realization that traumatic stress in adulthood has specific and enduring detrimental effects independent of childhood developmental histories and personality types.

There is a cumulating literature on the use of cognitive-behavioural modification therapy in the clinical setting. There has been some limited work in a research context applying the principles of cognitive-behavioural modification, in particular in training for parachute jumping (Dinner and Gal, 1984; Shalit, Carlstedt, Carlstedt and Shalit, 1985).

There is very little published on the topic of stress inoculation as a preventive measure in the face of anticipated trauma. It is a new area.

The next chapter is an attempt to review the current practices in three conscript armies, with regard to preparing their soldiers for the stress of combat.

CHAPTER 2. STUDY 1: COMPARISON OF ISRAELI, SWEDISH AND SWISS STRESS MANAGEMENT PROCEDURES.

This chapter reviews current practices in relation to preparation for combat stress (stress inoculation) in three conscript armies: Israel, Sweden and Switzerland. During the course of the study, attention came to be focused on leadership training in officers, within the social psychological context of the unit, and to the part they play in facilitating coping by the men under their charge. Current practices are noted and compared and a model of stress inoculation is described which considers the way the soldier in combat processes information and the relevance of that information processing for the soldier's survival and effectiveness. It discusses (a) how the soldier might be better prepared by training through the development of a more appropriate cognitive framework, and (b) how information processing during combat can be supported by "the active management of available information" and through the process of Group Emotional Reconstruction. The different aspects of this model are supported by reference to the present study, and to the existing literature.

The fieldwork for this study was conducted between November 1986 to March 1987. Since then, there have been further developments in military applications in relation to combat stress management and inoculation, in the countries visited. Some of these changes are reported at the end of this chapter, for purposes of updating the information.

INTRODUCTION.

There is now much literature on the detrimental effects of "stress" on both health and performance (for example Lazarus, Deese and Osler, 1952; Hockey 1983; Cox 1978; Dubos 1985; Cohen et al 1985; Janis 1971; Kaplan 1983; Cox, Cox and Thirlaway 1983; Cox and Mackay 1982), and as a result, interest has begun to focus on how individuals might be best prepared to meet stressful situations, and strategies based on selection (Watson 1980) and training (Meichenbaum 1985; Woolfolk and Lehrer 1984; Meichenbaum and Jarenko 1983) have been variously suggested. Not surprisingly, this issue has been of particular concern in the military context in relation to combat stress (Milgram 1986; Sonnenberg, Blank and Talbott 1985; Bourne 1969).

This paper reviews current practices in preparation for combat stress using stress inoculation techniques in three countries: Israel, Sweden and Switzerland. Essentially, stress inoculation refers to any education or training activity designed to nurture and develop coping skills, not only to resolve specific immediate problems but also to apply to future difficulties (Meichenbaum 1985). It provides individuals and groups with a proactive defense or a set of coping skills to deal with future stressful situations. Particular attention was paid to leadership training in officers, within the social psychological context of the unit, and to the part they play in facilitating coping by the men under their charge. Current practices are noted and compared and a model of stress inoculation is described which considers the way the soldier in combat processes information and the relevance of that information processing for the soldier's survival and effectiveness. It discusses (a) how the soldier might be better prepared by training through the development of a more appropriate cognitive framework, and (b) how information processing during combat can be supported by "the active management of available information" and through the process of Group Emotional Reconstruction. The different aspects of this model are supported by reference to the present study.

METHOD OF STUDY.

Information was gathered from three military establishments: the Israeli Defence Force, the Swedish Armed Forces, and the Swiss Defence Force, all conscript armies. Commanders and Chief Instructors of Officer Cadet Schools were interviewed, using a semi-structured interview format. The intention was to identify existing training programs pertaining to combat stress inoculation and to examine the nature of and rationale behind that training. In addition, various other personnel in the three establishments were also interviewed: psychologists, mental health personnel, behavioural researchers and commanders. The Israeli Defence Force was visited in November/December 1986. The Swedish Armed Forces was visited in January 1987 and the Swiss Defence Force in March 1987. Each visit lasted from one to two weeks, and in each of the countries, about twenty key individuals were interviewed. A summary report was written soon after the information was gathered, and was sent back to the respective establishments for checking for accuracy. All were returned with only minor changes.

This methodology was adopted in order to enlarge the body of information that exists on the subject. There is however the possibility that the interviewees may not be disclosing the truth. This problem is circumvented in two ways: (a) more than one person was asked the same question, and (b) the summary report was sent back to the establishment for vetting for accuracy. The information gathered in this way was supplemented, where possible with those published materials which could be made available to the researcher, and by several searches of the open scientific literature.

FINDINGS.

ISRAELI DEFENCE FORCE.

Introduction.

Those interviewed during the visit to the Israeli Defence Force did not identify any training course dedicated to combat stress inoculation. However, it was clear that certain aspects of practice and policy did have an acknowledged bearing on this issue in two ways: first, to better manage and support soldiers during combat, thus reducing the experience and impact of stress, and second, to better manage the aftermath of combat stress.

Field Psychologists.

A unique feature of the Israeli Defence Force is the deployment of psychologists in the field, administratively under the purview of unit commanders but professionally under the purview of the Chief Psychologist. Their role is to act as consultants to unit commanders particularly on issues pertaining to unit morale and psychological readiness. They perform the functions of organizational development managers. Team building activities, conflict resolution, and other related aspects are subjects which they are trained to transmit to the junior commanders in the units they are attached to. They are clearly differentiated in role from the clinical psychologists who attend to individual problem cases that are referred to them (Greenbaum, Rogovsky and Shallt 1977; Babad and Salomon 1978). The existence of the field psychologists in the Israeli Defence Force embodies the importance that is given to the element of group processes in the efficient and even

superior functioning of the fighting unit. It is an organizational measure aimed at deallenating the individual soldier, and conversely, integrating him into the group.

Management During Combat.

1. Role of the officer.

Brigadier-General Kahalani, Deputy Commander of the Field Forces HQ, is one of the most highly decorated Israeli commanders who is living today. While being interviewed in November 1986, he said "The commander, all the time during combat, is like an actor on the stage. Men are behind you, they watch you. You have to act like a hero." In a combat scenario, particularly in between engagements, the officers have the task of attending to their men, planning their moves and ensuring that appropriate orders are issued and executed. Because they are so occupied, the psychological attrition amongst officers is much lower than that of the men under their charge (Gal and Lazarus 1975; Shalit 1986). Officers in the Israeli Defence Force follow the dictum to "lead from the front", and strive to inspire their men by personal courage and example. However, this has also often resulted in a higher attrition rate for officers. Thus, in the 1973 war, 28.5 percent of total Israeli casualties were suffered by officers (Gabriel and Gal, 1984). A recent investigation of combat stress reactions in the 1982 Lebanon War indicated that post traumatic stress syndrome was partially explained by war experiences, primarily by the soldier's feelings that he lacked support from his commanding officers (Solomon, Benbenisti and Mikulincer, 1987).

2. Unit cohesiveness.

In a retrospective examination of forty IDF soldiers who suffered psychiatric breakdown in the 1973 War, Noy (1978) found that 40% of these casualties reported minimal group affiliation, in contrast to only 10% in a control group of non-casualties. Steiner and Neumann (1978) found the following characteristics in seventy four reserve soldiers presenting with acute or late onset of post traumatic combat reactions after the 1973 War: low morale, with little or no identification with their unit or team; lack of trust in leadership; frequent transfer or rotation; feelings of loneliness and not

belonging to their units; and low self-esteem concerning their military performance. More recently, the data from a pre-war morale survey administered in May of 1981 to a large sample of Israeli combat troops were analyzed by means of intercorrelations and factor analysis. A surprising outcome of the factor analysis is that morale, both at the individual and unit level, merged together with the cohesion variables to form one integrated factor (Gal 1986). This study, referred to as the "Golan Heights" study, suggests that morale and cohesion, interchangeably, are two aspects of the same factor. In a combat scenario, it is the practice in the Israeli Defence Force that newcomers are introduced to the others, and efforts are made to arrive at some shared background of interests, to create a sense of belonging and acceptance. This deliberate effort at integration is believed to make for better cohesiveness and lessen the psychological casualty rate. It is the sense of alienation that is deemed to accelerate psychological casualties.

3. Information dissemination.

Research conducted by the field psychologists in 1982 reflected that the Israeli soldier reported that the most stressful aspect of being in the field was not having sufficient information (Even-Chen and Hadas, 1983). By this he was referring to knowledge of his location, the position of the enemy, the relative strength of the enemy, the arms and tactics of the enemy, and such information, relating to the field conditions. It was noted by the researchers that during peacetime exercises, the soldiers displayed little interest in these issues. Thus, commanders who trained with the soldiers might think they are in fact not interested in these matters, and therefore fail to transmit the information to them. In actuality, during combat situations, the soldiers are keenly interested in this information. Even a statement to the effect that certain aspects are not known, in itself is valued as information. It was found that in the absence of official information, fabrications took their place. It was often detrimental in nature. In the field therefore, the commander is persuaded to share as much information as he possibly can without jeopardizing strategic and security considerations. Once again, this task in effect serves to reduce the sense of alienation that the individual may otherwise experience. When he is informed of available 'intelligence' he is better able to orientate himself and his fellow soldier, with a greater sense of assurance and certainty. This is an aspect referred to as orientation by Shalit

in his model for measuring morale (Shalit 1982a; Shalit 1986). Having a well structured orientation is deemed to be the first step in establishing the morale of any unit, and eventually its psychological readiness for combat.

Management of Aftermath.

1. Group emotional reconstruction.

Group emotional reconstruction is the psychological equivalent to the military debrief that is conducted by the commander after an engagement. It has now been written into the General Orders of the Israeli Defence Force, that this should be conducted. It is a unique feature of the Israeli military. In effect, the commander of the unit first has a conversation with the field psychologist. It is an emotional reconstruction of the engagement for him personally. He then proceeds to lead his unit in the emotional reconstruction. This serves the purpose of filling in missing pieces of the picture of the total battle scene, for the individual participants. It also serves the role of abreaction, and facilitates the grieving process. This enables the soldiers to then carry on with the next part of their engagement. The procedure for carrying it out is detailed by the Behavioural Science Department of the Israeli Defence Force (Rogovsky and Baruch, 1983). Field psychologists are trained to do this. Their role is to advise the field commander where appropriate, so that he can conduct it for the men under his charge. It is treated as a command function. It is also a process that serves to bind the commander to his men, in their shared experience. Not all the soldiers in the group will be able to speak, as the group size would not permit it. However, they may identify with the views expressed by some of those who have an opportunity to speak.

This psychological debrief in effect serves to reduce the sense of alienation that the individual soldier may feel. Through it, he realizes that his grief is shared, and he is provided with the formal opportunity and overt permission to admit to emotional hurt and pain. Having dealt with the issue openly, he is then freed of the conflict of acting as if he is all right when in fact he is labouring under the pressure of grief, anger and survivor guilt. The psychological debrief is conducted in between engagements, during a suitable lull in the proceedings.

2. Management of stress casualties.

The principles of proximity, immediacy and expectancy are the three cardinal elements advocated in the management of combat stress casualties in the Israeli Defence Force. Research conducted by the Mental Health Department on adherence to these principles during the Lebanon War showed that this was only practiced in total in 7% of cases. Where all three elements were present, the rate of return to the front-line was significantly better than when only one or two aspects were adhered to. Proximity refers to treatment at the frontline or close to the area of deployment of the troops. Immediacy refers to treatment being administered as close as possible in time to the onset of symptoms. Expectancy refers to the expectation by the commander that the soldier will return to the front-line (Solomon, Benbenishty and Spiro, 1986). The research reflected that where the three cardinal principles were adhered to, there were significantly fewer cases that required longer term psychiatric treatment. In effect, the frontline treatment consists of letting the soldier have nourishing food and rest. He is expected to help with light duties where possible. He is visited by his commander, and it is conveyed to him that he is required back in the front-line, and it is expected that he will rejoin his section shortly.

This process of managing stress casualties in effect integrates the soldier back to his unit. It supports him physically and socially. The affliction is regarded as any other physical affliction of a temporary nature and not of life-threatening proportions. It reduces his sense of alienation. It is the sense of belonging to the group that recreates feelings of obligations and reciprocities required of the individual soldier. This is the underlying feature of the therapeutic processes involved.

Summary.

In the Israeli Defence Force, there is little formal preparatory training for the stress of combat. There is however, visible leadership of a cohesive unit, active management of information and experience of combat, supported by an organisational system for handling psychological casualties.

SWEDISH ARMED FORCES.

Context.

Shalit and Carlstedt (1984), in an article entitled "The perception of enemy threat", had drawn attention to the reaction of two Swedish soldiers to the sighting of suspected enemy submarine and/or frogmen off their coastline. Referred to as the Karlskrona incident, in effect what happened was that the two soldiers spent time discussing the intentions of the frogmen until the submarine and the frogmen disappeared from view once more. The National Defence Research Institute also conducted a field investigation into the reaction of the Swedes into an incident of noxious gas emission. Referred to as the Karlskoga incident, it occurred in January 1984. The conclusion drawn was that the Swedish temperament is phlegmatic, and not easily evoked to respond to a situation that requires the classic alarm reaction for "fight or flight". Instead, they are passive, almost lethargic. Those threatened show a lack of openess to background information, thus reducing their coping potential (Shalit 1986).

Against this backdrop, the military has become attuned to the role that mental conditioning can play in the behaviours of the Swedish soldiers, the majority of whom are reservists. There is also the awareness that the conscript today is not brought up according to authoritarian norms of child-rearing styles. There is a Swedish law whereby a parent can be prosecuted for spanking his own child. The youths who enter the military as fresh recruits are used to an egalitarian lifestyle. The traditional military norm is totally alien and unacceptable to them. With the changing times therefore, the Swedish military is changing its approach. The change is still in the process, and not completed a full cycle yet. There are schools of traditionalists who adhere to the old norms. However, the central command have opted for the change, and the training schools are instructing along these lines.

In 1982, the Swedish Army High Command directed that the soldier must be allowed to play a more participative role during training, in order to enhance his commitment, and at the same time, combat stress inoculation has become featured in the officer training syllabus, and at other military training schools. Exposure to combat stress inoculation is scheduled for conscripts

soon after enlistment. Also for reservist battalions undergoing refresher training. Short courses of two to three days duration have been specially designed and run for very senior military officers. The National Defence Research Institute, with its staff of psychologists, sociologists and educationists engaged in behavioural research, is the source of the necessary professional expertise (Larsson and Anderzen, 1987). They teach senior instructors from the various military training schools (Larsson 1987).

Training aids.

In teaching about stress and its effects, an experiential approach is often adopted, in addition to the lecture method. Participants are sometimes put through a stressful experience and only subsequently informed that it was in fact an exercise. They then proceed to discuss about the effects of stress, and how to cope with it. They are also taught relaxation techniques, and encouraged to practice it. Training films have been made by a central institute called FLC, the Swedish Armed Forces Educational Centre, based in Stockholm. Professional actors were used in the making of the films. The films highlight episodes in a combat scenario, under the leadership of a platoon commander and a company commander respectively. Various typical situations are enacted. The overt signs of battle fatigue, the reactions of the soldiers under such conditions, and situations requiring firm leadership, are variously depicted. Each case study is followed by an opportunity for the class to discuss and arrive at an understanding of the dynamics involved and consider how best to behave in a similar situation. Another training aid that has been developed by FLC is a twelve minute audio tape. This details the thoughts of a section of soldiers who are guarding an airbase, and expecting an air attack. The fears, expectations and behaviours of the men as they wait anxiously, are portrayed. Then the sounds of the approaching enemy aircraft are heard, followed by the bombing, the men firing their weapons, and the aftermath. The tape is played outdoors, usually in the growing darkness of dusk, after the men have undergone a day of hard training. The timing and atmosphere is thought to heighten the sense of authenticity of the experience. In the case of the reservist soldiers, the tape considers the thoughts of the more mature soldier, who may think of his family while he is waiting. Listening to the tape is followed by a discussion led by the Platoon Commander, who is equipped with a handbook produced by the Educational

Centre, on how to conduct this session. The discussion starts with the feelings after hearing the tape, the scenario of war, and how they would feel in the battlefield. The Platoon Commander then outlines the support systems available to aid those wounded in battle. Also, the part the soldiers can play to help each other, to cope with combat stress. It is emphasized that it is a normal reaction to experience the effects of combat stress, and that it is not indicative of mental illness.

Leadership.

The role of the leader is now emphasized as being amongst the soldiers, not in front of them. This is to make the point that a dictatorial style of leadership is not acceptable. The officer should aim to be the 'natural' leader of the group, by being a friend to the men under his charge. They should trust him. In the syllabus at Karlberg, the Officer Training School, there is emphasis on experiential teaching of this style of leadership. The emphasis is on reducing the social distance between the leader and those he leads. Officer training attempts to develop and practice leadership qualities. Progressively, more time is devoted to planning the contents and format of the forthcoming lessons, by the course participants. This is in line with the aim of training the officers to exercise initiative and take responsibility for what they undergo. There is also a deliberate attempt to increase self-awareness and self-confidence. At Karlberg, on initial intake, when asked to list strengths and weaknesses, all the cadets can list more than five weaknesses, but they are invariably unable to list five self-perceived strengths. The structure of the officer training course is such that feedback is given to the participants by fellow students periodically, and instructors are required to give positive feedback of the strengths of the participants. In this way, it is hoped to achieve one of the principal aims of the course, to inculcate initiative and self-awareness of their strong points.

Comments.

The Swedish military provides a very different scenario to that associated with the IDF, for several reasons, some relating to the national temperament. However, two "things" are shared: (a) interest in "close" and "active" leadership, and reducing the social distance between leaders and men, and

also the need for the leader to discuss the emotional reaction to combat with the men. This was seen in the case of the Israeli Defence Force in terms of post combat group emotional reconstruction (GER), and in terms of the Swedish Armed Forces, during training. Perhaps the main difference, vis-a-vis this particular study, is that the Swedish Armed Forces are deliberately incorporating stress inoculation training while the Israeli Defence Force is not.

SWISS ARMED FORCES.

Introduction.

The Swiss military have not formally addressed the issue of combat stress. Indeed there is a marked reluctance to acknowledge and address psychological issues in general. There are no psychology practitioners in the Swiss military. Where necessary in cases of psychological illness, referrals are made to civilian clinical psychologists, but there are few such referrals, as the regular force is small and the armed forces is largely made up of reservist militiamen. Despite this, there are aspects of the Swiss Armed Forces organisation and training which are relevant to survival and performance under combat stress. The first is their organisation by cantons, which promotes social cohesion and motivation, and the second is their physically punishing training regime. The duration of basic training for recruits is 17 weeks (Swiss Department of Defense 1986).

Defence by Cantons.

The organisation of the Swiss Armed Forces is such that battalions are formed within each district or Canton. This confers some advantage by way of motivation (for local defence) and social cohesion. The position adopted is that each militiaman is actually defending his own homestead, as his unit is based in his own Canton. There is therefore a direct personal investment in defense. Reservist battalions continue to be augmented by new reservists, as those who have completed their cycle move out. It is assumed that the mixture of older and younger reservists in the same unit has a beneficial overall effect. The older reservists have a mellowing effect on the younger ones. They also assume responsibility for the younger ones. This is deemed to

be a more satisfactory arrangement than having a cohort of the same age group. However, no research has in fact been conducted into this. However, there is, at the same time, a major language problem.

As far as possible, units are formed according to the language spoken (Wenger 1987). Thus, there are German speaking battalions, French and Italian speaking battalions and there are some battalions where the various companies are formed according to the language spoken. As far as possible, efforts are made to instruct each soldier in his mother tongue but where it may not be possible, then the rule is that the instruction for the class is conducted in the language of the majority. The minority participants can usually understand the other main languages, and are permitted to reply in their own mother tongue: the instructor is expected to understand his reply or questions.

In the central officer training schools, and particularly so for the senior officer courses, the language of instruction is German, although the French participants speak in French during the course. No research has been conducted into the integration of the different language speaking companies and battalions as cohesive linguistic entities. This was confirmed in personal communication by the Chief of Information of the Swiss Armed Forces in January 1987.

Physically punishing training regimen.

The training regimen is physically and mentally punishing. It involves long route marches through hilly terrain, under cold and wet conditions. Particularly so in the case of officer cadet training, there is an exercise referred to as Exercise Guisan. It takes the cadet through the length and breadth of Switzerland, by various means of transport: sometimes travelling by train, mostly on foot, and stretches on bicycle: they sleep in a cave one night, in open terrain on other nights. This particular exercise lasts for one week. At various locations, they are engaged in firing at targets, and encounters with enemy simulators. For each day, a different cadet is appointed to lead the section. Pressure is exerted on the men by changing orders before they can proceed to execute a plan of action. They do not have full rations, and do not have a chance to have the usual hours of sleep. The

exercise was described in a personal communication by Abt (1987).

Reservist units also have exercises that are physically demanding. The Mountain Regiments for instance, train in the mountains, under conditions of snow and ice. It is thought that such training in itself serves to prepare the soldiers for the stress of actual battle. No doubt, training in the terrain under physically demanding conditions may help in confidence-building with regard to the capacity to cope under such conditions.

Concluding comments.

Shelters are built in the Swiss mountains for the military and up to 90% of all private homes have a bomb shelter in their basement. Bridges, railway lines, electrical plants and all key installations, have been wired with explosives. This will be set off should the enemy enter the country, in order to delay their progress (Putman and Coulson, 1986). Each reservist keeps his rifle and a round of ammunition in his home. This is to ensure speed in his assumption of active duty, should he be required to do so at short notice (Swiss Department of Defense 1986). The Swiss military are aware that their mountainous border serves as a protective barrier, and they have special mountain regiments and an avalanche unit consisting of professionals in the art of creating avalanches as a defense measure. With all the effort applied to deterrent measures, perhaps the event of actual engagement with frontline troops is not envisaged.

UPDATE OF INFORMATION.

Since the fieldwork was conducted, there have been some developments in a couple of the countries visited, with regard to the subject of enquiry. The updating of the information was through personal reports by the personnel actually involved, at the occasion of an International Conference on the Psychology of Adjustment during Times of War and Peace, held at Tel Aviv in January 1989. The information will be recounted in the following paragraphs for updating purposes.

Swiss Defence Force.

A reservist unit has been set up, headed by a psychiatrist and staffed with a sociologist. The main task of this unit is to attend to the combat stress aspect for the Swiss military. As yet, plans for the operational functioning of the unit have not been finalized.

Israeli Defence Force.

The Psychology Branch of the IDF Airforce has started a program of combat stress inoculation for their fighter pilots. The Head of the Branch is an ex-fighter pilot and a clinical psychologist. The program that he runs consists of beginning with verbalizing of expected fears in a combat scenario by the pilots. The scenario that they express reservations about is then recreated through simulation procedures and training is provided for them to facilitate successful coping. The evaluation output from this program has been a statement of increased confidence by the participants, in anticipation of similar encounters in an actual engagement.

A senior instructor at the Leadership Training School at Netanya, which provides special courses for army personnel, is engaged in his capacity as a reservist with the Air Force Psychology Branch Head, in research into training aids for combat stress inoculation. It may be expected that at some stage in the not too distant future, this may lead to programs that will cater to the army.

SYNTHESIS OF FINDINGS: MODEL FOR COMBAT STRESS MANAGEMENT.

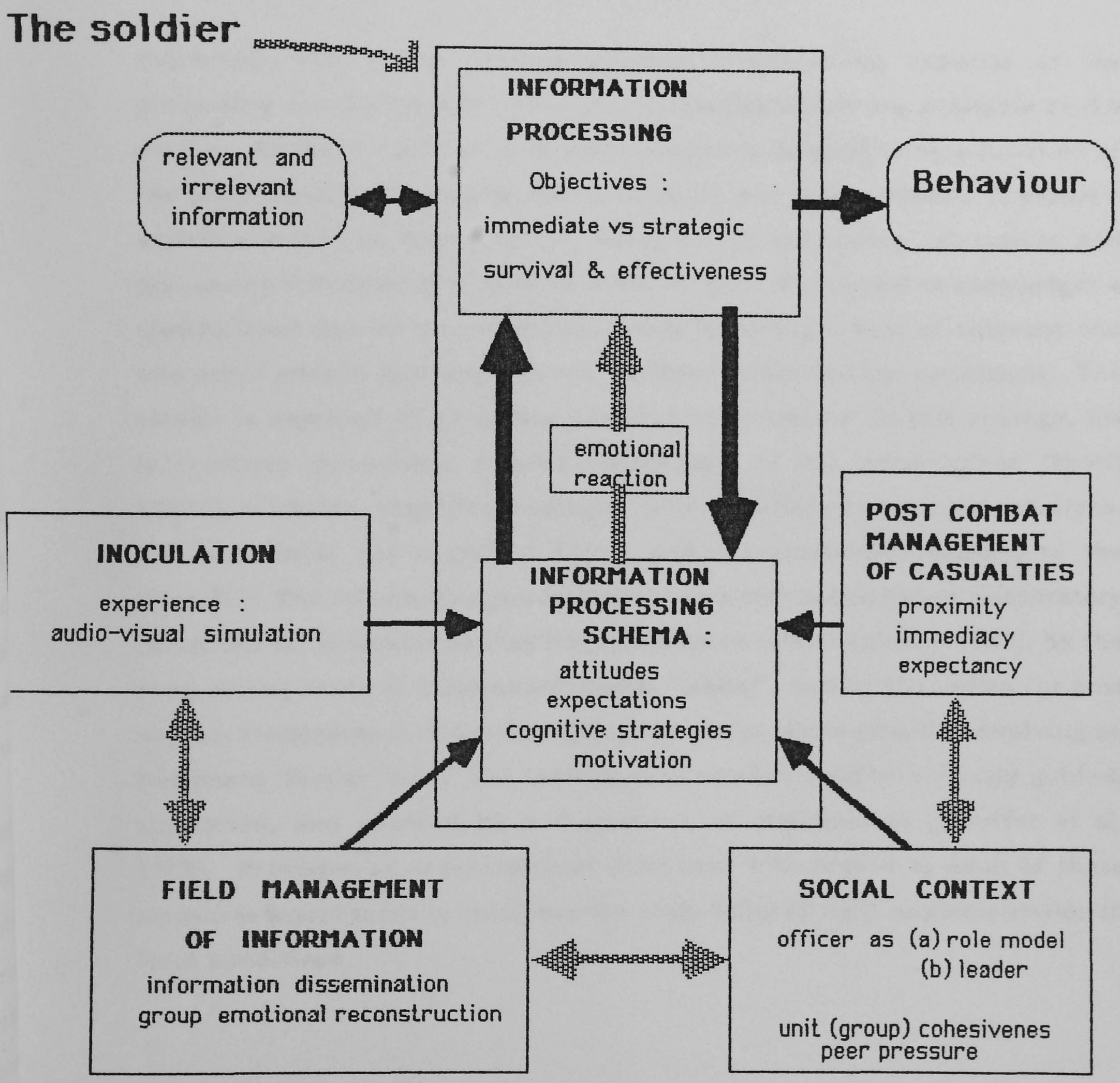
Several general issues emerge from an overview of the three studies. First, promoting social cohesion within units is seen as important in all three countries, although actual strategies for achieving this differ. For example it is an objective of leadership training in Israel and Sweden, and a function of organisation in Switzerland (Swiss Department of Defense 1986). However achieved, it emphasizes the social context to military effectiveness. Any model of the soldier in relation to combat stress must thus be set in such a context. Second, leadership is treated as a key process not only in terms of providing 'direction' and 'promoting social cohesion'; but also in managing

information flow and any emotional response to combat. This was particularly so in Israel and Sweden, and issues relating to the active management of information has to be an important element in any model of the soldier in combat. Thus the 'leader' must be seen as an important agent in our developing model, involved in several different aspects of its operation. Third, all three countries attempted to prepare soldiers for the combat situation, although not necessarily in direct relation to combat stress. All three offered "leadership training", often not exclusively for their "officer class", and there was some exposure to simulated combat conditions, although the perceived value of these simulations differed from country to country. Thus "preparation" (through training) must also be an aspect of our model (Meichenbaum 1985). The primary objective was the improvement of performance in an organizational (military) setting through the use of psychological training techniques (Larsson 1987) used in conjunction with other organizational initiatives.

Finally, training often seemed to address issues of 'attitude and confidence'. Stouffer et al (1949) demonstrated that the attitudes of companies of American soldiers while training, and sometimes almost a year prior to engagement in Normandy, predicted their subsequent performance, as measured by the nonbattle casualty rate. Attitude measures were obtained on willingness for combat, confidence in combat stamina and confidence in combat skill. A related study upheld consistent correlations between the attitudes of individuals and their combat performance while engaged in heavy fighting in Philippsbourg, France, and in 'breaking' the Siegfried Line outside of Saarbrucken. The individual assessments were made by at least two independent raters in individual personal interviews. Our model must also include mention of such processes.

Based on a reading of the published literature in the subject area, and drawing on the study of the three countries, what is effectively a cognitive-behavioural model for combat stress management is proposed. A schematic representation of this model is presented in Figure 2.1. The main elements in the model are: (a) the soldier as an information processing unit, (b) the social context in which he operates, (c) deliberate management of relevant information in the field, (d) his preparation through inoculation, and (e) the management of his reactions to combat. Thus this is essentially an

FIGURE 2.1. COGNITIVE-BEHAVIOURAL MODEL FOR COMBAT STRESS MANAGEMENT.



information processing model set in a social context. It does not subscribe to the traditional linear information-processing approach (Broadbent 1971). rather, it portrays human cognitive processing as both information-seeking and interactive (Rohmert and Luczak, 1979). Cognitive processes and structures such as attitudes, are presumed to involve a determination of which environmental stimuli are attended to, as well as how such stimuli (information) are interpreted. Their role in analysing stimulus input is analogous to the function of schemata in remembering (Bartlett 1932; Neisser 1967), and in perceiving (Vernon 1955).

Enhancing information-processing capacity.

Bainbridge (1974) has defined information-processing capacity as the processing operations and processing strategies which are available to the person. An individual's level of performance is deemed to be a function of the interaction between processing capacity and task demands. A person's experience will be important in terms of the processing operations and processing strategies that have been developed. The model acknowledges a motivational and an informational input, involving a host of relevant and irrelevant stimuli that impinge on a soldier under combat conditions. The soldier is depicted as an active information-processor. In this analogy, his information processing schema, comprised of his expectations (Shalit 1982b), attitudes, cognitive strategies, and conditioned emotional reactions, will determine his cognitive frame and his emotional reaction to the situation. The information processing schema are shaped by any preparatory (inoculation) programs he may have undergone (Meichenbaum 1985), by the field management of information by his "leader", and by the policy for post combat management of psychological casualties, again possibly involving an important "leader" role. The individual in combat is simultaneously guided, supported, and coerced by a framework of organization (Stouffer et al, 1949). Provision of organizational directives with regard to each of these measures would serve to reinforce the probability of their implementation in field conditions.

Counteracting psychological isolation.

For the frontline soldier, the total program is set within the social context of his unit and his leader. The isolation of the frontline is such as to make the combat man feel completely set apart. Even in the midst of his fellows, each man had the inner loneliness that comes from having to face death at each moment (Stouffer et al, 1949). This psychological isolation is mitigated by the presence, example, and support of other soldiers in the unit. The interactional process determines the outcome of his decisions and actions, immediate and strategic, and his survival and effectiveness in functioning.

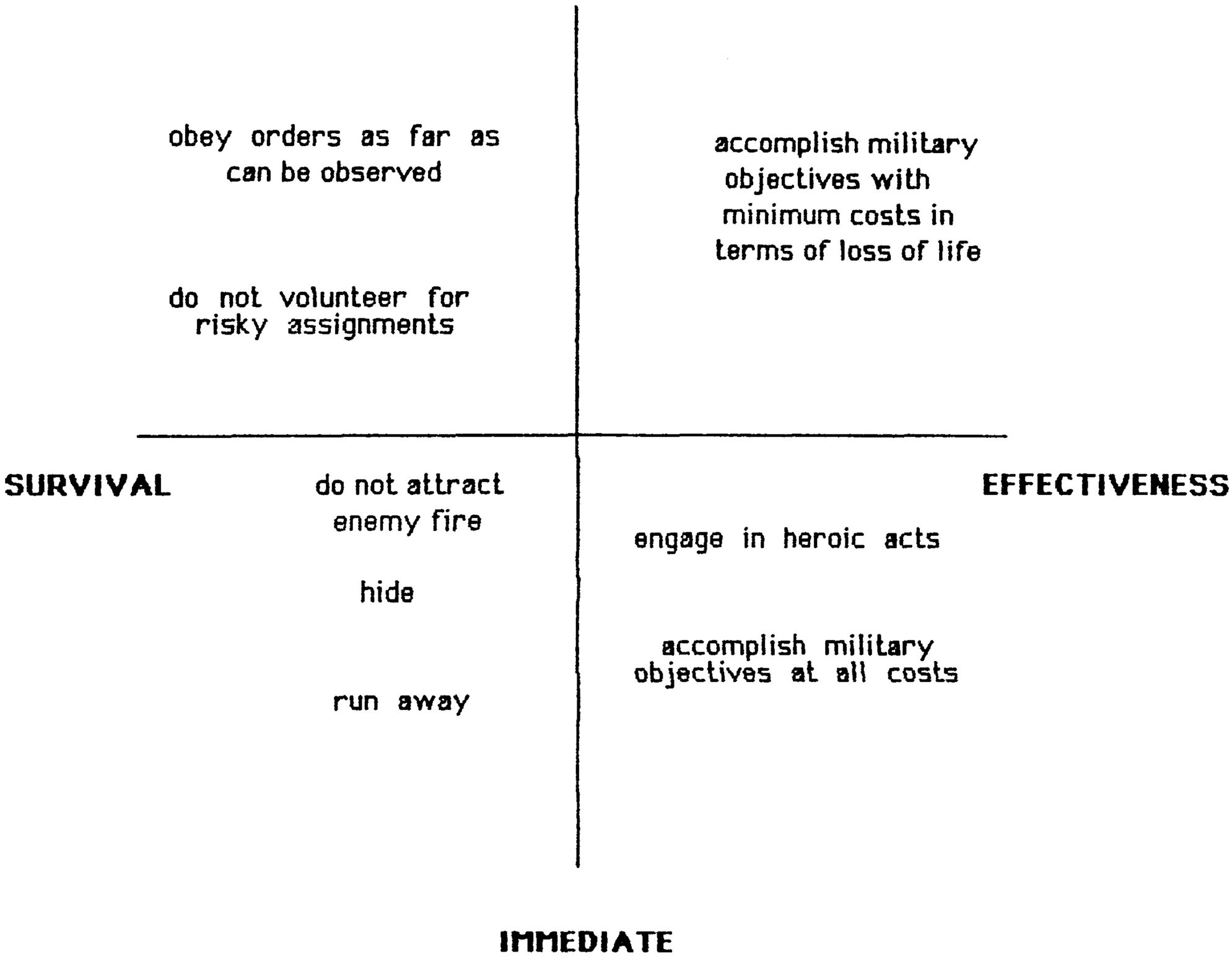
Focusing the dilemma of conflicting objectives.

The soldier in the field is guided in his behaviours by both immediate and strategic objectives, which may act in contradiction with each other. Thus, while a particular action may accomplish the immediate objective of annihilating a particular enemy soldier, it may also draw attention to his particular location thereby attracting enemy. This particular example also draws attention to the other governing principles for a soldier in the field, the question of his survival and that of his effectiveness as a soldier. These two guiding principles for the soldier's action or inertia, are placed in the main information processing cell in Figure 2.1. The psychological dilemma of conflicting objectives is set out in the diagram at Figure 2.2. In conventional decision-making situations, the usual problems are to do with: (a) too little information, or (b) too much information. In this context of the soldier in combat, the third problem is (c) accessing and receiving information in relation to conflicting objectives.

This dilemma may be solved through the use of well developed heuristics incorporated into everyday language, like "he who fights and runs away - lives to fight another day". Another potential area of conflict that may arise in this connection may be to do with conflicts between the individual, the group, and the leader, in terms of objectives guiding action in the combat field.

Whatever actions at any point in time will be a function of his cognitive frame and his motivation. The cognitive frame is constituted by his

FIGURE 2. 2. A SOLDIER'S DILEMMA OF CONFLICTING OBJECTIVES.



expectations, cognitive strategies (Landau and Goldfried, 1981), and his emotional reactions. Lazarus (1988) is of the view that it is essential to consider how a person is appraising what is happening to understand his or her emotional reactions.

Providing a cognitive map.

Another perspective is provided by Neisser's "cognitive map" (1976). It is acknowledged that the model must also address the processes that access, manipulate, and change the internal representations (Anderson 1978). In combination, they determine the nature and texture of the individual soldier's information processing schema. This information processing schema are his way of interpreting the events that he witnesses and experiences in the combat zone. It therefore plays a part in the original expectations that he brings with him, and it continues to function in making sense of events as they occur. Thus, it is this combination of processes that should be addressed in any attempt to effect the soldier's actions, reactions and responses in the combat zone. There is a multiplicity of information that impinge on his senses and awareness, some of the items are relevant while others are irrelevant. His information processing schema will determine which of these items he actually addresses his attention to. It will also determine his emotional reaction, both at that point in time, and subsequently. Mental preparation for the combat scenario can facilitate coping processes by changing the schema and therefore the reactions.

Analysis of meaning in emotion: the GER.

Mandler (1975) presented a view of emotion as having three parameters: arousal, cognitive interpretation, and consciousness. He placed special emphasis on the interaction between arousal and cognitive interpretation, and the analysis of meaning in emotion (Mandler 1979). The group emotional reconstruction procedure employed by the IDF is an attempt to influence the emotional representation of negative experience. It serves also the function of accelerating the bereavement process and bringing it to completion, so that it no longer remains as an obtrusive psychological phenomena that periodically resurfaces to consciousness, impeding effective performance. The process can theoretically be utilized as an inoculation procedure, in

place of actual combat experience, with the assistance of audio-visual aids. As a stress inoculation procedure, the GER procedure may be employed to act on the emotional response, possibly through changing the schema. The emotions and moods evoked can be measured to map their developmental progress.

Stress, arousal and coping.

This aspect is further investigated in the experimental work reported on later in this thesis. The phenomenology of the processes that are initiated by such a procedure are investigated in a laboratory context. In particular, the stress and arousal trends are measured using the Stress and Arousal Checklist (Mackay, Cox et al, 1978). The initial experiments also attempted a measure of the perception of ability to cope in a combat scene by using the Wheel Questionnaire (Shalit 1982a). The effect of the experimental procedure on the subjects' initial perception of ability to cope was also measured.

It is postulated that elements of this model could be developed to be applicable in other situations where potentially aversive experiences are anticipated, such as are met by members of the police force (Hillas and Cox, 1986), ambulance staff, medical personnel, crisis intervention workers, the fire brigade, and relief workers in incidents of bereavement or trauma. It is a model involving preparation that will aid in coping in anticipated trauma.

Implications.

The data suggest thus that there is a role for some mental preparation for the anticipated stress of combat. The principal structures of such a programme, drawn from the current experience, would include:

(a) a leader who is in close touch with the emotional feelings of his men,

(b) a cohesive sub-group which acts as a emotional buffer and a source of motivation to perform well, and

(c) opportunity to express openly within the group what has happened and the feelings and strong emotions aroused as a result of witnessing or being involved in traumatic events.

In particular, if the leader of the group conducts a controlled discussion session, this is thought to give sanction to the expression of feelings as legitimate within the boundaries of the assignment. This is very much in keeping with the Israeli procedure for group emotional reconstruction, but also contains obvious elements from the Swedish commander training philosophy.

Concluding remarks.

Combat requires a sharp break with many moral prescriptions of peacetime society. As easy as it seems to be for men to kill when their immediate group sanctions it, and as ambivalent as normal people often are about killing, it is still true that to kill other human beings requires of most men an effort to overcome an initial moral repugnance. Under the requirements of the situation, men in combat were careful to hide this feeling, and it was not a subject of much discussion among soldiers (Stouffer et al, 1949). Killing is the business of a combat soldier, and if he is to function at all he must accept its necessity. Yet the acceptance of killing did not prevent men from feeling ambivalent.

