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Two-Stage Investigation of Blood Donors Who Experience Vasovagal Reactions: Affective, Coping, and Physiological Factors

Perry S. J. Adler

A Thesis

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ABSTRACT

Two-Stage Investigation of Blood Donors Who Experience Vasovagal Reactions: Affective, Coping, and Physiological Factors

Perry S. J. Adler

The differences between blood donors who experience vasovagal reactions (e.g., fainting) and those who do not were investigated in two stages. The first stage involved the identification and preliminary questioning of donors who experienced vasovagal reactions (Reactors) and their matched controls (Non-Reactors). The second, laboratory-based, stage had subjects watch a video depicting a blood donation procedure while various physiological and affective responses were repeatedly assessed. Subjects also performed a Valsalva maneuver as a means of assessing autonomic nervous system balance and completed additional questionnaires. The results indicate that Reactors differ from Non-Reactors in that they report greater fears of injections and medical procedures, tend to appraise the situations encountered as more threatening, use a greater amount of withdrawal and self-focused coping, and report more extensive histories of syncope, hyperventilation and somatic sensitivity. Support was provided for the hypothesis that vasovagal reactions are associated with heightened activity of both branches of the autonomic nervous system.

The results suggest re-examination of the accounts which cite generalized fears and the perception of (non)control as central factors in vasovagal reaction causation. The results also suggest new directions in syncope treatment, focusing on modifying aberrant breathing and the

tendency to misinterpret somatic sensations due to an overconcern with potential threats to personal physical integrity.

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This thesis is dedicated to my parents who through both their words and deeds have always been an inspiration to me and who taught me that hard work is rewarded.

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Introduction

Vasovagal syncope (emotional fainting) is a common and somewhat dramatic reaction that frequently occurs as a response to an emotionally disturbing event or in circumstances of real, threatened, or fantasized injury (Graham, Kabler, & Lunsford, 1961; Kozak & Montgomery, 1981). The vasovagal faint can be described as "a sudden drop in blood pressure and pulse rate, accompanied by a report by the individual of some disturbance of consciousness expressed in such words as 'dizzy', 'lightheaded', and 'woozy'...it is not an all-or-none reaction but occurs in various degrees." (Graham et al., 1961, p.494).

The physiology of syncope is diphasic. The presyncopal first phase, which usually lasts from one to two minutes, is similar to a standard anxiety reaction. That is, in response to a threatening circumstance, anxiety occurs and is accompanied by increased heart rate, blood pressure, cardiac output, and total peripheral resistance. At this stage the individual usually reports acute apprehension and distress. The second, syncopal phase occurs with a marked, sustained reduction in vascular resistance in skeletal muscles, reduction in blood pressure, and a rapid fall in heart rate. Pallor, sweating, visual blurring, epigastric discomfort, and nausea may occur. Ultimately the cerebral blood flow may be sufficiently diminished to cause unconsciousness (Graham et al., 1961; Kozak & Montgomery, 1981). Although this whole process is usually short-lived, with no after effects, a weak heart may be damaged by the reduced blood flow to the cardiac muscle (Vander, Sherman, & Luciano, 1975).

Vasovagal syncope is a particularly interesting subject for

researchers in the field of psychosomatics because approximately 50 percent of syncope cases cannot be explained on purely physiological grounds (i.e., as being due to physiological factors such as aortic stenosis, pulmonary hypertension; Kapoor, Cha, Peterson, Wieand, & Karpf, 1987). Furthermore, vasovagal syncope is a useful and practical psychosomatic model due to the short time span between cause and effect. This feature offers a unique opportunity to study the specific characteristics of the biopsychosocial context in which the fainters develop their symptoms.

Studies which have investigated the situational and behavioural variables associated with vasovagal syncope have consistently found that syncope episodes are triggered in situations containing a real or imagined threat of physical or psychological injury (Engel, 1962, 1978; Sledge, 1978). An important feature of the situations that trigger syncope seems to be the individual's inability to successfully cope with the threat, usually due to the unavailability of an acceptable, effective response (including escape). Thus, the fainter is hypothesized to feel ineffective and helpless in a threatening situation. This might be due, for example, to the presence of authority figures and/or other social pressures which constrain overt action (Kozak & Montgomery, 1981; Vingerhoets,1984; Vingerhoets & Schomaden, 1985). A situation possessing many of the features which are often associated with vasovagal syncope is the blood donation procedure.

Vasovagal syncope is particularly evident during and after blood donations where the incidence is estimated at between 2-9% (Kaloupek, Scott, & Khatami, 1985). The occurrence of syncope during blood donation

cannot be totally explained by the hemodynamic factors involved because not enough blood is removed during donation to cause fainting. Vasovagal reactions during blood donation are especially intriguing because the physiological activity associated with the response is opposite to what is generally expected. That is, whereas most fear producing situations induce some form of a fight or flight reaction that is characterized by increased sympathetic nervous system activity (Lang & Cuthbert, 1984), the all-important second phase of the syncope response reflects a parasympathetically dominated physiology. This uncharacteristic parasympathetic overactivity in response to fear is in fact a well documented and common response to exposure to blood and/or bodily injury stimuli (Ost, Sterner, & Lindahl, 1984; Sartory, 1981; Taggart, Hedworth-Whitty, Carruthers, & Gordon, 1976). Furthermore, between 80 and 100 percent of blood/injury (BI) phobics faint when exposed to BI stimuli (Ost et al., 1984; Kleinknecht, 1987). Thus, individuals fearful of blood and/or injury are particularly prone to syncope reactions. Exposure to blood and/or injury cues does not, however, necessarily lead to vasovagal reactions, nor do such reactions only occur in response to such cues. The determination of which situational, psychological and physiological factors are central in the causation of vasovagal syncope reactions remains to be made.

Models for Syncope

There are two general models for the interaction between psychological and physiological processes that results in vasovagal syncope. The activity of the two branches of the autonomic nervous system naturally are central considerations in both accounts because

cardiovascular responses to stress are regulated by the net balance between sympathetic and parasympathetic activity (Carruthers & Taggart, 1973). Both models propose that the first phase of the syncope process is brought about by a perceived threat which causes increased sympathetic activity (i.e., the "fight or flight" response). The difference between the two accounts lies in the type of psychological process that is believed to occur before the faint.

The first account, which will be referred to as the motor inhibition hypothesis, represents the proposals of Engel (1978) as well as Vingerhoets and Schomahen (1985). This account suggests that the individual is caught in a struggle between sympathetic fight/flight responses and parasympathetic conservation/withdrawal tendencies. The individual experiences distress and wishes to fight or flee but cannot because of motor inhibition caused by an opposing withdrawal response. Feelings of helplessness ensue and further disruption of the circulatory adjustment to the stressors occurs due to the simultaneous discharge of both branches of the autonomic nervous system . In the end circulatory collapse occurs as a result of the incompatibility of the states.

This hypothesis is in agreement with the psychological findings previously mentioned (Sledge, 1978; Engel, 1978) which show that fainters initially want to escape the situation but cannot, and therefore experience helpless and hopeless feelings before the onset of the symptoms. The major criticism of the motor inhibition hypothesis is that syncope often occurs after a threat has disappeared, presumably after the abatement of the antagonistic sympathetic and parasympathetic reactions (Vingerhoets & Schomahen, 1985).