It would appear that the countries under study are currently committed to some extent in attending to the subject of combat stress inoculation. Over the last two years, the subject has assumed greater importance in particular in the Swiss military and in the IDF. It is an interesting point as to whether the researcher in some way had stimulated an increased awareness through the process of enquiry into the subject. There would be too many threads to unravel to arrive at an answer, and it is expected that many tangles will be encountered along the way, so the question will simply be posed without a serious attempt to arrive at an answer. Attempts will be made to trace the origins of the initiation of the recent programs in the two countries above.

It is an impossible task to quantify the overall cost benefits of instituting such a program. It is possible to make interim evaluations. It is also possible to check, though to a limited extent, the effect of some of the individual components of the total program. For instance, the immediate impact of the stress inoculation process can be assessed. This can be recreated to some degree under laboratory conditions. The comparative effects of the stress

inoculation procedure can best be studied under such controlled conditions. The rest of this thesis is devoted to studying the actual impact of group emotional reconstruction of a war scenario. The study is set within an Asian context, to be culturally relevant. Chapter 3 sets out the methodology, procedure and instruments of research.

CHAPTER 3. METHODOLOGICAL ISSUES.

This chapter will first set out the general strategy adopted for the various experimental studies (see Chapters 4 to 7). This will be followed by a description of the subjects used, how they were sampled and recruited. The design of the experiments will then be discussed, and the study paradigm and procedures presented. The independent variables and dependent variables will then be described in some detail, and the statistical analyses employed outlined.

1. STRATEGY AND OBJECTIVES.

The strategy for the rest of the research described in this thesis is based on an experimental analysis of simulated 'stress inoculation' training for combat. The "small group" formed the basis of these investigations, and group discussion was central to the procedures used. Essentially, subjects were given stress inoculation training based on a modified version of the Israeli GER procedure, but including aspects of the Swedish stress management training. They were subsequently tested in a stressful situation. Subjects' reactions to stress inoculation training, and the appropriate control conditions, were assessed using self-report and performance based measures.

Stress inoculation has been defined (see page 45) in terms of psychological preparation for stressful experiences which will reduce the reaction to those experiences. In terms of the (short term) experimental validation of such preparation, a stress inoculation effect should be obvious both in terms of the pattern of reaction to the overall series of events (preparation then stress testing) and also in the persistence of any reduced reaction to stress. It is possible, of course, that while a pattern of reaction suggestive of a stress inoculation effect might be obvious in the short term, it might not persist in the longer term.

2. SUBJECTS.

The population for the research consisted of pre-conscript male youths in Singapore, currently engaged in pre-tertiary education. This stratum of

youth reflects the racial and religious diversity which constitutes the Singapore society. The samples were drawn from 16 and 17 year old male Junior College students from various Junior Colleges in Singapore. For each of the experiments, a sample was obtained from two Colleges, apart from the last experiment where all the subjects were from one College. A cross-section of the typical Junior College Singapore male population was thus obtained.

Permission for conducting the study in the Colleges was first obtained by presenting an outline of the experimental design and objectives to the Ministry of Education. This was approved in principle, and the next task was to obtain the agreement of the individual Junior College principals to conduct the study in their College. In one College, the experimenter was invited to speak to a large group of students within the required age category, to invite them to participate in the study. Those students interested in participating took home a letter drafted by the experimenter, requesting their parent's consent for such participation. The letter included assurances that all individual data would be treated in strict confidence and that only aggregate scores would be reported. An official letter from Nottingham University was also appended to verify the bona fide status of the study.

In all the other Junior Colleges, especially those where the experimenter was personally acquainted with the Principals, students were recruited by their teachers according to availability as determined by their lecture time-tables. It was emphasized that there was to be no coercive element involved, and all participants were thus volunteers. There were three main reasons why the students volunteered:

(1) they were interested in finding out what a stress study would be like. It was a novel experience for them to participate in such a study.

(2) they were aware that there was some connection with defence topics. As they were due to do national service within a couple of years, they were curious to find out what this study was about, and what they could learn about what lay ahead for them in national service (of two and a half years duration for them).

(3) they were told that feedback would be provided, at the conclusion of the study. There was an intrinsic interest in finding out how they performed, even if it was only aggregate scores.

Subjects were randomly assigned to experimental and control conditions. In all experiments, conditions were matched by educational level and College. In each condition, subjects were tested in groups of ten to fifteen.

3. DESIGN.

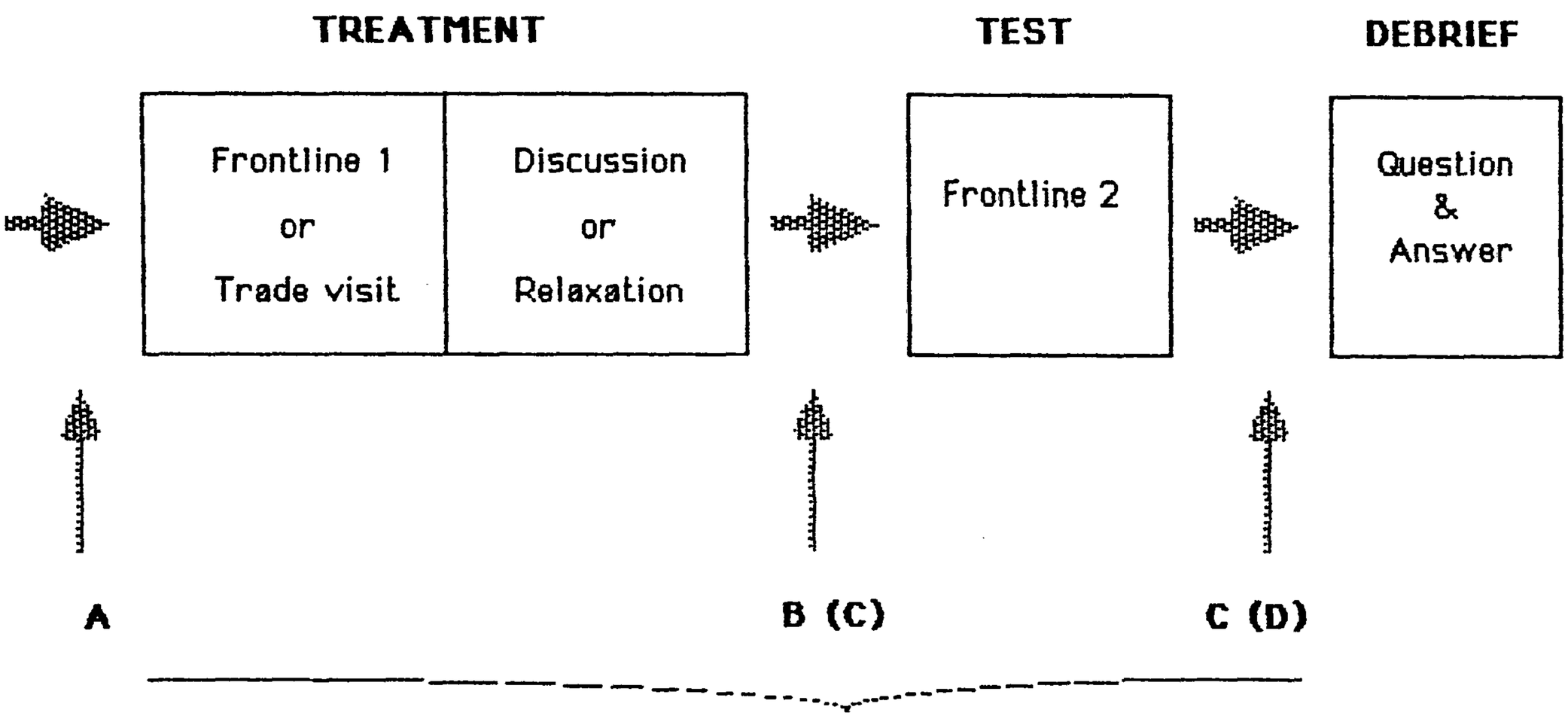
This section presents the experimental paradigm, and discusses procedures involved in the research design. A schematic representation of the design is presented in Figure 3.1. This is elaborated further in the paragraphs on procedures.

3.1. Paradigm.

The experimental paradigm involves assessing the effects of different treatments (experimental versus control) during a subsequent test session. The test sessions involved exposure to potentially stressful (emotion-evoking) audio-visual stimuli, and the effects of this exposure were measured in terms of changes in self-reported mood (stress and arousal). This approach was used to test the hypotheses that it is possible to affect the experience of stress when viewing a disturbing emotion-evoking scenario about war, by prior psychological preparation (stress inoculation); in particular by engaging subjects in an emotional reconstruction of an earlier and similar experience (GER).

The discussions were focused on subjects' experience of the audio-visual stimuli and their reactions to it. All subjects were involved in these discussions. By requiring a response from all subjects, the individual members of the group are drawn into an exchange of viewpoints. Thinking processes are stimulated as positions adopted based on value judgements have to be defended, or points conceded and a change of viewpoint adopted. The group discussion forces subjects to work with the information that they have been presented with.

FIGURE 3.1. THE EXPERIMENTAL PARADIGM.



A Initial Baseline Measures	B (C) Post Treatment (Pre Test)	C (D) Post Test
Biodata SACL GWBQ Wheel	SACL	SACL Wheel Debriefing

3.2. Procedures.

The experiments commenced with brief words of introduction by the experimenter, outlining of the time involved for the experiment, and the various procedures that would be involved. The main hypotheses under test were not divulged, so that subjects remained naive. Similarly they were not told of the procedures that other subjects (experimental conditions) would be engaged in. It was promised that there would be further clarification of the purpose of the study, at the end of the experiment during a question and answer session. What was conveyed in essence was that the study was a data-collection session for the purpose of completing a PhD, and the main objective was to consider how best to mentally prepare pre-conscripts for the combat scenario.

All participants were asked to fill out a biodata form. This form asked for particulars such as name, age, school, class, race, religion and date of the experiment. In addition, for the last two experiments, there were additional questions about the frequency of viewing or reading with regard to war-related topics. There was also a question about whether or not they were interested in finding out about defence-related issues.

The experimental design involved obtaining initial baseline measures of stress, arousal, and general well-being. In some experiments, a baseline measure of perception of likely control in the war scenario was taken. In the last experiment, a baseline measure of performance on a diagrammatic reasoning task was obtained.

The baseline measures were followed by a **treatment** phase. This began with the viewing of a documentary video film for about twenty minutes. Depending on the condition, this could either be the first part of a disturbing war film entitled "Frontline" (experimental), or a film about the visit of a Singapore trade delegation to China (control). The experimental condition viewed the war documentary then were involved in GER relating to the film. The control condition viewed the trade documentary, and then engaged in a discussion about the film they had just viewed. The alternative treatment conditions viewed the disturbing war documentary, then (a) underwent a relaxation procedure, or (b) read magazines and refrained from discussing

the film. All these activities were matched for duration, which was half-an-hour. An assessment of self-reported stress and arousal scores was then made at this point, marking the end of the treatment phase.

In the first two experiments there was then an interval of about half-an-hour, while in the last two experiments, this interval was stretched to about three hours (across lunch-time).

The test phase of the experiments then commenced. For the last two experiments, and after the longer time interval, this commenced with measurements of stress and arousal. All subjects then viewed the second part of the disturbing war documentary "Frontline". In the last experiment, the subjects were instructed to complete a parallel form of the Diagrammatic Reasoning Test, while the video was being viewed. The test was scheduled to commence five minutes after the film was started, and to end at the same time as the documentary. All subjects then completed another stress arousal checklist. They were then given a debriefing form to fill out, with open-ended questions, so they could express their views on various aspects of the experiment, and comment on the exercise as a whole. Finally, there was a question and answer session, when any queries they had were clarified.

4. INDEPENDENT VARIABLES: TREATMENTS.

The experimental, control and alternative treatment conditions represented the main independent variable of interest. These were designated GER, Control, Relax and Control II and are described in the following paragraphs.

4.1. GER.

The experimental condition (GER) watched the first part of a war film called "Frontline", edited from a documentary series produced in 1979 for NBC, a US television network. The contents included a particularly horrific scene of the aftermath of a Vietcong bombing of a primary school in Cambodia. The scenes depicted in the first part of "Frontline" included crying and injured civilians, men, women and children, and a particular scene of children fleeing down a road with the clothes burnt off them as a result of napalm. There was also an incident where a Vietcong soldier was executed in public

with a shot at close range to his temple. The journalist who had filmed it narrated that the South Vietnamese army chief carried out the execution because the family of his good friend, the Police Commissioner of the district, had just been murdered by the Vietcong. Nine of the children, some of whom were his grandchildren, had their throats cut. The narration, and the scene of the Vietcong soldier, with his hands bound, falling to the ground after being shot, and the blood flowing in a pool on the ground from the opposite side of his head, had had visible effects on previous audiences. Time magazine (September 23, 1985) featured an article about Neil Davis, the Australian cameraman who recorded the live footage for this documentary, and who was the narrator. He died filming a military coup in Thailand in 1985.

Subjects in the GER conditions were then involved in a tutored group discussion of the more disturbing aspects of the film: the episodes of violence, killing and chaos. Participants were encouraged to talk about and share their emotional reactions to these scenes. The discussion was timed to last for half an hour.

Two qualitatively different GER procedures were used over the four experiments. The standard GER procedure invited the participants to comment about their reactions to the more emotive aspects of the war documentary. By contrast the emotion-focused GER procedure required the subjects to put themselves in the "situation" of the soldiers depicted in the documentary. They were asked to report on what they thought they would do in the context, and what they would feel about their actions and emotional reactions. In particular, they were asked about their reactions to the requirement to "kill" as a soldier. In the emotion-focused GER, the subjects were quietly provided with information about combat stress reaction and its effect on military performance, and about post traumatic stress syndrome symptoms.

As a general rule, it is unusual for young male Singapore youths to engage in discussions about their emotions. As a result, they needed encouragement to draw them out in such a discussion. The prospect of enlisting for conscript service over the next couple of years served as a motivating factor in encouraging participation in the discussion, as the youths saw the topic as

personally relevant.

4.2. Control.

During the treatment period, the control condition watched a neutral documentary on the subject of a visit to China by a political-cum-trade delegation from Singapore. The documentary showed scenic views of China including the Great Wall, grand temples sited on mountain slopes, new hotels, and maps of the main cities open to trade and communication links. Meetings between the political leaders of China and Singapore were also shown, including excerpts of speeches made at banquets in connection with the visit. The background music for this documentary was a gentle Chinese melody, and the narrator adopted a factual tone. The group was then engaged in a general discussion about the more noteworthy points of this documentary.

Deliberate attempts were made to moderate the tone of the discussion so that it was muted and not emotionally charged. Attempts were also made to draw the discussion away from personal identification and involvement by the participants. The duration of the film and the duration of the discussion were matched with that for GER.

4.3. Alternative Treatment: Relax.

The alternative treatment condition, "Relax" watched the same war documentary as the GER condition. However, immediately after viewing this film, they were led through a relaxation exercise (Benson 1985). They remained seated in their chairs during this session and the exercise was conducted with their eyes closed. They were sequentially encouraged to relax the various parts of their anatomy, culminating in self-addressed instructions to relax while they exhaled. The students did in fact undergo the exercise successfully, as reflected in their outward behaviour, and in their feedback comments in their debriefing form. They did not discuss the war documentary as a group during this phase of the "treatment".

The duration of the relaxation procedure was matched for time with the discussion periods for the other two conditions.

4.4. Alternative Treatment: Control II.

In the second alternative treatment condition, "Control II" participants viewed the war documentary, but then engaged in reading magazines while they remained in the same room. They were not permitted to talk to each other. The magazines provided by the experimenter consisted of back issues of Newsweek, Time, Life and the Far Eastern Economic Review. These magazines were deliberately chosen as they reflect a staid, reasoned, factual, writing style, and it was hoped, would minimize emotional arousal in the reader.

The time permitted for the reading of the magazines was matched for duration with the time for discussion and relaxation respectively for the other conditions.

5. DEPENDENT VARIABLES.

This research was looking to measure aspects of the previous cognitive, emotional and behavioural responses to potentially stressful situations through self-report, particularly with regard to the experience of stress, arousal, well being and coping strategies. These were measured using four paper and pencil tests: the SACL (Stress Arousal Checklist), the GWBQ (General Well Being Questionnaire), the WQ (Wheel Questionnaire) and the DRT (Diagrammatic Reasoning Test) respectively. Some description of these tests is presented below. The data collected using the SACL, WQ and DRT provided the main dependent variables for the various studies, while those collected using the GWBQ were to establish the equivalence of the groups.

5.1. Measurement of stress.

The measurement of mood may offer one direct method of tapping the individual's experience of stress, although many other forms of measurement have been offered. There is an expectation that these different measures will be intercorrelated, and that collectively they should describe a general stress syndrome. Repeated failure to demonstrate a tight pattern of intercorrelations has led many to reject stress theory, and even the notion of 'stress' itself. However, Cox (1985) argues that such intercorrelations are not

to be expected because of the nature of the different measurement methods used, and the temporal characteristics of the different response systems involved (see Introduction 1.(7)). Thus, it would be unwise to compare state measures of mood with, say, cumulative measures of urine catecholamine excretion or with continuous heart rate measurements, when the latency of the mood response is different to that of adrenal or cardiac function, and perhaps is also of different intensity and duration. Moreover, the increased production of adrenaline by the adrenal medulla, or glucose from glycogen, and their entry into the blood may be balanced by an increased utilization or loss (excretion). Measures of blood levels may indicate no change, despite a gearing up of the function.

There are also individual differences between a person who reports the experience of stress and who shows an elevation of heart rate and increased urinary catecholamine excretion, and the person who does not show these physiological correlates, or one who shows elevated catecholamine excretion and a decrease in heart rate. Cox (1985) argues that the latter examples are not failures as tests of stress theory. On the contrary, the apparent independence of the different correlates provides for a richness of description. Thus while there cannot be direct physiological measures of stress, there are physiological correlates of stress.

The question of the measurement of stress is theoretically based and its assessment should logically focus on the individual's perception of their situation and their emotional experience of it.

5.2. Stress Arousal Checklist.

Measurement of self-reported stress and arousal has been an issue in the mood literature. Cox (1985) has argued for researchers to place greater trust in the development of reliable, fair and valid methods for obtaining subjective data, and in their subjects' ability to provide it.

5.2.(1). Introduction.

The Stress Arousal Checklist (SACL) revised by Cox and Mackay (1985), is a self-report adjective check-list, for the measurement of mood. Because of

its multidimensional basis, and non-specific nature, the manifestations of mood are likely to be complex and varied. Whatever the mechanism, it may be maladaptive as well as adaptive. Mood appears to be intimately linked to a variety of ongoing activities and has as one of its precursors the physiological well-being of the individual (Gotts and Cox, 1988).

The SACL was developed as a subjective measure of mood states. It started as an adaptation of Thayer's (1967) checklist for the measurement of self-reported 'activation'. Over several experiments, Thayer was able to confirm his hypothesis that self-report measures of arousal would correlate more highly with physiological composite variables than individual physiological measures would correlate among themselves. He suggested that "self-reported arousal" may be "an integrative variable more representative of the general status of bodily activity than any single psychophysiological variable" (Thayer 1967, 1970). Similarly, Eysenck (1975) has concluded that controlled verbal report may be in many ways the preferred method by which to measure arousal.

Unfortunately, the original Thayer instrument was not found to be useful in studies conducted at Nottingham (Mackay, Cox, Burrows and Lazzerini, 1978). A revision was therefore undertaken. Thayer's original instrument was found to be too 'American' with the use of words like "peppy", "full-of-pep", "clutched-up" and "blue". The frequency of these words was reported to be considerably less in the U K than in the United States. Furthermore, in addition to possible cultural-linguistic differences, the authors also felt that Thayer's model was conceptually inconsistent. His model had four orthogonal arousal factors making up a single mood continuum. Thayer (1971) later reported differences in the stability and independence of his activation factors and more recent work (Thayer 1978), using oblique factor rotations, suggests that a two bipolar, rather than a four monopolar solution is the most satisfactory. This is compatible with the conclusions of Mackay and Cox (Mackay et al, 1978), which served as the basis of the development of the SACL. Gotts and Cox (1988) suggest that the two clusters observed in almost all work on self-reported arousal are a reflection of, if not totally identical to, their two factor structure of mood.

5.2.(2). Initial Development of the SACL.

A list of 45 adjectives containing Thayer's original adjectives, but with the American words removed and new words substituted, was compiled. Thayer's original asymmetric response scale was used, that is; 'definitely feel' (++), 'feel slightly' (+), 'do not understand or uncertain' (?) and 'definitely do not feel' (-). This inventory was administered to 154 undergraduate students. Factor analysis and orthogonal rotations were performed on the raw data (long scoring). In factor analyses of the SACL the scale points are assigned the values of '1 to 4', that is the scores are not dichotomized. However, for robustness in scoring the separate stress and arousal factors they are dichotomized; the '?' responses being grouped with the '-' responses and the '+' responses being grouped with the '++' responses. These analyses revealed the existence of two bipolar factors. These factors, utilizing 34 of the 45 adjectives, accounted for half of the total data variance.

A similar set of analyses were performed on the data from 72 subjects, 36 of each sex, who completed the 45 item inventory twice during a study designed to investigate sex differences in a variety of fear-provoking situations (Lazzerini, Cox and Mackay, 1978). Factor analyses produced nearly identical bipolar factors to those of the earlier analyses. Based on a re-examination of Thayer's checklist and of the composition of the two factors these were labelled 'stress' and 'arousal' respectively. Gotts and Cox (1988) conclude that the first of these factors is a combination of the two original monopolar factors 'high activation' and 'general activation' and 'general deactivation', and the second a combination of 'general activation' and 'deactivation-sleep' (Thayer 1967).

The background research leading to the development of this instrument is reported in Mackay, Cox, Lazzerini and Burrows (1978). It reports a finding of two orthogonal dimensions from factor analysis, labelled as stress and arousal respectively. Updated normative data is reported in the manual by Gotts and Cox (1988).

5.2.(3). Two-dimensional model of mood.

Meddis (1969, 1972), drew attention to the conflicting results arising from the use of similar adjectives, and among other things, attributed them to differences in the rating scales employed. In particular, Meddis noted two difficulties with the scales used by Nowlis (1965) and subsequently copied by others: one of ordinality and the other of symmetry. Sjoberg and Svensson (1976) and Sjoberg, Svensson and Persson (1979) have criticized previous work using mood adjective checklists on other grounds. As well as the use of inappropriate response scales, they suggest that the psychometric model, implicit in common factor analyses as used by most researchers, is invalid. They propose a radex model, and according to their factor and multidimensional scaling analyses, mood can be described within a two dimensional framework: 'activation' and 'pleasantness'. All other moods, feelings and emotions can, they suggest, be defined in terms of their location within this two dimensional space. Further evidence in support of a two factor pattern was provided by Mackay (1980) when reporting the outcome of a multidimensional scaling of an inventory of 120 adjectives.

5.2.(4). Description.

The SACL consists of thirty adjectives derived from a series of factor analytic studies, the first of which was reported by Mackay, Cox, Lazzerini and Burrows in 1978. Meddis (1969) had hypothesized two basic components of mood: hedonic tone, reflecting a general sense of well-being, and 'vigour', which may correspond to the physiological concept of arousal. The two factors in the study by Mackay et al (1978), support this idea. They reflect two fundamental aspects of mood, stress and arousal. Arousal is described as being alert, awake, attentive and lively. Stress is described as feeling tense, uncomfortable, unpleasant and bothered. The authors suggest that the experience of "stress" often accompanies the realisation that the person faces an unpleasant situation or difficult problem with which they cannot easily cope.

The SACL is relatively short, easy to administer and the response requirements (instructions) are easily understood. The checklist is sensitive to minor changes in transitory mood states. Repeated measures can help

determine the time course and direction of stress and arousal levels. The speed with which it can be administered and the ease with which it can be scored makes it an ideal instrument for those situations where minimum subject intrusion is desirable.

The experiments used all four parallel forms of the SACL, for consecutive measurements of the two factors of stress and arousal at the different stages of the experimental procedure. The instructions to respondents begins by saying that the adjectives describe different feelings and moods, and that they are requested to use the list to describe their feelings at that moment in time (Gotts and Cox, 1988). They are then instructed to respond to each of the thirty adjectives on a four point scale ranging from (++) and (+), to (?) and (-). The (++) is to be circled if the adjective definitely describes the respondent's feelings, and the (+) if the adjective more or less describes his feelings. The (?) is circled if the subject does not understand the adjective, or cannot decide whether it describes how he feels. The (-) is to be circled if it is thought that it does not describe the respondent's feelings. The instructions then brief the respondents that their first reactions will be the most reliable, and therefore they should not spent too long a time thinking about each adjective. They are requested to be as honest and accurate as possible.

Table 3.1 shows the distribution of adjectives across factors (Gotts and Cox, 1988). For scoring purposes, the response scale is dichotomized and the two halves scored 1 or 0 according to whether the adjective in question is positive or negative, as reflected in Table 3.1. Positive adjectives score 1 for responses (++) and (+), and 0 for responses (?) and (-). Negative adjectives score 1 for responses (?) and (-), and 0 for responses (++) and (+).

The use of the "?" response is a part of instructions to respondents of the SACL and there is no reason to believe that subjects have difficulty in understanding such an instruction. It is also used to cover the contingency that subjects do not understand the adjective presented. Deliberate emphasis is placed on the uncertainty instructions as part of a four-point rating scale from 'do not feel' to 'definitely feel' (Cox and Mackay, 1985).

Stress (18)		Arousal (12)	
Positive (10)	Negative (8)	Positive (7)	Negative (5)
Tense Apprehensive Worried Bothered Uneasy Dejected Nervous Distressed Uptight Jittery	Relaxed Restful Peaceful Cheerful Contented Pleasant Comfortable Calm	Active Energetic Vigorous Alert Lively Stimulated Activated	Drowsy Tired Idle Sluggish Sleepy

Table 3.1. Distribution of Adjectives across Factors on the SACL.

Symmetrical scales have been strongly criticized by Bohlin and Kjellberg (1973), who have argued that the experience of mood is not itself symmetrical, and that the strength of a feeling as described by an adjective runs from its absence to some maximum amount. Including several rejection categories in a response scale (to balance the acceptance categories) implies a grading of the absence of a feeling, a task which must appear unnatural to most subjects. Subjects appear to consider both the certainty and the strength of their feelings when using mood scales (Bohlin and Kjellberg, 1973). Gotts and Cox (1988) acknowledge the possibility that an inability to report feelings may be symptomatic of a disordered psychophysiological state and may be reflected in the magnitude of the score on the Q scale.

5.2.(5). Further development.

Since its development in 1978, the SACL has been extensively and fruitfully used in both pure and applied research and in the development of contemporary stress theory, and in clinical and occupational practice, and in military and sporting settings (Gotts and Cox, 1988). It has been used in a number of different English speaking countries (Australia, Canada, USA and New Zealand), and has also been translated into several other languages (Dutch, French, Mandarin, Swedish and Welsh).

The total sample upon which the norms for the SACL have been compiled is broadly based. While the sample is not random, wholly representative nor stratified, and is predominantly urban, it is nonetheless, suitably heterogenous. Sample members represent all ages and differ across a wide range of educational, occupational and social class categories. As a group, sports people reported the highest stress level, understandably since the SACL was administered to the competitors 15-20 minutes prior to the time of competition. Cutters (manual textile workers) reported the second highest stress levels (mean of 7.4) and the highest levels of arousal (mean of 8.5). Manual workers (mean of 5.5) reported the lowest arousal levels. Overall, while the 31-45 years age group reported the highest arousal levels (mean of 7.2), there is a tendency for stress scores to become smaller with increasing age.

As a measuring instrument, the SACL is reliable, and has demonstrated extraordinary factorial robustness, across diverse samples (for example, age, sex, education, ethnic origin and occupation). It has sound construct, concurrent and predictive validity, and obvious face validity. It does not however, describe the quality of mood beyond its two fundamental dimensions, stress and arousal. Also, a single administration of the checklist cannot provide information about the temporal characteristics of mood (how it changes over time).

5.2.(6). Reliability studies.

Because of the inherent instability of stress and arousal levels over time, item-remainder (for items) and split-half or alpha coefficients (for scales) provide more meaningful measures of the reliability of the SACL. Split-half correlation coefficients for the overall sample was .83 for stress and .85 for arousal. Coefficient alpha is the general index of internal scale stability. Alphas for the overall sample were .89 for stress and .84 for arousal.

The results of reliability analyses reported by Gotts and Cox (1988), are uniformly consistent. The individual items have more than adequate item characteristics with respect to comprehension, response spread (item discriminability), item-remainder coefficient size, individual and group discriminating power, their contribution to overall scale robustness and to

the domain of the sub-scales to which the items belong. The stress and arousal scales are to all intents and purposes independent of each other. They are robust, internally consistent, return expected retest values and can reasonably be scored by either the dichotomous or long scoring method.

5.2.(7). Validity.

Gotts and Cox (1988) report investigations of construct, criterion-related and face validity of the stress and arousal scales of the SACL. Their results support the contention that to a large extent, stress is cognitively based and that arousal and motivational states are reciprocally dependent. Thus, on average, higher ability judo players reported less symptoms, 2.5 to 6.9 when compared with those of lesser ability. For the team sports, the differences were not as pronounced, 4.4 for higher and 5.3 for lesser-ability players respectively. Rushall, Barry and Gotts (1983) have shown that for a sample of wrestlers (elite to novice levels) the greater the ability of the competitor the lower the number of pre-competition symptoms reported. They suggest that the differences are stress-related. This position has been supported in that Gotts and Mathews (1986) found 'ability' to correlate .60 with stress and to be unrelated to arousal. Nideffer (1980) had found that anxious individuals direct attention inadequately and become highly overloaded by their own thoughts and feelings. Since it is important for successful judo exponents to have a broad internal focus of attention, Mathews and Gotts (1986) hypothesized that overloaded internal and external foci would be positively associated with stress and negatively with arousal. This was confirmed; stress and arousal being moderately and predictably related to the Overloaded External (OET) and Overloaded Internal (OIT) scales of Nideffer's Test of Attentional and Interpersonal Style (Nideffer 1976).

Ray and Fitzgibbon (1981) in their study of 36 cholecystectomy patients found that preoperative stress was positively related to post-operative stress and pain. Conversely, arousal was negatively related to all of the post-operative measures. In particular, those patients who had higher preoperative arousal levels experienced less pain post-operatively, received less medical treatment for pain and sleeplessness, and were more quickly discharged from hospital.

King, Burrows and Stanley (1983), reported the results of a validation study using the SACL. They found it of value in the description of mood in an economic way, and recommend its further use in research. Cox and Mackay (1985) in a later report state that feelings of unpleasantness or pleasantness (stress), may partly reflect how appropriate the level of arousal is for a given situation, and the effort of compensating for inappropriate levels.

The SACL has been used in a number of research undertakings in diverse environments, for example, in a study of stress in Australian Antarctic expeditioners (Godwin 1985). Further support was reported from this study for the claim that the relationship between stress and arousal is orthogonal, confirming results for Australian samples reported by King et al (1983). A shortened 20-item format was used for both these Australian studies, and the instrument shown to be sensitive to change in different situations.

Validity studies have shown that stress and arousal can reasonably be differentiated from unlike constructs and are congruent to similar constructs. The SACL also displays suitable face validity.

5.3. Stress Inoculation Index.

Stress inoculation has already been defined as psychological preparation for subsequent stressful experiences in order to reduce maladaptive (emotional) reactions to these experiences. Furthermore, it has been pointed out that, in an experimental validation, stress inoculation effects should be obvious in differences in the pattern of reaction of inoculated and non-inoculated subjects to events (preparation then testing) and in the persistence of any such differences.

An attempt was made in the present experiment to measure stress inoculation effects in terms of patterns of reaction. Measurement of such effects necessarily involved studying differing stress levels during treatment and test phases respectively. With an inoculation effect, it was expected that the difference in stress level during the treatment phase would be appreciably more than the difference in stress level during the test phase. Figure 3.2 sets out the expected directional trends for stress levels during the treatment and test phases respectively.

5.3.(1). Computation of the stress inoculation index.

A stress inoculation index was calculated as the difference between the change during the test phase from the change during the treatment phase, on stress, as measured by the SACL. The treatment score was based on subtracting the post treatment score from the pre treatment score (A-B). The test score was based on subtracting the post test score from the pre test score (C-D). Figure 3.2 illustrates the relative positions of the various scores during the total experimental procedure. The stress inoculation index was based on subtracting the test score from the treatment score (A-B)-(C-D).

5.3.(2). Interpretation.

There is deemed to be an inoculation effect when there is less of a difference at the test stage, thereby resulting in a negative index score. As a demonstration, A-B=-X, and C-D=+Y, and (-X)-(+Y)=-Z. The graphs shown in Figure 3.2 are an example of an instance of a stress inoculation effect as a result of the experimental treatment procedure. The stress level at the end of the test phase is not extremely severe when compared to the score at the end of the treatment phase.

A positive index would indicate no inoculation effect, and the larger the magnitude of the positive index, the less 'protection' or advance preparation the subject is deemed to have had in anticipation of the stressful situation. In such an case, A-B=+X, and C-D=-Y, and (+X)-(-Y)=+Z. Figure 3.3 is an example of such a case. There is a lowered level of stress during the treatment phase, and a sharp rise in stress ending with a high stress score at the end of the test phase.

5.3.(3). Predictive value.

Efforts were made to calculate the extent to which the stress inoculation index could be predicted on the basis of biodata and initial psychometric performance. Analyses of variance were also conducted between the stress inoculation index means for the different experimental conditions to determine whether there were significant differences between conditions on this index.

Figure 3.2. Calculation of Stress Inoculation Index.

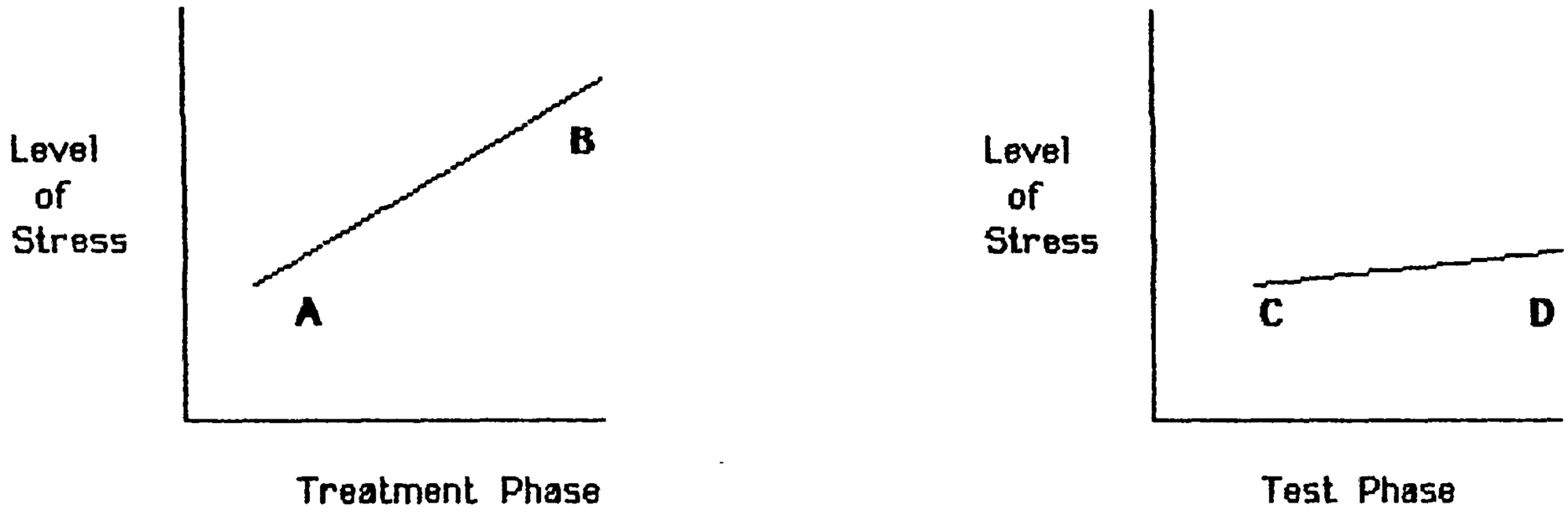
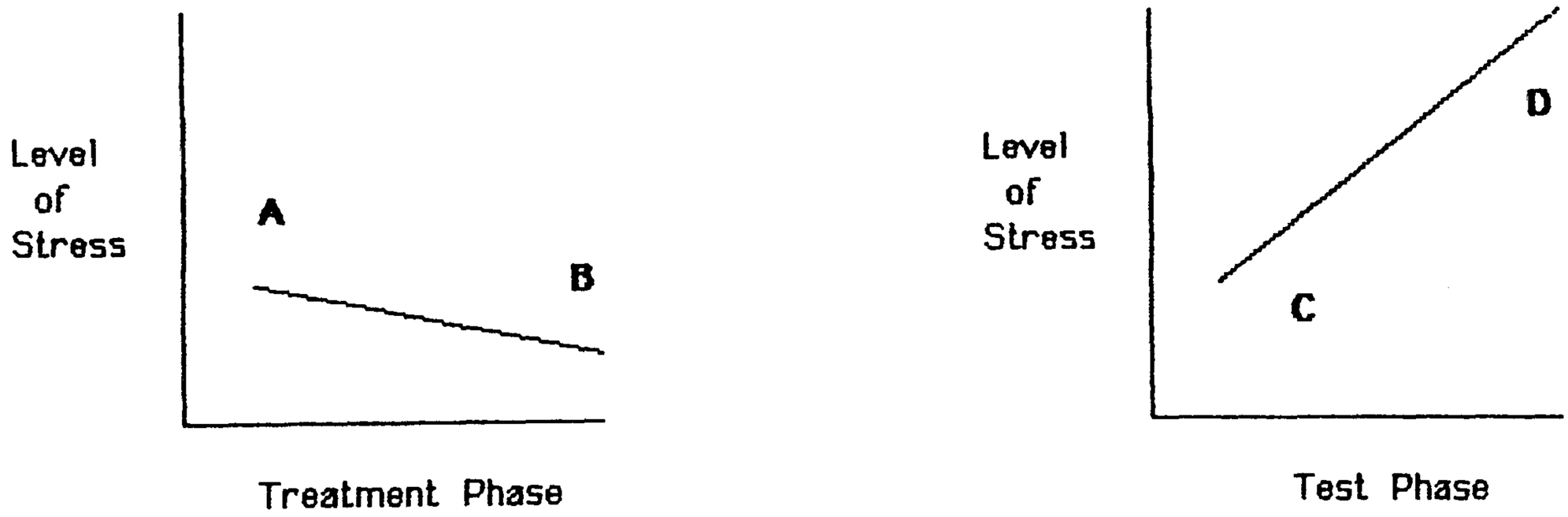


Figure 3.3. Demonstration of Absence of Inoculation.



5.4. General Well Being Questionnaire.

In order to establish comparability of groups prior to commencing experimental procedures, it was necessary to measure equivalence on general health and well-being, as these have implications for the levels of stress and arousal reported. The General Well Being Questionnaire (GWBQ) developed by Cox, Thirlaway, Gotts and Cox (1983) as a measure of self-reported well-being, was selected as the most appropriate instrument for the purposes of this research.

5.4.(1). Items and format.

The questions include items relating to becoming bored easily, being forgetful, troubled by stammering, and being scared when alone. There is a five point response scale, ranging from "all the time", "often", "sometimes" to "rarely" and "never". The respondent is instructed to answer all the questions.

5.4.(2). Factor analytic studies.

Two clusters of symptoms or factors were identified, from a series of factor analytical studies on 1,665 British subjects. These factors were derived as orthogonal. The first factor was defined by symptoms relating to tiredness, emotional lability, and cognitive confusion. This factor was termed "worn out". The more cognitive items would appear to imply difficulties in decision making: (a) has your thinking got mixed up when you have had to do things quickly, (b) has it been hard for you to make up your mind, and (c) have you been forgetful. These may have implications for personal problem solving and coping (Cox 1987). The second factor was defined by symptoms relating to worry and fear, tension and physical signs of anxiety. This factor has been termed "uptight and tense".