The second model for vasovagal syncope, the abatement hypothesis, follows the proposal by Graham et al. (1961). In the first phase, the initial increased sympathetic activity caused by anxiety calls forth antagonistic parasympathetic reflexes which act to prevent the heart rate and blood pressure from rising excessively. In the second phase, the cessation of the perceived threat produces relief from anxiety and a rapid decrease in sympathetic activity which leaves the parasympathetic mechanisms relatively unopposed. This imbalance results in decreased blood pressure and heart rate, potentially leading to syncope. The major criticisms of this hypothesis are that fainting often occurs at the height of the threatening situation when anxiety should be very much present, and it does not always occur as soon as people overcome their anxiety (Vingerhoets & Schomahen, 1985).

Few investigations of syncope have simultaneously examined physiological and psychological aspects of the reaction. It is important, however, to examine both aspects concurrently in order to determine the sequence of events and the relative value of the two theoretical accounts. It may well be, as Graham et al. (1961) proposed, that there are two or more explanations, each correct for a particular group of individuals and their respective coping styles and/or physiological make-up.

Coping and Syncope

It is now widely recognized that both the demands and constraints of a situation as well as individual differences in coping styles are intricately involved in determining the effectiveness of particular efforts to cope with stressful situations (Kaloupek & Stoupakis, 1985;

Lazarus & Folkman, 1984; McCrae, 1984). Our laboratory group has concentrated on investigating how coping efforts can moderate the influence that fear stimuli and other affective stressors exert on the individual's immediate physiological functioning. Evidence thus far suggests that coping moderates the relative strength of cardiovascular suppression or elevation (Kaloupek & Stoupakis, 1985). Evidence also indicates that two of the primary modes of coping with stress, approach and avoidance (Roth & Cohen, 1986), are important in the understanding of syncope causation (Kaloupek, White, & Wong, 1984).

Approach and avoidance are shorthand terms for the cognitive and behavioural activity that is oriented either toward or away from threat. Approach strategies seem to be better than avoidance strategies in situations which are controllable because they allow for appropriate action and the possibility for noticing and taking advantage of changes in a situation. Avoidance strategies, on the other hand, seem useful in uncontrollable situations because they may reduce stress and prevent anxiety from becoming crippling (Roth & Cohen, 1986).

The blood donation experience fits the description of a situation in which avoidant coping probably would be more effective because it lacks the opportunity for effective behavioural coping. Basically, blood donors have something done to them, and the procedure is most easily completed when they are relatively passive and compliant. Previous investigations (Kaloupek et al., 1985; Kaloupek & Stoupakis, 1985; Kaloupek et al., 1984) have examined the untrained coping strategies of volunteer blood donors in order to assess the relationship between coping and affective responding. Blood donors who fainted were found to be more

likely to engage in relatively ineffective coping strategies such as approach and vigilance (i.e., focusing on and ruminating about potentially distressing aspects of the situation or their emotional reaction to it). In contrast, non-fainters most often used an avoidance strategy which is associated with lower anticipatory ratings of anxiety and distress. The fact that fainters differed from non-fainters in terms of coping methods is consistent with the idea that coping may moderate both the affective responses and the physiological reactions (e.g., the relative level of cardiovascular suppression) during contact with the stressful aspects of the donation experience.

A desirable methodology for the study of syncope would involve assessment of coping and physiological responding while blood donors actually undergo phlebotomy. This, however, would be an intrusive, expensive, and logistically difficult undertaking. The following laboratory-based methodology offers a partial remedy for these problems by extending previous work done in the field of physiological reminiscence or "reliving".

The Reliving Paradigm

According to Vrana, Cuthbert, and Lang (1986), it has been shown repeatedly that people respond to affectively descriptive text with patterns of autonomic, catecholaminergic, and humoral activity similar to those found in the actual emotional situations (Cobb, Ripley, & Jones, 1973; Lang, Kozak, Miller, Levin, & McLean, 1980; Masuda, Notske, & Holmes, 1966). A recent study supports these findings and provides a good example of the paradigm. Gottman and Levenson (1986) brought 30 married couples, a pair at a time, into a laboratory to have a

high-conflict discussion in which they attempted to resolve an issue in their marriage that had been a major source of disagreement for both partners. Each spouse returned to the lab on a separate occasion to view a video tape of these interactions and to provide continuous self-ratings of affect on a rating dial that used a "positive/neutral/negative" scale. This continuous rating allowed non-interrupted viewing of the conversation and detection of rapid changes in emotion. During both the discussion and the video viewing sessions, four physiological variables were measured: heart rate, pulse transit time to the finger; skin conductance, and general somatic activity.

Gottman and Levenson reasoned that if subjects experienced the same sequence of emotions when viewing the video tape as they experienced during the actual interaction, then autonomic nervous system activity in the video recall session should be similar to that which occurred in the interaction session. Thus they termed this outcome, "physiological reliving". Degree of physiological reliving was determined by computing the coherence between the interaction session and the video recall session for each of the 30 couples for each of the four physiological measures (e.g., interaction session heart rate vs recall session heart rate). This was carried out separately for the physiological responses of each spouse during each of the two interactions. Of these almost 500 comparisons, over 90% were statistically significant, indicating that the spouses could be said to be reexperiencing the original physiological responses as they watched and rated the video tapes. Overall there was approximately 35% shared variance in physiological responses between the interaction session and the video recall session. Furthermore, not only

were these two sets of responses strongly correlated, but the time series were also usually in phase. This phase linkage means that when individuals watched the tape of their interactions, changes in cardiovascular functioning, electrodermal activity and physical movement all occurred at approximately the same times as they had occurred during the live interaction.

A theory of the mechanism through which such patterns of physiological activity are produced has been proposed by Lang (1977, 1979, 1984; cited in Vrana et al., 1986):

> Emotion is conceived to be an action set, defined by a specific information structure in memory, which, when accessed, is processed as both a conceptual and a motor program. ...emotion information is coded in memory in the form of propositions and that these propositions are organized into an associative network ...which is processed as a unit when a critical number of propositions are accessed. (p.247)

Thus, a film which matches or resembles an emotional situation should be able to activate such a memory network if there is sufficient similarity between the recorded stimuli and the actual event. Once the memory network is activated, a "response program is accessed which results in measurable activity in the appropriate effectors." Furthermore, "This program is the same response sequence that could be occasioned by the actual situation..." (Vrana et al, 1986, p.247). In other words, the physiological responding under such a paradigm should mirror that found under real life experiences.

Based on the preceding speculations and evidence, it should be possible to investigate the physiological and psychological processes that are associated with syncope in blood donors without having to conduct actual phlebotomies. It is expected that former blood donors can relive their last blood donation experience with the aid of a suitable

video tape presentation. Accordingly, it should be possible to elicit response patterns and coping efforts similar to those which occurred in the actual donation experience for both donors who experienced a vasovagal reaction (Reactors) and those who did not (Non-Reactors). This parallel responding would enable indirect examination of the various physiological and psychological processes associated with a vasovagal reaction occurring under the stress of the blood donation situation.

The Present Investigation

The present study gathered information both during a blood donation clinic and, later, in a laboratory setting during which the subjects were asked to relive their blood donation experience while watching a video presentation of a donation procedure. The main goal of the investigation was to determine whether Reactors and Non-Reactors differed on various measures reflecting cognitive appraisal, coping efforts, affective distress, and physiological responding, as well as physical or demographic characteristics. It was hoped that the identification of such differences would further the understanding of the causation of vasovagal reactions.

Demographic, Physical, and Physical State Considerations. Physical considerations such as body size, food/caffeine/nicotine intake, health status, were not expected to be related to vasovagal reactions in blood donors because previous studies have not found such relations (Kaloupek, & Stoupakis, 1985; Kaloupek et al., 1984). Based on previous findings (Kaloupek et al., 1985) the Reactors were expected to report having had more vasovagal reactions in general and less blood donation experience.

Fears. As mentioned earlier, BI fear seems to be consistently

related to the occurrence of vasovagal reactions. Accordingly, Reactors were expected to score more highly on measures of such fears.

BI fear may not be the only fear constellation which is important in relation to vasovagal reactions. Engel (1962, 1978), has suggested that social concerns such as the fear of embarrassment may lead people with high levels of these concerns to remain in a physically threatening situation. Therefore, the Reactors were expected to report having been more concerned regarding potential embarrassment during blood donation than the Non-Reactors and to score more highly on a measure assessing the fear of negative evaluation. Due to the roles BI and social fears may play in syncope causation the Reactors were also expected to have experienced dizziness more often in situations involving BI or social evaluation fear stimuli than Non-Reactors.

Appraisal and Coping Variables. The interactional perspective of Lazarus and Folkman (1984) assumes that an individual actively appraises a situation and then selects coping activities based on this appraisal. The major accounts for processes that result in vasovagal syncope hypothesize that Reactors appraise the situation as potentially psychologically and/or physically threatening and see themselves as helpless (Engel, 1962, 1978; Sledge, 1978). As such, subjects were requested to rate both the blood donor clinic and the laboratory session in terms of the potential for physical and psychological harm, and for self and situational control. During the laboratory testing subjects also rated the situations in terms of challenge - appraisals which focus on the potential for gain or growth inherent in the situation (Lazarus & Folkman, 1984). The Reactors were expected to report a greater concern

over potential physical harm and a lower level of self and situational control. No firm expectations were held regarding potential differences between Reactors and Non-Reactors in terms of their challenge appraisals.

Regarding coping, given previous evidence that a blood donation situation seems best approached by being passive and compliant it was expected that the Non-Reactors would mainly use passive-withdrawal coping methods, whereas the Reactors were expected to use more active-approach methods. The focus of coping is another important aspect of an individual's coping efforts. Such focus can either be towards the environment or towards the self (Folkman & Lazarus, 1980; Gil, 1984). Based on the belief that focusing in on one's own physiological responses is an initial aspect of a syncope reaction, the Reactors were expected to manifest self-focused coping efforts more than the Non-Reactors. The Reactors were also expected to show more variability in their choice of coping techniques due to the likelihood that they would be less experienced donors (Kaloupek et al., 1985) and thus not have well established coping methods to deal with the stressors of the donation procedure.

It was expected that the subjects' coping efforts in both the blood donation clinic and the laboratory setting would be similar, reflecting the reliving process subjects experienced while watching the video presentation.

Affect. Blood donor Reactors have been found to report greater degrees of anxiety prior to donation than Non-Reactors (Kaloupek et al., 1984). In the current study, Reactors were expected to report greater anxiety, distress, and physiological arousal than the Non-Reactors before

the donation as well as throughout the video presentation.

Autonomic Nervous System Imbalance and Somatic Perception Issues. Researchers studying vasovagal syncope have suggested that an imbalanced or over-reactive autonomic nervous system may be partly responsible for the occurrence of syncope reactions (Sledge, 1978; Vingerhoets & Schomahen, 1985). To investigate this possibility various assessments of the balance or reactivity of the subjects' autonomic nervous systems were conducted.

In one such assessment, the reactivity of the subjects' autonomic systems separate from their emotional responses was measured. There is evidence that responses to a Valsalva maneuver can be used to help assess the integrity of parasympathetic function (Leon, Shaver & Leonard, 1970) and that the cardiovascular response to the Valsalva maneuver is due almost exclusively to the physical stress involved, with little influence from emotional factors. Subjects thus performed Valsalva maneuvers during which the Reactors were expected to show physiological responses indicative of over-reactive or imbalanced autonomic nervous systems (e.g., greater heart rate variation during both the strain and the release phases of the maneuver; Coghlan, Phares, Cowley, Copley, & James, 1979).

A second indication of the state of each subject's autonomic nervous system was obtained through an assessment of the extent to which they reported the presence of a variety of ailments or physical disturbances which could be hypothesized as resulting from disturbances in the autonomic nervous system (Barr & Kiernan, 1983; Vander et al., 1975). The Reactors were expected to identify the presence of ailments at

significantly more severe degrees than did the Non-Reactors, thus reflecting greater disturbances in their autonomic nervous systems.

A third factor has been proposed as important in the occurrence of vasovagal reactions. Although it was previously mentioned that Reactors were expected to report greater use of self-focused coping methods, it has been suggested that Reactors may be less perceptive of initial changes in their physiological state as compared to Non-Reactors (Kaloupek et al., 1985). In other words, it takes Reactors longer to notice equivalent changes in the levels of physiological activity but once noticed, use a greater amount of self-focused coping methods. To help illuminate whether Reactors are less perceptive of initial physiological changes, subjects who experienced symptoms associated with vasovagal reactions were asked to indicate at which point of the donation procedure these symptoms were first noticed. It was expected that Non-Reactors who experienced symptoms would have noticed them at an earlier stage of the procedure than did the Reactors, thus reflecting a quicker awareness of their reactions.

The information regarding point of first awareness of physiological reactions was also expected to help determine which of the two models of syncope causation is more accurate. The motor inhibition account would be favoured if subjects reporting symptoms indicated experiencing the greatest number of symptoms before or during phlebotomy. However, if the subjects indicated most symptoms occurring after cessation of the threat (i.e., after needle removal) the abatement account would be favoured.

Recordings of various physiological indices were made during the video presentation/reliving experience. It was expected that these

recordings would indicate that Reactors were experiencing simultaneous sympathetic and parasympathetic activation while they viewed the video and relived their donation experiences. Such results would be consistent with the motor inhibition account of vasovagal causation.

Hyperventilation. Individuals prone to hyperventilation have also been found to be prone to syncope-like reactions (Herman, Stickler, & Lucas, 1981). Breathing disturbances have not been advanced as a major cause of blood donors' syncope reactions, but recent evidence indicates that maladaptive breathing patterns may be a central feature in panic attack (see Ley, 1985), and that breathing has a strong influence on cardiac activity (e.g., Respiratory Sinus Arrhythmia; Grossman & Svebak, 1987). Accordingly, Reactors were expected to show a greater propensity to hyperventilate or report breathing problems than were the Non-Reactors.