	Factor 1. Worn Out.
1.	Have your feelings been hurt easily?
2.	Have you got tired easily?
3.	Have you become annoyed and irritated easily?
4.	Has your thinking got mixed up when you have had to do things quickly?
5.	Have you done things on impulse?
6.	Have things tended to get on your nerves and wear you out?
7.	Has it been hard for you to make up your mind?
8.	Have you got bored easily?
9.	Have you been forgetful?
10.	Have you had to clear your throat?
11.	Has your face got flushed?
12.	Have you had difficulty in falling or staying asleep?
	Factor 2. Up Tight.
1.	Have you worn yourself out worrying about your health?
2.	Have you been tense and jittery?
3.	Have you been troubled by stammering?
4.	Have you had pains in the heart or chest?
5.	Have unfamiliar people or places made you afraid?
6.	Have you been scared when alone?
7.	Have you been bothered by thumping of the heart?
8.	Have people considered you to be a nervous person?
9.	When you have been upset or excited has your skin broken out in a rash?
10.	Have you shaken or trembled?
11.	Have you experienced loss of sexual interest or pleasure?
12.	Have you had numbness or tingling in your arms or legs?

Table 3.2. Items defining the two factors on the GWBQ.

Scores on both scales have been shown to be determined by the nature of the person, and by the nature of of their work and work environment. A study of 300 schoolteachers revealed that "neuroticism" scores on the Eysenck Personality Inventory were significantly related to scores on the GWBQ, concurrently administered. Between 37 and 41% of the variance in well being was accounted for by "neuroticism" (emotional instability). However, there was no significant relationship between "extraversion" and well being.

5.4.(3). Description.

Following a series of linked studies in Britain and Australia, with 2,287 subjects, Cox and Gotts (1988) deleted a number of symptoms from the two original scales. The GWBQ now consists of twenty-four non specific signs and symptoms of ill health that the respondent may have experienced in the immediately preceding six months. The two new "international" scales are defined by twelve symptoms, but retain their essential nature: "worn out" and "uptight and tense" (Cox, 1988). Table 3.2 sets out the items in the two factors, based on the international scale.

The scoring ranges from a high of 4 for the response "all the time" to 0 for the response "never". It is therefore possible to obtain a maximum score of 48 and a minimum score of 0 for the two factors worn out and up tight respectively, using a simple additive model of computation.

5.4.(4). Norms.

Cox and Gotts (1988) report norms for a mixed population of Australian and British students. The mean score for worn out for the 16-20 years age group was 19.7, standard deviation 8.5, while the mean score for up tight was 12.0, standard deviation 7.3.

For the Singapore sample, the worn out mean was 21.5, standard deviation 5.3, while the mean score for up tight was 13.7, standard deviation 5.2. The scores for the Singapore students are not significantly different from the Cox and Gotts (1988) norms, apart from having elevated base-line scores for one standard deviation below the mean.

5.5. Wheel Questionnaire.

There was a need to measure the impact of the inoculation treatment procedure on the expressed perception of ability to cope in a war scenario. For cross-cultural comparison purposes, it was best to utilize a culture-fair instrument. A projective test would mean minimum suggestibility, and objective and quantitative measurement would fulfil the objectives of rigorous psychometric testing. Happily, such a tool was found, Shalit's Wheel Questionnaire (1982a).

5.5.(1). Description.

This is a self-report projective instrument developed by Shalit (1982a) for a measure of perception of control in any given situation. It is shaped like a wheel with twelve segments. Respondents were asked to fill in as many of the twelve sections as they liked with answers to the question "What characterizes war?" They were then instructed to rank each of their responses in order of importance, beginning with 1 for the item judged to be the most important. Ties were permitted for this ranking. The next instruction was to decide whether the items were positive, negative or neutral. For each item reported in a segment of the Wheel, the respondent had to circle on a scale from "++" for "very positive" to "+" for "positive" and "o" for neutral", "-" for "negative" and "--" for very negative". The last instruction to subjects was to indicate the extent to which they had control over each item listed in the various segments of the Wheel. They answered this question by circling "much", "some" or "none".

5.5.(2). Computation of the coping score.

A measure of coping was obtained after scoring all the various elements involved, namely, the perceived detail and clarity of structure with regard to the subject under enquiry, the emotional loading, and the extent of perceived control. The actual calculation for the coping measure is as detailed by Shalit and Carlstedt (1984), with a possible range of -36 to +36. Essentially, the index shows the extent to which the individual feels he can control those factors in the mapped universe which he feels to be important, regarding the topic under enquiry (Shalit 1982a). The rationale is that even a negatively perceived factor has a less negative effect if possible control over it is perceived, and conversely, a positive factor which is perceived as a chance factor has a less positive value in the final appraisal.

The index of control shows to what extent one believes that one can affect or control different elements in war. A negative score is due to the fact that most factors associated with war are perceived as negative, combined with the feeling that one cannot control these factors. The difference between different groups of soldiers lies mainly in the extent of perceived control, as the vast majority of all factors is seen as negative by all groups. Shalit

(1982b) postulates that optimal coping will occur when the best fit occurs between the perceived demands of the situation (in coherence terms) and the perceived coherence of the situation. Shalit (1982a) describes the importance of such a goodness of fit in the military context.

5.5.(3). Qualitative analysis.

The content analysis of the Wheel Questionnaire has training implications. The ability to perceive the more concrete aspects of war would appear to be associated with a better coherence of appraisal. The more coherent the appraisal of a situation in general, and war specifically, the greater the predisposition to perceive the more concrete aspects of that situation as the most salient (Shalit 1982b). This in turn means a better ability to learn and train for that situation, and to cope with it when it does occur. The general rule for handling anxiety is to translate it into concrete terms. Thus, one can teach a person to cope with concrete issues but not with diffuse concepts. Shalit found in his research with Swedish national servicemen that for about 50% of the soldiers, the rather diffuse category of "mental" factors is that which primarily characterizes war. He proposed that discussions with the soldiers must be focused on concretizing this concept. Scenarios in which confusion, anxiety and anguish are played must be the basis for such discussion, which must lead to concretizing both the symptoms for reflecting diffuse anxiety, vague fears and the like, and the means for counteracting such responses. Discussions must also relate those abstract feelings to concrete persons, the soldiers or his peers. Much of this pertains to the re-conceptualising aspects of the procedure of GER as institutionalized in the Israeli Defence Force.

5.5.(4). Culture-fair applications and interpretation.

Distinct from content analysis, the objective nature of the Wheel Questionnaire scoring eliminates inter-rater scoring reliability problems. The fact that answers do not have to be read makes the literary level of the respondent nearly irrelevant, and allows the Wheel Questionnaire to be applicable to a wide range of subjects and cultures.

5.5.(5). Norms.

Shalit (1982b) reports a mean Control score of -8.8, standard deviation 6.0, for a sample of Swedish national servicemen. This compares with the Coping index (similarly derived from the Wheel), for the Singapore pre-conscript sample, with a mean of -5.5, standard deviation 6.3. The Singapore sample have a slightly less negative perception of coping ability in a war scenario.

5.6. Diagrammatic Reasoning Test.

There was a requirement for a cognitive performance test in order to test for experimental effect on the performance of a cognitive task. As the design involved re-testing, there was a need to have parallel forms of the same test, and a requirement that there be no significant improvement from one form to the next as a result of practice. Several tests were studied for this purpose, including the AH2, AH3, Numerical Reasoning Test, and Saville and Holdsworth's Spatial Reasoning Test. The Diagrammatic Reasoning Test was finally selected, as it could be most readily adapted for split-half reliability testing to develop parallel forms for the research. The level of difficulty was also assessed to be appropriate for the population intended.

5.6.(1). General description.

This is a derivation of the original questionnaire entitled Diagrammatic Reasoning (DT8), produced as a component of their Technical Test Battery by Saville et al (1982). The testing time is 15 minutes, and the range specified as from CSE level groups through to degree standard candidates. The instructions to the candidates advises them to work quickly and accurately, and not to ponder too long over any one question.

5.6.(2). What it measures.

The test itself requires information processing in a spatial sequencing set, and then the making of a decision on the missing element. It is not represented as measuring generalised 'abstract' reasoning skills. As a diagrammatic reasoning test, no great verbal or numerical skills are required, and it is distinguished from spatial ability tests which require the

rotation of shapes in space rather than the recognition of sequences within designs.

Saville et al (1982) reported that it correlated most highly, not with Spatial Reasoning or Visual Estimation, but with Numerical Computation (.49) and with Verbal Comprehension (.48), followed closely by the other numerical and verbal sub-tests of the battery. This test was chosen because it relates to possible cognitive involvement in a combat situation and maps on to the cognitive-behavioural interactional model with regard to information-processing and decision-making as set out in Chapter 2. It was used as a cognitive performance test, to check for any deterioration in performance as a result of stress, or enhanced performance as a consequence of stress inoculation.

5.6.(3). Task.

The task involves the discovery of logical rules governing sequences occurring in rows of symbols and diagrams (Saville et al, 1982). The subject is required to choose from five possible diagrams the one which will best complete the given series. The missing diagram may occupy any position within the series and so requires the subject to reason flexibly forwards and backwards through the item.

5.6.(4). Split halves.

With the permission of the test producers, the 40 item questionnaire was split into two halves on an alternate item basis. Two pilot studies were then conducted to establish the reliability coefficient of the two halves with two different set completion times.

The two halves of the test comprising of odd and even numbers respectively were then used in this way as parallel forms for inclusion in the last experiment. The two studies conducted to check on the reliability coefficients of the alternate forms will be reported in the following paragraphs.

DR Reliability Study 1.

Introduction.

It was necessary to pilot the alternate forms of the newly derived "short DR" Test. The intention was to introduce some degree of stress by shortening the set completion time so that the task would be subject to time pressure.

Subjects.

The study was conducted in August 1988, during the Open University's summer teaching programme. Subjects were recruited from among both lecturers and students, residing at Derby Hall, University of Nottingham. The subjects were all males, aged 25 years and above, all Caucasians, with the exception of one Afro-Carribean. There were a total of 33 subjects who had all volunteered to do the study, following a personal request made by the experimenter at the beginning of one of their morning lecture sessions. They agreed to spend an hour after lunch doing the psychological tests, on the understanding that they would be given individual feedback of their results if they so desired it.

Method.

Testing was completed over two days under group administration procedures. Ten were tested on the first day and twenty three on the second day. Order of presentation of the alternate forms was controlled. On each day, half the group was administered the Odd Series first, while the other half began with the Even Series. Following the general instructions and three practice examples, they were permitted 5 minutes only, to complete the test. They were then administered the Stress and Arousal Checklist, untimed. They did not take longer than 10 minutes to complete this. This was followed by a strictly timed further 5 minutes, to complete the second half of the DR Series.

Results.

Nearly all the participants reported that they found the task difficult. Only four managed to score more than 50% correct. The mean score for the whole group of 33 was 14.0 out of a possible 40, with standard deviation of 4.9.

Pearson r correlation coefficient were calculated (using SPSSx). For the Odd Series with the Even Series for all 33 participants, a correlation of 0.38 was obtained. There was no significant difference (matched pairs T test) between means. Details are presented in Table 3.3 below.

Odd Series	Even Series
Mean=7.3 s.d.=2.7	Mean=6.8 s.d.=3.2

r=0.38, n=33, p=.02

Table 3.3. Pearson Correlation of Odd Series and Even Series of the DR Test.

Correlations were also calculated between the total scores on the DRT and scores on 'stress' and 'arousal' respectively. Both yielded non-significant correlations.

To check whether the order of presentation made a difference the protocols were divided by order of presentation.

There were 17 cases that had started with the Odd Series first, and 16 cases that had started with the Even Series first. Those starting with the Even Series first fared better overall (mean=15.3 standard deviation=5.9), compared with those starting with the Odd Series first (mean=12.9 standard deviation=3.4).

Correlations between the alternate halves were initially run with the 17 protocols. No significant correlation was obtained. The total score on these 17 protocols was then correlated with stress and arousal scores. No significant correlation was obtained with the stress score, however there was a weak, negative correlation of -0.36 with arousal, tending towards

significance with p=0.08.

Similar analyses were conducted with the 16 protocols that started with the Even Series. The results are reflected in Table 3.4. A significant correlation of 0.58 was obtained, with p=0.009.

Odd Series	Even Series
Mean=8.4 s.d.=2.9	Mean=6.9 s.d.=3.7

r=0.58, n=16, p=.009

Table 3.4. Pearson Correlation for protocols starting with the Even Series.

Correlations were also run between the total scores on the DR for these 16 protocols and scores on stress and arousal respectively. No correlation was found with arousal, but there was a correlation of 0.41 with stress, tending towards significance with p=0.06.

Discussion.

The results indicate that when the total test time is effectively reduced from 15 minutes to 10 minutes, with 5 minutes permitted for each half of the test, the two halves of the test cannot be considered to be parallel forms, equated for difficulty level. Though there is some correlation in performance on the Odd and Even Series respectively, this appears to be influenced by the order of presentation of the two halves, and the correlation does not attain 0.7 or above, which is normally required to fulfill the alternate parallel forms general requirement (Ghiselli 1966, 1973). There also appeared to be little indication of any substantial overall correlation between stress and arousal scores, and the overall performance. The difficulty level of the task is apparently too high for the group tested, with the completion time reduced by a third of the original total time, from 15 minutes to 10 minutes.

Recommendations.

There should be a more concerted effort directed at the introduction stage, to ascertain that all participants are conversant with the procedure for arriving at the correct answers for the three examples, prior to commencing the DR Test proper. Enquiries should be invited and the exhortation made that it is important that everyone understands how the answers for the examples were derived.

A second recommendation is that the time permitted for each half should be extended. It may be necessary to extend it beyond the total test time of 15 minutes to permit a better assessment of performance under other than time duress, to ascertain the separate effect of other stressors apart from time constraint on task completion.

DR Reliability Study 2.

Introduction.

Following on from the first reliability study, it was decided to run a second study, this time increasing the total test time to 20 minutes, with 10 minutes for each half. Concerted attention was directed at the introduction stage to ensure that all participants understood the procedures for arriving at the correct answers for the three examples. These two measures were a direct result of the findings from the pilot reliability study. This second reliability study was conducted with the subject population targetted for later examination in relation to stress inoculation.

Subjects.

A total of 32 Singapore Junior College male students, aged from 16 to 17 years, were the sample for this study. They were rather serious in affect. They had volunteered to do the test as a result of exhortation by their form teacher and principal, out of curiosity, and to advance the cause of research. The principal had agreed to the experimenter's request on the proviso that lessons were not disrupted. All subjects were Chinese by ethnic origin.

Method.

All subjects were tested together in the audio-visual room of the Anderson Junior College. Each subject sat at a desk which was separated by partitions from adjoining desks, though they had unrestricted vision directly ahead. The Principal's "Do Not Disturb" sign was hung outside the door to preclude any interruptions.

Half the candidates were administered the Odd Series first, and the other half were administered the Even Series first. A stop-watch was used to strictly time the two halves of the DR Test, with 10 minutes permitted for each half. The SACL was sandwiched in the middle. The students completed the SACL within 5 minutes. The same three demonstration examples were used as introduction to the second session. Again, it was carefully ascertained that all the students were aware of the procedure for arriving at the answers to the examples, before they commenced the test proper.

Results.

Unlike the first study, most of the participants reported that they did not find the task difficult. This was in fact borne out by their better overall performance. Only 6 of the 32 subjects scored a total of less than 50% correct answers on the DR Test. The mean score for the whole group of 32 was 26.1 out of a possible 40, standard deviation 6.7.

Pearson r correlation was calculated. Correlating the Odd Series protocols against the Even Series protocols for all 32 participants, a correlation of 0.77 was obtained. Details are reflected in Table 3.5.

Further analyses reflected that the correlation of the Odd Series with the total DR score was 0.94, and that of the Even Series with the total score was also 0.94, both significant at the .001 level.

Correlations were also run between the total scores on the DR Test and scores on stress and arousal respectively. Both yielded non-significant negative results, though there was a tendency towards a weak negative correlation of -0.27 for Stress, $p=0.07$.

Odd Series	Even Series
Mean=13.0 s.d.=3.5	Mean=13.1 s.d.=3.6

r=0.77, n=32, p=.001

Table 3.5. Pearson Correlation of Odd Series and Even Series of the DR Test.

To check on any effect of order of presentation on overall performance, the protocols were divided into the 16 cases that started with the Odd Series first, and the second lot of 16 cases that started with the Even Series. In both instances, significant correlations were obtained between alternate halves of the protocols. For the Odd Series protocols, there was a correlation of 0.76, and for the Even Series protocols, a correlation of 0.85, both at p=.001. In neither case was there any correlation with stress or arousal scores, apart from a tendency towards negative correlation of -0.39 for the Even Series (p=0.07) with stress.

Tables 3.6 and 3.7 respectively, set out the particulars for the two lots of protocols.

Odd Series	Even Series
Mean=12.8 s.d.=3.3	Mean=14.1 s.d.=3.3

r=0.76, n=16, p=.001

Table 3.6. Pearson Correlation for protocols starting with the Odd Series.

The overall mean for stress was 6.1, standard deviation 3.9, and the mean for arousal was 7.0, standard deviation 2.9. There was little variation between the two lots of protocols on these scores.

Odd Series	Even Series
Mean=13.1 s.d.=3.8	Mean=12.2 s.d.=3.7

r=0.85, n=16, p=.001

Table 3.7. Pearson Correlation for protocols starting with the Even Series.

Discussion.

Considering all the protocols, the scores on the two halves of the Diagrammatic Reasoning test showed a correlation of 0.77. Considering only the protocols where the Even Series was administered first, the correlation was 0.85. For the protocols where the Odd Series was completed first, there was seen to be a slight improvement in general performance across the two administrations, though the size of this improvement was very slight. This could be a random effect of the small group size, conversely, it could indicate a better facility for improvement through practice when the Odd Series is administered first. The correlation between the alternate halves of the protocols with the Odd Series completed first was 0.76.

There was weak evidence of a negative correlation between overall performance and stress scores, as might have been anticipated. The size of the correlation might have been affected by the relative lack of felt stress during the testing, as reported by the subjects. The suggestion of a relationship between test performance and the experience of stress validates the use of the DRT in later experiments.

Recommendations.

The data suggests that the split halves of the Diagrammatic Reasoning Test can be used as alternate forms, at least with a Singapore population.

6. STATISTICAL ANALYSES.

All statistical analyses were performed using the SPSSx statistical package on the main frame computer at the University of Nottingham.

6.1. ANOVA.

Analyses of variance were variously used to test the null hypotheses that the group means on the different dependent variables and at different times of testing were equal. However, before the main effects of interest were examined, analyses of variance were conducted for all groups and conditions, on all baseline measures, to check for initial equivalence. The baseline measures used included initial stress and arousal, the worn-out and up-tight scores on the GWBQ, and the initial Wheel coping score.

6.2. Pearson's r correlation.

Correlations were run using Pearson's r, for continuous data, again as part of SPSSx. Pearson's r was used, for example, to establish the degree of correlation between the alternate halves of the Diagrammatic Reasoning Test. By default, the significance level for each coefficient is based on a one-tailed test.

6.3. Analysis of covariance.

Analyses of covariance were conducted using the data from the treatment and test phases respectively, to check for any significant differences between conditions when initial scores were entered as covariates, and thus controlled for. Covariance is essentially used when groups have been shown to be non-equivalent with respect to these initial scores.

The default method is the classic experimental approach for decomposing sums of squares in analysis of variance. Each type of effect is assessed separately in the following order:

Effects of covariates.

Main effects of factors.

Interaction effects.

The effects within each type are adjusted for all other effects in that type and also for the effects of all prior types. Each main effect is assessed with the other main effects held constant, and two-way interactions are assessed

with all main effects and other two-way interactions held constant. The three-way interaction is assessed with all main effects and two-way interactions held constant.

The covariate list in the SPSSx package can name up to 10 variables as covariates. The baseline measures of the SACL, GWBQ and WQ, where applicable, were usually held as covariates, in testing for for the effects of the different experimental conditions.

6.4. Multiple linear regression.

Multiple linear regression analyses were applied to the stress inoculation index to determine whether that data could be predicted by biodata gathered at the start of the experiment, or by the initial psychometric data.

Variables must pass both tolerance and minimum tolerance tests to enter and remain in a regression equation. Tolerance is the proportion of a variable's variance not accounted for by other independent variables in the equation. The minimum tolerance associated with a given variable not in the equation is the smallest tolerance any variable already in the equation would have if the given variable were included. If a variable passes the tolerance criteria, it is tested further by using FORWARD or BACKWARD, (STEPWISE) methods. FORWARD, which was used here, selects variables according to the probability of F-to-enter (keyword PIN).

The default values were used for the stepwise calculations in this research.

CONCLUSION

Chapter 3 has set out the experimental paradigm, design, sampling, procedures, instruments, and statistical analyses employed on the data collected, for the four experiments. Each of these experiments is presented in turn in the following chapters. The first of these is reported in Chapter 4.

CHAPTER 4. EXPERIMENT 1: COMPARISON OF GER, RELAXATION AND CONTROL PROCEDURES ON MOOD AND PERCEPTION OF COPING.

INTRODUCTION

A model of the soldier in combat was presented and discussed in Chapter 2, based on research into current practices in three conscript armies. Several different forms of intervention were identified which had been designed to improve the performance of soldiers during war. Particular interest was expressed in the possible role of group emotional reconstruction (GER) which is employed by the Israeli Defence Force, between engagements, as a form of constructive psychological debrief.

Considering the objectives and practice of GER in the context of the current literature on combat stress, it can be seen that it may also offer a usable form of stress inoculation if adapted for use prior to combat. The Swedish Armed Forces attempt to prepare their soldiers for combat by exposing them to the audio-visual stimuli of war, and following this by constructive discussion of feelings and coping strategies. Their handbook on leadership, "Chefen & Ledarskapet" (FOA 1986), sets out the officers' role in stress management for the men under his charge. Such procedures would appear to represent the required adaptation of GER. In personal communication, Andersson (1989) suggested that his research with the field battalion has been characterized by "target orientation and delegation of authority". The implementation of this required the officer to engage in psychological debriefs with his men, much akin to GER procedures. With this "new method of working", Andersson (FOA, Sweden) reports "increasing satisfaction in work in the battalion", "good morale", and "good training results" (personal letter, 1989). These aspects are in themselves facilitative in stress management. Unfortunately there is a dearth of evaluative data on the use of GER and GER-type procedures as vehicles for stress inoculation. This important question is the subject for the experiments reported in Chapters 4 to 7. Larsson (1987) had incorporated relaxation as one of the components in mental training techniques taught to 214 Swedish conscripts and cadets who followed the training for 8 months. It was subsequently found that the performance of this group was significantly better than the control group on actual task examinations and mental tests. It was decided to use the

relaxation technique as an alternative treatment device in the first experiment.

This first experiment was designed to compare the effects of different treatment after viewing a disturbing war documentary, on self-reported stress and arousal and on the perception of control in a war scenario. It was conducted with pre-conscript male youths in Singapore. Attention was particularly focused on the effects of group emotional reconstruction (GER) as stress inoculation, and the effects of this treatment were compared with those of a relaxation procedure as an alternative treatment procedure. Both treatments were compared to a control condition in which subjects viewed and discussed a neutral travel documentary.

There are two hypotheses for Experiment 1, as follows:

(1) subjects in the GER condition would show a reduced reaction to subsequent exposure to the disturbing war film, compared to that of subjects in the control condition, and

(2) the GER procedure would be more effective in producing this stress inoculation effect than the relaxation (alternative) treatment.

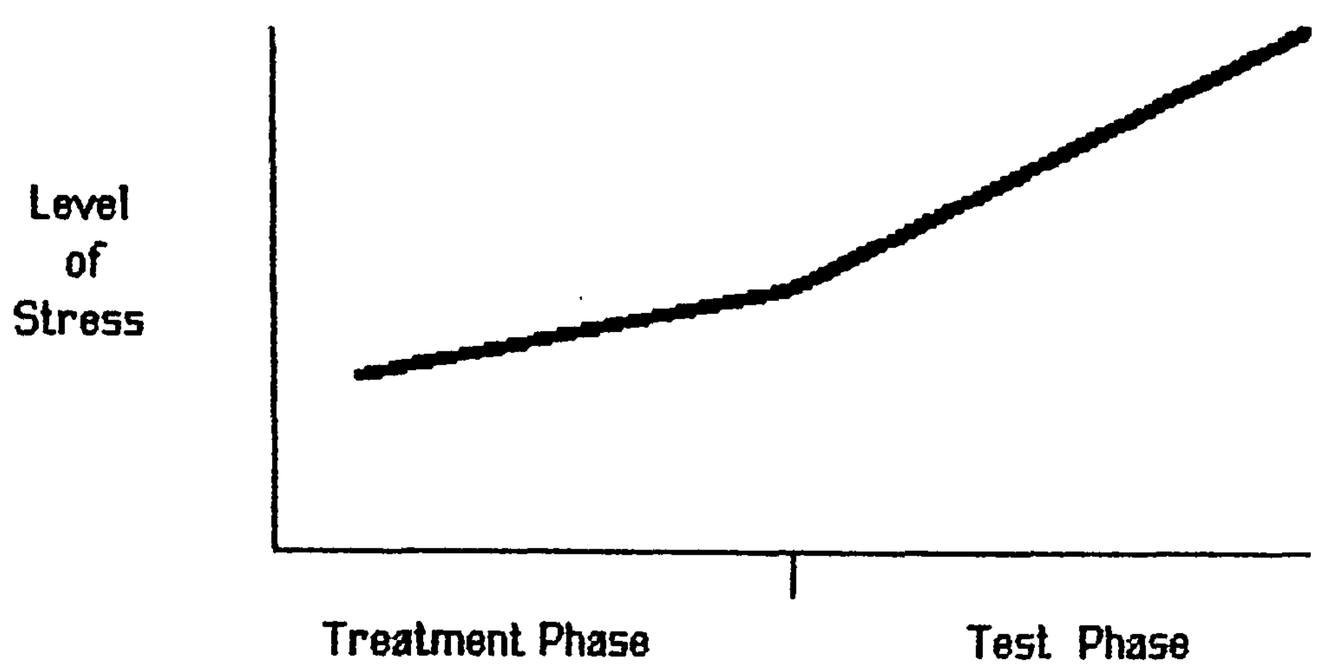
The hypothesis about stress inoculation was that there would be greater changes in stress levels at the treatment stage compared to the test stage for subjects in the GER condition, and for subjects in the control and alternative treatment conditions, there would be greater change in stress levels at the test stage. The expected change in levels is as shown in Figure 4.1.

METHOD

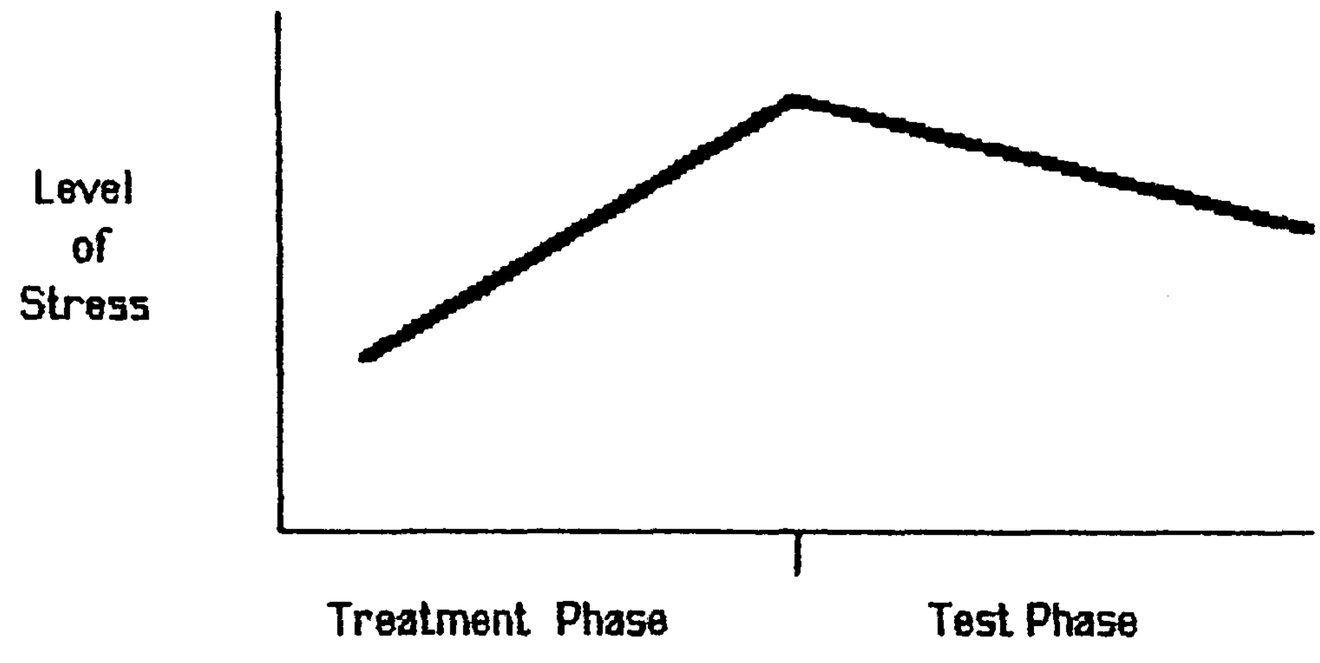
This section details the sampling methods employed, the experimental design and procedures, and the dependent variables in the experiment. The contrasting treatments are set out, and a brief description provided for each of the conditions.

FIGURE 4.1. EXPECTED CHANGES IN STRESS LEVELS.

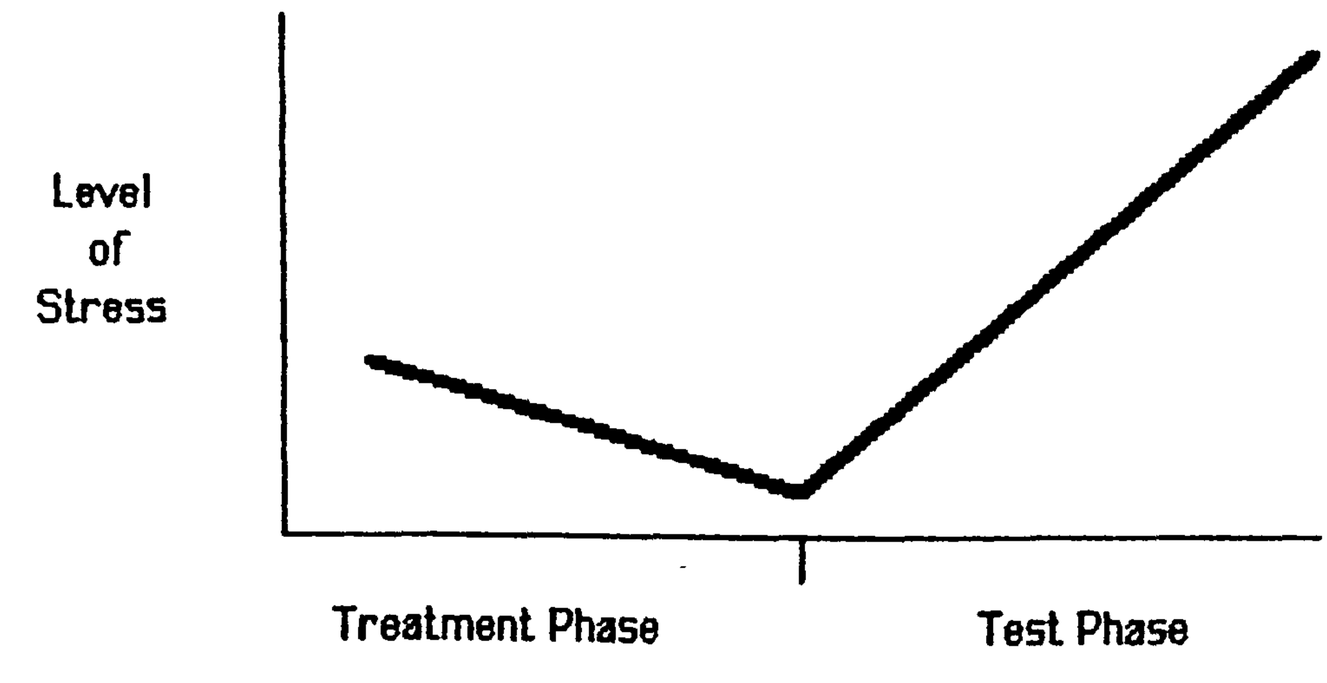
(a).Control.



(b).GER.



(c) Alternative Treatment : Relaxation.



1. SAMPLE.

The subjects for this experiment were drawn from two subsamples of the male (pre-conscript) Junior 1 and 2 population of Singapore. Groups of students from two colleges were randomly allocated to one of three different conditions: control, group emotional reconstruction (GER) and the alternative treatment: relaxation (relax). The selection of students within Colleges has been discussed in Chapter 3. The distribution of subjects across conditions is summarized in Tables 4.1 and 4.2. The subjects within each condition were tested in two groups of 9 to 11: testing taking place in the audio-visual aids rooms of the colleges. The experiment was conducted between 4 January 1988 and 15 January 1988.

There were no major variations by race, religion, age or school between the three conditions, although conditions were not completely matched by race and religion (see Tables 4.1 and 4.2).

Condition	Chinese	Malay	Indian	Total
Control	20 (100%)			20 (100%)
GER	21 (100%)			21 (100%)
Relax	17 (80.95%)	1 (4.76%)	3 (14.29%)	21 (100%)

Table 4.1. Cross-Tabulation of Sample by Condition and Race.

It can be seen from Table 4.1 that the alternative treatment condition had a small minority group representation while the other two conditions did not. This was also reflected in the distribution of religions by condition. The alternative treatment condition contained one person from each of the two minority religions, that is, Muslim and Hinduism, while the other two conditions did not. Half of the subjects in the control and relaxation conditions were Christians. Only one quarter of the subjects in the GER condition were Christians. The GER condition had a proportionately higher representation of freethinkers. Later multiple regression analyses, using race and religion as dummy variables, suggested that the differences

between conditions referred to here were not significant in terms of the dependent variables.

Condition	Christ.	Musl.	Hind.	Buddh.	Freethink.	Total
Control	9 (45%)			9 (45%)	2 (10%)	20 (100%)
GER	5 (24%)			8 (38%)	8 (38%)	21 (100%)
Relax	11 (52%)	1 (5%)	1 (5%)	5 (24%)	3 (14%)	21 (100%)

Key: Christ.= Christian, Musl.= Muslim, Hind.= Hindu, Buddh.= Buddhist, Freethink.= Freethinker.

Table 4.2. Cross-Tabulation of Sample by Condition and Religion.

2. DESIGN.

A factorial design was used to test the effects of condition (between subjects factor) over time (within subjects factor). Subjects in the three conditions were tested before and after the initial treatment period and again after the subsequent test period. The experimental paradigm is set out in Figure 3.1 in Chapter 3.

During the treatment period, subjects in the different conditions viewed one of two films, a neutral film (control) versus a disturbing war film. This was followed by either a tutored group discussion (GER, control) or a relaxation exercise (alternative treatment: relax). During the subsequent test period, subjects were exposed to a second clip of the disturbing war film.

Contrasting Treatments.

Two different comparison conditions were used in this experiment. In addition to the 'basic' control, an alternative treatment condition was used involving a relaxation treatment. The basic control differed from the experimental condition in terms of the content (and affect) of the film that was viewed. The alternative treatment condition differed in that, although subjects watched the same disturbing war documentary as the experimental

group, they then underwent a relaxation procedure and not a tutored discussion (GER). Details of the three conditions are set out below.

(a) Control-GER.

During the treatment period, the control groups watched a neutral documentary on the subject of a visit to China by a political-cum-trade delegation from Singapore. They were then engaged in a tutored group discussion about the more noteworthy points of this documentary. The discussion was timed to last for half an hour.

The GER groups viewed a disturbing war documentary and were then involved in a tutored group discussion on the more disturbing aspects of the film: the episodes of violence, killing and chaos. Participants were encouraged to talk about their emotional reactions to these scenes.

(b) Relaxation-GER.

The alternative treatment condition was the relaxation groups. They watched the same disturbing war documentary as the GER condition, but immediately after this viewing, they were led through a standard relaxation exercise (Benson 1985).

They did not discuss the war documentary as a group during this phase of the "treatment".

3. PROCEDURE.

In all three conditions, participants were first put at their ease, and the purpose of the exercise, the time involvement and the nature of the procedures were described to them. Subjects were also assured of the confidentiality of their individual scores, and that only group data would be reported. All then filled out a questionnaire enquiring about their biodata including questions about their age, race, religion, class and school. They also completed the first set of SACLs, the GWBQ, and the Wheel Questionnaire on "what characterizes war?". This initial enquiry took about 50 minutes. Subjects were then given a ten minute break.

Control.

The subjects in the control groups viewed the neutral documentary on the trade mission to China: this lasted fifteen minutes and was followed by half an hour discussion about the film. A second SACL form was then administered. This was followed by another ten minute break. The second part of the disturbing war documentary "Frontline", was then shown. This was also of fifteen minutes duration. Immediately after the viewing, the third SACL form was administered. This was followed by a second set of Wheel Questionnaires on "what characterizes war?". The exercise was concluded with a supportive debriefing during which each participant filled out a "debriefing form". The form invited general comments about the whole exercise, and also asked for specific comments about the different aspects of the whole procedure. Many of the students spent some time on this form, and it in fact appeared to have a cathartic effect for them, especially after viewing the war documentary.

GER.

After the first break of ten minutes the subjects in the GER groups were shown the first part of the disturbing war documentary. This was of fifteen minutes duration.

The discussion started with a review of noteworthy points in the documentary. Many of the students were emotionally affected by what they had seen, and highlighted the incidents of injury, killing and chaos. The discussion was brought to bear on how the participants would feel if they were personally involved in similar incidents. The students expressed different perspectives, often disagreeing with each other on value judgements adopted. Each student was encouraged to state a viewpoint.

The emphasis was on emotion-focused coping rather than problem-focused coping (Folkman and Lazarus, 1980, 1985). The position adopted was that there was little that could be done in the way of altering the nature of the scenario of killing in war.

The discussion was brought to a close after half an hour. The second SACL form was then administered. Then there was a ten minute break. The timings

parallelled those of the control groups.

After the second break, the second part of "Frontline" was viewed. They then completed the third set of SACLs, the second set of Wheel Questionnaires on what characterizes war, and the debriefing form.

Alternative Treatment: Relaxation.

After the first break of ten minutes, subjects in the relaxation groups viewed the first part of "Frontline". They were then put through a relaxation procedure, for a period of half an hour. They remained seated in their chairs and the exercise was conducted with their eyes closed. They were sequentially encouraged to relax the various parts of their anatomy, culminating in self-addressed instructions to relax while they exhaled. The students did in fact undergo the exercise successfully, as reflected in their outward behaviour, and in their feedback comments in their debriefing form. They then completed the second set of the SACL forms before having their second break of ten minutes.

After the break, they proceeded similarly as the subjects in the control groups and the GER groups. After viewing the second part of "Frontline", they completed the same set of questionnaires as for the other two conditions.

4. DEPENDENT VARIABLES.

The SACL and the Wheel provided the dependent variables for this experiment. These have been discussed in some detail in Chapter 3.

(a) SACL.

The stress and arousal scores on the SACL (Stress and Arousal Checklist): (Mackay, Cox, Burrows and Lazzerini, 1978; Cox and Mackay, 1985), provided the two 'central' dependent variables. The SACL was administered on three occasions. The first was pre treatment to give a baseline measure. The second was at the end of the treatment phase, and the third was at the end of the test phase.

(b) Wheel.

The coping index on the Wheel Questionnaire (Shalit 1973), provided the third dependent variable. The Wheel was administered on two occasions: the first was pre treatment, and the second was post test.

RESULTS

The data were first analysed to determine whether the different conditions were comparable in terms of their initial scores on the dependent variables. One way analyses of variance were carried out on the initial stress and arousal scores, the General Well Being Questionnaire (GWBQ) measures of worn out and up tight, and the Wheel Questionnaire's coping score.

Following this, three further analyses were used to determine whether there were any significant interactions between conditions and times of testing. First, analyses of covariance were applied to the complete data set representing the 3 x 3 factorial design (3 conditions x 3 times of testing). Second, analyses of covariance were carried out, to determine whether there were any significant differences between the three conditions at different points in time taking previous scores into account. Finally subjects in the GER and control conditions were compared, ignoring the data from the relaxation condition. A stress inoculation index (SI) was calculated for the stress data based on the difference between the change in scores over the treatment and retest periods respectively. The argument was that the SI would reflect much change during the treatment period and then little during the re-test period: (A-B) - (B-C) = negative index. The data pertaining to the index were then subjected to multiple linear regression analyses on two subsets of variables: the biodata and psychometric data respectively. Race and age of subject were used in the analyses by biodata. Stress and arousal scores from the pre treatment SACL, and the worn out and up tight scores on the GWBQ were used in the analysis by psychometric data. Simple analyses of variance were also conducted between subjects in the GER and control conditions using the stress inoculation data.