Somatic Sensitivity. Vingerhoets and Schomahen (1985) have reported that syncope prone individuals score more highly on the hypochondriasis scale of the MMPI than do controls. On the basis of this finding, the Reactors were expected to report greater general somatic sensitivity than the Non-Reactors (i.e., to be more concerned about or bothered by physiological processes or minor illnesses). Similarly, during the Valsalva maneuver, Reactors were expected to report that their physiological activity underwent greater changes than did the Non-Reactors. This higher degree of autonomic awareness scores may be due to actual greater physiological responses or may represent misinterpretations of the severity of these responses.

Panic Attacks. Hyperventilation and the catastrophic

misinterpretation of certain bodily sensations have both been suggested as playing major roles in the production of panic attacks (Clark, 1986; Holmes, McCaul, & Solomon, 1978). The similarity between panic attacks and vasovagal reactions in terms of the importance hyperventilation and somatic sensitivity may play in their respective causations led to the investigation of whether Reactors would indicate greater histories of panic-like attacks than the Non-Reactors.

Sex Effects. Previous studies provide unclear evidence concerning the relationship between sex, fear, and fainting, suggesting the need to investigate possible sex differences. For example, whereas some report that females are more likely to faint than males (Kleinknecht, 1987), others report that males are more prone to fainting (Engel, 1978). Thus, although the investigation of sex differences was not considered a central feature of the present study, this factor was included in the design.

Finally, it is important to note that syncope did not occur in our previous investigations in which fainters imagined scenes involving blood, injections, injuries and other aversive stimuli (Schwartz, Adler, & Kaloupek, 1987). Accordingly, full-blown syncope reactions were not expected in this study; rather, attenuated responses such as lowered heart rate were anticipated.

Method

The study consisted of two stages. The first stage was conducted in a mobile blood donation clinic conducted by the Canadian Red Cross at Concordia University. This first stage enabled subject selection and some preliminary data collection. The second stage took place in a laboratory setting in which more refined self report and physiological data were collected.

Stage I

Subjects

The subject recruitment procedure generally matched that reported by Kaloupek et al. (1985). Volunteer blood donors were observed by an experimenter who monitored the donation area for signs of donor syncope reactions. Donors who experienced a vasovagal reaction (Reactors) were identified when, during phlebotomy, their chairs were moved from the standard semi-reclined position to a fully reclined position (with feet elevated) by the attending nurse. A matched control group (Non-Reactors) consisted of the donors who were each the first non-reacting (i.e. semi-reclined throughout phlebotomy) donor of the same sex to be served by the same nurse following identification of a reacting subject. Of the 660 people who donated blood at the clinic, 37 (5.6%) were identified as Reactors and 33 agreed to participate in the study's first stage. The four Reactors who declined participation seemed to have suffered severe reactions; two actually experienced convulsions. Of the 33 participating Reactors, 28 signed forms allowing future contact to discuss possible participation in the study's second stage. Thirty-five of the 37 identified as Non-Reactors participated in Stage I, with 30 of

these agreeing to possible future contact.

Procedure

Potential subjects were approached (after they had enough time to recover on the rest cots following donation) and asked to participate in an experiment investigating the psychological and physiological reactions of blood donors. They were informed that participation was voluntary and not required as part of the Red Cross procedure. Those who indicated interest were then given a consent form which provided brief procedural details and assured the confidentiality of any information obtained (see Appendix A). After signing the form, subjects were provided with a packet of questionnaires to be completed in a semi-secluded refreshment area adjacent to the blood donor clinic area. Subjects were offered donuts and soft drinks and asked to sit alone at cafeteria style tables while completing the forms.

The last item included in the questionnaire packet informed subjects of plans for future research and requested their consent for possible future contact (see Appendix A).

Materials

The questionnaire packet completed by subjects during the study's first stage included the Blood Donor Questionnaire, the two versions of the Dimensional Coping Checklist, and the Affect Scale (see Appendix A).

Blood Donor Questionnaire. This questionnaire included a personal data sheet which requested information regarding the subject's age, sex, height, weight, and whether they were experiencing any chronic or acute illness. It also requested information on recent behaviours relevant to the subjects' current physical state (e.g., recent food, cigarette,

coffee/tea consumption and sleep duration; see Appendix A), and information about subjects' previous blood donation experience and syncope history.

A series of syncope questions asked subjects to report whether they had ever become weak, dizzy, or faint in nine specified situations involving either blood/injury or social evaluation stimuli. The questionnaire also provided a list of 11 sensations commonly associated with syncope reactions and subjects were asked to indicate which sensations they experienced and whether a sensation occurred before needle insertion, during the actual donation, and/or after needle removal. For each sensation listed, subjects received a score of 0 if they reported not experiencing the sensation, a score of 1 if it was experienced in only one stage of the donation procedure (e.g., before needle insertion), a score of 2 if in two of the stages, and the highest score of 3 if the sensation was present throughout the three stages. Thus the scores reflected not only the presence of the sensations but also their strength in terms of duration.

Each subject was also asked to report on their sense of control, anxiety level, and sense of anticipatory threat regarding potential physical or psychological harm. These assessments were conducted by having the subjects make vertical marks through ten centimeter scales presented as horizontal lines anchored with contrasting statements at either end (e.g., "no control" and "complete control"). Scores were obtained by measuring the distance (in cm) between the beginning of the line and the vertical mark drawn by the subject.

Dimensional Coping Checklist (DCC). The DCC is a newly developed

measure of coping methods. There are both global and specific versions of the measure. The two versions are virtually identical, differing only in that the former was used to assess coping efforts over the entire blood donation procedure, whereas the latter assessed coping efforts made just before needle insertion (see Appendix A). Scores were calculated for each DCC form relative to three primary coping dimensions. The first score indicated the object of focus (environment vs. self); the second indicated the main direction of coping in relation to the object of focus (approach vs. withdrawal); and the third addressed the form of coping production (active vs. passive). Both versions of the DCC consisted of the same 24 phrases which subjects were to endorse if the statement described their thoughts or actions during the target segment of the blood donation. Each phrase had the potential to contribute to the assessment of one or more of the coping dimensions. For example, the phrase "I was trying to find out more information" was coded as an active approach coping effort with environment focus (see Appendix A for scoring details).

Affect Scale. This scale asked subjects to indicate which adjectives, chosen from a list, predominated while the nurse was making preparations to insert the needle (see Appendix A). The list of adjectives was compiled following recommendations made by Watson and Tellegen (1985) who demonstrated that a basic two-dimensional structure of affect emerges through reanalysis of a number of studies of self-reported mood (see Appendix A). They concluded that these two consensual factors, which they call Positive Affect and Negative Affect, represent the major dimensions of emotional experience. These two

dimensions - running from low to high extremes - are orthogonal to each other, with responses to words at the opposite pole on the same dimension negatively correlated with each other. Watson and Tellegen include two additional orthogonal dimensions in their representation of mood experience which lie at 45 degree angles to the Positive Affect and Negative Affect dimensions. These dimensions, labeled Engagement and Pleasantness, contain mood terms which are not pure markers of either Positive or Negative Affect, but rather represent a mixture of the purer dimensions. Although Watson and Tellegen choose to call the third dimension the Engagement factor, they clearly see it as an arousal dimension. The Affect Scale is scored to reflect each of Watson and Tellegen's four dimensions (see Appendix A for scoring details).

Stage II

Subjects

Stage I subjects who indicated interest in future participation were contacted by telephone. To help ensure that Reactors' symptoms during their recent blood donation were not due to weakness caused by low food intake, only those 24 who had eaten within 8 hours of donation were solicited. Telephone contact involved a brief description of the upcoming study in accordance with a standardized contact statement (see Appendix B) and notice that a more detailed description would be offered upon arrival at the laboratory, after which they could decide whether to participate further or not. Potential Stage II subjects were told they would receive a $2 payment if they decided not to participate after hearing the more detailed explanation and a $10 payment if they chose to participate, even if they did not complete the entire procedure.

Appointments were made with interested individuals, and they were asked not to consume any products containing caffeine, alcohol or nicotine for two hours prior to their appointment.

The Reactor group tested during Stage II consisted of 14 subjects (7 male, 7 female). The individuals who compose the Reactor group tested in Stage II were the only Reactors who expressed strong interest in participating in the study's second stage and who came to the laboratory to receive a more detailed explanation. The control group consisted of 14 subjects who had been identified as Non-Reactors during Stage I; they were approximately matched to Reactor subjects in terms of age, sex, and number of prior blood donations. Twenty of the 30 Non-Reactors from Stage I who had agreed to future contact were phoned in order to form the group of 14 Non-Reactors tested during Stage II. No subjects declined participation in Stage II after hearing the more detailed explanation.

All potential subjects were screened for any acute or chronic disorders that require medication or that significantly affect either the autonomic nervous system in general or the cardiovascular system in particular. No individuals had to be excluded from participation on this basis.

Apparatus and Physiological Measures

Stage II of the study was conducted in two adjoining temperature regulated rooms - an experimental and a control room. The experimental room contained a comfortable armchair for the subject, a table, a 20-inch colour video monitor, a video cassette recorder (VCR), a microphone, a camera, and connectors for the physiological transducers. The control room contained a Coulbourn Model S16-17 recorder interfaced to an IBM

Personal Computer, a Lafayette Instruments (Model 76101) polygraph, an intercom communicating with the experimental room. A one-way mirror allowed observation of the subject from the vantage of the control room. Subjects were seated in a semi-reclined position similar to that used in the blood donation clinic. The centre of the television screen on which a video was presented was slightly above eye level for most seated subjects and 5 1/2 feet from the recliner's headrest when the chair was in the semi-reclined position.

Physiological recording equipment was attached to measure the following variables: heart rate (HR), skin conductance (SC), and digit temperature (DT). HR was recorded using three Beckman Dyna/trace ECG electrodes, one placed on each of the subject's ankles and one placed below the collar bone on the left side. The signal was processed through a Coulbourn Model S75-01 high gain bioamplifier and Model S77-26 cardiotachometer. SC was recorded via Beckman standard silver/silver chloride electrodes (#650951; 16mm diameter), filled with Unibase creme (Parke-Davis) that was prepared following the recommendations of Fowles et al. (1981). The electrodes were attached by adhesive collars at adjacent sites on the hypothenar eminence of the non-dominant hand. The signal was processed by a Coulbourn Model S71-22 constant voltage (0.5V) skin conductance coupler. DT was recorded using a thermistor sewn into a glove worn on the subject's non-dominant hand. The thermistor was pressed against the middle phalanx of the subject's middle finger. The signal was processed by a Coulbourn Model S71-30 temperature coupler. All psychophysiological signals from the Coulbourn recorder amplifiers were additionally processed by an IBM Personal Computer, using A-D

conversion, via a Coulbourn Lablinc interface system.

All three physiological measures were sampled at five Hz for 30 second periods, resulting in 150 data values. Custom designed Lotus 1-2-3 spreadsheets were used to calculate the various physiological indices examined in the study. The HR beats per minute for each sample was determined as an estimate based on the actual number of heart beats in a 30 second sample multiplied by 2. The cardiotachometer data were further analyzed to calculate variability in terms of the mean successive absolute difference between values sampled at one second intervals. Also calculated was the mean amplitude of voltage changes between trough and peak of heart rate cycles expressed in a beats per minute equivalent. This index is believed to reflect the level of parasympathetic activation.

The raw skin conductance data were used to calculate the mean SC level (SCL) by averaging the 6 values which were the lowest in each consecutive 5 second period in the sample. SC response frequency (SCR-Freq) was calculated by locating all upward deviations in values which were greater than or equal to 0.1 micromhos and which moved from inflection to peak points within one second for each 0.1 micromhos of amplitude (to a maximum of five seconds). An assessment of the power of SC responses was also desired. Accordingly, the mean SCR rise rate per second (SCR-Rise) was determined by dividing each response amplitude by the interval between inflection and peak (to the nearest 200 msec) and then averaging these individual rise rate values for a 30 second period. Skin conductance data was used to assess sympathetic activation.

The raw digit temperature data were used to calculate mean

temperature based on the average of the highest value in each of six consecutive 5 second periods. An index for the proportion of increases (DT-Inc) was calculated, based on the percentage of the 150 sample values (excluding the first) which showed increase relative to the preceding value. This index was intended to reflect responsiveness of DT related to release of efferent sympathetic activity.

The specific rationale for using these physiological measures included the well established HR reaction associated with syncope, the potential value of skin conductance as an index of physiological inhibition (Fowles et al., 1980) that may relate to conservation/withdrawal forms of coping, and the ability of DT to provide an indication of peripheral resistance. Peripheral resistance to blood flow can provide valuable information regarding the subject's reactions to stress because changes in blood flow through skin arterioles are a result of sympathetic reactivity (Vander et al., 1973). Furthermore, this physiological function has been reported to decrease in blood phobics - a group showing a high incidence of syncope (Glick and Yu, 1963). More generally, these three physiological measures are among the most frequently used indices of physiological arousal in anxiety research. Heart rate and electrodermal measures in particular are believed to be relatively valid measures of anxiety (Hersen and Bellack, 1985).

Procedure

Upon arrival at the laboratory, subjects were greeted by a male experimenter and given a consent form (see Appendix B) which explained that the experiment was designed to measure their physiological reactions

while watching a video depicting a blood donation. The consent form included a brief section to assess comprehension. Information that was not initially understood was explained in more detail by the experimenter.

After signing the consent form, each subject completed the Research Participant Form, the Personal Illness Questionnaire, the Donor Memory Test, and the Situation Appraisal Rating Scale (see Appendix B). After the subjects completed these scales, they reviewed with the experimenter the rating scales to be completed during the video presentation. The physiological recording attachments were made when subjects indicated complete understanding of their tasks.

Subjects were led to believe that a female co-experimenter was helping the male experimenter operate the physiological recording equipment behind the one-way mirror in the control room. This deception was intended to reduce any bias introduced by the fact that only a male experimenter conducted the study. Subjects were again asked to try to remember and relive their last blood donation experience using the video as a memory aid. The experimenter then left the room and calibrated the physiological recording equipment. All further instructions were relayed on the video cassette presentation itself.