1. INITIAL MEASURES: ANALYSIS OF VARIANCE.

The mean scores of subjects in the three conditions on the initial measures of self-reported stress and arousal are shown in Table 4.3.

Condition	Control	GER	Relax	Overall	F	df	p
Initial Stress	4.7	5.4	3.4	4.5	1.60	2, 61	0.21
Initial Arousal	6.8	7.3	6.7	6.9	0.29	2, 61	0.75

Table 4.3. Mean Scores on Initial SACL by Conditions.

One way analyses of variance revealed no significant differences between subjects in the three conditions on initial stress or arousal scores. Subjects in the three conditions were thus equivalent in these respects (Cook and Campbell, 1979).

Condition	Control	GER	Relax	Overall	F	df	p
Worn Out	22.7	20.5	21.3	21.5	0.88	2, 61	0.42
Up Tight	14.9	13.2	12.9	13.7	0.81	2, 61	0.45
Coping	-4.5	-5.7	-6.3	-5.5	0.46	2, 61	0.63

Table 4.4. Mean Scores on Coping and Well Being by Conditions.

Furthermore, subjects in the three experimental conditions did not differ significantly with regard to the base-line measures on the Wheel coping score and the two GWBQ factors. Table 4.4 reflects the analysis of variance conducted for these measures.

2. ANALYSES OF VARIANCE: FULL DATA SET: CONDITIONS X TIME.

Table 4.5 presents the results of an analysis of variance on the stress data for all subjects across conditions and time. It is seen that there is a significant main effect of conditions (p=0.006), but no significant difference between the various groups constituting the three different conditons.

Source of Variation	Sum of Squares	df	Variance Estimate	F	p
Condition	256.58	2	128.28	5.53	0.006
Group	74.47	1	74.47	3.21	0.08
Interaction					
Condition x Group	131.06	2	65.53	2.82	0.07
Error	1299.74	56	23.21		
Time	204.52	2	102.26	9.60	0.0001
Interaction					
Condition x Time	235.49	4	58.87	5.53	0.0004
Group x Time	96.14	2	48.07	4.51	0.01
Condition x Group					
x Time	56.88	4	14.22	1.33	0.26
Error	1193.48	112	10.66		

Table 4.5. Simple Analysis of Variance of Stress Scores.

The simple effect of group and the interaction between condition and group approached significance, p = 0.08 and p = 0.07 respectively. There was a significant difference between stress scores over time, (p = 0.0001) and an interaction between condition and time (p = 0.0004). The data are plotted in Graph 4.1.

Graph 4.1 shows the pattern of change in the stress scores for the subjects in the three conditions over the three measurement points. It can be seen that the subjects in the GER condition followed a different pattern of response to the subjects in the two comparison conditions. After the inoculation procedure, the stress scores for the subjects in the GER condition went up, while the scores for the subjects in the control condition went down. Subjects in the alternative treatment condition, in spite of seeing the war documentary, but after undergoing relaxation, also showed decreased stress

scores. After the test phase, the subjects in the GER condition showed no further increase in stress. Subjects in the control and alternative treatment conditions both reflected a rise in their stress scores. This demonstrates the stress inoculation effect, but subjects in all conditions end up with similar stress scores (see Discussion).

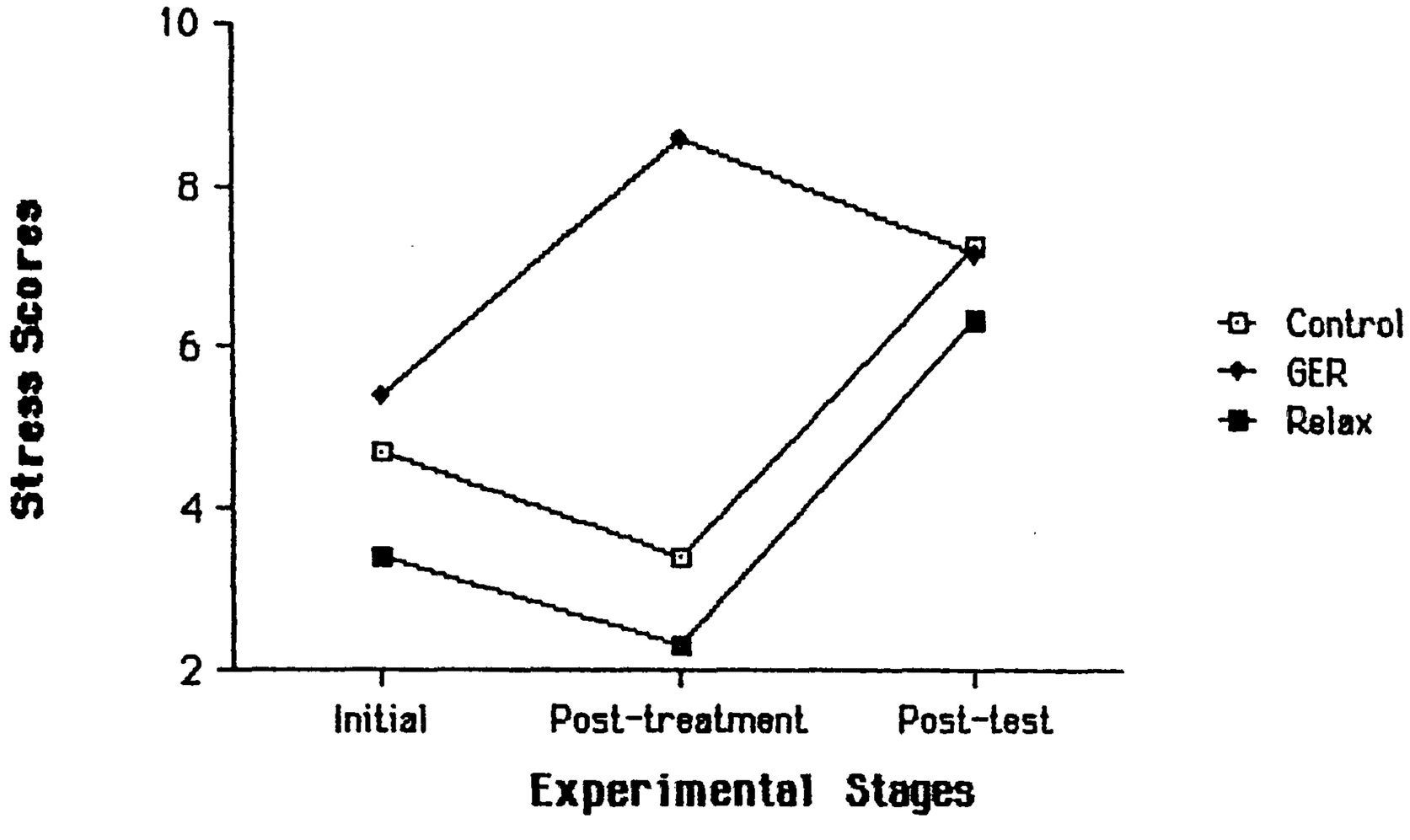
Table 4.6 shows the results of a similar analysis carried out with the self-reported arousal scores. The analysis indicates a significant interaction effect between conditions over time.

Source of Variation	Sum of Squares	df	Variance Estimate	F	p
Condition	36.62	2	18.31	1.16	0.32
Group	7.84	1	7.84	0.50	0.48
Interaction					
Condition x Group	12.01	2	6.01	0.38	0.68
Error	850.62	54	15.75		
Time	46.06	2	23.03	4.61	0.01
Interaction					
Condition x Time	126.08	4	31.52	6.31	0.0001
Group x Time	16.98	2	8.49	1.70	0.19
Condition x Group					
x Time	62.47	4	15.61	3.13	0.02
Error	539.70	108	5.00		

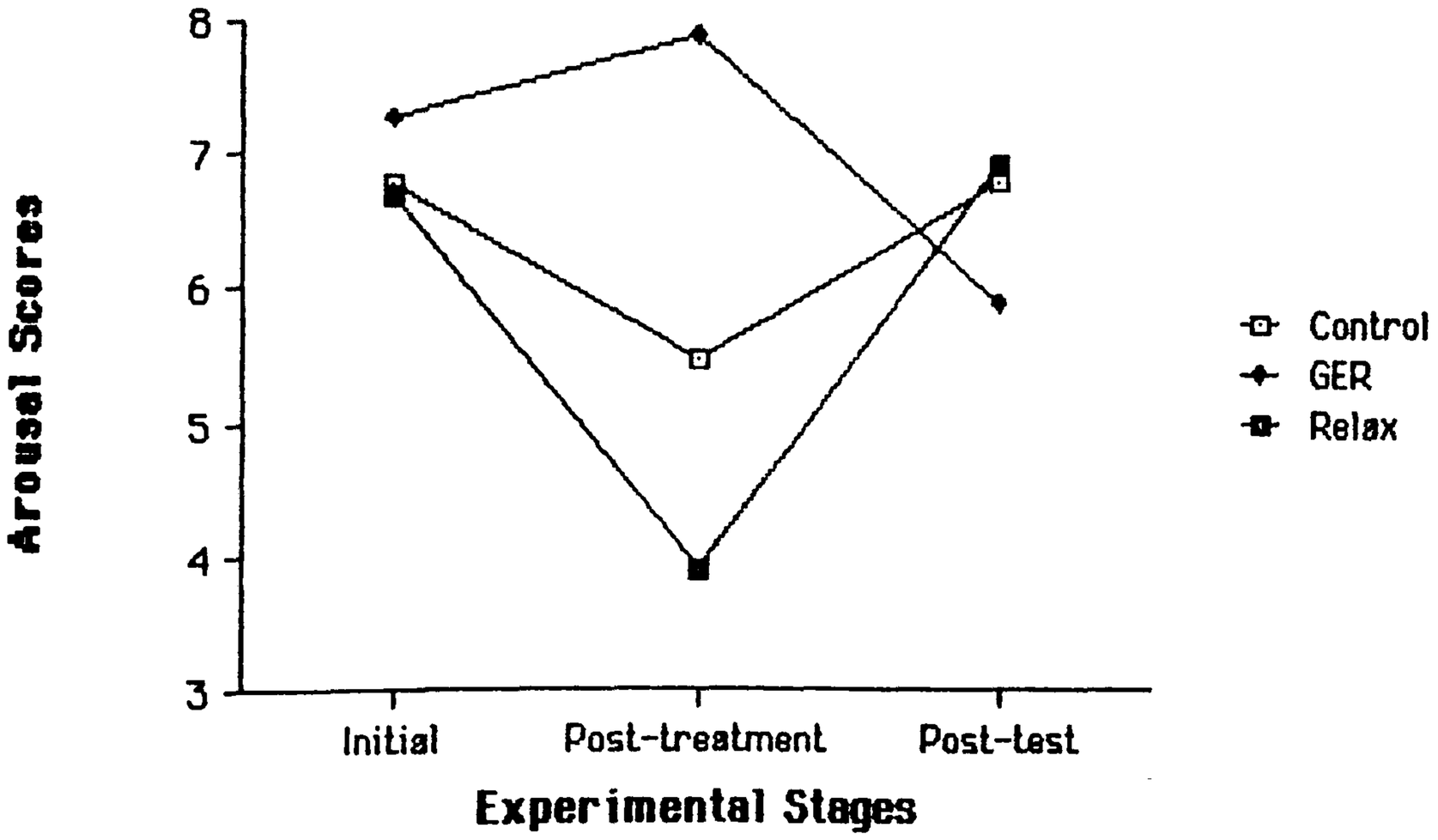
Table 4.6. Simple Analysis of Variance of Arousal Scores.

Graph 4.2 reflects the pattern of change of the arousal scores over the course of the experiment, by conditions. The subjects in the two comparison conditions behaved quite differently especially after the treatment phase. Subjects in all three conditions started at similar arousal levels. During the inoculation phase, subjects in the GER condition became more highly aroused than subjects in the comparison conditions. Subjects in the two comparison conditions showed a reduction in their arousal states, in particular those in the alternative treatment condition. At the end of the test phase, subjects in the GER condition had an arousal state lower than at the start of the experiment. Subjects in the two comparison conditions had their arousal states raised to comparable levels as at the start of the experiment.

Graph 4.1. Stress Scores by Experimental Conditions.



Graph 4.2. Arousal Scores by Experimental Conditions.



It is understandable that subjects in the alternative treatment condition should feel the least aroused immediately after undergoing a relaxation procedure. Subjects in the GER condition were the most aroused, having engaged in a discussion about a war documentary that was emotion evoking.

3. ANALYSIS OF COVARIANCE: EFFECTS OF CONDITION AT DIFFERENT POINTS IN TIME.

Analyses of covariance were carried out on the stress and arousal scores after the treatment and test phases respectively. Preceding measures of stress and arousal were entered as covariates. The GWBQ measures and the initial Wheel coping measure were also held as covariates. Only analyses with significant differences between conditions are reported. Analyses of covariance for the post test Wheel coping scores were also carried out.

(a) STRESS.

Table 4.7 shows the mean stress scores by conditions at the three measurement points in the experiment.

Condition	Control	GER	Relax	Overall
Initial Stress	4.7	5.4	3.4	4.5
Post Treatment Stress	3.4	8.6	2.3	4.8
Post Test Stress	7.3	7.2	6.4	7.0

Table 4.7. Mean Stress Scores by Conditions over Time.

Separate analyses of covariance on the stress data at post treatment and post test showed a significant effect of condition at the post treatment stage, but not at post test.

Source of Variation	Sum of Squares	df	Variance Estimate	F	p
Covariates	205.86	4	51.47	4.43	0.004
Initial Stress	37.36	1	37.36	3.22	0.08
Worn Out	9.65	1	9.65	0.83	0.37
Up Tight	83.68	1	83.68	7.21	0.01
Initial Coping	22.35	1	22.35	1.93	0.17
Main Effects	459.98	2	229.99	19.81	0.001
Condition	459.98	2	229.99	19.81	0.001
Explained	665.84	6	110.97	9.56	0.001
Residual	638.43	55	11.61		
Total	1304.27	61	21.38		

Table 4.8. Analysis of Covariance of Post Treatment Stress Scores.

Table 4.8 shows the analysis of covariance results for post treatment stress when pre treatment stress was held as a covariate together with the Wheel coping score and the two factors on the GWBQ. It is seen that the experimental condition does determine the degree of stress reported by the subjects. However, it can also be seen that the subjects' uptight scores (GWBQ) and their initial stress scores also determined their post treatment stress scores.

(b) AROUSAL.

Table 4.9 reflects the mean arousal scores by conditions over the three measurement stages of the experiment. No significant differences were found between the subjects by conditions on arousal scores as measured by the initial SACL. However, significant differences were then found between conditions immediately after the treatment procedure (ANCOVA).

Condition	Control	GER	Relax	Overall
Initial Arousal	6.8	7.3	6.7	6.9
Post Treatment Arousal	5.5	7.9	3.9	5.8
Post Test Arousal	6.8	5.9	6.9	6.5

Table 4.9. Mean Arousal Scores by Conditions over Time.

Table 4.10 gives the details of the analysis of covariance of post treatment arousal when pre treatment arousal was held as a covariate together with the initial Wheel coping score and the GWBQ factors.

The initial level of arousal and the worn out and up tight scores (GWBQ) were significant covariates of post treatment arousal.

Source of Variation	Sum of Squares	df	Variance Estimate	F	p
Covariates	115.43	4	28.86	3.69	0.01
Initial Arousal	32.29	1	32.29	4.12	0.05
Worn Out	62.56	1	62.56	7.99	0.007
Up Tight	28.86	1	28.86	3.69	0.06
Initial Coping	1.50	1	1.50	0.19	0.66
Main Effects	139.37	2	69.68	8.90	0.001
Condition	139.37	2	69.68	8.90	0.001
Explained	254.80	6	42.47	5.43	0.001
Residual	430.57	55	7.83		
Total	685.37	61	11.24		

Table 4.10. Analysis of Covariance of Post Treatment Arousal Scores.

Significant differences between conditions were also found on the post test arousal scores when the post treatment arousal scores were held constant. The implication is that the treatment procedure played a part in affecting the

final measure of arousal post test. Subjects in the GER condition had a significantly lower level of arousal on the final SACL than subjects in the control or alternative treatment condition. It was as if subjects in the GER condition were using a lower state of arousal as a coping device, having experienced a heightened degree of stress after the treatment phase. Table 4.11 shows the analysis of covariance with post treatment arousal held as a covariate.

Source of Variation	Sum of Squares	df	Variance Estimate	F	p
Covariates	91.64	4	22.91	3.01	0.03
Post Treatment Arousal	68.30	1	68.30	8.97	0.004
Worn Out	7.10	1	7.10	0.93	0.34
Up Tight	18.63	1	18.63	2.45	0.12
Initial Coping	17.68	1	17.68	2.32	0.13
Main Effects	76.92	2	38.46	5.05	0.01
Condition	76.92	2	38.46	5.05	0.01
Explained	168.56	6	28.09	3.69	0.004
Residual	418.88	55	7.62		
Total	587.44	61	9.63		

Table 4.11. Analysis of Covariance of Post Test Arousal Scores.

(c) WHEEL.

Analysis of covariance was conducted on the initial and final Wheel coping scores. Table 4.12 reflects the mean coping scores by conditions on the two occasions of measurement.

Condition	Control	GER	Relax	Overall
Initial Coping	-4.5	-5.7	-6.3	-5.5
Retest Coping	-4.1	-6.2	-6.7	-5.7

Table 4.12. Mean Coping Scores by Conditions.

No significant differences were found between conditions. The treatment and test procedures did not differentiate between the conditions on the Wheel index of coping. Qualitatively, the perception of war by Singapore pre-conscripts compares with that of the Swedish national servicemen in being more abstract than concrete (see Chapter 3, section 5.5.(3)).

4. SI DATA: COMPARISON OF CONTROL & GER CONDITIONS.

Regressions and anovas were conducted using the SI index. Table 4.13 reflects the results of the statistical analyses conducted with the Stress Inoculation index (SI).

Factors	Predictors or independent variables	Dependent variable: stress inoculation index
Biodata	Age	NS
Psychometric	SACL A : Stress and Arousal GWBQ : Worn Out and Up Tight	var=15% mr=.48 F(1,39)=2.72 p=.04
Situational	Conditions : GER :mean=-4.62 sd=10.66 Ctrl:mean=5.25 sd=6.49	F(1,39)=12.67 p=.001

Table 4.13. Summary of Results for Regression Analyses and Anova on the Stress Inoculation Index for GER and Control.

All the students in the control and GER conditions were Chinese. As such, race was not included as a biodata variable for the regression analysis.

Significant differences were found between the subjects in the GER and control conditions on the SI index, with the subjects in the GER condition reflecting a clear stress inoculation effect and the subjects in the control condition no inoculation.

5. SI DATA: COMPARISON OF RELAXATION AND GER CONDITIONS.

Regressions and anovas were conducted using the SI index for the alternative treatment (relaxation) and GER conditions. Table 4.14 shows the results. In this comparison of stress inoculation effect for the GER and alternative treatment conditions, it is seen that the biodata variables do not contribute towards prediction of the SI. The alternative treatment condition had four non-Chinese while the GER condition was completely constituted of Chinese. In spite of this, race was not a significant contributor to the SI index.

Factors	Predictors or independent variables	Dependent variable: stress inoculation index
Biodata	Age; Race	NS
Psychometric	SACL A : Stress and Arousal GWBQ : Worn Out and Up Tight	var=16% mr=.48 F(4,37)=2.99 p=.03
Situational	Conditions : GER :mean=-4.62 sd=10.66 Relax:mean=5.10 sd=7.98	F(1,40)=11.18 p=.002

Table 4.14. Summary of Results for Regression Analyses and Anova on the Stress Inoculation Index for GER and Relaxation.

As with the previous analysis, about 16 percent of the variance in the stress inoculation index was explained by the initial psychometric data. Furthermore, a significant difference in the index effect was found between

subjects in the GER condition, and those in the alternative treatment (relaxation) condition. The latter subjects had a mean SI score of 5.10 comparable to that of subjects in the control condition (5.25).

DISCUSSION

Self-reported stress and arousal and ability to cope in a context of war were measured under three different conditions: GER, alternative treatment and control.

Immediate treatment effects.

Simple analyses of variance revealed significant differences in stress and arousal scores over time, and a significant main effect of condition for the stress but not the arousal data. However, there was a significant interaction effect of condition by time for arousal. Together these findings suggest that these mood data were sensitive to the manipulations of the overall experimental paradigm.

Analyses of covariance showed significant differences between conditions post treatment for both stress and arousal. The data showed that after the treatment period both stress and arousal levels were higher for the subjects in the GER condition than for the subjects in the other two conditions. The data also showed that post treatment mood scores were determined not only by condition (treatment) but also by subjects' initial mood and general wellbeing.

Watching a stressful film and then discussing its emotional aspects increases feelings of both stress and arousal but watching the same film and then attempting relaxation produces a decrease in both. This latter pattern of effect is very similar to that produced by watching and discussing the neutral film, emotionally. The changes in mood which occur appear greater if the person's general well being is less at the outset of the session, and if their mood states are already elevated.

Test effects.

Although there was a significant interaction between condition and time for the stress scores (overall ANOVA), there was no effect of condition post test when post treatment scores were entered into an ANCOVA as covariates. Thus although there appears to be evidence for a stress inoculation effect in terms of the overall pattern of change across conditions and time, there is no evidence in terms of subjects' final stress scores.

For the post test scores, analyses of covariance showed a significant difference only for the arousal data: subjects in the GER condition reported lower arousal than did those in the two other conditions. Post treatment arousal proved a significant covariate for post test arousal.

SI effect.

With regard to the stress inoculation index, significant differences were found between subjects in the GER and control conditions (see above). The GER data demonstrated that more change had occurred during the treatment period compared to the test period, while the reverse was true for subjects in the control condition. This supports the hypothesis set out at the beginning of this chapter and goes some way to proving the effectiveness of the GER treatment but only in terms of the pattern of effect.

The comparison of subjects in the GER condition with those in the alternative treatment (relaxation) condition adds further support to the effectiveness of the GER procedure. The relaxation condition affords no inoculation and is comparable to the control condition in terms of the SI index. Subjects in the alternative treatment condition were completely relaxed at the end of their treatment. This was obvious both from their general demeanour, from their SACL scores, and from the statements made during their debriefing.

Subjects in the control condition were drawn into discussion about the trade film they viewed in the treatment session. Some of the participants became enthusiastic about the contents of the film, and the general discussion with their peers. This was reflected in terms of both stress and arousal (see Footnote 1 below).

Other research.

Research in the area of management of combat stress in a context of peace is of necessity limited by the constraint of lack of realistic testing. In its place, social laboratory situations have been recreated as the basis for evaluation. Sadly, however, there have still been very few such studies of this issue (Lazarus, Spiesman, Mordkoff and Davison, 1962; Mangelsdorff and Zuckerman, 1975; Steele and Cox, 1986), and especially in the last decade.

Steele and Cox (1986) explored the immediate psychological and physiological effects of aversive visual stimuli, presented as pictures of war. Psychological measures showed an increase in self-reported stress, as measured by the SACL (see Chapter 3), higher disturbance ratings and unprompted reports of various coping strategies (post experimental interviews) in response to war slides compared to neutral slides. Self-reported arousal, again measured by the SACL, and electrodermal activity, proved sensitive to the requirement to report, but only for female subjects. The Steele and Cox (1986) study lend support to the findings from this experiment with regard to increase in stress on exposure to aversive visual stimuli of war scenes, as seen in the post test stress scores for all conditions.

[Footnote 1 : Later studies showed that the arousal response for the control condition was atypical, but this was not known at the time of the first experiment. Deliberate changes in levels of arousal seems to be deployed as a coping device, with a lowering of arousal level being a means of reducing the stressful stimulus of the disturbing war documentary on the test session, especially for the subjects in the GER condition.]

An early experiment by Mangelsdorff and Zuckerman (1975) reported a physiological adaptation response, as indicated by a decrease in amplitude of skin conductance changes across trials indicative of habituation, with repeated viewings of slides of the My Lai massacre of Vietnamese civilians by American soldiers. Habituation was also observed in relation to subjects' ratings on a scale of "agitated" to "calm". A difference was observed in this study between ROTC (Reservist Officer Training Corps), and non-ROTC male students: the former habituated more rapidly.

Applying the Mangelsdorff and Zuckerman (1975) findings to this study, it could be argued that the reduced reaction of the subjects in the GER condition during the test session was due not to GER but habituation. Habituation to a disturbing stimulus may be a common pattern of response. However, the data from the alternative treatment condition do not support this argument. The reaction during the test session was greater than during treatment despite having already been exposed to a similar stimulus.

The findings of this experiment are in accordance with the findings of earlier related studies pertaining to the stressful reaction to aversive visual stimuli of war scenes.

Experimental paradox.

The present experiment produced some conflicting or paradoxical results. There was some evidence of an SI effect in terms of the different patterns of reaction observed in the GER and control conditions. That observed for the GER condition conformed to the pattern predicted for stress inoculation. However, despite this evidence of pattern of change, the differences between conditions did not persist. At the end of the test session subjects in the various conditions reported similar levels of stress. The question therefore exists: "are the effects of GER real, and the apparent paradox only a reflection of the design of the present experiment or not?" In this experiment, an attempt was made to resolve this question by using analysis of covariance to test for significant differences at the post test stage taking out the post treatment scores as covariates. Unfortunately (for arguments in favour of the GER procedure), this failed to separate the various conditions in terms of their post test stress scores. The question remains to be answered

in other ways by later research.

Summary.

In summary, this first study has demonstrated that it is possible through the use of the present experimental paradigm, to change subjects' mood.

The results indicate that:

a) It may be possible to manipulate the subsequent experience of stress by using group emotional reconstruction (GER). However, questions remain about the validity and persistence of this effect.

b) The level of self-reported arousal is heightened immediately after the process of GER, compared to control conditions. The level of arousal is then lowered when the subject of the reconstruction is reintroduced. It is significantly lower than that of comparison groups and covaries with the level of arousal post treatment.

c) The measure of ability to cope in a context of war did not change over the course of this experiment.

Next experiment.

In the next experiment, a replication of the results observed here is attempted but using only the GER and control conditions. Replication of the results is sought in accordance with the requirements of rigorous scientific investigations (Miller 1984).

In order to resolve the apparent paradoxical findings of the present study, the following measures were also incorporated:

(1) A deliberate effort was made to make the GER stronger and more emotionally oriented, and to ensure that all participants spoke about the impression the film made on them. Also, information was conveyed by the experimenter with regard to psychological casualties amongst soldiers in combat, and the behavioural effects on them from a military performance perspective, and from a personal perspective in terms of

moral dilemmas and post traumatic stress disorder manifestations.

(2) Particular attention was paid to reducing "noise" in the experimental procedure. These aspects are detailed in Chapter 5.

(3) The number of subjects in each condition was increased.

The results of these changes are reported in Chapter 5.

CHAPTER 5. EXPERIMENT 2: STRESS INOCULATION EFFECTS OF EMOTION-FOCUSED GER PROCEDURE.

INTRODUCTION

The previous experiment suggested the possibility of a stress inoculation effect using the GER technique but only in terms of the pattern of change observed. The present experiment was conducted with two main objectives:

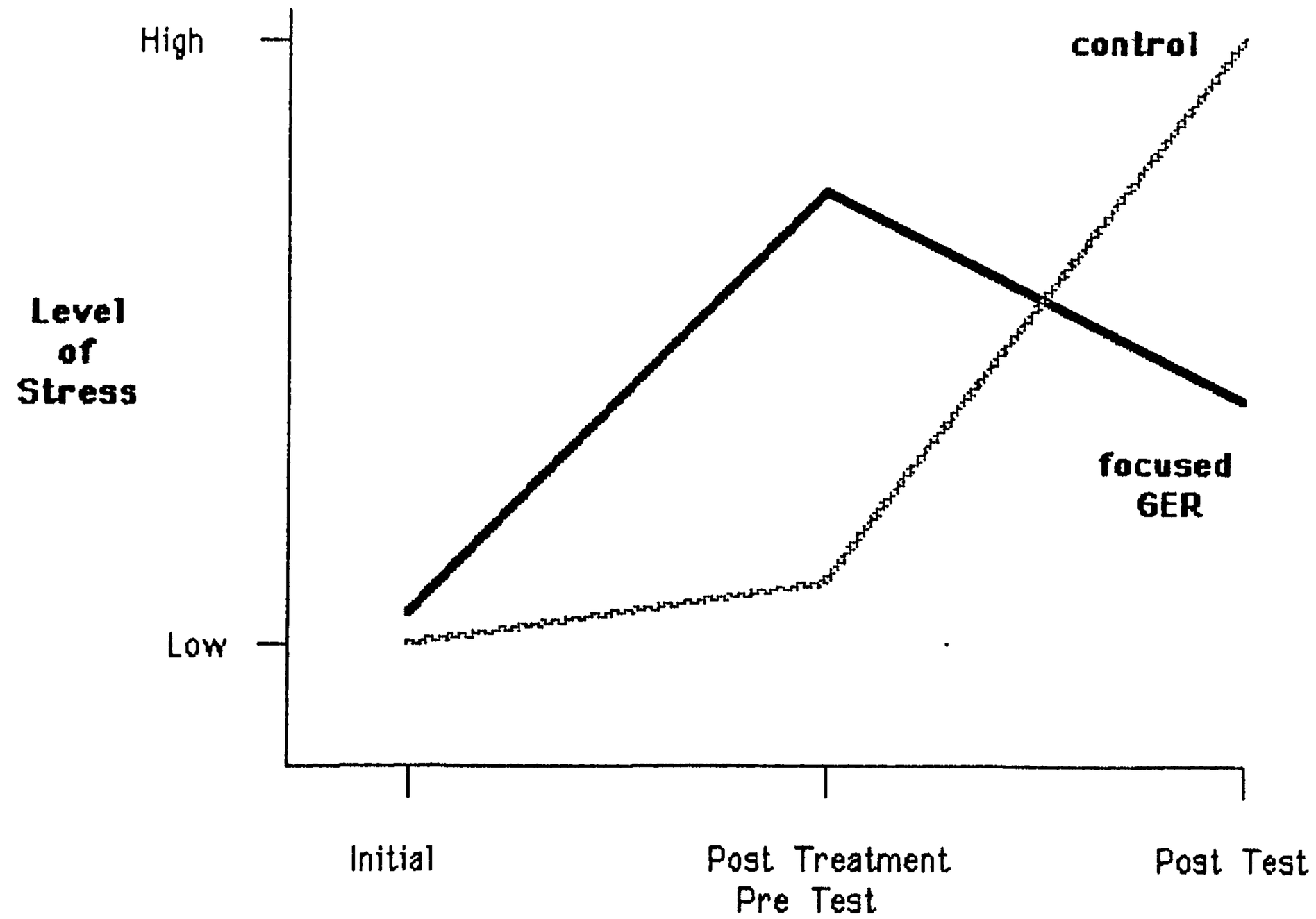
(1) to compare the effects of the GER and control conditions as in the first experiment but using a larger sample for each condition, and

(2) to resolve the paradoxical aspects of the first experiment by changing the qualitative nature of the GER to include more attention to the emotion-provoking aspects of the disturbing war documentary. It was hoped that such a strenghtening of the GER might cause not only greater differences in the pattern of change across treatment and test sessions but also the persistence of those differences to the end of the experiment.

In Folkman and Lazarus's (1980) terminology, the GER used here was **more** emotion-focused than in the previous experiment. Folkman and Lazarus (1980) distinguish between problem-focused and emotion-focused coping. They categorize as problem-focused coping: cognitive problem-solving efforts and behavioural strategies for altering or managing the source of the problem. The emotion-focused category includes cognitive and behavioural efforts directed at reducing or managing emotional distress (Folkman and Lazarus, 1985). Participants were asked to visualize themselves in the combat context and to report to the group how they envisaged they would feel and behave under those conditions. This is discussed in more detail below.

It was expected that with a more emotion-focused GER, the difference between the post treatment stress scores for the GER and control conditions would be would be even more strongly emphasized. This is schematically represented in Figure 5.1.

FIGURE 5.1. EXPECTED EFFECTS OF FOCUSED GER ON STRESS SCORES.



Special efforts were made to reduce actual "noise" levels during the experiment (Miller 1984; Stufflebeam and Hambleton, 1988). Two particular sources of "noise" were addressed: (i) other people entering the room to make enquiries (ii) broadcast announcements over the public address system about various society meetings. These "noise" elements were unfortunately present in the first experiment. These aspects were discussed with the school principals, and arrangements made to pre-empt such interferences for Experiment 2.

The time interval between the treatment and test phases was kept the same as Experiment 1.

Based on the previous findings and the use of a more focused GER, it was hypothesized:

(a) that the subjects in the GER condition would demonstrate a stress inoculation effect compared to the subjects in the control condition,

(b) there would be a significant difference post test between the subjects in the control and GER conditions, with the subjects in the GER condition reporting a lower level of stress, and

(c) the subjects in the GER condition would have significantly higher arousal post treatment, and significantly lower arousal post test, compared to the subjects in the control condition.

METHOD

This section sets out the sampling, experimental design, procedure, and describes the dependent variables for the experiment.

1. SAMPLE.

The sample consisted of a total of 65 male students from two Junior Colleges in Singapore. The experiments were conducted on groups of 9 to 13 students. There were six groups in all and they were tested between 23 February 1988 and 8 March 1988. The audio-visual aids rooms in the Junior Colleges were used for the experiments.

Three groups formed the controls. This consisted of 32 students in all. Another three groups consisting of 33 students formed the GER condition. The students were matched by educational level across the control and experimental conditions. There were no significant variations by age or race for the two conditions. Two of the control groups were from Junior College A while two of the experimental groups were from Junior College B. Cross-tabulation of the two conditions by religion reflected a difference in the distribution of religions across the two conditions, as seen in the table below:

Condition	Christian	Muslim	Buddhist	Freethinker	Total
Control	16 (50%)	2 (6%)	8 (25%)	6 (19%)	32 (100%)
Experimental	7 (21%)		15 (45%)	11 (33%)	33 (100%)

Table 5.1. Cross-tabulation of Conditions by Religious Affiliation.

It can be seen from Table 1 that half of the subjects in the control condition were Christians. 25 percent were Buddhist or Taoist, and there were 2 Muslims. Subjects in the experimental condition differ in that 45 percent were Buddhist or Taoist, one third were freethinkers, and only 21 percent were Christians. On religious affiliation therefore, the configuration of subjects in the two conditions differs. Subsequent multiple linear regressions conducted with the demographic variables showed no significant effect on the dependent variables.

2. DESIGN.

As with the previous experiment, and as discussed in Chapter 3, subjects in both conditions underwent a treatment phase and a test phase. The content of the treatment phase for the subjects in the experimental groups consisted of watching Part 1 of the disturbing documentary film on the war in Vietnam, entitled "Frontline", followed by the guided discussion. The treatment for the subjects in the control groups consisted of watching the documentary on the trade mission from Singapore to China, followed by a guided discussion of

that film. The two films were each of fifteen minutes duration, and the discussion periods were also matched in time for thirty minutes. The test phase was identical for all groups. They watched Part 2 of the war documentary "Frontline". Details of the contents of the documentaries are given in the Methods section of Experiment 1.

GER condition.

The nature of the strengthened (more focused) GER has been described in Chapter 3. The discussion for these subjects was directed towards the projection of the participants into the context of the film. They were encouraged to think through how they would be likely to react if they were in the situation as conscript soldiers. This also involved quietly providing additional background information:

(a) information on the documented incidence of war trauma was given, and

(b) they were briefed about psychological casualties in war. Typical responses and the debilitating effect on their performance was described.

3. PROCEDURE.

Subjects in all the groups started the experiment with the relevant introduction, and the same procedure was followed as set out in the Procedure for Experiment 1. The only difference was that the Wheel Questionnaire was not administered. This reduced the first phase to half an hour's duration. Subjects then proceeded directly with their respective treatment phases. There was a fifteen minute interval, then they proceeded with the test phase. At the conclusion of the test phase, they completed the third SACL and a debriefing form. As in Experiment 1, the debriefing form appeared to have a cathartic effect. The students were allowed to spend some time over this, writing in freestyle and discussing their thoughts about the films they had viewed, the instruments used, and the experiment as a whole.

4. DEPENDENT VARIABLES.

The main dependent variables for this experiment were the scores for stress and arousal on the SACL. Three measures were taken. The first was pre treatment, as a baseline measure. The second was taken immediately after the treatment phase. The third was obtained immediately after the test phase.

RESULTS

The results of the analyses of variance and covariance, and the computations with the stress inoculation data are reported in this section. Analytical strategies followed that reported in Chapter 4.

1. INITIAL MEASURES: ANALYSIS OF VARIANCE.

Simple analysis of variance did not reveal any significant differences between subjects in the control and experimental conditions on the baseline measures of the GWBQ: worn out and up tight. Table 5.2 shows the mean scores on the GWBQ for the subjects in the two conditions.

Condition	Control	GER	Overall	F	df	p
Worn Out	21.4	22.2	21.8	0.47	1, 64	0.50
Up Tight	12.8	13.0	12.9	0.01	1, 64	0.92

Table 5.2. Mean Scores on GWBQ by Conditions.

The mean scores for the GWBQ are comparable to those obtained for Experiment 1. Worn out has a mean score of 21.8, standard deviation 4.9, while up tight has a mean score of 12.9, standard deviation 4.7. For Experiment 1, the respective scores were 21.5, standard deviation 5.3, and 13.7 with standard deviation of 5.2. Again, the base-line measures for one standard deviation below the mean are elevated compared to the Cox and Gotts (1988) norms for Australian and British students.

Furthermore the subjects in the two conditions did not differ in terms of their initial SACL scores: stress and arousal. The differences in the religious backgrounds of the subjects in the two conditions did not affect their responses on the initial measures of stress and arousal. Table 5.3 shows the mean scores on the initial SACL measures for the subjects in the two conditions.

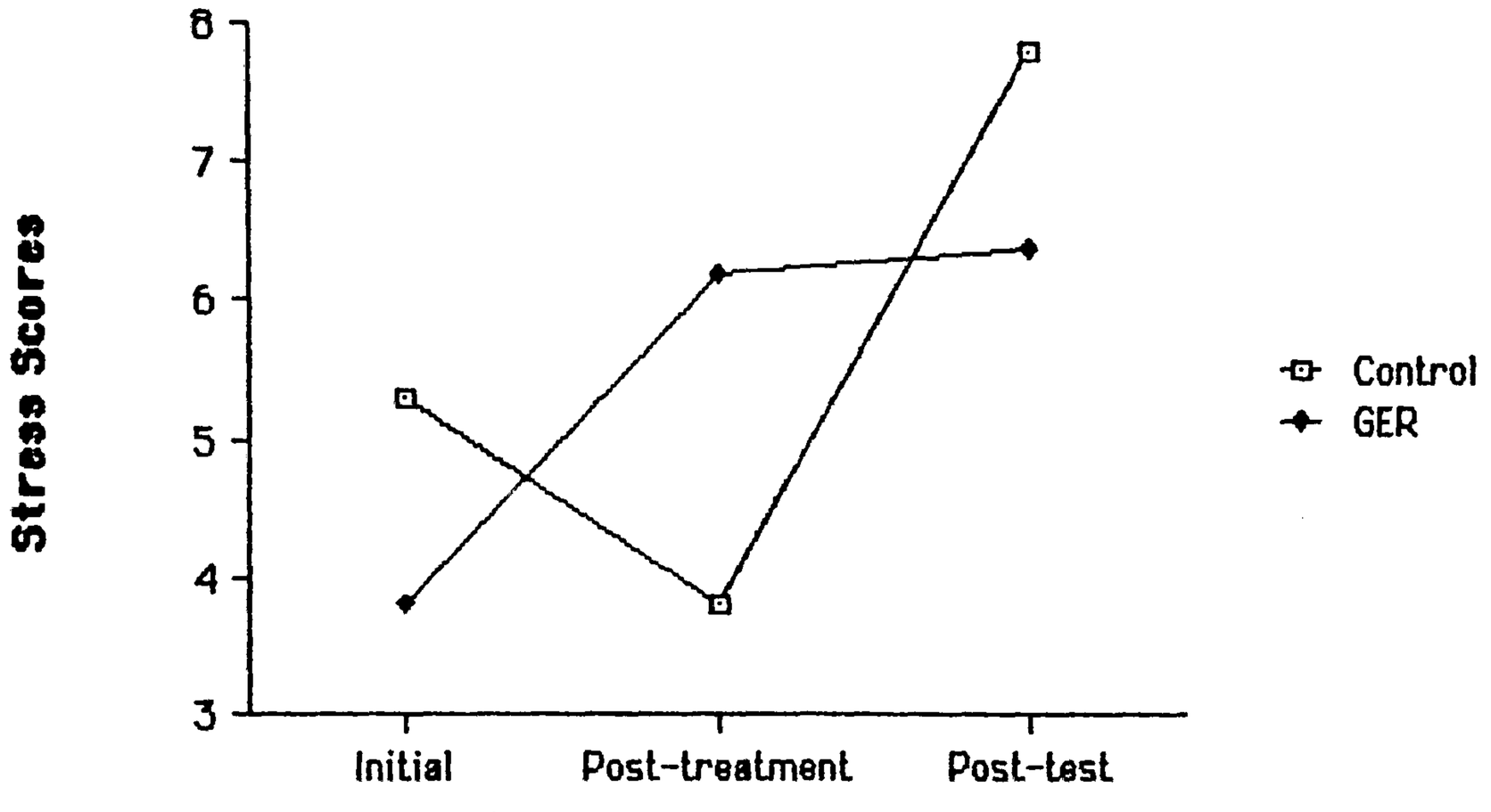
Condition	Control	GER	Overall	F	df	p
Initial Stress	5.3	3.8	4.5	3.32	1, 64	0.07
Initial Arousal	7.0	7.2	7.1	0.14	1, 64	0.71

Table 5.3. Initial Stress and Arousal Scores by Conditions.