When calibration was complete, the video presentation began with a two-minute practice segment depicting an individual going through the initial stage of the blood donation procedure (i.e., presenting their Red Cross card and completing intake forms at the check-in table). Immediately after this practice segment, subjects completed the same types of measures they were to encounter following each segment of the

remaining video presentation (i.e., the Abbreviated Dimensional Coping Scale [Brief DCC] and the Absolute State Ratings; see Appendix C). This allowed subjects to become accustomed to the rating procedures and to resolve any difficulties or questions before proceding further.

Next the subjects completed a 10-minute rest period during which they were to sit quietly with their eyes open until instructions were delivered for the next phase of the experiment. A 30-second sample of the three physiological measures was recorded immediately after 10 minutes of the baseline period elapsed. After this sample was recorded, subjects were again asked to complete the Brief DCC and the Absolute State Ratings.

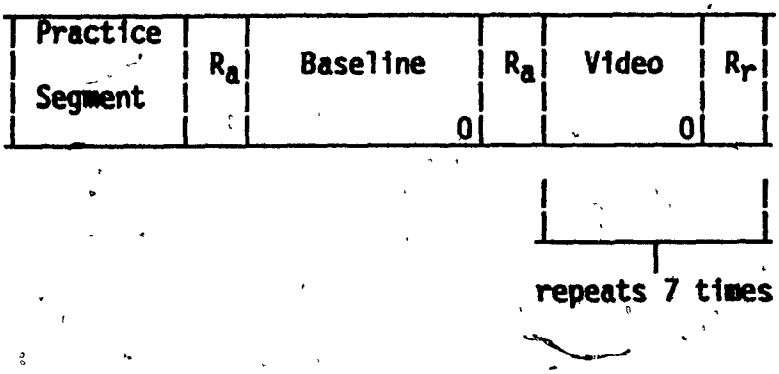
The full video presentation began after completion of the Absolute State Ratings (A description of the film content can be found in Appendix C). Subjects were purposely not told that they should try to watch as much of the film as possible - a common direction in reliving or exposure studies - because such instructions might have influenced their coping methods. Subjects were, however, informed that if it became too uncomfortable to watch the video, they could stop it by simply requesting aloud that it be stopped. They were reminded that premature termination would not affect payment for participation.

During the video presentation, 30-second recordings of physiological measures began at the following points: (1) the start of the general clinic procedure (i.e., I.D. check), (2) 15 seconds before the start of the preliminary finger-tip blood sample, (3) 15 seconds before needle insertion, (4) 85 seconds into the phlebotomy, (5) three and a half minutes into the phlebotomy, (6) the start of needle removal, and (7) one

minute after the start of the mandatory rest period. At the end of each of these sampling periods, the video showed a blank screen at the start of which the subjects were prompted to complete the Brief DCC and the Relative State Ratings (Appendix C). Figure 1 presents a time line which illustrates the sampling for each measure throughout the video presentation.

Following the video presentation subjects were asked to complete two versions of both the Dimensional Coping Checklist and the Affect Scale. During this period they also completed the Ailment Questionnaire, the Reliving Ratings, and a second Situation Appraisal Rating Scale (see Appendix D).

After all previously described assessments were completed, the subjects were asked to perform a Valsalva maneuver. The Valsalva test procedure followed that used by Coghlan et al. (1979). Initially, subjects were asked to sit quietly with their eyes open for 3 1/2 minutes. Three minutes into this rest period, a 30-second physiological sample was recorded to serve as a baseline for samples taken during the Valsalva maneuver, which began immediately after the baseline recording. During the Valsalva maneuver, subjects were guided by cues provided by the experimenter to take a deep breath for a period of five seconds and then expire against a specially designed tube and mouth piece. They were instructed to maintain a pressure of approximately 30 mmHg on a gauge in front of them for 15 seconds. Subjects were asked to sit quietly for a two minute period immediately following their 15 second exhalation. To help control for varying inspiratory reserve volumes, just before performing the maneuver the subjects had been briefly trained how to



Key

R_a = Brief-DCC and Absolute State Ratings

R_r = Brief-DCC and Relative State Ratings

O = Physiological recordings (HR, SC, DT)

Figure 1. Time line illustrating the sampling for each measure throughout the video presentation.

inhale deeply for a five second period prior to their 15 second exhalation.

The entire Valsalva procedure was divided into four sample periods of 30 seconds duration for the purposes of analysis. The first was the pre-maneuver baseline period, the second began at the point of forced expiration, the third began 50 seconds after release, and the fourth began 115 seconds after release.

The work-sheet calculated the minimum HR from the initial 10 seconds of the second sample period (Minimum Phase I HR); the maximum HR from the initial 16 seconds of the sample (Maximum Phase Two HR); the maximum HR from the final 14 seconds of the sample (Maximum Phase III HR); and identified the minimum HR values for each of ~~the~~ final three 5 second periods in the second sample (Minimum Phase IV HR). These four periods correspond to those suggested by Eckberg et al. (1983). The work-sheet was also used to calculate the overall mean HR for the sample based on all 150 cardiotach values and the Average HR from the cardiotach values for each of the six consecutive 5 second periods of the sample. These Average HR values generated for each of the three sample periods occurring after baseline (i.e., Valsalva maneuver, post-maneuver I, post-maneuver II) were examined to determine the point at which subjects' HRs returned to their baseline overall Mean HR. This value, expressed in seconds, was termed the Valsalva Recovery Time.

After finishing the Valsalva maneuver, subjects completed the Valsalva Questionnaire, a measure designed to assess the degree of awareness of changes in specified body sensations. Finally, subjects were asked to complete the Mass Testing Battery (see Appendix F), a set

of questionnaires used in a recent study of human fear dimensions (Schwartz et al., 1987).

After all these forms were completed, the recording attachments were removed and the subjects were debriefed as to the purpose of the study. They were informed that there never was a female co-experimenter present and were given an explanation for the deception. In the end they were thanked for their participation and received their payment.

Materials

Research Participant Form. This form included questions about the subject's age, sex, and recent behaviours relevant to their current physiological state (e.g., recent food consumption, sleep duration). The form also asked whether the subjects had donated blood again since they took part in Stage I of the study, and it included screening questions to determine if subjects were experiencing any disorders or taking any drugs which could significantly affect their cardiovascular system or autonomic nervous system (see Appendix B).

Personal Illness Questionnaire (PIQ). The PIQ is a fear measure developed by our laboratory for use in medical settings. This questionnaire consisted of 14 statements, and subjects were asked to endorse those they considered a correct description of themselves (see Appendix B). Principal components analysis has shown that the questionnaire has three factors that have been labelled Medical Procedures Fear, Disease Fear, and Somatic Sensitivity (Kaloupek, Schwartz, & Adler, 1986). As the labels indicate, the first factor reflects fear of medical procedures, the second factor reflects fear of succumbing to a major disease, and the third reflects sensitivity to

physical sensations or symptoms.