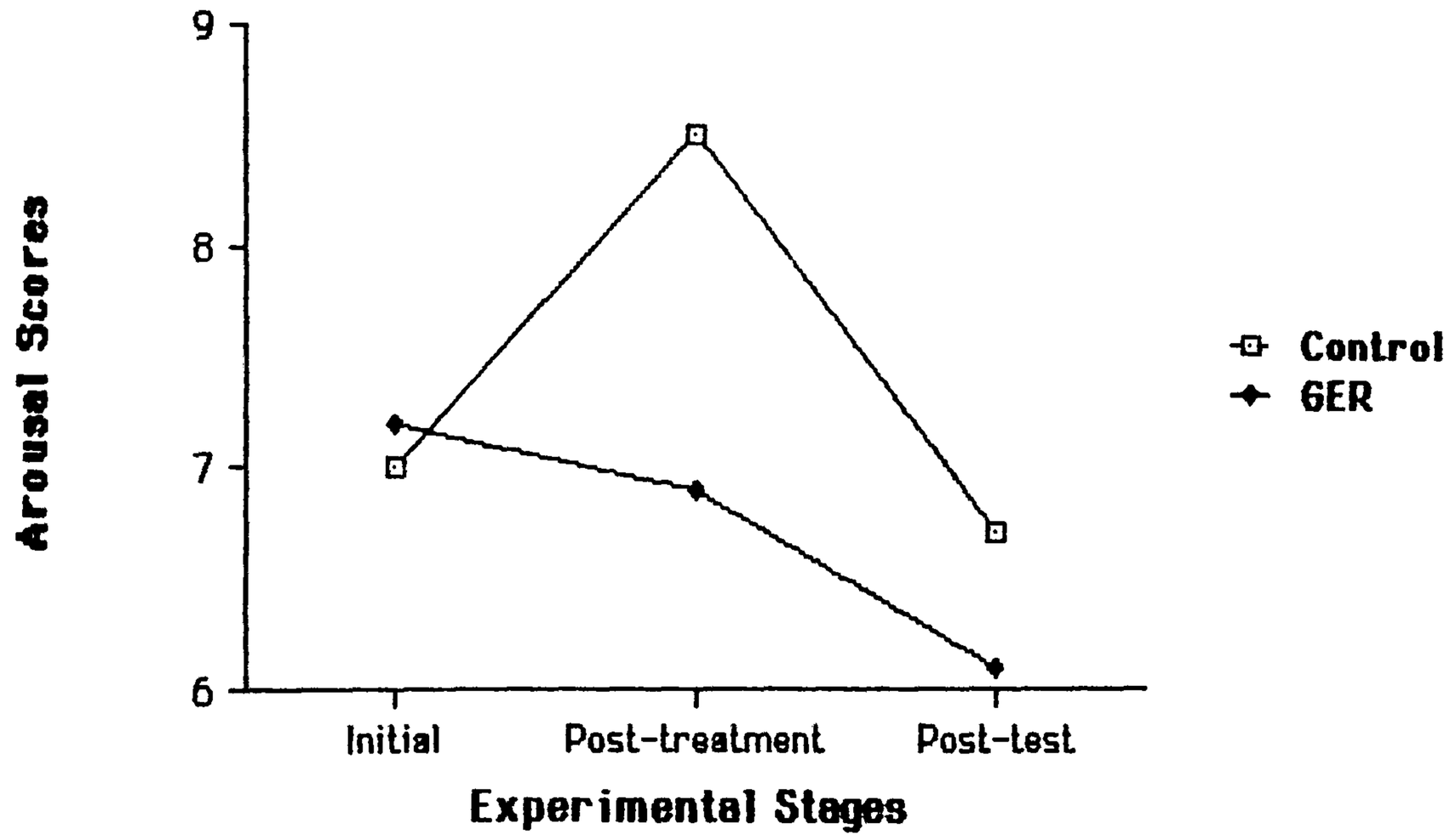
2. ANALYSES OF VARIANCE: FULL DATA SET: CONDITIONS X TIME.

Table 5.4 presents the results of an analysis of variance on the stress data across conditions and time. A significant main effect was found for time (p=.0001), while a significant interaction effect was found between condition and time (p=.004). The effect of the different conditions on the stress scores is clear from Graph 5.1.

Graph 5.1. Stress Scores by Experimental Conditions.



Graph 5.2. Arousal Scores by Experimental Conditions.



Source of Variation	Sum of Squares	df	Variance Estimate	F	p
Condition	5.04	1	5.04	0.20	0.66
Group	9.24	2	4.62	0.18	0.83
Interaction					
Condition x Group	65.70	2	32.85	1.29	0.28
Error	1499.71	59	25.42		
Time	242.86	2	121.43	9.64	0.0001
Interaction					
Condition x Time	147.60	2	73.80	5.86	0.004
Group x Time	64.39	4	16.10	1.28	0.28
Condition x Group					
x Time	56.78	4	14.19	1.13	0.35
Error	1486.60	118	12.60		

Table 5.4. Simple Analysis of Variance of Stress Scores.

There were no significant differences between groups either as a main or interaction effect. This supports the initial analysis establishing the equivalence of the various groups in the two conditions.

The subjects in the control and experimental conditions can be seen to differ in their stress scores, immediately after the treatment condition. The level of stress experienced by the subjects in the GER condition appears to have increased at the end of the treatment phase, and then remains stable across the test phase. For the subjects in the control condition, the level of stress decreases at the end of the treatment phase but then showed a sharp rise at the end of the test phase.Thus significant differences in the pattern of change, over the treatment and test phases, between the GER and control subjects were demonstrated. However, the question remains "do these differences persist to the end of the test session?" This question is answered in the next section (3).

Table 5.5 shows the results of a similar analysis carried out with the self-reported arousal scores. The analysis indicates a significant main effect over time. However, there were no significant differences between subjects by conditions on arousal either as a main or interaction effect. Graph 5.2 presents the arousal data.

Source of Variation	Sum of Squares	df	Variance Estimate	F	p
Condition	20.21	1	20.21	2.07	0.16
Group	58.39	2	29.19	2.98	0.06
Interaction					
Condition x Group	10.24	2	5.12	0.52	0.60
Error	577.45	59	9.79		
Time	59.28	2	29.64	3.41	0.04
Interaction					
Condition x Time	21.34	2	10.67	1.23	0.30
Group x Time	21.17	4	5.29	0.61	0.66
Condition x Group					
x Time	39.96	4	9.99	1.15	0.34
Error	1024.59	118	8.68		

Table 5.5. Simple Analysis of Variance of Arousal Scores.

Overall, the arousal scores of subjects increased across the treatment phase, and then decreased across the test phase. The post test arousal level for subjects in the GER condition in Experiments 1 and 2 are similar.

3. ANALYSIS OF COVARIANCE: EFFECTS OF CONDITION AT DIFFERENT POINTS IN TIME.

Analyses of covariance were carried out on the stress and arousal scores after the treatment and test phases respectively. Preceding measures of stress and arousal were entered as covariates. The GWBQ measures were also held as covariates. Only analyses with significant differences between conditions are reported.

(a) STRESS.

Table 5.6 shows the mean stress scores of subjects in the two conditions, over the three administrations of the SACL.

Condition	Control	GER	Overall
Initial Stress	5.3	3.8	4.5
Post Treatment Stress	3.8	6.2	5.1
Post Test Stress	7.8	6.4	7.1

Table 5.6. Mean Stress Scores by Conditions over Time.

Analyses of covariance conducted on the post treatment stress scores showed a significant difference between subjects by conditions at this point. This is similar to the finding in Experiment 1. Table 5.7 shows the details of the analysis.

Source of Variation	Sum of Squares	df	Mean Square	F	p
Covariates	96.38	3	32.13	2.37	0.08
Initial Stress	28.94	1	28.94	2.13	0.15
Worn Out	18.53	1	18.53	1.37	0.25
Up Tight	5.18	1	5.18	0.38	0.54
Main Effects	120.66	1	120.66	8.90	0.004
Condition	120.66	1	120.66	8.90	0.004
Explained	217.04	4	54.26	4.00	0.006
Residual	813.82	60	13.56		
Total	1030.86	64	16.11		

Table 5.7. Analysis of Covariance of Post Treatment Stress.

From Table 5.7 it can be seen that, unlike Experiment 1, none of the covariates had a significant effect on post treatment scores. The subjects in the experimental condition, having seen the first part of the disturbing war documentary and discussed it, were considerably more stressed (mean=6.2) than the subjects in the control condition (mean=3.8) who viewed a documentary on a trade mission visit followed by a discussion on the subject.

It can be seen from Table 5.8 that analysis of covariance for post test stress reflected a significant difference between conditions, after taking out the differences in post treatment stress as a covariate. These findings are different from Experiment 1 in this respect.

Source of Variation	Sum of Squares	df	Mean Square	F	p
Covariates	277.38	3	92.46	4.95	0.004
Post Treatment Stress	230.10	1	230.10	12.33	0.001
Worn Out	27.49	1	27.49	1.47	0.23
Up Tight	29.33	1	29.33	1.57	0.22
Main Effects	109.35	1	109.35	5.86	0.02
Condition	109.35	1	109.35	5.86	0.02
Explained	386.73	4	96.68	5.18	0.001
Residual	1119.88	60	18.67		
Total	1506.62	64	23.54		

Table 5.8. Analysis of Covariance of Post Test Stress.

The final measure of stress can be seen to differ significantly between the subjects in the control and GER conditions, when the measure of stress after the treatment condition is held as a covariate. The subjects in the control condition were more highly stressed than the subjects in the GER condition, after the test phase. Thus it would appear that the differences in reaction between the GER and control subjects do persist to the end of the test session, when their mood state at the beginning of that session is controlled for. Sadly, however, an analysis of covariance of the post test stress scores, entering the *initial* stress scores as covariates, did not differentiate between the subjects in the control and GER conditions. Thus, despite an inability to demonstrate overall differences between conditions in terms of their initial mood state (page 138), taking out initial inter-individual differences in mood removes the apparent post-test differences between conditions.

Table 5.8 shows the details of the analysis of covariance with the post treatment stress scores held as a covariate.

(b) AROUSAL.

Table 5.9 shows the mean arousal scores of the subjects in the two conditions, over the three administrations of the SACL. Analysis of variance showed no significant differences by condition. However, the covariance strategy did reveal some differences between the subjects in the two conditions.

Condition	Control	GER	Overall
Initial Arousal	7.0	7.2	7.1
Post Treatment Arousal	8.5	6.9	7.7
Post Test Arousal	6.7	6.1	6.4

Table 5.9. Arousal Scores by Conditions over Time.

Table 5.10 reflects the details of the analysis of covariance on the post treatment scores using the initial arousal data and the GWBQ data as covariates. It is seen that the initial arousal was a significant covariate for the post treatment arousal score but that neither of the GWBQ scores were. This is different from Experiment 1 where the GWBQ up tight score was a significant covariate for the post treatment arousal. It can be seen from Graph 5.2 that the subjects in the GER condition reported a lower level of arousal than the subjects in the control condition after treatment.

Source of Variation	Sum of Squares	df	Mean Square	F	p
Covariates	62.25	3	20.75	2.20	0.10
Initial Arousal	43.85	1	43.85	4.66	0.04
Worn Out	4.24	1	4.24	0.45	0.51
Up Tight	2.89	1	2.89	0.31	0.58
Main Effects	43.58	1	43.58	4.63	0.04
Condition	43.58	1	43.58	4.63	0.04
Explained	105.83	4	26.46	2.81	0.03
Residual	564.73	60	9.41		
Total	670.55	64	10.48		

Table 5.10. Analysis of Covariance of Post Treatment Arousal.

Analysis of covariance conducted on post test arousal scores reflect no significant differences between the two conditions. It is as if the single exposure of the subjects in the control condition to the second part of the war documentary was sufficient to reduce the arousal scores to a comparable level to those of the experimental condition who had lowered their arousal scores after a first viewing and then proceeded to an even lower arousal level after the second viewing.

4. SI DATA: COMPARISON OF CONTROL & GER CONDITIONS.

The stress inoculation index provides a measure of the change in stress during the test phase in relation to the change experienced over the treatment phase (see Chapter 3). Table 5.11 reflects the results of the analyses conducted with the stress inoculation index.

Factors	Predictors or independent variables	Dependent variable: stress inoculation index
Biodata	Age; Race	NS
Psychometric	SACL A : Stress and Arousal GWBQ : Worn Out and Up Tight	var=17% mr=.48 F(4,60)=4.34 p=.004
Situational	Conditions GER :mean=-2.3 sd=7.3 Ctrl:mean=5.5 sd=7.3	F(1,63)=18.58 p=.0001

Table 5.11. Summary of Results for Regression Analyses and Anova on the Stress Inoculation Index for GER and Control.

The biodata of the subjects did not predict their pattern of reactions, in terms of the stress inoculation index. However, the available psychometric data predicted this index accounting for up to 17 percent of the variance. Comparison of the SI indices for the subjects in the two conditions, using analysis of variance, confirmed the findings of Experiment 1. While the GER index was -2.3, the control index was 5.5. The difference between the two conditions was significant at the $p<.0001$ level.

DISCUSSION

This experiment attempted to:

(1) replicate the results from the first experiment with regard to the GER and control conditions, with a larger sample in each condition and,

(2) attempt to resolve the paradoxical aspects of the first experiment by strengthening the GER procedure used (more emotionally focused).

Effects on stress.

Once again, subjects' reports of stress were affected by the experimental paradigm. The two conditions (GER and control) differed significantly in

their stress scores at the end of the treatment phase, and there was a significant difference in their pattern of change over the treatment and test sessions providing some evidence of a stress inoculation effect. It appeared from the data that the subjects in the GER condition showed less change during the test session than subjects in the control condition, and that this difference persisted to the end of the test session. Analyses of covariance, taking out the post treatment scores as covariates, revealed a significant difference post test between the two conditions. Subjects in the GER condition appeared to report significantly less stress than those in the control condition. However, when *initial* stress scores were entered as covariates, this removed the apparent post test differences between conditions. Thus the attempts to resolve the paradoxical aspects of the evidence in favour of a stress inoculation effect have not succeeded.

Effects on arousal.

For arousal, it was observed that the subjects in the GER condition reported a lower level of arousal at the end of the treatment phase than the control. This contrasts with the findings of Experiment 1, where the arousal level at the end of the treatment phase was higher for the subjects in the GER condition. However, the magnitude of change involved was not very great in either case. In this experiment, it would appear that the interest of the subjects in the control conditions was aroused by the discussion following the travel documentary, possibly accounting for the increase in arousal scores at this stage. This finding was not as predicted. The subjects in the GER condition had a significantly lower level of arousal post treatment compared to the subjects in the control condition. Steele and Cox (1986) report on the varying arousal response when subjects were presented with slides of aversive war pictures, with the exception of consistent heightened arousal in a report condition for female subjects. Post test, however, there was no difference in the arousal levels, subjects in both conditions recording lower levels after exposure to the disturbing war documentary.

The data are somewhat surprising in that they indicate a low reported level of arousal associated with a high level of stress for subjects in the GER condition post treatment and for the subjects in the control condition post test. In both cases, these subjects had experienced stressful situations which might have been expected to produce high levels of both stress and arousal.

There are at least two possible explanations: the first involving habituation and the second some form of cognitive coping.

(a) First, immediate habituation to the aversive stimuli (Mangelsdorff and Zuckerman, 1975) may have occured. This would have to be very rapid and have a very strong and sustained effect. Arguments about the likelihood of the habituation response were discussed in Experiment 1, and it is thought that such an explanation is most unlikely here, especially as only arousal states were affected.

(b) The second probability involves the use of "mental disengagement" as a cognitive coping strategy (Carver, Scheir and Weintraub, 1989). These authors describe this as a variation of behavioural disengagement, postulated to occur when conditions prevent behavioural disengagement. Mental disengagement occurs via a wide variety of cognitive activities that serve to distract the person from thinking about the stressor or its effects. Tactics that reflect mental disengagement include using cognitive activities to take one's mind off a problem (a tendency opposite to the suppression of competing activities), daydreaming, escaping through sleep, or escape by immersion in television. These tactics are diverse, and the conceptual category of mental disengagement may form a "multiple act criterion" (Fishbein and Ajzen, 1974) rather than being a unitary class of cognitive behavior. Although disengaging from a goal is sometimes a highly adaptive response (Klinger 1975), this response often impedes adaptive coping (Aldwin and Revenson, 1987). As a result of mental disengagement, there is a lower level of arousal, although the situation is still stressful.

It is important to establish some criteria by which mental disengagement can be said to have occurred, as the activities which might constitute such coping (Carver, Scheier and Weintraub, 1989; Fishbein and Ajzen, 1974) cannot be

directly observed. From what has passed in this experiment, and from the above discussion, three criteria can be specified:

(a) prior exposure to a stressful situation which would normally be associated with high levels of both stress and arousal,

(b) demonstration of low levels of measured arousal associated with high levels of stress, and

(c) no obvious explanation of the lowered arousal in terms of other events, such as stress inoculation, relaxation training or some form of external distraction.

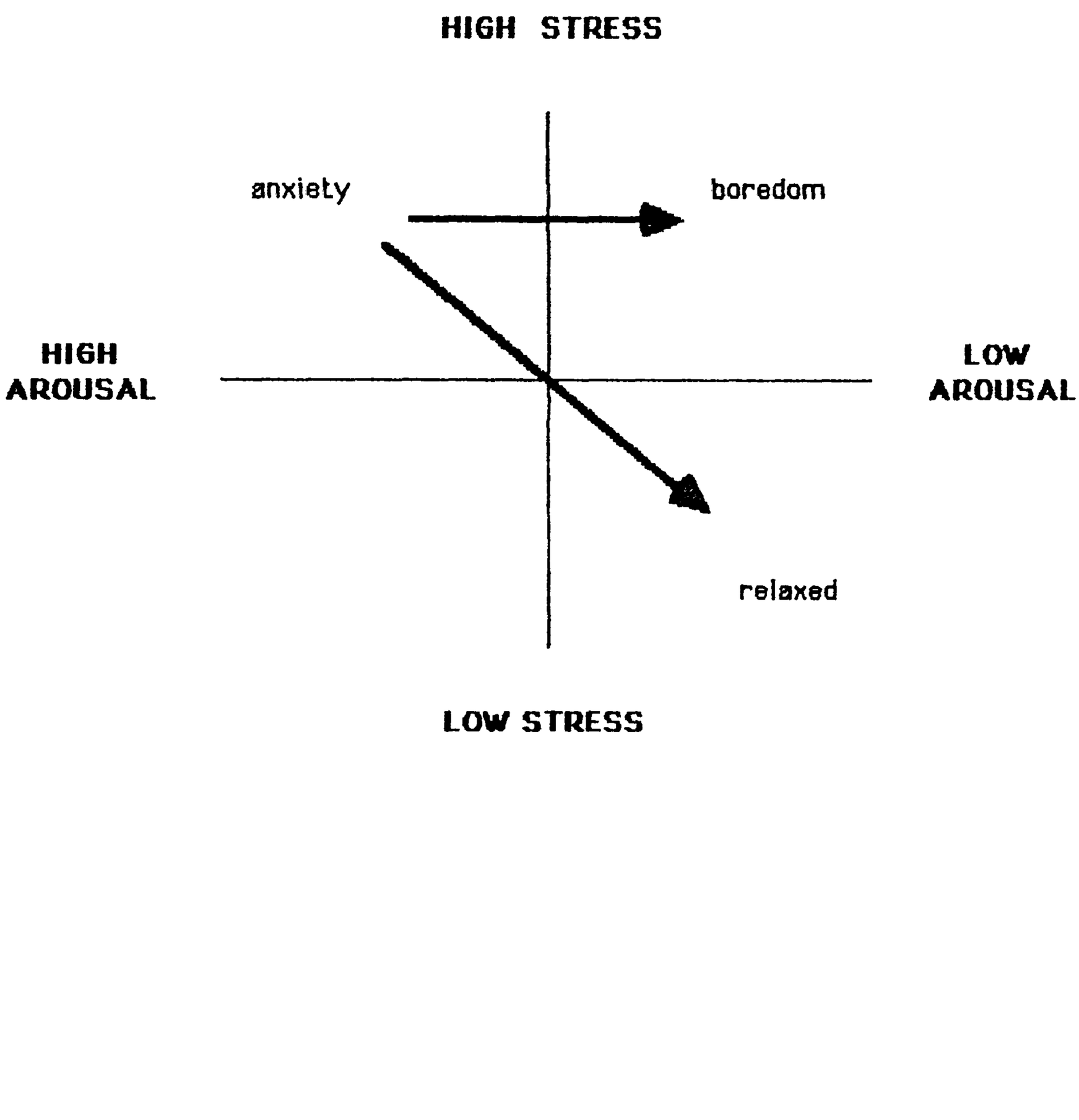
Given these criteria, evidence of mental disengagement could be sought post treatment in the GER (and alternative treatment) conditions, and post test in all conditions.

In Experiment 1, there were distractions from noise and interruptions throughout the study, and there was no evidence of mental disengagement in that experiment. In the present experiment, these distractions had been overcome, and there was evidence of mental disengagement for subjects in the GER condition post treatment. There was also an inoculation effect, and thus no evidence of mental disengagement post test for the GER condition. There was, however, evidence of such coping in the control condition post test.

What appears to be happening is that mental disengagement shifts the mood state from one of anxiety (high stress: high arousal) to one of boredom (high stress: low arousal) (see Cox 1978); see Figure 5.2.

In the interpretation of a specific mood state, it is interesting to note Schacter's basic idea (Strongman 1978), that emotions are controlled through a very close interrelationship and interaction between physiological arousal and cognitive appraisal. He had emphasized the role of cognitive mechanisms in interpreting the emotions. In the context of Experiment 2, disengagement appears to be employed as a cognitive strategy for reinterpreting emotions.

FIGURE 5.2. MOOD STATES AS A FUNCTION OF STRESS AND AROUSAL.



Debriefing.

A verbal debriefing was conducted at the end of Experiment 2 in an attempt to gain some insight into the mental processes employed by the subjects during the experimental procedure. However, subjects were not able to provide this abstraction. They appeared to be unaware of group processes and their effect on them. Subjects in the GER condition were specially studied with a view to understanding the aspects that particularly played an important part in shaping opinions and reactions. The participants were unable to give a coherent account for themselves, though trends of thought could be observed by the experimenter, to develop, in the course of the GER discussion.

Summary.

The results of this experiment, like those of Experiment 1, have suggested a stress inoculation effect but only in terms of the pattern of change in mood over the treatment and test sessions. Again, there was no totally convincing evidence of the persistence of this effect.

Interestingly, changes in arousal scores were also observed. It is possible that differences in arousal levels following treatment and test procedures may be a result of the employment of different coping strategies by the individuals in the two conditions. It was suggested that some subjects in stressful situations used 'mental disengagement' to cope with their experience.

Next experiment.

The following experiment was designed to study whether the paradoxical aspects of the findings of Experiments 1 and 2 could be resolved by adopting different methodological strategy, using:

(1) a standard GER procedure, but

(b) introducing a longer interval between the treatment and test phases.

A subsidiary interest was whether there would be any further evidence of mental disengagement as a strategy for coping with stressful situations.

CHAPTER 6. EXPERIMENT 3: STRESS INOCULATION EFFECTS OF GER PROCEDURE WITH DELAYED TESTING.

INTRODUCTION

There was some suggestion of a stress inoculation effect in the findings of Experiments 1 and 2 when the pattern of effect of the GER procedure was compared to that of the control procedure. However, despite this, the stress scores for the subjects in the control and GER conditions were similar at the end of the respective test sessions. Experiment 2 was an attempt to develop the findings of the first experiment and resolve this apparent paradox. The following measures were incorporated in Experiment 2:

(a) larger sample of subjects in each condition,

(b) content of GER procedure was more focused emotionally and

(c) special efforts were made to reduce the "noise" level in the course of the experimental procedure.

As it turned out, Experiment 2 failed to produce evidence of the persistence of the differences between the two conditions. Analysis of covariance with the *initial* stress scores held as covariates, failed to reveal any significant difference between the post test stress scores of the subjects in the GER and control conditions.

In Experiment 2, an interesting reduction in arousal was found post treatment and post test, during a period of high stress. It was thought that this might be due to subjects attempting to "disengage" (Carver, Scheier and Weintraub, 1989). In a sense, disengagement failed because stress levels remained high, but succeeded in reducing arousal. This lowering of arousal was not seen post treatment for the subjects in the GER condition in Experiment 1. A standard GER procedure had been used in Experiment 1, and an emotion-focused GER in Experiment 2.

Experiment 3 was designed to check on the post treatment lowering of arousal, and to further explore and resolve the paradoxical findings of

Experiments 1 and 2 by separating the treatment and test phases by a longer time interval, as they would be in "real life", although not to the same extent. As in Experiment 2, a larger sample, compared to Experiment 1 was used in each of the control and GER conditions. The GER procedure was similar to that in Experiment 1, however, the treatment and test phases were separated in time by about three hours over the lunch-break. As in Experiment 2, arrangements again were made to reduce the extraneous "noise".

The hypotheses for this experiment are:

(a) subjects in the GER condition will demonstrate a stress inoculation effect,

(b) there will be a significant difference in post test stress between the subjects in the GER and control conditions, with subjects in the GER condition reporting a lower level of stress,

(c) subjects in the GER condition will report a heightened level of post treatment arousal compared to subjects in the control condition, and

(d) subjects in the GER condition will report a lower arousal level post test, compared to subjects in the control condition.

The arousal pattern is hypothesized to be like that observed in Experiment 1 rather than in Experiment 2, in view of the less involving nature of the GER procedure.

METHOD

This section sets out the sampling, experimental design, procedure, and describes the dependent variables for this experiment.

1. SAMPLE.

The sample consisted of a total of 60 male students from two Junior Colleges in Singapore. The experiments were conducted in groups of 9 to 11 students.

There were six groups in all and they were tested between 18 May 1988 and 26 May 1988. A classroom or the audio-visual aids room in the Junior Colleges was used for the experiments, depending on availability. Three groups formed the control condition. This consisted of 30 students in all. Another three groups consisting of 30 students formed the GER condition. Two of the control groups were from Junior College A while two of the experimental groups were from Junior College B. The sample was matched for educational level, all of them being in the first year of Junior College. There were no significant variations between the control and experimental groups by race or religion, though there were 8 Muslims in the experimental group and only 2 in the control group. Subsequent multiple linear regression analysis revealed that the demographic variables did not have an effect on the dependent measures.

Condition	16 years	17 years	18 years	Total
Control	21 (70%)	9 (30%)		30 (100%)
Experimental	8 (26.7%)	19 (63.3%)	3 (10%)	30 (100%)

Table 6.1. Cross-Tabulation of Conditions by Age.

It can be seen from Table 6.1 that while two-thirds of the subjects in the control condition were 16 years old, the students in the experimental condition were mostly a year older.

2. DESIGN.

The design followed closely that of Experiment 2 with the following exceptions:

(a) A long time interval of two to three hours was introduced between the treatment and test phases. The treatment phase was conducted in the morning. The test phase was conducted after lunch.

(b) The discussion with the experimental groups for this experiment did not incorporate providing background information about war trauma, as in Experiment 1.

(c) There was also no attempt to project the participants into the context of the film by encouraging them to think through how they would be likely to react if they were in the situation as conscript soldiers.

With regard to (b) and (c), it was therefor similar to Experiment 1. The similarities and differences between Experiments 1, 2 and 3 are shown in Table 6.2.

Experiment	GER	Interval
First	standard	15 mins
Second	emotion focused	15 mins
Third	standard	180 mins

Table 6.2. Three Experiments by GER type and Treatment-Test Interval.

The procedure prior to the first viewing of the films was essentially similar to that for Experiment 1 with the following exceptions:

(a) Three additional questions were included in the biographical enquiries. The first asked about the number of war films or war documentaries seen over the last four weeks. The second asked about the number of books, reports or articles read on the subject of war over the last four weeks. The last question asked whether they were interested in finding out about defence and war issues.

(b) A Wheel Questionnaire was also administered after the General Well Being Questionnaire. As for Experiment 1, the subject for the Wheel was "What characterizes war?". Unlike Experiment 1, no second Wheel was administered after the test phase. The purpose of administering the first Wheel Questionnaire was to provide a coping index for use in the

prediction of later mood states.

The additional aspects in this experiment were included in an attempt to control the expressed interest in war films, and any differences in perceived ability to cope in a war scenario.

3. PROCEDURE.

After the interval, the students filled out a SACL, to assess their initial states of stress and arousal prior to viewing Part 2 of the war documentary. At the conclusion of the test phase, they filled out a final SACL, as for Experiments 1 and 2. For this experiment therefore, four measures on the SACL were obtained, compared to three in Experiments 1 and 2. They then concluded the experiment by completing a debriefing form as for the previous experiments.

4. DEPENDENT VARIABLES.

The main dependent variables in this study were subjects' report of stress and arousal.

RESULTS

This section sets out the sample characteristics, baseline measures of the conditions, analyses of covariance results on the stress and arousal measures, and the results of computations of the stress inoculation index.

1. SAMPLE CHARACTERISTICS.

42% of the total sample had seen war films or war documentaries over the preceding four weeks. 67 percent said they had read books, reports or articles on the subject of war in the preceding four weeks. 73 percent said they were interested in finding out about defence and war-related issues.

2. INITIAL MEASURES.

No significant differences were found between subjects in the control and experimental conditions on the following baseline measures: initial stress, initial arousal, worn out, up tight, coping, incidence of viewing war films and documentaries over last four weeks, incidence of reading of books, reports and articles on the subject of war over the last four weeks, and statement of interest in finding out about defence and war-related issues.

Chi-square tests and analysis of variance reflected no significant differences between subjects in the control and experimental conditions on the above measures.

3. ANALYSES OF VARIANCE: FULL DATA SET: CONDITIONS X TIME.

Table 6.3 presents the results of an analysis of variance on the stress data across conditions and time. It is seen that there was a significant main effect of conditions (p=0.04). There was also a significant change over time (p=0.0001) and a significant interaction effect of condition by time (p=0.0006).

Source of Variation	Sum of Squares	df	Variance Estimate	F	p
Condition	190.87	1	190.87	4.68	0.04
Group	53.60	2	26.80	0.66	0.52
Interaction					
Condition x Group	11.28	2	5.64	0.14	0.87
Error	2202.10	54	40.78		
Time	271.96	3	90.65	9.53	0.0001
Interaction					
Condition x Time	174.38	3	58.13	6.11	0.0006
Group x Time	19.40	6	3.23	0.34	0.92
Condition x Group					
x Time	99.34	6	16.56	1.74	0.12
Error	1541.64	162	9.52		

Table 6.3. Simple Analysis of Variance of Stress Scores.

One way analyses of variance revealed the simple effects of time of measurement of stress for the subjects in the two conditions. Significant differences were found over time of administration for subjects in both the control and GER conditions, p=0.002 and p=0.001 respectively. Post hoc T tests revealed that differences in scores for the two conditions existed at both post treatment (p=0.001) and at pre test (p=0.03) stages.

There was no significant difference between the various groups constituting the two different conditions. Graph 6.1.(a) and Graph 6.1.(b) reflect the changes in stress levels for the subjects in the two conditions during the treatment and test phases respectively.

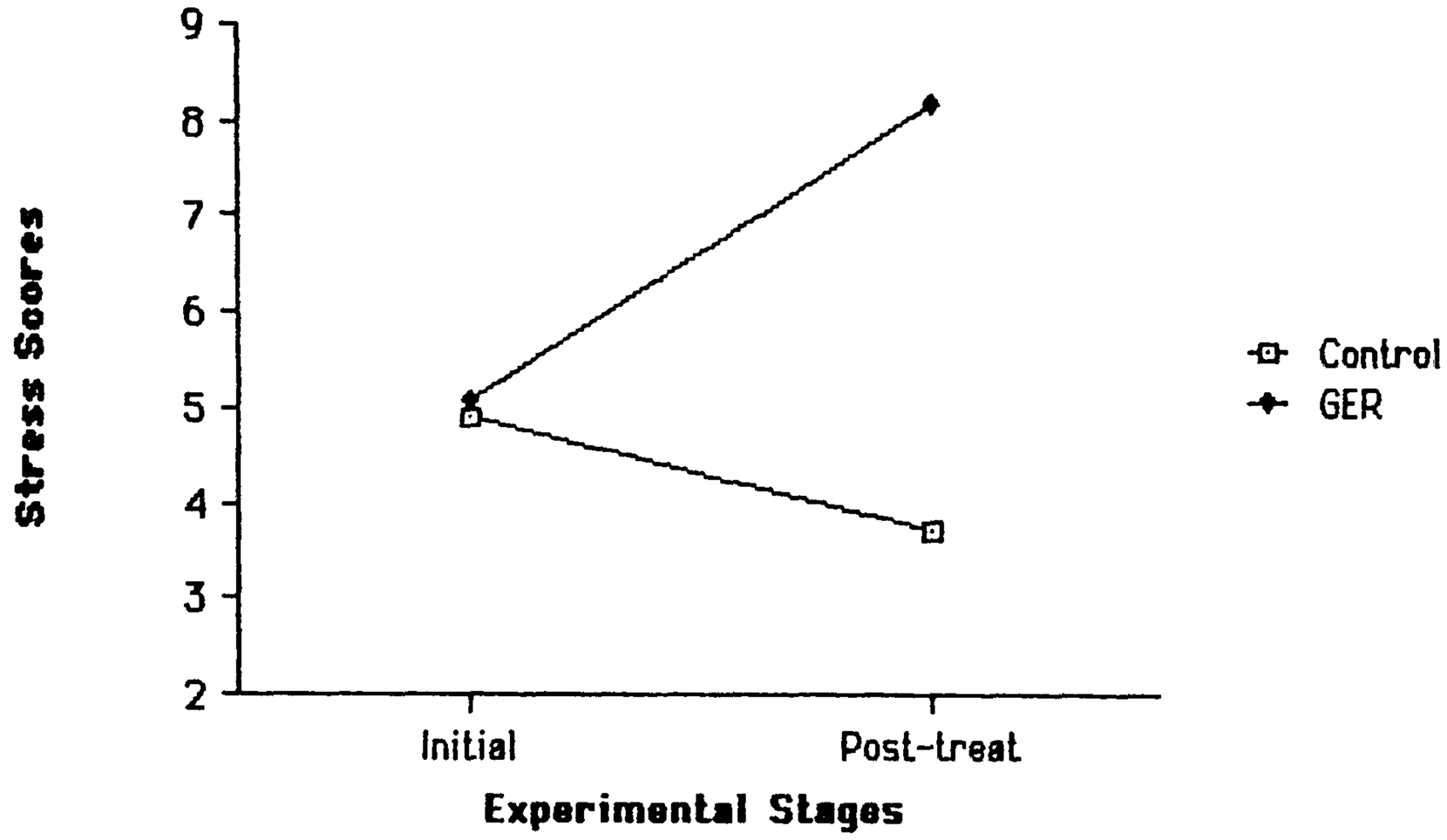
Table 6.4 shows the results of a similar analysis carried out with the self-reported arousal scores. The results indicated no difference between conditions on arousal, but a significant group effect was seen (p=0.0001).

Source of Variation	Sum of Squares	df	Variance Estimate	F	p
Condition	10.16	1	10.16	0.61	0.44
Group	350.60	2	175.30	10.49	0.0001
Interaction					
Condition x Group	70.49	2	35.24	2.11	0.13
Error	902.54	54	16.71		
Time	242.89	3	80.96	12.58	0.0001
Interaction					
Condition x Time	67.29	3	22.43	3.48	0.02
Group x Time	17.45	6	2.91	0.45	0.84
Condition x Group x Time	31.75	6	5.29	0.82	0.55
Error	1042.80	162	6.44		

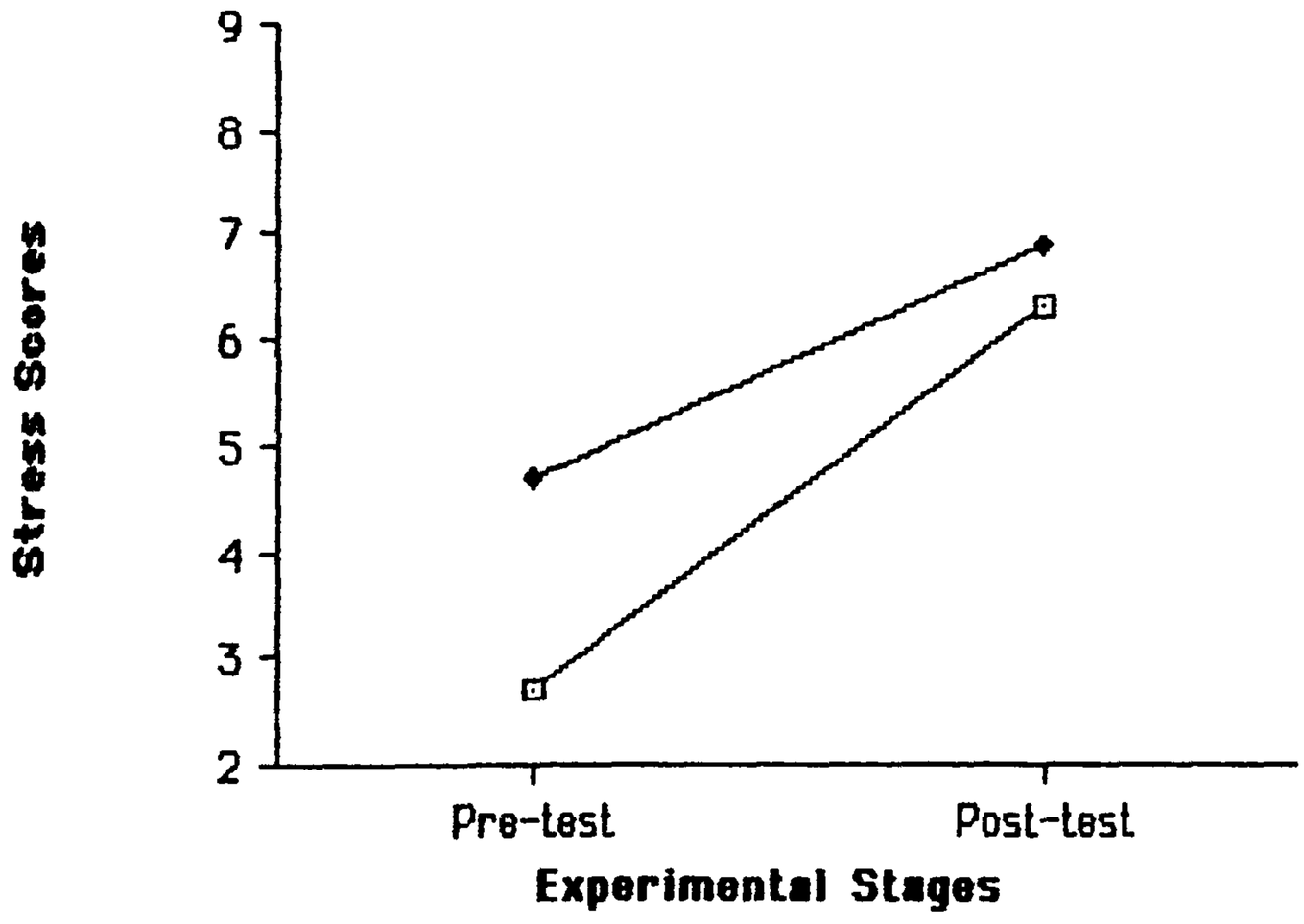
Table 6.4. Simple Analysis of Variance of Arousal Scores.

There was also a significant effect over time, p=0.0001, and a significant interaction effect of condition by time, p=0.02. There was no significant interaction effect of group by time. While there was a significant group

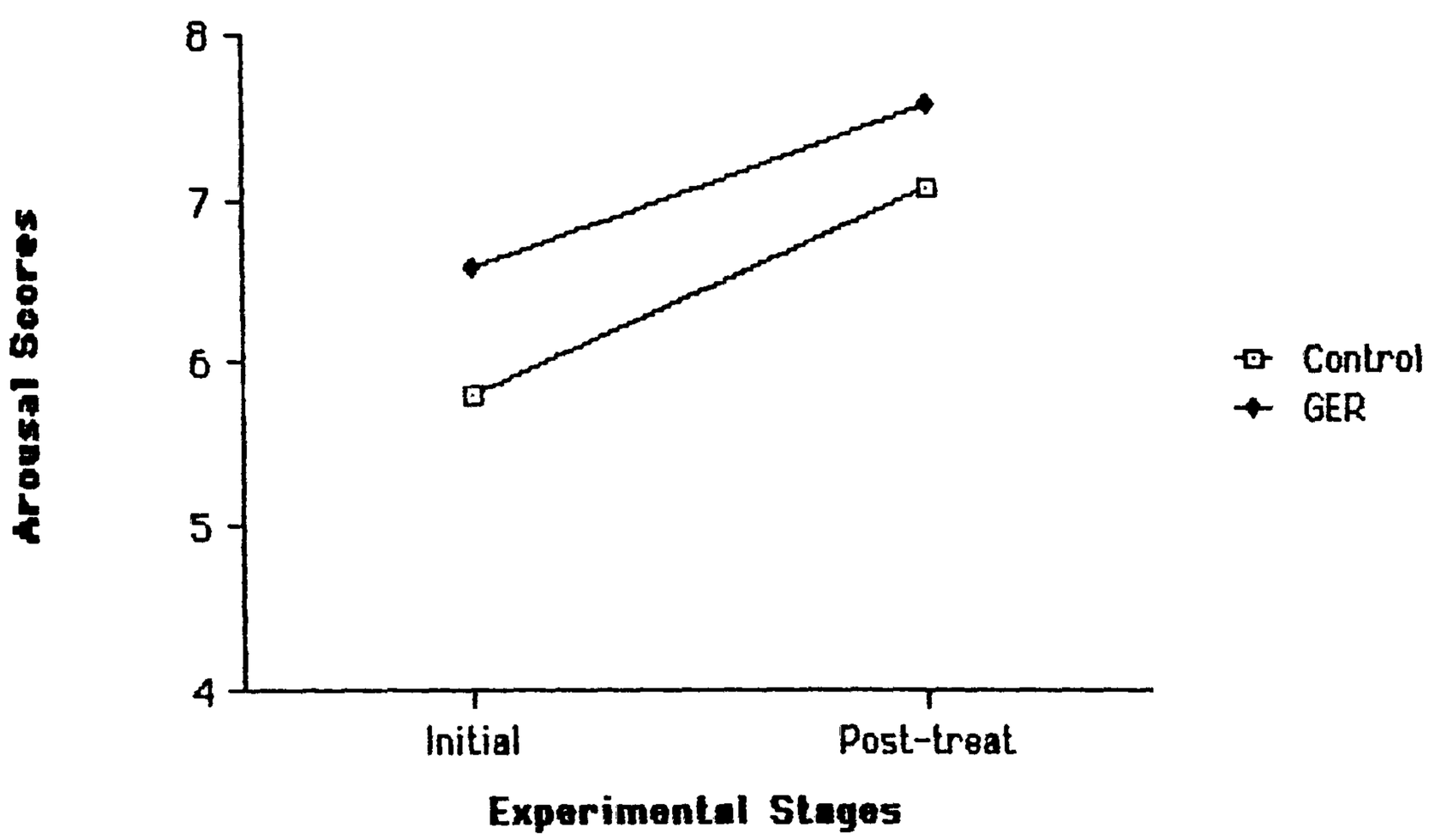
Graph 6.1. (a) Treatment Phase for Stress .



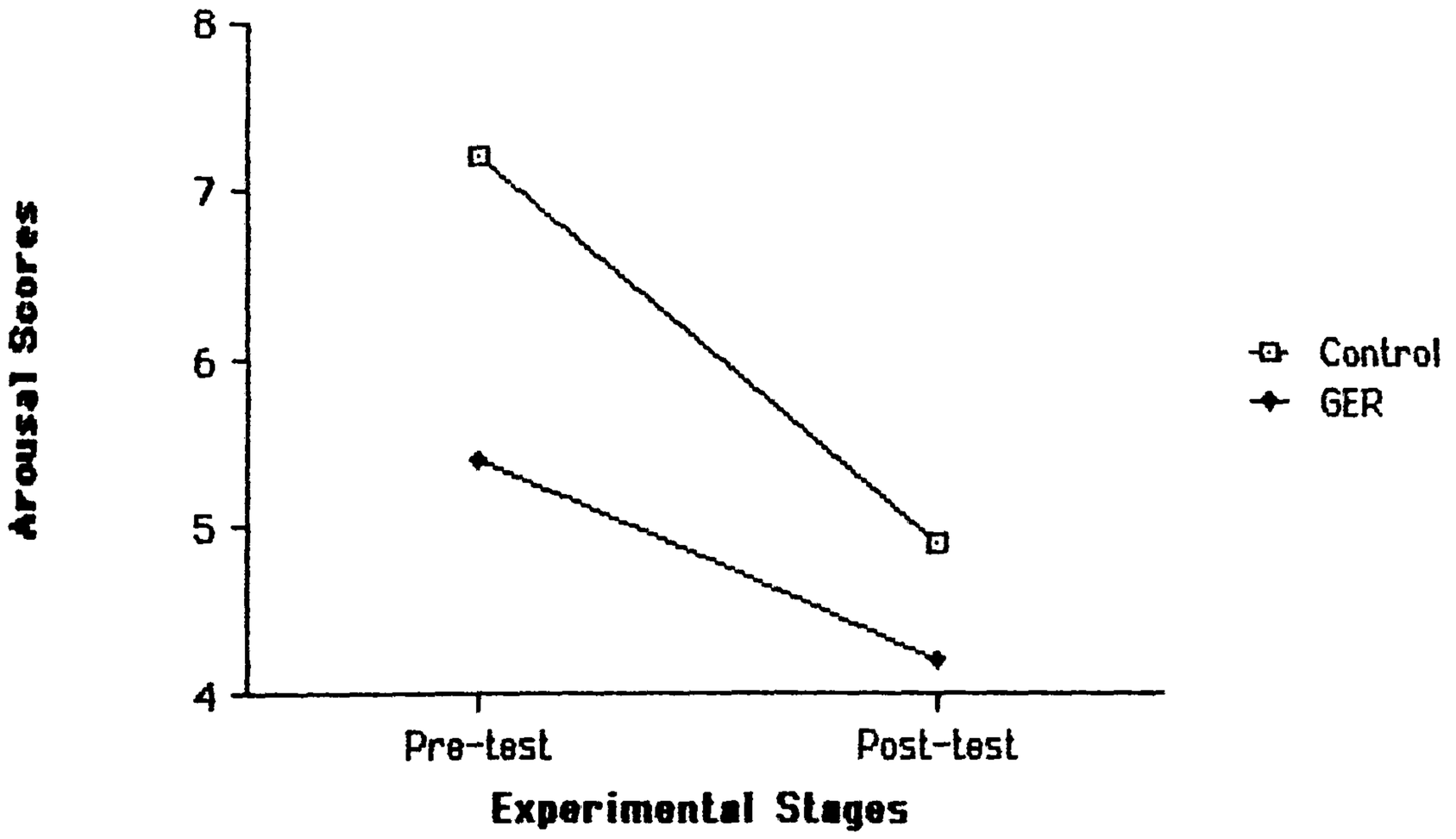
Graph 6.1. (b). Test Phase for Stress.



Graph 6.2. (a). Treatment Phase for Arousal.



Graph 6.2. (b). Test Phase for Arousal.



effect, p=0.0001, the group differences did not emerge as a significant feature over time while condition by time was significant.

Further post hoc analyses indicated significant differences over time for the control and GER conditions separately, (p=0.02 and p=0.0001 respectively). However, subjects in the two conditions were found to be significantly different at one point in time only, and this was at the pre test phase of the experiment. Thus, at this point in time, the subjects in the control and GER conditions started the test phase at different levels of arousal, subjects in the GER condition having a much lower level of arousal, which was further lowered by the end of the test phase. By the end of the test phase though, the level of arousal of the subjects in the control condition was at a similar low level.

Graph 6.2 (a) and Graph 6.2 (b) reflect the change in arousal levels for the two experimental conditions during the treatment and test phases respectively.

4. ANALYSIS OF COVARIANCE: EFFECTS OF CONDITION AT DIFFERENT POINTS IN TIME.

Analyses of covariance was conducted for the stress and arousal scores at post treatment, pre test, and post test. The immediately preceding scores were used as covariates. All instances of significant differences are reported in some detail in the following paragraphs.

(a) STRESS.

At the end of the treatment phase, subjects in the experimental condition, with a mean of 8.2, had a significantly higher level of reported stress than subjects in the control condition with a mean of 3.7 (see Tables 6.5 and 6.6). Subjects in the GER condition maintained the *higher* level of stress through to the pre test stage, despite an actual fall from the post treatment to the pre test stages (see Tables 6.5 and 6.7).

Condition	Control	GER	Overall
Initial Stress	4.9	5.1	5.0
Post Treatment Stress	3.7	8.2	6.0
Pre Test Stress	2.7	4.7	3.7
Post Test Stress	6.3	6.9	6.6

Table 6.5. Mean Stress Scores by Conditions over Time.

Stress scores increased in both conditions across the test session. Furthermore subjects in the two conditions reached similar stress scores at the post test stage, but in doing so, subjects in the GER condition showed less change.

Source of Variation	Sum of Squares	df	Mean Square	F	p
Covariates	214.83	4	53.71	4.30	0.004
Initial Stress	178.51	1	178.51	14.29	0.001
Worn Out	0.06	1	0.06	0.005	0.95
Up Tight	0.90	1	0.90	0.07	0.79
Initial Coping	17.79	1	17.79	1.42	0.24
Main Effects	296.45	1	296.45	23.73	0.001
Condition	296.45	1	296.45	23.73	0.001
Explained	511.28	5	102.26	8.19	0.001
Residual	674.65	54	12.49		
Total	1185.93	59	20.10		

Table 6.6. Analysis of Covariance of Post Treatment Stress.

Treatment Effects (Post Treatment and Pre Test).

Watching the first part of the war documentary and discussing it had appreciably heightened the level of stress of subjects in the GER condition. Details of the analysis of covariance are seen in Table 6.6. Initial stress state significantly determined post treatment stress.

There was a significant difference between subjects in the GER and control conditions pre test when initial stress was held constant. Though the level of reported stress was now lower for subjects in both conditions subjects in the experimental condition still had a higher mean of 4.7, than subjects in the control condition, 2.7 (see Tables 6.5 and 6.7).

Source of Variation	Sum of Squares	df	Mean Square	F	p
Covariates	185.24	4	46.31	4.62	0.003
Initial Stress	118.44	1	118.44	11.81	0.001
Worn Out	3.05	1	3.05	0.30	0.58
Up Tight	4.36	1	4.36	0.44	0.51
Initial Coping	16.21	1	16.21	1.62	0.21
Main Effects	63.79	1	63.79	6.36	0.02
Condition	63.79	1	63.79	6.36	0.02
Explained	249.02	5	49.80	4.97	0.001
Residual	541.58	54	10.03		
Total	790.60	59	13.40		

Table 6.7. Analysis of Covariance of Pre Test Stress.

When post treatment stress was held as a covariate, there was no significant difference between subjects in the two conditions. This would tend to indicate that individual differences in post treatment scores were affecting apparent differences between subjects in the two conditions on pre test scores. The total sample mean at 6.5 was higher than the pre treatment mean of 5.0.

(b) AROUSAL.

Subjects in the control and experimental conditions did not differ in their arousal scores on the pre treatment or immediate post treatment measures. In Experiment 1, subjects in the GER condition had an elevated arousal level post treatment, with the reverse happening in Experiment 2. In the present experiment, the post treatment arousal level of subjects in the GER condition did not differ from that of the subjects in the control condition.

Condition	Control	GER	Overall
Initial Arousal	5.8	6.6	6.2
Post Treatment Arousal	7.1	7.6	7.4
Pre Test Arousal	7.2	5.4	6.3
Post Test Arousal	4.9	4.2	4.5

Table 6.8. Mean Arousal Scores by Conditions over Time.

They differed significantly in their arousal scores after the interval. Subjects in the control condition had a mean of 7.2 while subjects in the experimental condition had a mean of 5.4. Table 6.8 shows the similarity of the trends for the subjects in the two conditions, with the only perceptible difference between the two occuring at the pre test stage.

Source of Variation	Sum of Squares	df	MeanSquare	F	p
Covariates	64.27	4	16.07	1.62	0.18
Initial Arousal	40.80	1	40.80	4.11	0.05
Worn Out	7.74	1	7.74	0.78	0.38
Up Tight	0.05	1	0.05	0.005	0.94
Initial Coping	1.17	1	1.17	0.12	0.73
Main Effects	63.82	1	63.82	6.43	0.01
Condition	63.82	1	63.82	6.43	0.01
Explained	128.09	5	25.62	2.58	0.04
Residual	536.10	54	9.93		
Total	664.18	59	11.26		

Table 6.9. Pre Test Arousal with Initial Arousal as Covariate.

Table 6.9 shows the details of the analysis of covariance with initial arousal as a covariate. Subjects in the conditions are seen to be significantly different at the pre test phase, and initial arousal is a significant covariate.

Even when the immediate post treatment scores were held as covariates, subjects in the GER and experimental conditions differed significantly in their arousal scores. Details of this analysis are seen in Table 6.10.

Source of Variation	Sum of Squares	df	Mean Square	F	p
Covariates	101.12	4	25.28	2.74	0.04
Post-Treatment Arousal	77.65	1	77.65	8.41	0.005
Worn Out	8.29	1	8.29	0.90	0.35
Up Tight	1.36	1	1.36	0.15	0.70
Initial Coping	4.33	1	4.33	0.47	0.50
Main Effects	64.32	1	64.32	6.96	0.01
Condition	64.32	1	64.32	6.96	0.01
Explained	165.44	5	33.09	3.58	0.007
Residual	498.74	54	9.24		
Total	664.18	59	11.26		

Table 6.10. Pre Test Arousal with Post Treatment Arousal as Covariate.

The effect of the treatment measure was therefore seen to be delayed rather than immediate, as far as arousal was concerned. While the arousal score immediately after treatment was not significantly different for both conditions, it was different when they entered the test phase. The post treatment arousal was a significant covariate, as seen from Table 6.10.

The immediate effect of the post test phase was to lower the arousal scores of subjects in both conditions. They did not differ significantly from each other on this final measure, when each of the previous SACL arousal scores were held as covariates.

There was less change pre-post test on arousal for subjects in the GER condition than for subjects in the control condition (see Graph 6.2).

5. SI DATA: COMPARISON OF CONTROL & GER CONDITIONS.

The statistical analyses of the stress inoculation index data are shown in Table 6.11. It is seen that biodata did not predict the stress inoculation index; however, once again 16 percent of the variance was predicted by the psychometric data. Subjects in the GER and control conditions were significantly different in terms of the stress inoculation index.

Factors	Predictors or independent variables	Dependent variable: stress inoculation index
Biodata	Age ; Race	NS
Psychometric	SACL A: Stress & Arousal GWBQ: Worn Out & Up Tight	var=16% mr=.41 F(1,58)=12.01 p=.001
Situational	Conditions: GER :mean=-0.90 sd=4.70 Ctrl:mean=4.77 sd=7.09	F(1,58)=13.30 p=.0006

Table 6.11. Summary of Results for Regression Analyses and Anova on the Stress Inoculation Index for GER and Control.

DISCUSSION.

The results of the statistical analyses and their implications are discussed below.

Effects on stress.

Once again (as in Experiments 1 and 2) the results clearly distinguished the reactions of the subjects in the GER condition from those in the control condition in terms of the immediate post treatment stress scores. The differences between subjects in the two conditions were still obvious three hours later (pre test), although this difference was demonstrably based on the post treatment difference. The pre test scores for the subjects in the GER condition were higher than the pre test stress scores for the subjects in the control condition. In the test phase, the stress scores of subjects in both conditions increased but once again they showed similar final scores.

Stress inoculation effect.

A stress inoculation effect was thus found in this third experiment but only in relation to pattern of change as predicted. Subjects in the control condition experienced greater changes in stress during the test phase in

relation to the treatment phase, when compared to those in the GER condition.

Implications.

As in Experiments 1 and 2, there is some evidence for a stress inoculation effect, albeit weak, but only in terms of the pattern of change across conditions and not in terms of its persistence. Indeed, the evidence, such as it is, would appear to have been weakened by increasing the delay between treatment and test. This further suggests that the changes in pattern which occur (with the standard GER,at least) have no great persistence.

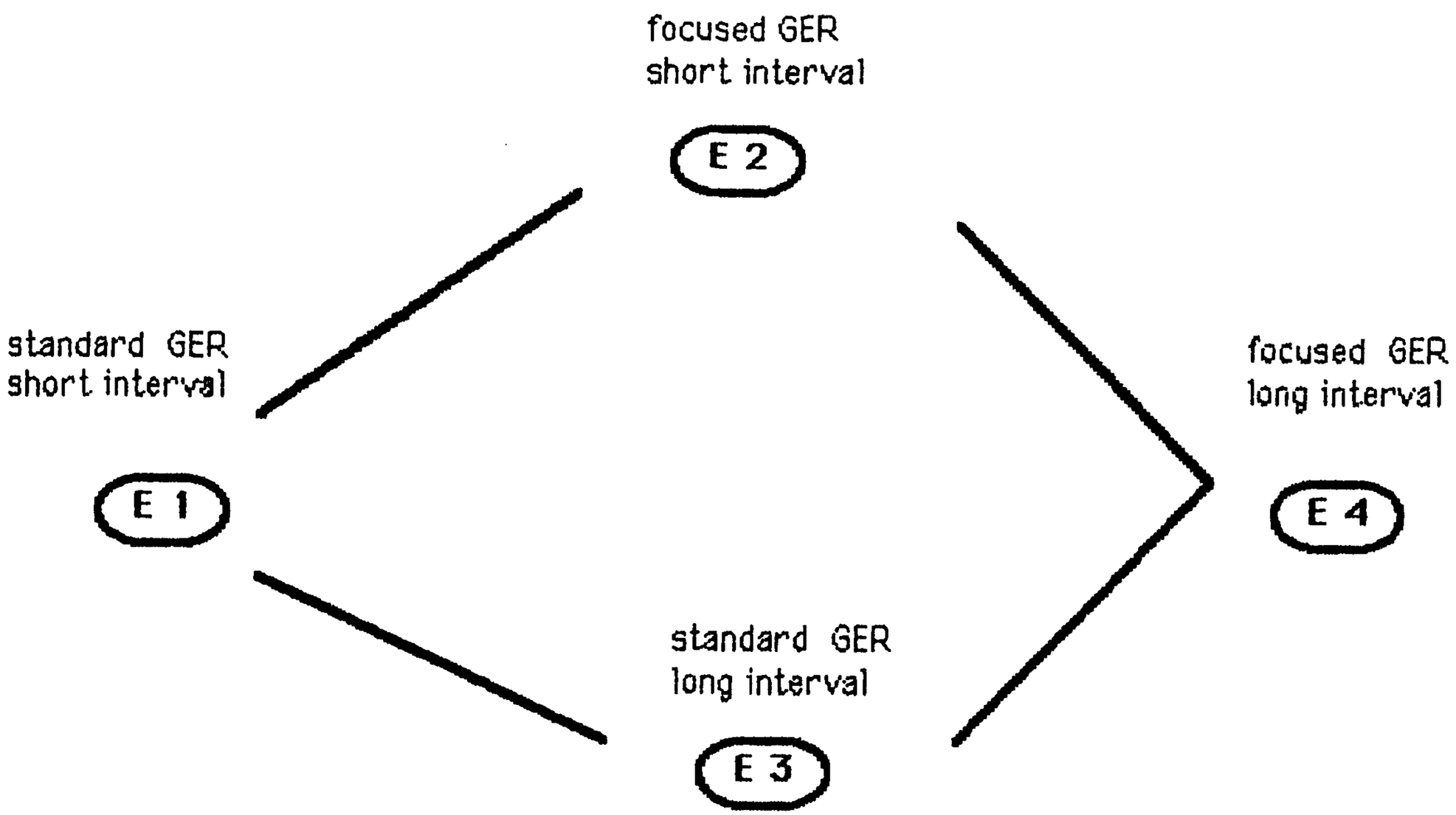
Effects on arousal.

The effect of the GER procedure on arousal appears to be somewhat delayed in this experiment. Still, there is a consistent phenomena, that after the GER procedure, in the face of expecting a further exposure to similar emotion-provoking stimulus, the response is to react by lowering the level of arousal. This is clearly seen in the distinct arousal scores obtained at the pre test phase by subjects in the GER and control conditions respectively. After exposure to the second war documentary, the arousal level is lowered for both conditions.

No differences were found in arousal post treatment unlike the previous two experiments. Significant differences were found in pre test arousal, with the GER condition having a lower arousal level. If this is taken as a delayed treatment effect, then the trend is more akin to that observed in Experiment 2, rather than Experiment 1. Post test, there are no differences in arousal levels, subjects in both conditions reaching a similar lower level.

The notion of mental disengagement was introduced and defined in the previous experiment. Against the criteria established there, it is suggested that mental disengagement occurs for subjects in both the GER and control conditions post test, but not post treatment. There was no external distraction (or relaxation) involved in this study, yet there was no mental disengagement observed during treatment for subjects in the GER condition. However, in Experiment 2 where there was such an effect, the GER

FIGURE 6.1. SEQUENTIAL DESIGN OF THE FOUR EXPERIMENTS.



procedure was more emotion focused. This may have been an important contributory factor. There was mental disengagement for subjects in both conditions post test. This would be acceptable on the basis of the present explanation, if the inoculation effect which occurred could be said to be relatively weak, which it was.

Summary.

In terms of the hypotheses for this experiment, it is seen that:

(a) despite some differences in the pattern of change between the two conditions, post test stress levels were not different,

(b) there was no difference between subjects by conditions on post treatment arousal, however ...

(c) there was evidence of the use of mental disengagement by subjects in both the conditions post test.

Next experiment.

The final experiment is an attempt to integrate the design and findings of the previous three experiments (see Figure 6.1). The design will incorporate a focused (strengthened) GER and a long interval. However, in addition, a performance measure will be included to explore any effects of stress inoculation treatment on cognitive functioning in a stressful environment. The purpose of this is to draw comparisons with the expected effects of stress inoculation on the cognitive functioning of the soldier in combat. Research pertaining to the performance of military personnel in sustained military operations (Haslam 1984, 1985), under sleep deprivation conditions (Haslam 1982), and under varying environmental stressors (Allnutt 1970), have underlined the detrimental effects on performance of adverse conditions.

As a result of introducing the performance test, it is expected that the task performance may deteriorate as a function of stress during the test phase, with the subjects in the GER condition demonstrating the least deterioration as a result of 'inoculation'. Conversely, if the performance test itself acts as

a distraction, then there will be no deterioration in performance for subjects in any of the conditions. There will also be no lowering of arousal as there will not be any need for the subjects to invoke mental disengagement.

CHAPTER 7. EXPERIMENT 4: STRESS INOCULATION EFFECTS OF EMOTION-FOCUSED GER WITH DELAYED TESTING ON MOOD AND PERFORMANCE.

INTRODUCTION

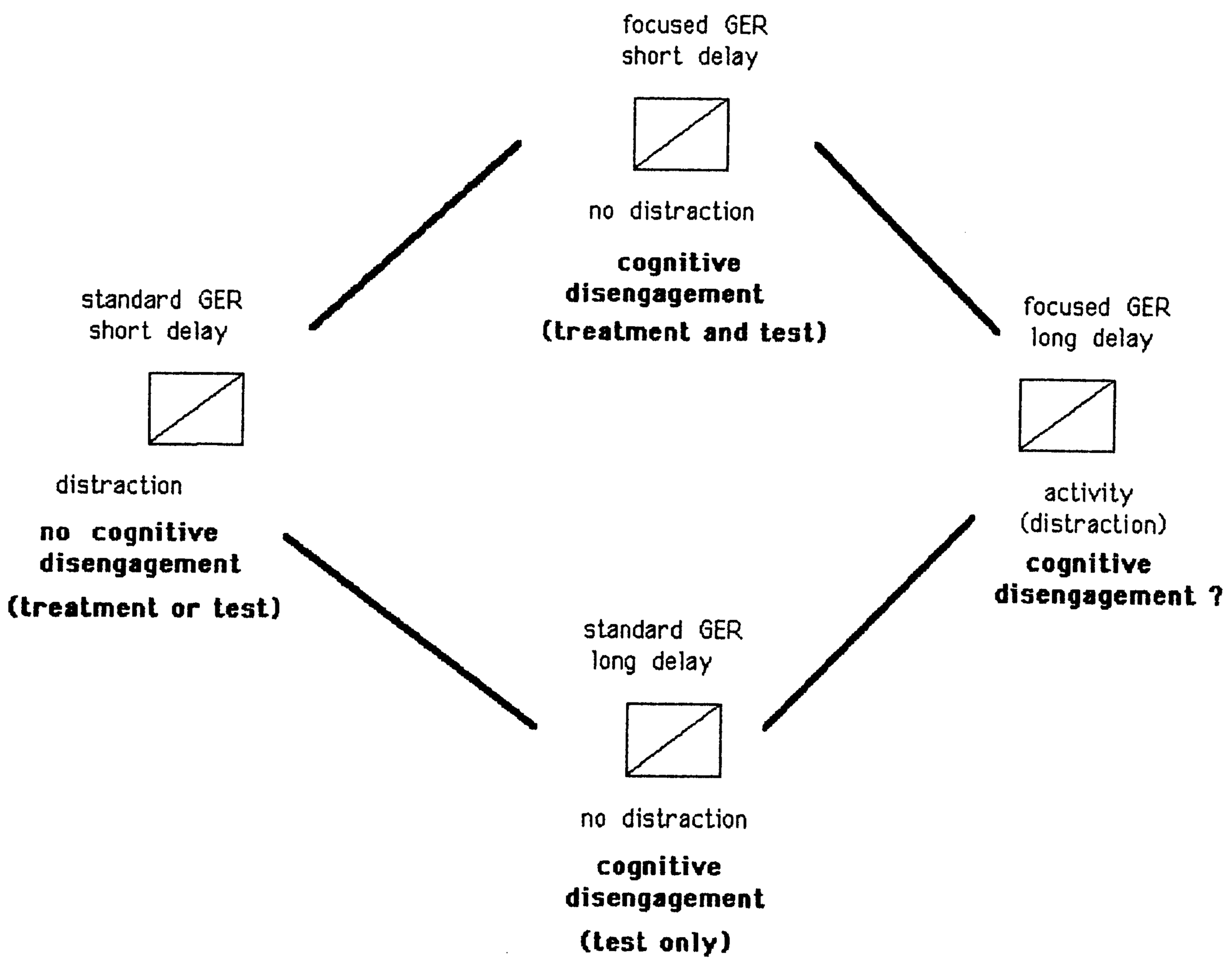
In this final experiment, the effect of introducing a cognitive task during the test phase was studied. This test was included as a performance measure to explore any effects of stress inoculation on cognitive functioning in a stressful environment. The objective was to draw comparisons with the effects of stress inoculation on the cognitive functioning of the soldier in combat (cf. model Chapter 2). A modified version of the Diagrammatic Reasoning Test was used for this purpose (Saville and Holdsworth, 1982), but only after a short series of psychometric studies of its reliability (see Chapter 3). The final validation study in this series was conducted on a sample from the target population for the main studies and performance on the test was shown to be weakly related to the subjects' report of stress.

Over the three experiments there was weak evidence of a stress inoculation effect, but only in terms of differences in the pattern of mood change between the GER and control conditions. These differences could not be shown to persist, and were therefore questionned. However, it is possible that despite this, evidence for stress inoculation might be forthcoming in terms of changes in performance. The question posed in Experiment 4 was thus whether any effects of stress inoculation might generalize to task performance. The possible role of stress inoculation in relation to performance and in particular its relevance to combat are set out in the information processing model in Chapter 2.

While the effects of introducing the Diagrammatic Reasoning Test were of primary interest, the question of the use of cognitive disengagement by subjects also attracted attention.

Figure 7.1 summarizes the overall research strategy used for the four experiments reported in the thesis. It can be seen that in Experiment 1 there was a standard GER and a short delay. There was some degree of external intrusion which served as a possible distraction, so that no attempt at

FIGURE 7.1. RESEARCH MODEL OF THE FOUR EXPERIMENTS.



cognitive disengagement was observed post treatment. In Experiment 2, there was an emotionally focused GER and a short delay. The GER condition was observed to report a lowering of arousal level post treatment in contrast to the raised arousal level of the control condition. This was thought to be an attempt at cognitive (mental) disengagement, as discussed by Carver, Scheir and Weintraub (1989). In Experiment 3, there was a standard GER and a long delay. A delayed cognitive disengagement effect was observed, at the pre test stage. The difference in time of onset of the process may have been a function of the difference in the nature of the GER procedure. In Experiment 4, it was planned to use an emotionally focused GER with a long delay. It thus poses the question about the interaction between an emotion focused GER and a long interval. Does the latter cancel any effects of the former.

Face validity of the performance test.

The performance test used was the Saville et al's Diagrammatic Reasoning Test (DRT). It relates to visual information processing and decision making. The task require subjects to make inferences about sequences and logical deductions about trends and pattern configurations. Essentially, it involves finding the missing elements in a pattern akin to finding the missing pieces in a jig-saw, but more complicated than a simple pictorial representation. This process in turn involves making a decision and choosing between several alternatives, each of which may appear to provide a plausible solution. However, only one choice is correct in each set of problems in the Diagrammatic Reasoning Test. The task has face validity as a performance test, in the context of the cognitive-behavioural model for stress management in a combat scenario, set out in Chapter 2.

Stress inoculation and performance.

Although evidence is sparse, it is suggested that research in stress inoculation training in the sports and military training context has some relevance to the present enquiry. There has been some research in specific stress inoculation training in preparing soldiers for parachute jumps (Dinner and Gal, 1983). Larsson (1987), reports work in the Swedish Armed Forces, on routinization of mental training techniques: relaxation, meditation and

imagery rehearsel, and finding significant performance benefits on actual task examinations and mental tests, compared to a control group. This research did not find any difference between the groups on physical and mental well-being. Larsson, Cook and Starrin (in press) also report a study on a stress inoculation training program developed and used with 14 Swedish elite male golfers. Performance improvements in this group were found to be significantly better than those of the control.

There is little other published literature on the effects of stress inoculation training on combat or task performance. There is also field research on the anticipation responses of soldiers in a combat situation (Gal 1975). None of these studies involve any form of preparation for the stressful situation, with a view to measuring its effects on performance. However, there is current research at the University of Haifa by Shlomo Breznitz (personal communication, 1988), involving simulation of the confusion, noise and chaos of a battlefield, and requiring the soldiers to make decisions and function under such conditions, as stress inoculation training for combat. As yet, there are no reports on the outcome of these studies, which are ongoing.

Hypotheses.

The hypotheses for Experiment 4 were:

(a) there would be a significant stress inoculation effect for subjects in the GER condition,

(b) subjects in the GER condition would perform better than subjects in the control and alternative treatment conditions on the second performance test, as a result of inoculation, unless the Diagrammatic Reasoning Test itself acts as a distraction, in which case there will be no deterioration in performance across conditions.

METHOD

1. SAMPLE.

The sample consisted of a total of 45 male students from Anderson Junior College in Singapore. The subjects were tested in three groups of 15, between 14 September 1988 and 20 September 1988. The students were matched by educational level: they were all in Junior College I. All the subjects were Chinese. This was unavoidably different from previous studies, where mixed groups (by race) were used. This was also reflected in the distribution of religions by group. In particular, there were no Muslim or Hindu subjects.

Condition	Christian	Buddhist or Taoist	Freethinker or No Religion	Total
GER	2 (13%)	7 (47%)	6 (40%)	15 (100%)
Control I	3 (20%)	12 (80%)	0 (0%)	15 (100%)
Control II	3 (20%)	8 (53%)	4 (27%)	15 (100%)

Table 7.1. Cross-Tabulation of Conditions by Religion.

No significant difference was found by religion across the groups. However, the demography of the sample could not be completely matched (see Table 7.1). However, subsequent multiple linear regression analyses showed no effect of the demographic variables on the dependent variables.

2. PROCEDURE.

The audio-visual aids room in the Junior College was used for the experiment. The first group consisted of subjects assigned to the experimental or GER condition. The other two groups of subjects formed the alternative treatment and control conditions, following the paradigm used in Experiment 1. The alternative treatment consisted of seeing the first part of the disturbing war documentary, and then quietly reading magazines and not discussing the film. The control group followed the standard control

procedure: watching and discussing the neutral trade visit documentary. The test procedure was similar to that used in Experiment 3. However, there were the following changes:

(a) the Wheel Questionnaire was not administered,

(b) the modified Diagrammatic Reasoning Test was included in the initial battery of paper-and pencil tests, and

(c) introduction of a parallel form of the modified Diagrammatic Reasoning Test during the test phase.

In the test situation, subjects were required to complete the task while the disturbing war documentary was being played, and the soundtrack in particular was audible. The experimenter sat in front and kept time and watched over the subjects completing the Diagrammatic Reasoning Test. To some extent, this behaviour of the experimenter may have set a business-like and efficient air to the proceedings, and detracted from the possibly more disruptive behaviour that may otherwise have been enacted, like a higher frequency of surreptitious glancing at the disturbing war documentary while engaged in doing the Diagrammatic Reasoning Test. The subjects were highly motivated to do well on the task, and this may in itself have served to focus their attention to the task, regardless of experimenter behaviour. This aspect has bearing on the influence that the leader exerts on the men in a field situation, and further research could produce interesting findings.

RESULTS

1. SAMPLE CHARACTERISTICS.

51 percent of the total sample had seen war films or documentaries over the preceding four weeks. 80 percent said they had read books, reports or articles on the subject of war in the preceding four weeks. 87 percent said they were interested in finding out about defence and war-related issues.

2. INITIAL MEASURES: ANALYSIS OF VARIANCE.

No significant differences were found between three conditions on the following baseline measures: initial stress, worn out, up tight, diagrammatic reasoning odd series, incidence of viewing war films and documentaries over last four weeks, and statement of interest in finding out about defence and war-related issues.

A significant difference was found on the reading of books, reports and articles on the subject of war over the preceding four weeks. Nearly half the control condition had not read at all on the subject. This was in contrast to the other two conditions where only one person each indicated not having read anything on the subject in the preceding four weeks. While a simple analysis of variance showed no significant difference between the conditions on the initial arousal score, analysis of covariance did reflect a significant difference. With worn out, up tight and diagrammatic reasoning odd series held as covariates, the state of arousal of the alternative treatment condition at 8.6, was found to be significantly higher than that of the experimental (6.3) and control (5.1) conditions.

3. ANALYSES OF VARIANCE: FULL DATA SET: CONDITIONS X TIME.

Table 7.2 presents the results of an analysis of variance on the stress data across conditions and times. It is seen that there is a significant main effect

Source of Variation	Sum of Squares	df	Variance Estimate	F	p
Condition	28.30	2	14.15	0.56	0.58
Error	1063.00	42	25.31		
Time	147.57	3	49.19	7.77	0.0001
Interaction					
Condition x Time	113.61	6	18.94	2.99	0.009
Error	798.07	126	6.33		

Table 7.2. Simple Analysis of Variance of Stress Scores.

of time of measure, (p=0.0001), and an interaction effect of condition by time, (p=0.009). Thus there is some evidence of differences in the pattern of change between the GER and control conditions over the treatment and test sessions.

The data are plotted in Graphs 7.1.(a) and 7.1.(b). The graphs show the pattern of change in the stress scores for the three conditions over the four measurement phases in the experiment. It can be seen that the subjects in the GER condition followed a different pattern of response to the subjects in the two comparison conditions, particularly during the post treatment session. However, post hoc T tests revealed that post treatment was the only occasion where the the subjects in the three conditions were significantly different in terms of stress (p=0.01). Further analyses showed that the subjects in the GER condition varied significantly over time (p=0.0001), and the subjects in the control condition also varied significantly in the stress measure over the time course for this experiment, with p=0.008.

Table 7.3 shows the results of a similar analysis of variance carried out with the self-reported arousal scores.

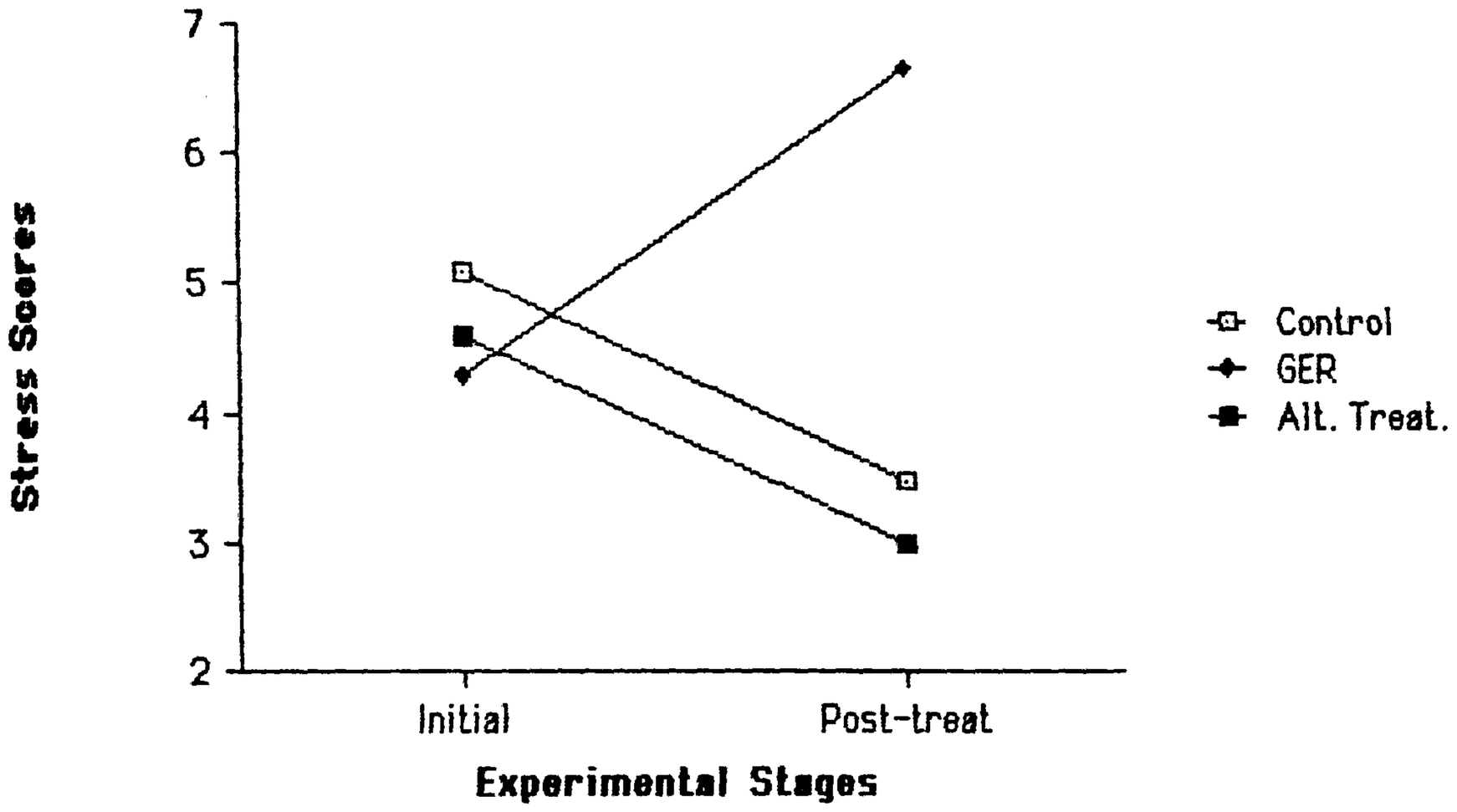
Source of Variation	Sum of Squares	df	Variance Estimate	F	p
Condition	50.18	2	25.09	1.18	0.32
Error	893.97	42	21.29		
Time	62.18	3	20.73	3.24	0.02
Interaction					
Condition x Time	222.36	6	37.06	5.80	0.0001
Error	804.97	126	6.39		

Table 7.3. Simple Analysis of Variance of Arousal Scores.