Donor Memory Test. This form assessed the accuracy and extent of recall of the blood donation procedure. The test consisted of 15 statements describing particular steps or events in a blood donation procedure. Subjects were asked to indicate which events they remembered experiencing during their own donation during Stage I. Of the 15 events listed, only eight could have possibly occurred in the highly standardized donation procedure set out by the Red Cross. The remaining seven events were listed as filler items. A subject's score on the Memory Test was calculated by subtracting the number of incorrect answers (false positives and false negatives) from the number of correct answers (true positives). Negative scores were changed to zero so that the range of possible scores was 0 to 8 (see Appendix B). The Memory Test was included because avoidant and/or less experienced donors may have had a less vivid memory of their donation experience that might impede reliving.

Situation Appraisal Rating Scales (SARS). Two versions of the Appraisal Ratings Scales were used in Stage II, one administered before the video presentation and one after the presentation. Both versions provided an assessment of how subjects viewed the experience along themes of Self Control, Situational Control, Threat, and Challenge. However, the version completed by subjects after they had actually experienced the laboratory procedure (version B), assessed how they would view the reliving experience again if they had to go through it again. In completing the SARS subjects rated 10 bipolar items composed of contrasting statements at the ends of 10 cm lines. They placed a mark

across each line to indicate the degree to which one statement better reflected their views regarding the upcoming situation. Each statement pair was associated with one of the four appraisal targets: (1) potential for situational control, (2) potential for self control, (3) potential threat, and (4) potential challenge. The scores for the statement pairs associated with each appraisal target were added together and the average represented the subject's score along that particular appraisal theme (see Appendix B for scoring details).

Abbreviated Dimensional Coping Scale (Brief DCC). The Brief DCC was adapted from the 24-item DCC. The Brief DCC provides a quick assessment of the three coping dimensions, i.e., Focus, Direction, and Production. Subjects rated four bipolar items composed of contrasting statements at the ends of 10 cm lines by placing a mark across each line to indicate the degree to which one statement better described their thoughts or actions during a specified time during the experiment. For the first item, both statements reflected Environment focused and Approach directed coping efforts, but they differed on the Production dimension, with one reflecting a passive coping effort and the other an active effort. The statements for the second item differed only on the Focus dimension, with one statement reflecting a self-focused coping effort and the other an environment-focused effort. The third and fourth statement pairs had poles that differed on the Direction dimension (i.e., Approach vs. Withdrawal). Scores were obtained by dividing the 10 cm lines into 5 segments of 2 cm each and then judging in which segment the subject's hand drawn mark was placed. Segments were numbered from one to five starting from the left pole (see Appendix C).

State Ratings. Two types of State Ratings were completed during the study (Absolute and Relative). Both ratings addressed subjects' levels of anxiety, physiological arousal, and distress. The Absolute Ratings had subjects report both their current levels and how these levels compared to how they usually feel while relaxing quietly at home. The Relative State Ratings sought the same information as the Absolute State Ratings, except that subjects rated their current state relative to how they felt at the end of the rest period held before the laboratory reliving experience. Ratings were made by having the subjects make vertical marks through ten centimeter scales presented as horizontal lines anchored with contrasting statements at either end. Scores were obtained by measuring the distance in centimeters between the beginning of the line and the vertical mark drawn by the subject (see Appendix C).

Dimensional Coping Checklists - Lab (DCC - Lab). The Global and Specific versions of the DCC used in the second stage were virtually identical to those used in Stage I, differing only in the context of application. That is, both Stage II questionnaires referred to the subjects' coping methods used while watching the video presentation rather than while going through the actual blood donation procedure. Whereas the Global version addressed methods used throughout the presentation, the Specific version targeted methods used just before the video depicted the needle insertion. The scoring methods were the same as those used for Stage I DCC data (see Appendix D).

Affect Scales. The Global and Specific versions of the Affect Scale used in Stage II were essentially the same measures as the Affect Scale used in Stage I. The Stage II Affect Scales, however, had been revised

with easier-to-understand instructions. The Global version of the scale was in reference to the subjects' feelings during the entire video presentation, whereas the Specific version addressed the subjects' emotional states just before the needle insertion depiction in the video. The scoring methods were the same as those used for the Stage I Affect Scale data (see Appendix D).

Ailment Questionnaire. This scale determined the extent to which subjects had ever suffered from 16 different physical disturbances or ailments. The sixteen disturbances or ailments were chosen on the basis of evidence that they may be related to imbalances in the activity of the autonomic nervous system (Barr, 1979; Masuda et al., 1966; Vander et al., 1975). The extent of disturbance was indicated on ten centimeter bipolar analogue scales ranging from an assessment of never having experienced the disturbance/ailment to it being always present. Scores were obtained by measuring the distance in centimeters between the beginning of the line and the vertical mark drawn by the subject (see Appendix D).

Reliving Ratings. The subjects were asked to indicate the degree to which they were able to relive the blood donation experience while watching the video. Subjects placed marks on ten centimeter bipolar analogue scales reflecting the highest and average degree to which they felt they were actually re-experiencing their Stage I blood donation and the degree to which they were able to recall that donation (see Appendix D). Scores were obtained by measuring the distance in centimeters between the beginning of the line and the vertical mark drawn by the subject. The Reliving Score was determined by averaging the subject's responses to the three bipolar analogue scales which compose the Reliving

Ratings.

Valsalva Questionnaire. This questionnaire assessed the subjects' degree of awareness of changes in specified body sensations, chosen because of their probability of occurring during performance of a Valsalva maneuver. The ratings were made on ten centimeter bipolar analogue scales ranging from no change to large change (see Appendix D). Scores were obtained by measuring the distance in centimeters between the beginning of the line and the vertical mark drawn by the subject. An average score across all the ratings was included as part of the information derived from the questionnaire.

Mass Testing Battery. This set of questionnaires (see Appendix E) was previously used in the mass testing of 700 Concordia University students for the purpose of examining various dimensions of human fear (Kaloupek et al., 1986; Schwartz et al., 1987). Included in the packet were the Mutilation Questionnaire (MQ; Klorman, Weerts, Hastings, Melamed, & Lang, 1974), the Fear of Negative Evaluation Questionnaire (FNE; Watson & Friend, 1969), the Zung Depression Scale (ZDS), the Nijmegen Hyperventilation Questionnaire (NHQ), and the General Information Sheet. There were two reasons for including this battery in the present study. The first reason was to compare subjects in the present study to the larger population of subjects recruited in the previous study. These comparisons will not be discussed here. The second reason for including the questionnaire battery was that a subset of the information obtained by the packet was considered relevant to the present study. This subset consisted of the MQ, FNE, NHQ, and certain questions which were part of the General Information Sheet.

The MQ was used to assess general bodily-injury fear (Klorman et al, 1974). It consisted of 30 true/false statements regarding being bothered or frightened by blood, illnesses, and/or injuries. Six scores were derived from the MQ data: The MQ-Total score reflected the total number of fear statements endorsed by the subjects; the MQ-Blood score reflected the percentage of blood fear related statements the subject endorsed; the MQ-Accident score reflected the percentage of fear of viewing accidents related statements endorsed; the MQ-Medical score reflected the percentage of fear of medical situations statements endorsed; the MQ-Inject score reflected the percentage of fear of injection statements endorsed; the MQ-Cut score reflected the percentage of fear of body cuts statements endorsed (Kaloupek, Peterson, & Levis, 1981).