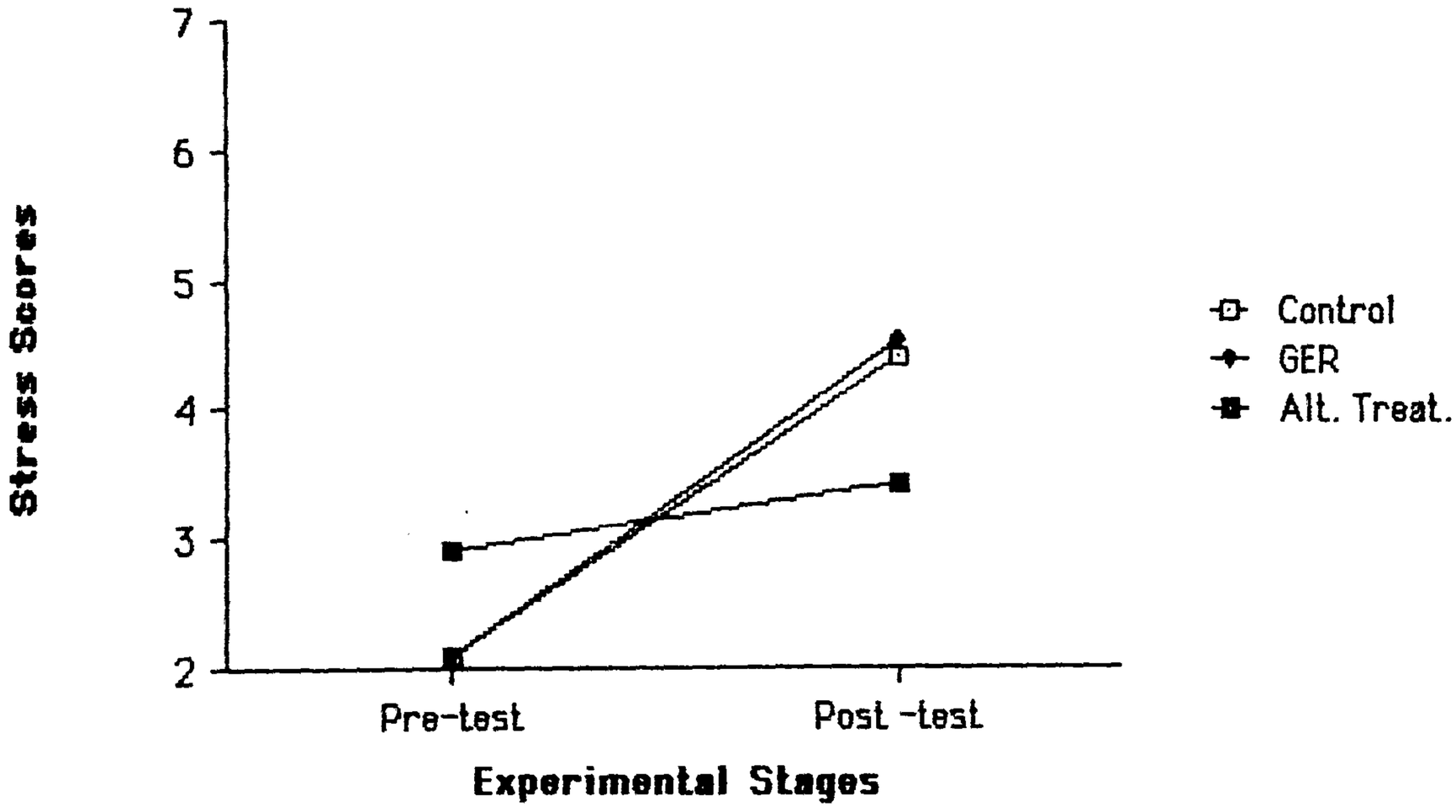
The analysis indicates a significant main effect of time for the arousal measure (p=0.02), and a significant interaction effect of time by condition (p=0.0001).

Graphs 7.2.(a) and 7.2.(b) reflect the pattern of change of the arousal scores over the course of the experiment, by conditions.

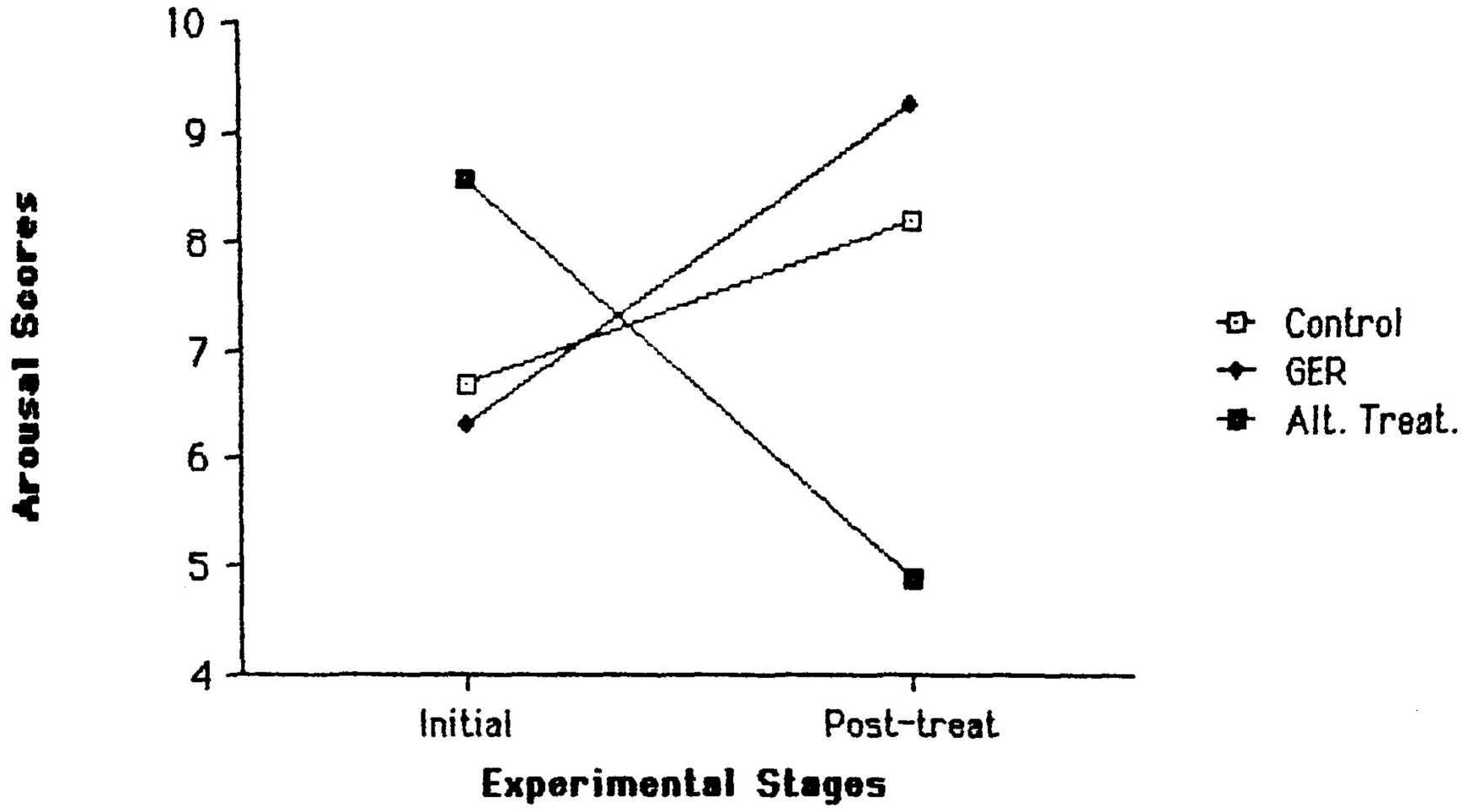
Graph 7.1. (a). Treatment Phase for Stress.



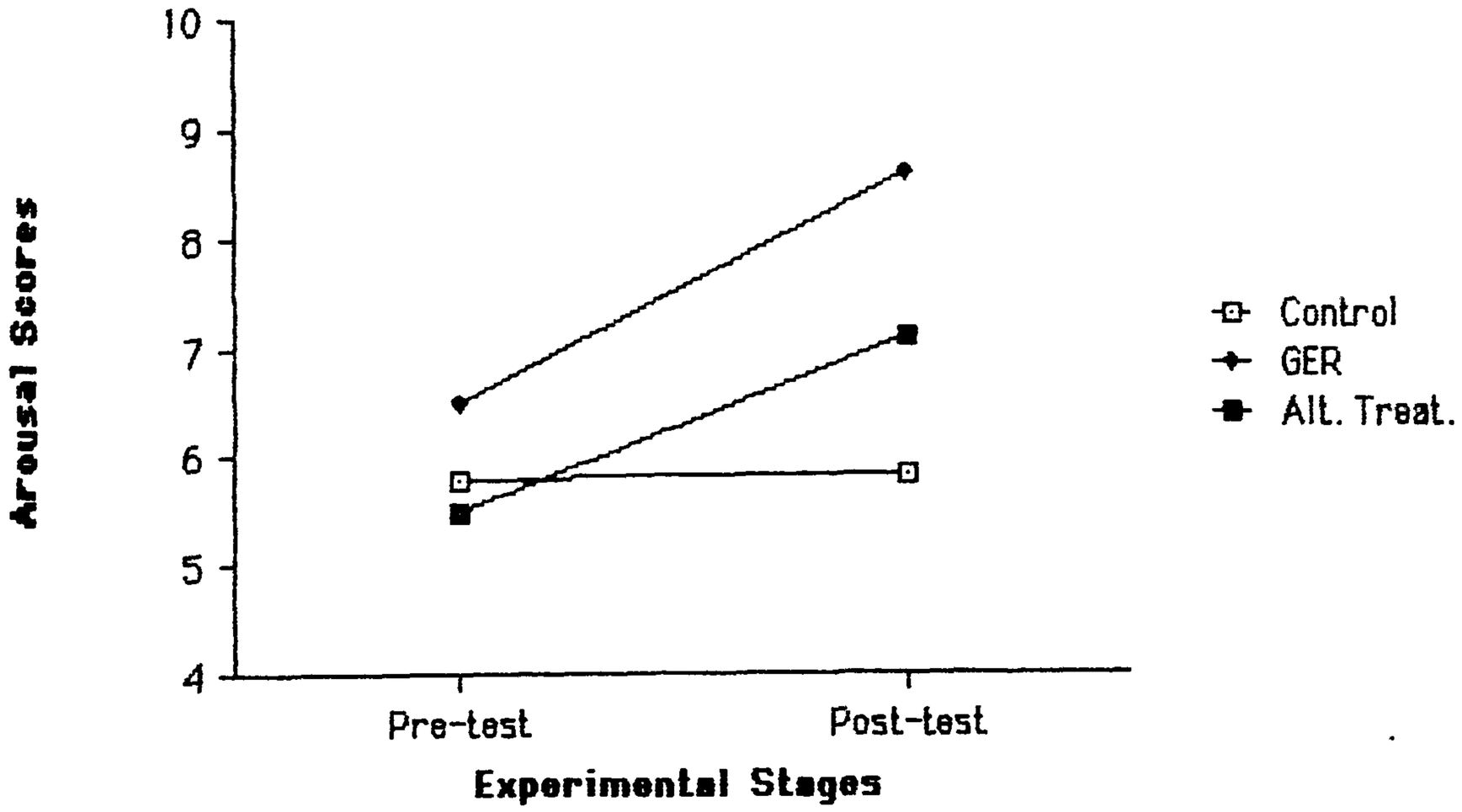
Graph 7.1. (b). Test Phase for Stress.



Graph 7.2. (a). Treatment Phase for Arousal.



Graph 7.2. (b). Test Phase for Arousal.



Post hoc analyses using T tests revealed that at the post treatment phase, there was a significant difference between conditions on the arousal measure (p=0.0001). Subjects in all three conditions also recorded a significant time effect on the arousal measure (GER p=0.002, alternative treatment p=0.0001, and control p=0.03). Subjects in the GER condition reflected the highest level of arousal for all measures after the treatment phase.

4. ANALYSIS OF COVARIANCE: EFFECTS OF CONDITION AT DIFFERENT POINTS IN TIME.

Analyses of covariance were carried out on all the stress and arousal measures after the initial phase. Preceding measures of stress and arousal were entered as covariates. The GWBQ measures, and the initial Diagrammatic Reasoning Test scores, were also used as covariates. Only covariance analyses with significant differences between conditions are reported.

(a) STRESS.

The trend of the mean stress scores for the three conditions over the total experimental procedure can be seen from Table 7.4.

Condition	GER	Alternative Treatment	Control	Overall
Initial Stress	4.3	4.6	5.1	4.7
Post Treatment Stress	6.7	3.0	3.5	4.4
Pre Test Stress	2.1	2.9	2.1	2.4
Post Test Stress	4.5	3.4	4.4	4.1

Table 7.4. Mean Stress Scores by Conditions over Time.

Analyses of covariance on the stress data at the post treatment stage showed a significant difference between conditions (see Table 7.5). Subjects in the

GER condition had a higher score of 6.7 compared to subjects in the comparison conditions. Subjects in both the control and alternative treatment conditions reported a lower level of stress than at the beginning of the experiment.

Table 7.5 shows the analysis of covariance results for post treatment stress when initial stress is held as a covariate together with the two factors on the GWBQ, and the initial Diagrammatic Reasoning Test measure. (See Chapter 3 for details of the various tests.)

Source of Variation	Sum of Squares	df	Variance Estimate	F	p
Covariates	204.27	4	51.07	6.04	0.001
Initial Stress	13.31	1	13.31	1.58	0.22
Worn Out	6.89	1	6.89	0.82	0.37
Up Tight	38.70	1	38.70	4.58	0.04
Initial Performance	6.34	1	6.34	0.75	0.39
Main Effects	121.10	2	60.55	7.16	0.002
Condition	121.00	2	60.55	7.16	0.002
Explained	325.37	6	54.23	6.42	0.0001
Residual	321.21	38	8.45		
Total	646.58	44	14.70		

Table 7.5. Analysis of Covariance of Post Treatment Stress Scores.

It is seen that the experimental condition determines the degree of stress reported by the subjects post treatment in combination with the up tight score on the GWBQ. This is a similar finding to that in Experiment 1, though not supported in Experiments 2 and 3.

No significant differences were found between the conditions on stress at the pre test or post test stages. Again there are differences in the pattern of change but no evidence of persistence.

(b) AROUSAL.

The trend of the arousal scores for the three conditions over time can be seen from Table 7.6 below. Immediately post treatment, subjects in the GER and control conditions who had engaged in a discussion immediately prior to the measure showed a higher level of arousal, compared to those in the alternative treatment condition, Control II, who had been reading magazines for half an hour.

Condition	GER	Alternative Treatment	Control	Overall
Initial Arousal	6.3	8.6	6.7	7.2
Post Treatment Arousal	9.3	4.9	8.2	7.5
Pre Test Arousal	6.5	5.5	5.8	6.0
Post Test Arousal	8.6	7.1	5.8	7.2

Table 7.6. Mean Arousal Scores by Conditions over Time.

Analysis of covariance at the post treatment stage showed a significant difference between subjects in the three conditions on arousal. Table 7.7 sets out the details.

It is seen that though all the variables held as covariates are significant at $p=0.03$ in relation to the arousal measures at this stage for the three conditions, individually, none of the variables are significant. It differs in this respect from the previous experiments where in all cases the initial arousal was a significant covariate, while in Experiment 1, the worn out measure was also a significant covariate.

Source of Variation	Sum of Squares	df	Variance Estimate	F	p
Covariates	80.90	4	20.23	3.07	0.03
Initial Arousal	8.95	1	8.95	1.36	0.25
Worn Out	8.99	1	8.99	1.36	0.25
Up Tight	3.21	1	3.21	0.49	0.49
Initial Performance	9.45	1	9.45	1.43	0.24
Main Effects	199.94	2	99.97	15.17	0.0001
Condition	199.94	2	99.97	15.17	0.0001
Explained	280.84	6	46.81	7.10	0.0001
Residual	250.36	38	6.59		
Total	531.20	44	12.07		

Table 7.7. Analysis of Covariance of Post Treatment Arousal Scores.

At the pre test stage, analysis of covariance did not show any significant difference between the conditions. Thus, the time interval in between was sufficient to equalize the level of arousal across conditions. Interestingly, the alternative treatment condition, which started with an elevated level of arousal compared to the other two conditions, continued, as from the post treatment stage, to have the lowest level of arousal across the three conditions. This was the condition where the subjects were instructed to read magazines after viewing the disturbing war documentary, and were not permitted to discuss it in the testing room.

Analysis of covariance, with the previous SACL arousal score held as covariates, individually and together, reflects a significant difference between conditions on arousal at the post test phase. Subjects in the GER condition had an enhanced level of arousal compared to subjects in the other two conditions, which were comparable in level of arousal to each other at this stage. Table 7.8 sets out the details for the analysis when the pre test arousal was held as a covariate in combination with the initial GWBQ and Diagrammatic Reasoning Test scores.

Source of Variation	Sum of Squares	df	Variance Estimate	F	p
Covariates	268.93	4	67.23	14.77	0.0001
Initial Arousal	241.27	1	241.27	53.00	0.0001
Worn Out	12.87	1	12.87	2.83	0.10
Up Tight	10.95	1	10.95	2.41	0.13
Initial Performance	15.65	1	15.65	3.44	0.07
Main Effects	62.67	2	31.33	6.88	0.003
Condition	62.67	2	31.33	6.88	0.003
Explained	331.59	6	55.27	12.14	0.0001
Residual	172.99	38	4.55		
Total	504.58	44	11.47		

Table 7.8. Analysis of Covariance of Post Test Arousal Scores.

The immediate pre test measure of arousal was a significant covariate. This is similar to the findings in Experiment 1, except that in Experiment 1, worn out was also a significant covariate. There are no parallels in Experiments 2 and 3, where the post test arousal with the immediately preceding arousal measure as a covariate, did not show significant main effects by conditions.

(c) DIAGRAMMATIC REASONING.

The scores on the baseline and test scores on the Diagrammatic Reasoning Test for the three conditions are shown in Table 7.9. Analysis of covariance on the performance task at the test stage using initial scores as covariates showed no significant difference between the conditions. The test situation did not affect the task performance of subjects in any of the three conditions.

Condition	GER	Alternative Treatment	Control	Overall
Initial Performance	12.1	11.2	12.5	11.9
Test Performance	13.9	11.9	14.1	13.3

Table 7.9. Mean Performance Scores by Conditions over Time.

This reflects no interference by the disturbing war documentary, and conversely, no improvement in performance as a result of learning and practice.

5. SI DATA: COMPARISON OF CONTROL & GER CONDITIONS.

The stress inoculation data are presented in Table 7.10. It can be seen that the biodata does not predict the stress inoculation index. The psychometric data accounts for 45 percent of the variance. This is substantially more than the 16 percent reported in the previous experiments.

Factors	Predictors or independent variables	Dependent variable: stress inoculation index
Biodata	Age	NS
Psychometric	SACL : Stress & Arousal GWBQ : Worn Out & Up Tight	var=45% mr=.70 F(2,27)=12.98 p=.0001
Situational	Conditions : GER :mean=0.07 sd=6.02 Ctrl:mean=4.00 sd=5.48	F(1,28)=3.51 p=.07

Table 7.10. Summary of Results for Regression Analyses and Anova on the Stress Inoculation Index for GER and Control.

Finally, the stress inoculation index tended to distinguish between subjects in the GER condition and the control condition ($p=0.07$), with the subjects in the control condition showing a larger change in stress level from treatment phase to test phase.

DISCUSSION

Overall there is little evidence in this experiment of a stress inoculation effect. Although there are differences in the pattern of change in mood across sessions between GER and control, these are largely confined to the treatment session and there is no evidence of their persistence.

Treatment effects on stress.

A focused GER was used in this experiment, similar to that used in Experiment 2. In both experiments, a dramatic increase in stress levels across the treatment phase was observed for subjects in the GER condition, but not for subjects in the control or alternative treatment conditions. A summary table comparing treatment procedures and outcomes is shown in Table 7.11.

Condition	Stimulus	Activity	Stress Increase
GER (E1 to E4)	War Documentary	Discussion	Yes
E1:Alternative Treatment	War Documentary	Relax	No
E4:Alternative Treatment	War Documentary	Reading	No

Table 7.11. Comparison of GER with Alternative Treatments During the Treatment Phase.

It is evident from Table 7.11 that it is a combination of presentation of the war documentary with the focused discussion that produces an increase in stress level. Combining the war documentary with some form of distraction

(either relaxation or reading), does not produce an increase in stress. Steele and Cox (1986) had found an increase in self-reported stress on the SACL, higher disturbance ratings and unprompted reports of various coping strategies when subjects were exposed to aversive visual stimuli represented as pictures of war.

Effect of long delay on stress levels.

In this experiment, subjects in the control and alternative treatment conditions maintained a low level of stress across the intervals (delay). Subjects in the GER condition however, showed a dramatic lowering of stress across the interval. This compares with a similar trend observed for subjects in the GER condition in Experiment 3, though a greater lowering in stress level was observed here in Experiment 4 (6.7 to 2.1).

Comparative increase in stress pre test to post test.

Considering Experiments 3 and 4, it is observed that subjects in the alternative treatment condition in Experiment 4 recorded the lowest change in stress levels, from pre test to post test for all the conditions used. Table 7.12 sets out the pertinent points for comparison between the conditions.

Condition (treatment)	GER	War Documentary (test)	Performance Test (test)	Stress Increase (Size)
E4:GER	Yes	Yes	Yes	Some (2.4)
E3:GER	Yes	Yes	No	Some (2.2)
E4:Control	No	Yes	Yes	Some (2.3)
E3:Control	No	Yes	No	Much (3.6)
E4:Alternative Treatment	No	Yes	Yes	Little (0.5)

Table 7.12. Comparison of Increase in Stress in Experiments 3 and 4, From Pre Test to Post Test Phase.

To arrive at an understanding of why the increase in stress level is least for subjects in the alternative treatment condition in Experiment 4, some of the other relative changes need to be reviewed.

Subjects in the GER conditions in Experiments 3 and 4 record similar increases in stress pre test to post test. Thus, the introduction of the performance task has made little difference to subjects in the GER condition on reported stress when compared to the previous experiment.

Similarly, in Experiment 4, subjects in the GER and control conditions record similar increases in stress levels. However, comparing the reported stress increases for subjects in the control conditions in Experiments 3 and 4, it is seen that that there was a much larger increase in stress level for the subjects in the control condition in Experiment 3. Introducing the performance task in Experiment 4 appears to protect the subjects, perhaps by the process of distraction (Gal 1975).

Stress inoculation index.

There is weak evidence of a difference between conditions in terms of the stress inoculation index. The trend is not as clear as in the previous three

experiments. The introduction of the performance test has reduced any apparent difference between GER and control subjects. The main contributory factor here is that the final reported stress level is not elevated compared to the earlier experiments.

Mental disengagement.

In this experiment, there was no evidence of any mental disengagement effect. This would be predicted on the basis of the explanation put forward in previous chapters, apart from the lack of an effect for the GER condition post treatment. It is unclear why this did not occur, except that it might reflect the administering of the Diagrammatic Reasoning Test before the treatment phase.

Possible drawbacks of mental disengagement.

The most obvious drawback to relying totally on distraction as a "protective" shield is that there may be delayed effects, such as occurs with post traumatic stress disorder cases, which do not exhibit any immediate severe stress symptoms, but do so at a later time (Arnold 1985). There appears to be more of a case to argue for "dealing with" the stress experienced at a deliberate conscious level with a view to continue functioning after the issue is addressed. This is the rationale in the GER procedure.

Effects of the performance test.

In summary, introducing the Diagrammatic Reasoning Test in the test phase of the experiment does not affect the mood response of the subjects in the GER condition. It protects the subjects in the control condition. There is therefore an interaction effect between the task requirement and the condition, leading to similar patterns of response for the two conditions.

The alternative treatment condition showed the least change in stress during the test phase. This is a combination of distraction after the treatment phase and distraction during the test phase. This procedure appears to protect the subjects. This is a suitable avenue for further research. There is support for the role of distraction and activity as a powerful coping tool in the review

report by Gal and Lazarus (1975). The authors argue the position that non-threat related activities provide distraction or diversion of attention from threat.

Effects on Performance.

There were no demonstrable effects of condition on performance, and thus no evidence at all of any stress inoculation having occurred in this respect. Possibly this is due to the interaction between the test 'as a distractor' and the experience of stress (etc) as suggested above. Whatever, the use of a performance measure in addition to the assessment of mood has failed to expose any other effects of stress inoculation.

Summary

In summary, the main findings from this experiment are:

(a) introduction of the performance test possibly served as a external distraction, and no stress inoculation effect was found for subjects in the GER condition, and

(b) no effects on performance were found and there was no evidence of mental disengagement.

This pattern of effect was explained in terms of the imposition of the performance test. In the next chapter, the results of the four experiments will be discussed as a whole.

CHAPTER 8. DISCUSSION.

This chapter will review the data and ideas presented in the initial field study and the four laboratory experiments in the context of the the combat stress management model proposed in Chapter 2. Key features will be highlighted and their implications discussed. The findings will also be considered in the context of the relevant literature on stress, coping and arousal. The model will then be re-evaluated and modifications made as warranted by the data from the experiments. Finally, recommendations for future research, and for the application of research findings will be made.

1. COMBAT STRESS MANAGEMENT MODEL.

This thesis is primarily concerned with stress inoculation. However, that concern developed out of a wider consideration of stress management in relation to combat. From an initial review of the available literature, and a study of current practices in Israel, Sweden and Switzerland, a model of stress management in relation to combat was proposed. Particular aspects of this model are discussed below, and related to the experimental findings on stress, arousal and coping.

1.1. Multi-faceted nature of stress management.

The working definitions of stress provided by Cox (1978) and McGrath (1976) suggest that stress should not be seen as a unitary concept. Rather, it is an attempt to provide an economic description of a complex dynamic system involving the many emotional, psychological, or physiological outcomes of an individual's transactions with their environment. Stress is acknowledged to be present when these outcomes arise from the imbalance of abilities against demand, as referred to by Cox (1978), or of capabilities and resources versus costs and rewards as referred to by McGrath (1976).

Within this interactional approach to stress, the model proposed in Chapter 2 incorporates a variety of elements related to mental preparation, the reaction to and management of stress in the field situation, and the after-care for combat stress reaction (CSR) casualties. It implies that to be effective requires action at both the organizational and individual levels.

There are some aspects that require regulation and guidance by the organization: directives may need to be set out. The military commander is then responsible for the execution and management of the directives. For example, guidance can be given on the three rules for field care of combat stress reaction cases: immediacy, proximity and expectancy (Artiss 1963). However, it is known that the benefits of this system can only be realized with diligent application of all three principles (Solomon, Benbenishty and Spiro, 1988), and this may require further management action and personnel motivation. The officer plays a crucial role as the main executor of this system in the field (Gabriel and Gal, 1984). Furthermore, his effective leadership and the cohesiveness of the fighting unit are also known to be deterrents against a high incidence of combat stress reaction casualties. The officer's role is thus twofold: preventive and rehabilitative.

1.2. The GER procedure.

One of the rehabilitative strategies, adopted by the Israeli Defence Force (IDF) in the field, is to have unit commanders conduct psychological debriefs with their men at the first available opportunity after an engagement. This is thought to serve a cathartic function and it is believed that the men are then better able to face their next assignment. This feature was incorporated into the IDF General Orders in 1987. However, no evaluative research reports are available on the value and efficacy of this device. This debrief has been termed group emotional reconstruction (GER).

There has not been very much evaluative research in the area of combat stress inoculation. However, a similar type of procedure to the GER has been used by the Swedish Armed Forces in their training programs. With the use of audio-tapes and audio-visual presentations, they present vignettes relating to the development, manifestation and effects on military performance, of combat stress reactions. In their officer training programs, they create both classroom and field exercises that provide the junior officers with the experience of stress responses. All such lessons include a component of group discussion where participants talk about their personal emotional reactions in the situation. This discussion forms a vital part of their combat stress inoculation training.

The GER procedures used in the series of experiments reported in this thesis was derived initially from those used by the IDF. The Swedish Armed Forces practice of creating stressful scenarios for training in stress management, and their use of audio-visual aids for this purpose, was also incorporated into the GER procedure. The objective was to assess the efficacy of the resulting procedure as a stress inoculation device.

1.2.1. Functions and cost-effectiveness of GER.

The GER procedure directly addresses the emotional response and processes it in the maximum cost-efficient manner, with the officer-in-charge conducting the psychological debrief with his men (Rogovsky and Baruch, 1983). This procedure is thought to serve at least three important functions:

(a) facilitates subsequent performance. The experimental evidence is that after a GER procedure, in the face of a similar aversive stimulus, the participants maintain a higher level of alertness and arousal when required to execute a task (see Chapter 7),

(b) protects the participants from becoming combat stress reaction casualties in the battlefield, and

(c) may protect the participants from subsequent emergence of post traumatic stress disorder.

The argument for the theoretical position on post traumatic stress disorder is that the conflicting emotions of "survivor guilt" and intense feelings of bereavement, are directly and consciously addressed and attended to in the psychological debrief of the GER procedure. The numerous clinical case-studies on post traumatic stress disorder cases highlight the emergence of suppressed emotions as a main feature of post traumatic stress disorder manifestation. With GER conducted by the officer, these emotions are processed consciously (Mandler 1979) and in the supportive, and more importantly, the relevant and socially valid context of his fellow combatants. The feelings are addressed as the normal reactions of normal men to the abnormal and extreme situation of war (see Meichenbaum 1985, on adaptive appraisal in Chapter 1, section 1.2.(1).).

The GER is deemed to be cost-effective for the following reasons:

(a) the group is inoculated, rather than individuals in case-to-case transactions,

(b) it facilitates group cohesion, and

(c) it reduces the cost in terms of manpower, time and resources, by reducing the number of psychological casualties.

The experiments in this thesis are devoted to studying the qualitative nature of the GER as practiced in the Israeli Defence Force and the Swedish Armed Forces, and the laboratory findings on its effects on stress, arousal and performance. The implications of the findings from these experiments will be discussed later in this chapter.

1.3. Self-presentation in emotion-focused coping.

Combat stress reaction, and eventually, post traumatic stress disorder, is a reflection of the emotional response of the combatant. The objective of this thesis has been to consider an organisational structure, modus operandi and strategies that could usefully be employed to ameliorate the manifestation of extreme emotional reaction to war. This emotional reaction is a normal reaction to the acts and threats of violence and killing facing a combatant, which defy the usual codes of acceptable moral behaviour. The experiments in this study have been devoted to considering whether the emotional reactions to combat can be processed directly and overtly, in a supportive framework.

Laux (1988) underscores that research and theory on emotion-centred coping has focused on regulating emotional distress. He argues that persons who cope with negative emotions, not only intend to manage their feelings but also to try to manage their presentations. They attempt to project a positive image to other people and/or to themselves. Thus, concealing an emotional state may be an active attempt to convey the image of a self-controlled and stable person.

There are two aspects of this view that are relevant to the present study:

(a) the relevance of this concept in the GER context is that institutionalizing the procedure within the organization adds validity and gives "permission" to the individuals to "present" and behaviourally demonstrate their distress as expected and normal reactions.

(b) similarly, the "expectancy" principle in the management of combat stress casualties conveys to the individual that he is expected back in action before too long.

Measures on ecologically relevant and valid self-presentational scales in the field situation can provide useful interim measures for the military field psychologist who is gathering data on the psychological readiness of the troops for the field commanders. At the same time, it would give the commanders a measure of the efficacy of combat stress management procedures in the field.

Manstead (1988) argues that the degree to which an action meets or falls short of private or public behavioural standards will have an important bearing on the participants' emotional response. He argues for an appraisal dimension that relates to the consistency of behaviour with personal or social standards. Manstead (1988) argues that the inclusion of such a dimension is vital if emotions such as embarrassment, shame and guilt are to be discriminated in terms of their underlying cognitive appraisals. It is precisely this appraisal dimension that the GER attends to. If evaluative research is to be conducted on the efficacy of GER in frontline situations, measurements obtained on such a dimension would provide good intermediate self-report gauges.

1.4. Cognition, emotion and coping.

A major issue in the experiments reported in this thesis is the relationship between emotion, cognition and coping. Frijda (1988) argues that cognitive constituents and emotional experience are themselves part of emotional response: blaming others and self-blame are emotional reactions with distinct coping functions. To support his position, he presents evidence from discrepancies between reported cognitive appraisals, actual antecedents and

emotional behaviour, primarily derived from a self-report study of guilt feelings. Frijda (1988) conceptualizes that cognitions can fulfil three functions in relation to emotions. These functions are:

(a) as antecedents of emotional experience,

(b) as constituents of emotional experience, and

(c) as justifications for experience and response.

The GER procedure can contribute to the formulation of cognitions that can facilitate coping for the soldier in the field. In an evaluative study on the effectiveness of stress inoculation for patients who had agreed to undergo cardiac catheterization, Kendall et al (1977) report on their procedures as including discussion of the stresses to be expected together with suggestions for developing their own cognitive coping strategies. The latter was encouraged by suggesting various reassurances, modeling cognitive coping strategies, and reinforcing whatever personal cognitive coping responses the patient mentioned. Kendall et al (1977) report on the basis of their study that the immediate effects on mood of this process would be to heighten the level of stress experienced. This finding is replicated in the series of experiments reported in this thesis. It is reassuring to note that the patients in Kendall et al's (1977) study subsequently benefited from this procedure. This lends support to the efficacy of the GER procedure as a stress inoculation device.

1.4.1. Increase in self-confidence and optimal performance.

The relevance of the implementation of the total combat stress management model is underscored by the research reported by Boekaerts (1988). Boekaerts (1988) reports on the findings from laboratory research on appraisal processes and coping strategies. She reports that lack of overall confidence (trait) or a decrease in confidence prior to, or during task performance (situation-specific appraisal) produce negative feelings and cognitions about the task. Such a negative appraisal may well be experienced while waiting to be mobilized, and again immediately after an engagement (Gal 1975; Holmes 1985; Mangelsdorff 1985). These unpleasant sensations may lead to avoidance of effort and disengagement from the goals (cf Figure 2.2). They may have a detrimental effect both on motivation and

performance. Boekaerts (1988) reports that pupils with high and low overall confidence judgements respectively, not only had differential availability of instances of success, but they also had differential opportunities to apply their strategic knowledge. She postulates that the differences in experiencing dominant positive emotions during task performance and in experiencing control over the situation may have biased the beliefs they hold about the existence of contingent and non-contingent paths.

Boekaerts' research findings lend support to the importance of the total combat stress management model for the purposes of inspiring confidence in combatants. The individual units of preliminary preparation, actual management of information in the field (Even-Chen and Hadas, 1983), and an established procedure for managing psychological casualties (Solomon, Benbenishty and Spiro, 1986), would succeed in inspiring confidence within the social context of a cohesive unit (Shalit 1982a) and good leadership (Gal 1984).

Implementation of the total model would facilitate the appropriate 'labelling' of the emotional states (Schacter and Singer, 1962), which would then guide behavioural and other reactions (Bar-On et al, 1986). From another perspective, Dorner (1988) undertook a theoretical investigation of the importance and necessity of emotions *for* cognitions, in the context of a computer simulation of an "emotional-cognitive"system. He argues that it can be demonstrated that progress in learning and the "intelligence" of the system in problem-solving is not only dependent on the system's basic cognitive capabilities but also on its emotional sub-system. Without emotions the development of the system's world-knowledge and its intelligence in problem-solving will remain rather poor and develop only slowly. Dorner (1988) argues that his results indicate that emotions are an important factor for development and performance of cognitive processes and in no case an "old" and in some way useless or even disturbing instance of action regulation. To some extent, this view finds support with regard to military performance as evidenced in the reports by Rachman (1984), Shalit (1985) and Gal (1985a).

1.4.2. Emotion-focused coping and problem-focused coping.

The distinction between emotion-focused coping and problem-focused coping was made by Folkman and Lazarus (1980, 1985). Carver, Scheier and Weintraub (1989) have further developed this distinction. The main thrust of the combat stress management model and the experiments reported in this thesis relate to emotion-focused coping. Aspects of emotion-focused coping that are particularly relevant to the experiments reported in this study will be mentioned in the following paragraphs.

Carver, Scheier and Weintraub (1989) are of the view that acceptance is arguably a functional coping response, in that a person who accepts the reality of a stressful situation would seem to be a person who is engaged in the attempt to deal with the situation. Acceptance is thought to be particularly important in circumstances in which the stressor is something that must be accommodated to, as opposed to circumstances in which the stressor can easily be changed. This is the first step in the GER procedure - the acceptance of the painful reality of loss and injury in a combat scenario.

Following on from this, positive reinterpretation and growth is coping aimed at managing distress emotions rather than at dealing with the stressor per se. The argument is that construing a stressful transaction in positive terms should intrinsically lead the person to continue (or to resume) active, problem-focused coping actions. This idea finds a parallel in the "salutogenic" aspects of war (Antonovsky and Bernstein, 1986).

Another aspect of emotion-focused coping, focusing on and venting of emotions, forms a basic part of the GER procedure. Carver, Scheier and Weintraub (1989) acknowledge that such a response may be functional if a person uses a period of mourning to accommodate to the loss of a loved one and move forward. This in effect is how the GER procedure is conceptualized in the Israeli Defence Force. The gains are seen in the moving forward to further action after allowing for the expression of grief and mourning through the GER device.

Denial is an aspect of emotion-focused coping that is somewhat controversial. Amongst others, Breznitz (1983) has suggested that denial is useful, minimizing distress, and thereby facilitating coping. It can be argued

that denial only creates additional problems unless the stressor can profitably be ignored (Lazarus 1985). A third view is that denial is useful at early stages of a stressful transaction, but impedes coping later on (Suls and Fletcher, 1985). In the context of the combat scene, denial of the stressor in the midst of engagement would appear to be the only option available in order to continue functioning (Janis 1971). GER conducted in between engagements by the commander, would facilitate better integration of the strong residual emotions that have shown a tendency to resurface in post traumatic stress disorder symptomatology (Arnold 1985).

Mental disengagement is a manifestation of an attempt at emotion-focused coping. It serves to distract the person from thinking about the behavioural dimension or goal with which the stressor is interfering. This has been elaborated on in Chapter 7, as the "mental disengagement" phenomena. In the series of experiments reported on in this thesis, there has emerged a consistent tendency for subjects in the laboratory situation to react to feelings of heightened stress by lowering their level of arousal. This has been interpreted as an attempt at cognitive disengagement as a coping strategy in the face of the unpleasant stressful feelings. What appears to happen is that subjects change mood states from anxiety (high stress: high arousal) to boredom (high stress: low anxiety). This strategy is abandoned when there is some form of distraction. When it is external distraction like an interruption, the level of arousal is raised, however, the stress level remains high (see Experiment 1). When the distraction is in the form of activity that requires the subject to engage in a task, for subjects who have undergone stress inoculation treatment, the level of arousal is raised and the level of stress is lower than in a similar situation without a task component (see Experiments 2 and 4). The stress inoculation procedure would appear to have a facilitating effect in maintaining a required degree of alertness to complete an assigned task, when compared to a control and alternative treatment condition (see Experiment 4).

To some extent, the phenomena of cognitive (mental) disengagement appears to be functioning in a similar fashion to the process of denial. It would appear to serve a useful role as an emotion-focused coping strategy in the short term, at least for self-presentation purposes.

1.5. Summary.

The work of Frijda (1988), Dorner (1988), Manstead (1988), Boekaerts (1988), Folkman and Lazarus (1980, 1985), Carver, Scheier and Weintraub (1989), and Laux (1988), lend support to the main thrust of the combat stress management model set out in Chapter 2. In particular, the use of the GER procedure for the handling of emotion in relation to combat stress. The methodology is a developmental progression of Spinoza's perspective, 300 years ago, when he wrote in the introduction to the third part of *Ethics* that he would " consider human actions and desires in the same manner, as though I were concerned with lines, planes and solids. Thus the passions (emotions) .... answer to certain definite causes, through which they are understood ...." (Groen 1975, pp 727).

2. FINDINGS OVER FOUR EXPERIMENTS.

The aim of the four experiments conducted in this study was to look at the effects on self reported stress, of GER (group emotional reconstruction). The intention was to develop an effective procedure for combat stress inoculation. At the same time, the concurrent effect on the state of arousal and possible implications for performance, were also studied.

The experimental paradigm involved assessing the effects of various treatment sessions during a subsequent test session. The GER procedure was the consistent experimental treatment condition across all four experiments. Two qualitative levels of the GER procedure were used, and compared with a control treatment and with two alternative treatment procedures. The first two experiments used a short time interval between treatment and test sessions. The last two experiments used a much longer time interval. The last experiment also introduced a performance test. The inclusion of alternative treatment procedures in the research design provided an additional measure of comparison for the value of the GER procedure as a stress inoculation device.

The test sessions involved exposure to a disturbing war documentary, and the effects of this exposure were measured in terms of changes in self-reported mood (stress and arousal). This approach was used to test the hypothesis that

it is possible to affect the experience of stress when viewing a disturbing emotion-evoking scenario about war, by prior mental preparation; in particular by engaging subjects in an emotional reconstruction of an earlier and similar experience (the GER procedure). The main findings across the four experiments will be discussed in this section. The first experiment produced some evidence of a stress inoculation effect in terms of a significant difference in the pattern of change in self-reported stress between subjects in the GER and control conditions. However, this difference did not persist and was not obvious at the end of the experiment. The subjects in the two conditions entered and left the experiment reporting similar levels of stress. The findings were, to this extent, paradoxical, showing evidence of a stress inoculation effect in a difference in patterns of change over the test and treatment sessions but no evidence of any persistence of this difference. The following three experiments were directed towards resolving this paradox. The effects on arousal, and the part played by distraction and cognitive disengagement were also explored in these experiments.

2.1. Increase in stress after treatment for GER.

The one consistent and highly significant phenomena reported in all four experiments was that stress increased in the GER conditions during treatment. The combination of exposure to a disturbing war documentary film followed by the GER procedure consistently increased subjects' levels of self-reported stress compared to the control condition. The control condition consisted of a non disturbing film followed by a discussion. It offered a structural control (film + discussion). In two of the experiments, alternative treatment conditions were offered (Experiments 1 and 4). This combination of the war documentary film with some form of distraction (relaxation or reading), did not produce an increase in stress. In a somewhat similar way, Steele and Cox (1986) explored the effects of presenting aversive visual stimuli, pictures of war scenes, and found an increase in self-reported stress with exposure to those pictures.

The use of covariance techniques for the analyses of post treatment scores allowed the contribution of individual differences in initial mood, wellbeing (GWBQ) and coping (Wheel) to be assessed. There was some evidence from

three of the four experiments (1, 3 and 4) that subjects' initial stress and uptight (GWBQ) scores partly determined their post treatment stress scores. It appeared that the more stressed and uptight subjects were to begin with the higher their post treatment stress levels independent of the effects of condition (GER).

A simple conclusion is that viewing a disturbing film and then discussing its emotional aspects increases subjects' feelings of stress. It is conceivable that the stress increase noted during treatment may have been to do with the context of it being stressful for youths to discuss their emotional reactions in public, with a stranger. But the question central to this thesis is 'whatever the reason for the stress, does it have an adaptive longer term effect: ie does it bring about later stress resistance?'

2.2. Stress inoculation: Does it exist?.

The results of the first experiment suggested some evidence of a stress inoculation effect for the GER condition but only in terms of the pattern of change across the treatment and test conditions. Despite this difference, the levels of stress reported in the different conditions were similar at the end of the experiment. There was no evidence of persistence of the difference in pattern of change. In order to be confident of any stress inoculation effect, it is argued that both sorts of evidence are required. This 'paradoxical' situation clearly needed to be resolved, and was one of the objectives of the subsequent experiments. Two attempts were made to 'design out' the paradox: the first by strengthening the GER procedure and the second by introducing a substantial interval between treatment and testing (see Figure 8.1). These having effectively failed, the final experiment looked at the possibility of a stress inoculation effect in terms of cognitive performance rather than mood. Stress data from the four experiments are presented in Figure 8.2.

The second experiment used a more emotionally focused GER. It was in this sense that the GER was strengthened. Again, evidence of a stress inoculation effect was obtained in terms of overall patterns of change. However, while there was some suggestion that a difference did exist at the end of the experiment; they disappeared when differences in initial levels of

FIGURE 8.1. RESEARCH DESIGN OF THE FOUR EXPERIMENTS.

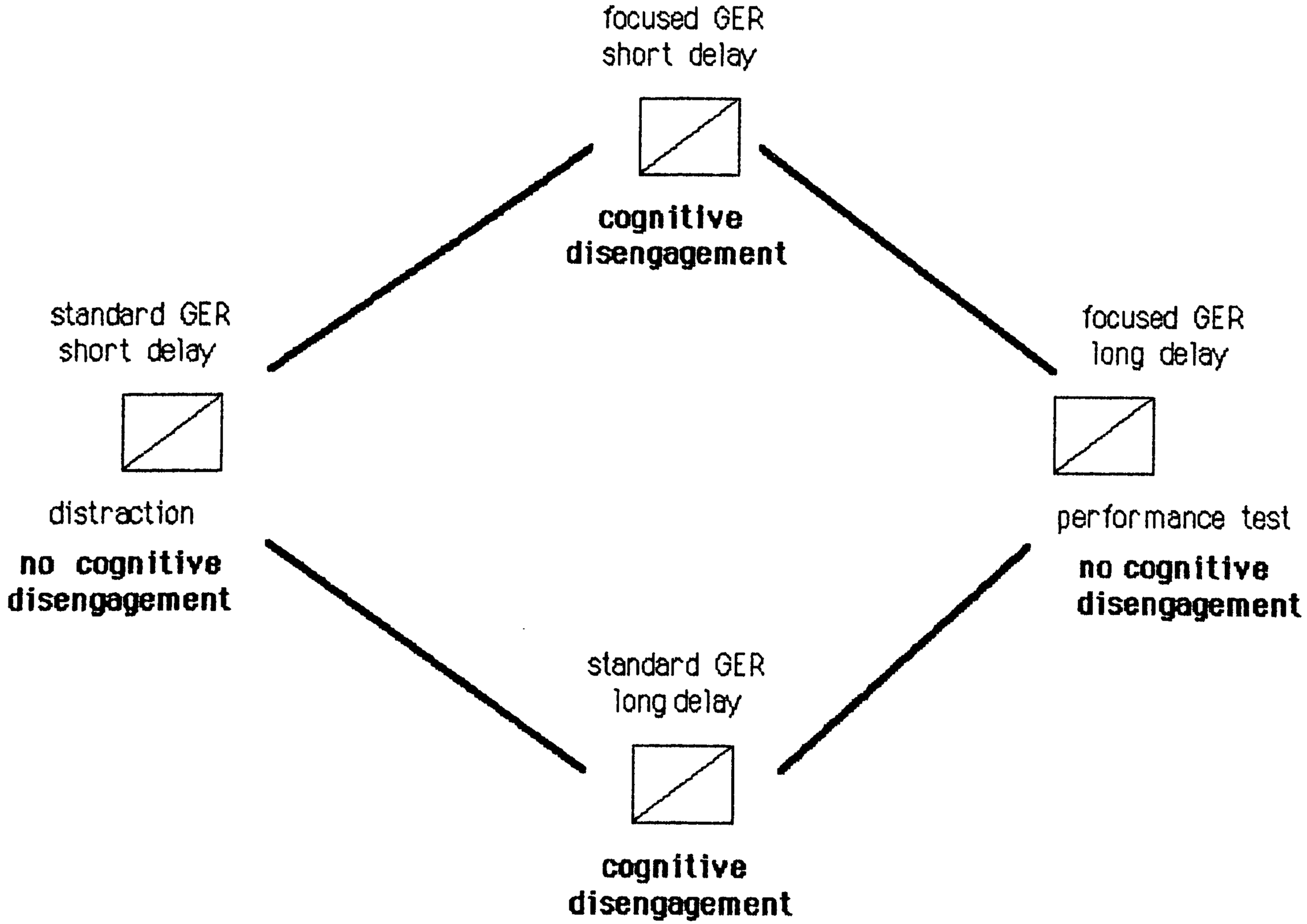
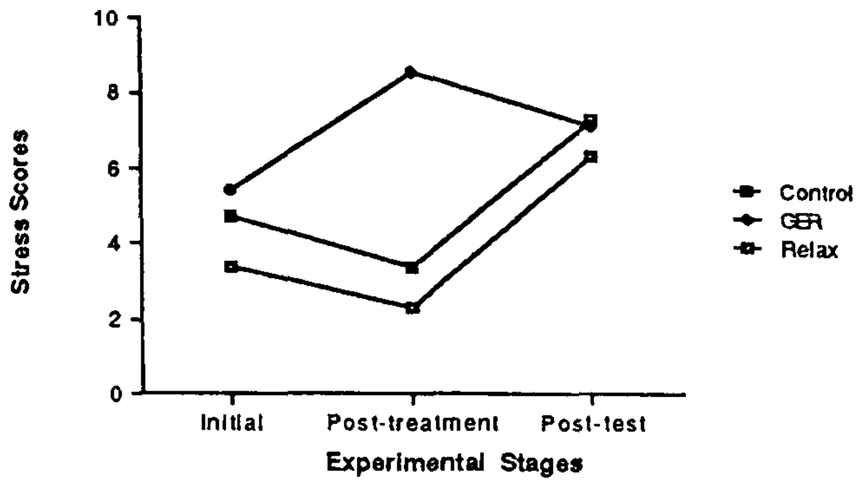
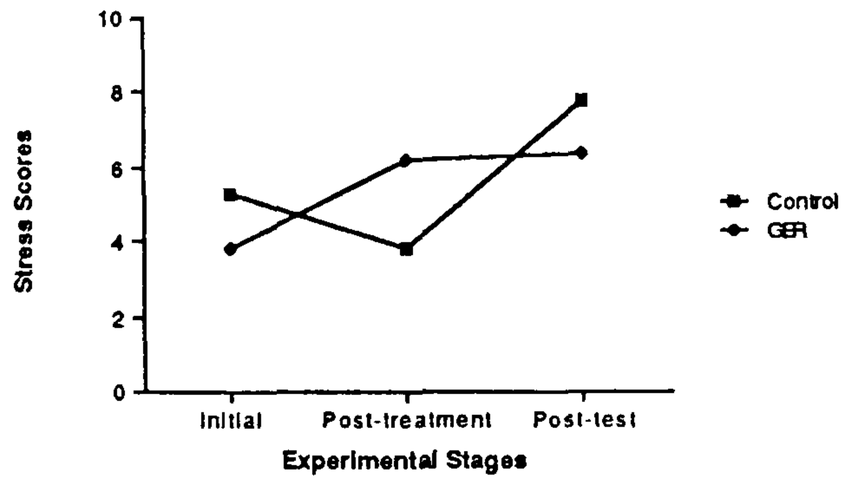


FIGURE 8.2. STRESS GRAPHS ACROSS THE FOUR EXPERIMENTS.

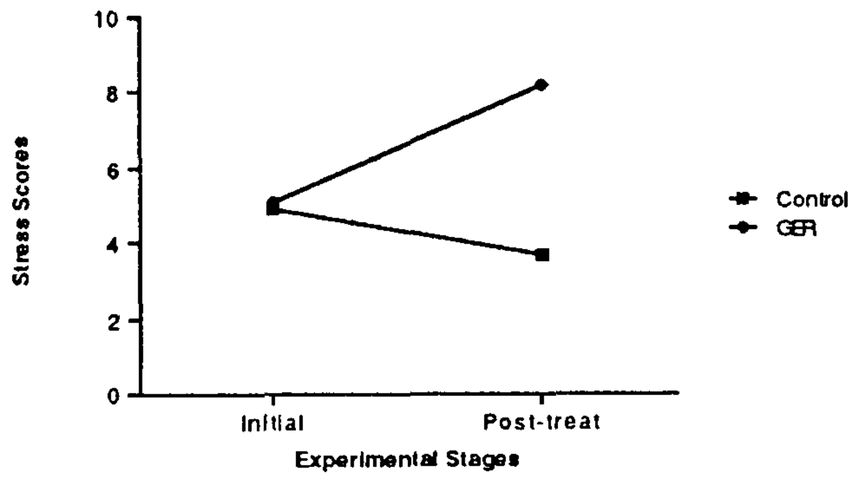
Graph 4.1. Stress Scores by Experimental Conditions.



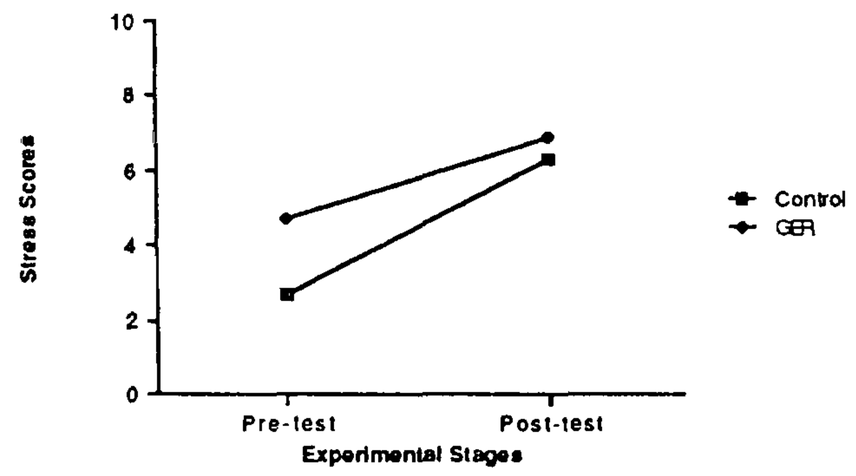
Graph 5.1. Stress Scores by Experimental Conditions.



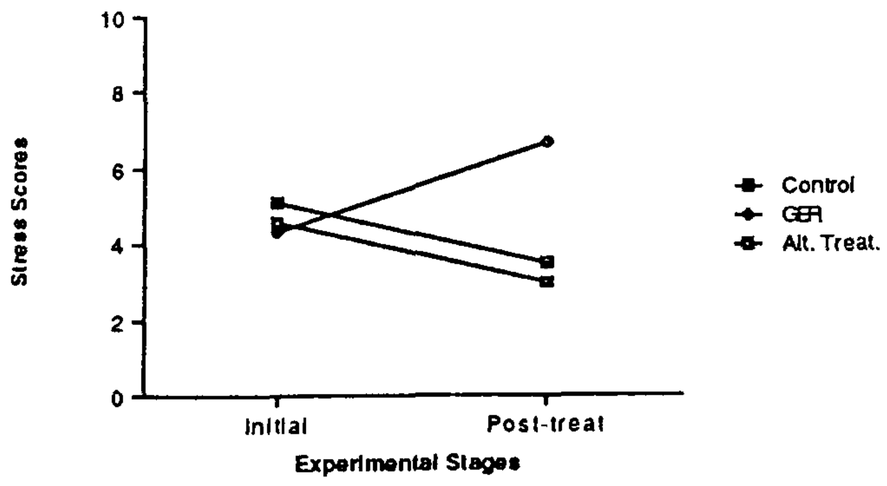
Graph 6.1. (a) Treatment Phase for Stress .



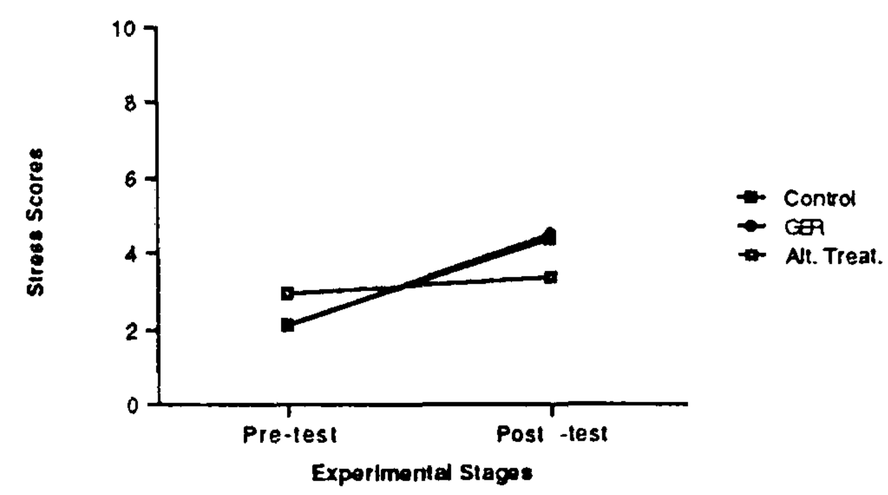
Graph 6.1. (b). Test Phase for Stress.



Graph 7.1. (a). Treatment Phase for Stress.



Graph 7.1. (b). Test Phase for Stress.



stress were controlled for. At the same time, it was noted that subjects in the GER condition reported significantly lower arousal levels post treatment and post test than the subjects in the control condition. This was interpreted as part of a possible process of mental or cognitive disengagement (see above: Carver, Scheier and Weintraub, 1989), shifting the mood state from anxiety to boredom.

Experiment 3 was designed using the original (standard) GER procedure as Experiment 1, but this time there was a longer time interval imposed between treatment and test sessions. Weak evidence of a stress inoculation effect was again demonstrated, in terms of overall patterns of change, but these differences reflected treatment not test effects. Again there was no evidence of any persistent effect. There was a suggestion of cognitive disengagement at pre test and post test stages for the GER condition. In Experiment 1 there had been physical interruptions during the course of the experiment, and this may have served as distraction, precluding the need for cognitive disengagement. However, there were no such interruptions in Experiments 2 and 3, where greater control had been exercised over the experimental situation. Subjects therefore may have needed to use this particular coping strategy in these experiments to control their mood.

Having failed to convincingly demonstrate a stress inoculation effect in terms of mood, it was decided to explore any such effect in relation to cognitive performance. Experiment 4 combined the emotion-focused GER (Experiment 2) with the longer time interval (Experiment 3), and a Diagrammatic Reasoning test was introduced to explore any differences in performance between conditions during the test session. However the performance test appeared to serve as a distraction across conditions and this changed the whole test situation. The introduction of the Diagrammatic Reasoning Test was intended as a measure of the effects of the experimental procedure on the performance of a cognitive task. However, what resulted was an interaction between the presence of the task and the overall test situation. The cognitive task served to distract attention from the stressor. Because they had something to do, subjects did not appear as susceptible to the experience of stress (Gal 1975). This observation could be tied to the previous discussion of cognitive disengagement and distraction.

There was no demonstrable stress inoculation effect during the test session for subjects in the GER condition. Subjects in all three conditions reported stress levels, post test, that were similar to their baseline measures. In terms of arousal, it was noted that the subjects in the GER condition reported significantly higher levels of arousal compared to subjects in the control and alternative treatment conditions. While performing a task, subjects in the GER condition appeared to have heightened levels of arousal.

Reviewing the evidence in favour of a stress inoculation effect with the GER procedure (see Figure 8.2 and above), it must be concluded that the experimental paradigm used was capable of changing mood, and demonstrating differences in the pattern of change between the GER and control (and alternative treatment) conditions. The pattern of change shown in the GER condition in Experiments 1 and 2, conforms to that predicted as stress inoculation, that is, greater changes during the treatment than the subsequent test session. This was not really so in Experiments 3 and 4. Furthermore, throughout there was no real evidence that these differences persisted to the end of the experiment, and some evidence that introducing a delay between treatment and test (Experiments 3 and 4) further weakened any arguments in favour of stress inoculation effect. It must be concluded therefore that the existence of a stress inoculation effect, dependent on both sets of evidence (pattern difference and persistence) is unproven. The GER procedure as used in these experiments does not produce an obvious and lasting stress inoculation effect, at least over the duration of these experiments.

2.3. Cognitive disengagement by lowering arousal level.

An interesting set of observations emerged during the experimental studies relating to how subjects coped. The data were interpreted to suggest the use of a particular form of cognitive coping, mental disengagement, under certain conditions. Cognitive disengagement was first identified as a possible cognitive coping strategy in Experiment 2, and criteria were established for its definition in that chapter. These allowed some explanation of the arousal findings of experiments 3 and 4. The relevant findings for all four experiments are summarised in Table 8.1.

Experiment	GER	Delay	Distraction	Cognitive Disengagement
E1	Standard	Short	Yes	No
E2	Emotional	Short	No	GER (treatment) Control (test)
E3	Standard	Long	No	GER (test) Control (test)
E4	Emotional	Long	Yes	No

Table 8.1. Cognitive Disengagement over the Four Experiments.

From a review of these data (see Table 8.1), it appears that mental disengagement occurs if there are no external distractions (or relaxation training).

Together the criteria of definition and this observation go some way towards accounting for this aspect of the mood response within the experiments and support a workable notion of mental disengagement as a cognitive coping strategy.

Baddeley (1972) conducted a series of experiments on the performance of divers in the open sea. He reported that subjects who are repeatedly exposed to a dangerous situation can in some as yet unspecified way learn to inhibit their anxiety and displace it away from the point of maximum danger. Baddeley advanced two reasons as to why this is likely to be useful: (1) it prevents performance being impaired at a crucial time, and (2) the displaced anxiety will tend to act as a warning of impending danger. However it is difficult to conceive of how a "displaced" anxiety can serve as a warning, unless it is clearly and unequivocally interpretable as such by the individual concerned.

Baddeley (1972) poses the question of whether the impaired performance of divers in the open sea can be entirely attributed to an arousal-produced narrowing of attention. Clearly, there is a confusion here between stress and

arousal. In the light of the factor-analytic studies of Mackay, Cox, Burrows and Lazzerini (1978), this should read "stress-produced" instead of "arousal-produced", and "lowering of arousal" or "cognitive disengagement" (Carver, Scheir and Weintraub, 1989), in place of "narrowing of attention". Baddeley (1972) concludes by noting:

> "We still do not know what mechanisms mediate the effect of arousal on the distribution of attention, or what is involved in the process of adaptation to fear. When we can answer these questions we shall be much closer to understanding human performance in dangerous environments." (pp 545).

King, Burrows and Stanley (1983) conclude from their investigations using the SACL on a non-homogeneous Australian sample, that the psychological trait underlying arousal may be regarded as a useful or appropriate aspect of the response to perceived demand. Arousal was elevated in response to a high load cognitive demand, and was at its lowest among psychiatric patients. They conclude that the stress scale may be measuring a less useful psychological aspect of response to a perceived threat combined with a diminished belief in one's ability to cope. Stress was elevated where fear may be assumed to be present (parachutists), and also in psychiatric patients.

However, in the present study, for groups that have undergone the GER procedure, when presented with a performance task in the presence of the aversive stimulus, their arousal level is heightened. It is as if, having dealt with the aversive stimulus earlier at a conscious level, they do not require the defence mechanism of cognitive disengagement while completing their task. The control and alternative treatment conditions in Experiment 4 were not similarly 'protected' by prior exposure and discussion, and had significantly lower arousal levels while completing the task.

Mullin (1960) in his study of U S Antarctic expeditioners reported that danger, hardship, and the cold climate were not reported as stresses at immediate post-expedition interviews. Godwin (1985) advanced an explanation that the potentially hostile physical environment may create a constant imbalance which individuals cannot resolve because they may not ever have to cope with the environment in a genuine threat situation. Godwin

(1985) hypothesized that coping mechanisms may be at a constant level of arousal, on standby as it were, but never be put to the test, and individuals may not be aware that they have raised their readiness, or arousal, to a new level.

On the basis of the findings from the four experiments, it is proposed that rather than having a heightened arousal level, the expeditioners were in a state of cognitive disengagement when they were not otherwise distracted by activity. This appears to be an almost automatic defence mechanism, which enables apparently normal functioning under situations of high stress. Where the source of the stress has been consciously verbalized and acknowledged, then the immediate benefits appear to be a heightened alertness (higher arousal) while carrying out a task. This is borne out by the findings from Experiment 4.

Thus, no cognitive disengagement was found in Experiment 1 where there was "noise" in the procedure in terms of interruptions, which served as distractors. Similarly, no cognitive disengagement was found in Experiment 4, where the performance test served as a distraction. Cognitive disengagement was found in Experiments 2 and 3, which were "noise free".

There is support for this position in the reports by Stanley, King and Glass (1988) in a laboratory task involving visual detection. Using the SACL (Cox and Mackay, 1985), they found that stress tends to be negatively related to performance, while arousal tends to be positively related to performance. They obtained a similar result in a study investigating the relationship between stress, arousal and performance in an arithmetic problem-solving task. It is noted that no performance deterioration was found in the present study, with a lower arousal level. It is apparent though that a task requiring vigilance would have shown deterioration in performance. Moreover, the students were well rehearsed in the task requirements and highly motivated to do well. These aspects may have acted as intervening variables to affect their final performance across all the conditions (see Chapter 7).

2.4. Perception of coping.

The coping index from the Wheel Questionnaire (Shalit 1982a) was used to measure perception of ability to cope, in the first experiment. The perception of ability to cope in the context of war did not change from the treatment to test phases for subjects in any of the conditions. It is suggested that the subjects were distracted, in this experiment, by interruptions, and did not consciously make an effort to process the implications of the GER procedure. In the following experiments, it is likely that the process of cognitive disengagement may have produced the same result.

2.5. Issue of Habituation.

It may be proposed that the tendency of the stress scores to be lower on the second exposure, particularly in the case of subjects in the GER condition, was a result of habituation to the war documentary. This sub-section is devoted to considering the issue of habituation and its possible relevance in the interpretation of the results of the four experiments.

Ziferstein (1967) described the public attitude to American military involvement in Vietnam as a sociopsychological case study of psychological habituation to war. She described how cognitive dissonance works to produce habituation, a state of "sociopathological ill health" (pp 460). She advocates sociotherapy, a parallel to dynamic psychotherapy, to help the average citizen feel less bewildered, less helpless, by helping him to understand, step by step, how the prevailing confused situation came about. To some extent, such "sociotherapy" on a unit level is what GER strives to achieve, in the frontline context. The task is made more difficult by the participant often being an active part of the actions involved.

Mangelsdorff and Zuckerman (1975) created a laboratory analog of the habituation process in early 1971, and suggested that it paralleled some of the attitudes toward the war in Viet Nam. They presented coloured slides as stimuli: (1) a picture from Life magazine's coverage of the My Lai massacre, (2) a neutral slide of two male students talking to each other, and (c) an automobile accident with two victims discernible. They found that the subjects did not differ in their reported degree of agitation to both the

violent scenes. They also found a significant trials effect indicative of habituation across trials for each topic.

The tendency of the stress score for the GER condition to remain stable or be lowered (as demonstrated with analysis of covariance in Experiment 2), is not a simple function of habituation as in the Mangelsdorff and Zuckerman (1975) case. This is demonstrated by the directional pattern of stress that the subjects in the alternative treatment condition followed. Subjects in both the GER and alternative treatment conditions in Experiment 1 viewed the disturbing war documentary. As a result of the immediate post-viewing treatment procedure, subjects in the GER condition experienced a higher stress level while those in the alternative treatment condition had a lowered stress level. At the next viewing in the test session, the stress scores for the subjects in the alternative treatment condition went up significantly, while the scores for subjects in the GER condition remained the same.

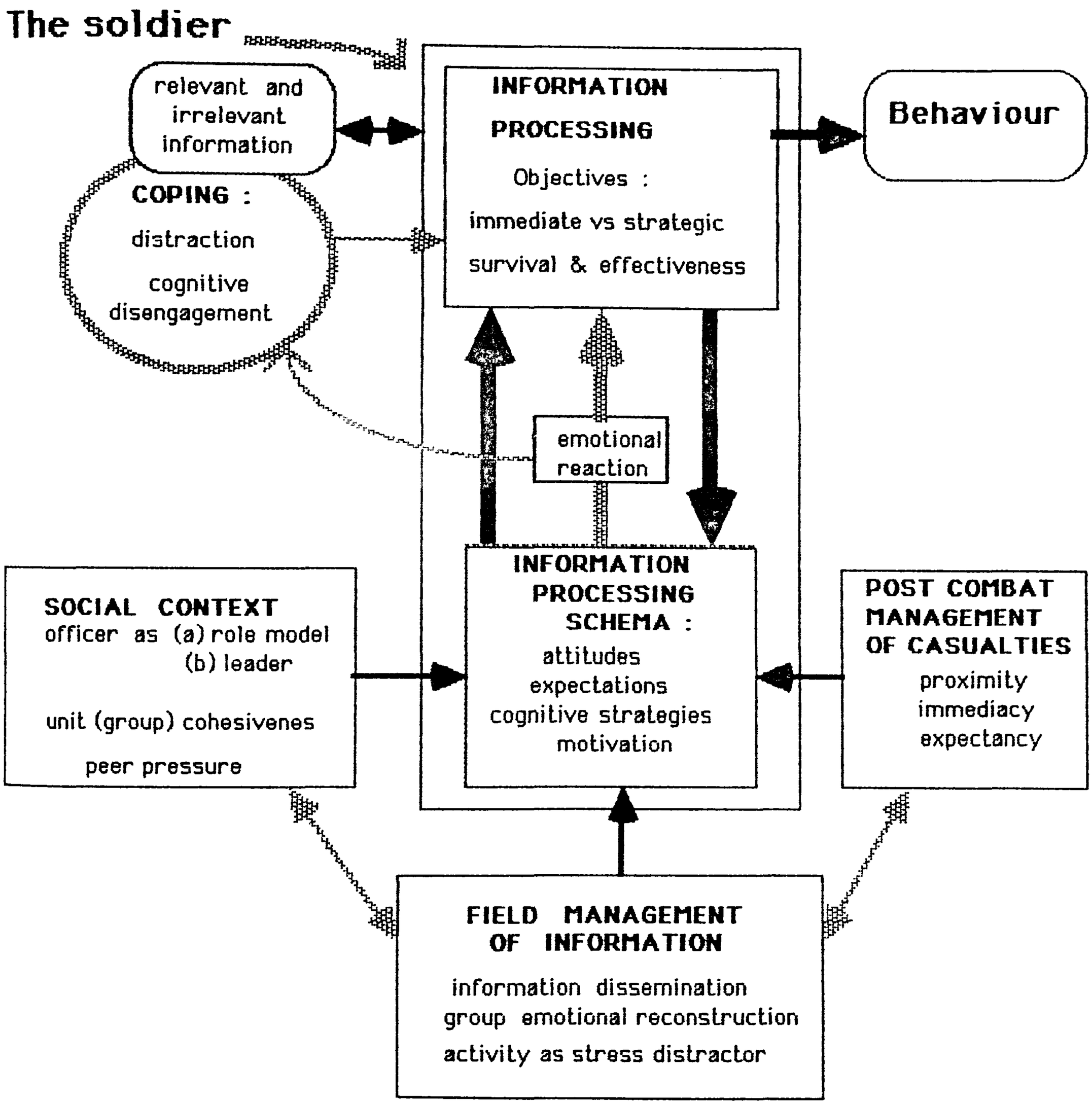
3. CHANGES TO THE COMBAT STRESS MANAGEMENT MODEL.

Three changes are proposed to the combat stress management model proposed in Chapter 2 in the light of the research findings and interpretation of the recent literature on stress, coping and arousal. The amended model is depicted in Figure 8.3.

The first change relates to "Field Management of Information". This should now read "Field Management", indicating some consideration of a broader range of processes. An additional item under this topic will be "activity as a distractor". The important part played by activity in ameliorating the experience of a high level of stress has been demonstrated in Experiment 4, and further discussed in the earlier part of this chapter.

The second change is under the topic "Inoculation". On the evidence of the present experiments, or rather lack of evidence, it would seem wise to remove this factor until further studies support its re-inclusion. The absence of any inoculation process in the model, if one later proves valid, could result in an unacceptably high rate of psychological casualties, both in terms of combat stress reaction casualties and poor military performance (Holmes 1985; Baddeley 1972).

FIGURE 8.3. COGNITIVE-BEHAVIOURAL MODEL FOR COMBAT STRESS MANAGEMENT.



The third change proposed was to identify another important factor relating to information processing and soldiers' emotional reactions; namely "coping". The two coping strategies postulated from the experimental findings were included under this head: "distraction" and "cognitive disengagement". The results of the four experiments suggest that these are coping strategies employed in the face of a high level of stress. The coping strategies would feed back into and affect information processing.

The model proposed in Chapter 2 is evaluated to be fairly sturdy in the context of the experimental research, and the various theoretical postulations on coping under stressful conditions.

4. RECOMMENDATIONS.

Recommendations will be put forward in this section on the basis of the findings from the research investigation.

4.1. Stress inoculation.

While there is an obvious investment in the development and use of stress inoculation procedures in countries such as Israel and Sweden (and the USA), there is as yet little evidence from well designed studies of the validity of such procedures. The data produced in the present thesis offers no support for stress inoculation with a GER procedure developed from current Israeli and Swedish practice. However, the limitations of the present experimental paradigm are recognised, along with the importance of the overall area. It is therefore recommended that further research be conducted into stress inoculation. This should not only concentrate on the type of paradigm used here but also attempt to bring in other more motivational and societal factors, as mentioned both in the preceding discussion and in Chapters 1 and 2. Furthermore, the effects of different forms of stress inoculation procedure should be examined possibly in conjunction with the presence or absence of distraction, and in relation to coping strategies such as cognitive disengagement.

It is also suggested that the effects of time and repeated exposure (in terms of the persistence of any effect) be examined. This should logically lead into

a consideration of the role of stress inoculation as both a preparatory and an on-going management device. However, until such studies have been successfully completed, the validity of stress inoculation should be questionned.

4.2. Simulation training.

Some of the research into stress inoculation could take the form of evaluative field studies on actual training programmes. A useful starting point might be a discussion of anticipated fears of a combat scenario. Then, a close approximation could be effected in recreating such scenarios in training using a simulation perspective. The training objective would be to enable practice in coping successfully in the simulated "feared" scenario. Such a procedure could be hypothesized to yield an enhanced coping after the training. Particularly so if there was specific skills and performance training in response to anticipated fears of being unable to perform effectively under the envisaged situation of extreme stress. Such work is currently being undertaken by the Psychology Branch in the IDF Airforce, with their fighter pilots (Barnea 1989, in personal communication). Although there is an absence of evaluative research at present, this appears to be a promising direction to pursue.

Thus in both laboratory and field simulations, more elements could be added to the situation in addition to the use of videos of war documentaries as in the present experiment. The elements of chaos, some degree of physical movement and involvement, some elements of physical discomfort and stimulation of the sense of smell in addition to the visual and auditory inputs, could be incorporated to better simulate a combat scenario (Breznitz 1987, in personal communication). The final validation of course can only be checked in an actual war.

4.3. Role of relaxation.

The results from Experiment 1 demonstrate that relaxation is not effective for stress inoculation, and it is not advisable to use it for this purpose. However, relaxation was associated with low levels of stress after viewing the disturbing war documentary although this association could not be further

broken down. Thus the part played by relaxation as a procedure that induces an immediate calming effect should be explored (Benson 1985), for short term management purposes. It can also be taught as a device that individuals can master and practise on their own, as a personal coping skill (Larsson 1987).

4.4. Activity and distraction as stress antidotes.

The value of activity and distractions as effective antidotes to the experience of obnoxious stressful feelings should be explored in the field situation. In between, and prior to engagements, when there are long periods of "waiting", the men should be engaged in some activity that will serve as an effective distractor preventing ruminative thinking that can be depressing. Such ruminative thinking can lead to combat stress reaction casualties at an accelerated pace (Holmes 1985).

4.5. Arousal, habituation and coping.

The role of arousal mechanisms in relation to cognitive coping (particularly mental disengagement) should be further studied. It would be interesting to explore the reliability of the observation developed to explain the presence of mental disengagement. Given the way the process has been defined and described it should be possible to design an experimental approach to their further study. At the same time, it would be important for at least the military and clinical contexts to consider the interaction between such coping strategies and externally managed inoculation effects. Particularly important for such study would be an examination of the effects of different forms of inoculation procedure (for example, more or less emotionally focused).

A more general exploration of the relationship between coping through mental disengagement, and stress and arousal, should also be undertaken. The interactive role of external distraction, both through interruption, and through engagement in a task, could be usefully studied. The findings may be of assistance in drawing up guidelines for the positive management of stress in the field situation.

The part played by habituation to scenes of violence, and its short and long term effects on performance and psychological well being could also be further investigated as an alternative explanation for some of the observed effects, and with reference to the post trauma situation. While the abundant literature on post traumatic stress disorder reports on the cases that emerge, the issue of the role of habituation has not been directly addressed as a phenomenon in its own right, in particular its generalization to behaviour.

5. CAVEATS.

Research in the area of management of combat stress, in a context of peace, is of necessity limited by the constraint of lack of reality testing (Watson 1980). Reality testing, in this case, is not a desired or sought after verification, regardless of its attractive academic appeal, and practical research purity. In its place, social laboratory conditions are recreated, to check on correlations, intercorrelations, and to discover possible determinants of behaviour and emotional response, and consequent effects on performance.

It is not postulated that there should be any physical injury involved in these training and test situations. To that extent, the attempt to simulate reality will be diminished.

Validatory data on the efficacy of simulation training as combat stress inoculation can be based on self-report by the participants involved. This is because combat stress reaction is a result of individual perception, and the ability to cope under traumatic conditions and the degree of confidence in own ability to cope can best be obtained from self-report. If there is a perception of increased ability to cope, then the exercise is worthwhile.

CONCLUSION

This investigation commenced with a literature review on the subject of stress inoculation in relation to war. This was followed by a field study of prevailing practices in three conscript armies: Sweden, Switzerland and Israel. Based on the literature review and field investigation, a cognitive-behavioural model of combat stress management was proposed.

The next phase of the research was conducting a series of experiments with regard to the effect on stress of the GER procedure. This was a device that appeared to have considerable face validity, and is incorporated in the Swedish Armed Forces commander training program. It is a device institutionalized in the standing orders of the Israeli Defence Force for the commanders to conduct this psychological debrief with their men in between engagements.

No evaluative data were available on the actual effects on stress of conducting the GER, nor on its effect on performance. It was with a view to throwing light on both these points that the experiments in this study were undertaken.

As it turned out, there was no compelling evidence of the validity of the GER procedure as a stress inoculation device. However, there was some suggestion that the experience of stress in the experimental paradigm used in the studies may initiate the defence mechanism of cognitive disengagement, which can act as a protective device in the absence of activity. However this process only appears to affect the arousal dimension, by lowering the level of arousal. Stress levels still remain high. Its functional utility is obviously short term, for immediate coping and for self-presentation purposes.

The florid manifestation of post traumatic stress disorder years after the actual 'triggering' event, and the incidence of immediate combat stress reaction in the field resulting in below par performance, are the two main elements that led to the undertaking of this thesis. The idea was to propose a realistic approach to combat stress inoculation for soldiers in a conscript army, so that the debilitating aspects of the stress of war could be ameliorated to some extent. As it turned out, the process of group emotional reconstruction tested out in the series of experiments, while demonstrating a significant treatment effect, did not display a tendency for persistence of change. This thesis has undertaken a first step towards the validation of stress inoculation programs, and it is anticipated that elements of persistence of effect may be demonstrated in studies with a longer time perspective. It is argued however, that such a program of inoculation would function effectively only within a total framework of a combat stress management model as set out in this thesis.

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