The FNE was used as a measure of general social fear (Watson and Friend, 1969). It consisted of 30 true/false statements regarding worry, upset, or fear related to various social situations. The FNE Total score indicated the number of statements endorsed by the subject. Scores could range from 0 to 30, with higher scores reflecting greater fear.

The NHQ consisted of 16 physical symptoms whose frequency of incidence could be indicated on a 5 point ordinal scale (1 = never, 5 = frequently). This questionnaire has been used as a screening instrument for the early detection of the hyperventilation syndrome (HVS; Dixhoorn & Duivenvoorden, 1985). Nonparametric principal components analysis has indicated the questionnaire structure to be three-dimensional, the dimensions being labelled: Shortness of breath, Peripheral tetany, Central tetany (Dixhoorn & Duivenvoorden, 1985). The first component has to do with difficulties with breathing and constitutes the core of HVS.

The second and third components address the specific consequences of excessive ventilation in relation to the individual's current metabolism (i.e., the phenomena summarized under the physiological concept of tetany). The peripheral manifestations of this tetany are relatively independent of the respiratory difficulties and of the central manifestations, and are assessed by the second component. The third component assesses the manifestations of central tetany. All three components have shown a high ability to differentiate between sufferers and non-sufferers of HVS (Dixhoorn & Duivenvoorden, 1985).

The questions of the General Information Sheet considered important in the present study were those addressing the subjects' experiences with syncope reactions and panic attacks, their frequency of blood donation within the last two years, and whether they were frightened by small animals (e.g., spiders and snakes). The assessment of the subjects' histories of vasovagal reactions, although similar to information obtained during the first stage of the study, went further than the first by also determining the frequency of reactions within the past year and the length of time since the subjects' first such experience. A similar group of questions asked subjects whether they had ever experienced panic attacks, and if they did, how many in the past year, in the past three weeks and the length of time since their first attack. The information regarding the fear of small animals was considered important because this fear has been associated with the presence of BI fear (Kaloupek et al., 1986).

Results

Stage I - Clinic Data

Stage I analyses were conducted only on data derived from the 28 subjects who took part in both stages of the study. Initial analysis involved two-way (Type X Sex) analyses of variance (ANOVAs) comparing the Reactor to the Non-Reactor groups and females to males. The primary focus of these initial analyses was the Type comparisons. Sex comparisons and interaction effects were of secondary interest, and results of these will be discussed only when significant differences or non-significant differences of particular interest were revealed. Dichotomous variables were analyzed by performing chi square analyses using Yates' correction for continuity due to the small sample size. Tables and discussion within the text are restricted to a presentation of significant findings ($p < .05$) or non-significant findings of particular importance. All statistical tests in the Results section are two-tailed. Non-significant results not discussed or presented in the text can be found in appendices which are referred to within the text.

Data analysis was first directed at determining whether the Reactor and Non-Reactor groups were comparable in terms of variables which could affect physiological reactions during blood donations. The results of analyses for background variables such as demographic and physical characteristics and physical state prior to blood donation are presented in Table 1. No differences were found between the groups on background variables which could affect current physiological functioning except for two unexpected findings (see Tables 1 and 2). The Reactor group reported marginally less sleep for the previous night and marginally less

Table 1

Comparisons between Reactors and Non-Reactors on demographic and physical state variables for Stage I

	Reactors (n = 14)		Non-Reactors (n = 14)			
Variables	Mean	SD	Mean	SD	F-value	p <
Age	23.80	2.08	21.80	5.82	1.41	NS
Height (inches)	67.00	4.02	67.40	3.40	< 1	NS
Weight (pounds)	137.60	24.53	143.30	25.08	< 1	NS
Body Mass Index (H^2/W)	4.40	.58	4.51	.54	< 1	NS
No. previous blood donations	3.07	2.27	6.79	6.62	3.71	.07
Sleep duration previous night (hr.)	6.86	1.03	7.50	.85	3.12	.09
No. cups coffee/tea	.71	.83	1.64	1.65	3.57	.08
Hours since last meal	2.70	1.68	3.60	2.10	1.38	NS
No. cigarettes smoked	.36	1.08	2.93	6.57	1.99	NS
No. dizzy episodes due to emotion	2.93	3.41	.86	1.41	5.91	.03
No. times unconscious due to emotion	.36	1.08	.07	.27	< 1	NS
No. dizzy episodes in blood/injury situation	.13	.20	.10	.18	< 1	NS
No. dizzy episodes in social evaluation situation	.10	.17	.12	.21	< 1	NS

Table 2

Comparisons between Reactors and Non-Reactors on dichotomous demographic and physical state variables for Stage I

Variables	Reactors (n = 14) %	Non-Reactors (n = 14) %	Yates' X^2	p <
Tired during donation	36	21	.18	NS
Drink coffee/tea	71	79	.00	NS
Hungry during donation	36	43	.00	NS
Smoke cigarettes	21	36	.18	NS
Have chronic health condition	7	0	.00	NS

coffee/tea consumption the day of donation than did the Non-Reactor group (see Table 1).

Given that both sleep duration and coffee/tea intake may influence physical state (Pincomb, Lovallo, Passey, Brackett, & Wilson, 1987), it was appropriate to consider both of these variables as potential covariates for analyses of state variables such as anxiety, symptoms, etc. However, only sleep duration was used as a covariate for subsequent analyses of Stage I variables based on two considerations. First, these two variables were found to be marginally correlated with each other ($r = -.27$, $p < .10$) so that some redundancy was likely. Second, it was possible that the Reactors' lower caffeine consumption reflected a general tendency to limit stimulant intake, and that covarying such a variable would negate important differences between groups. (The results of the ANCOVAs applied to Stage I data using sleep duration as a covariate which are not presented in text can be found in tabular form in Appendix G.)

Non-State Variables of the Blood Donor Questionnaire

Although attempts had been made to match the Reactor and Non-Reactor groups on previous blood donation experience, the Reactors still averaged marginally fewer previous donations. The Reactor group also reported a higher frequency of dizziness episodes, although there was no significant difference between the groups on the number of times they had been faint to the point of unconsciousness. Analyses of the subjects' syncope histories in the nine situations described on the questionnaire consisted of aggregating the situations into two groups: those depicting blood/injury fear (BI fear) and those depicting social evaluation. No

differences between the Reactor and Non-Reactor groups were found with regards to the life-time frequency of experiencing dizziness or fainting in either type of situation (see Table 1).

In terms of sex differences, the only noteworthy finding was that females (M = 3.07, SD = 3.41) had a greater history of dizziness episodes than did the males (M = .71, SD = 1.14; F = 7.65, $p < .01$).

State Variables

Blood Donor Questionnaire. The application of two-way (Sex by Type) ANCOVAs using sleep duration as a covariate revealed that Reactors endorsed more symptoms associated with vasovagal reactions than the Non-Reactors, thereby supporting the criterion used to establish group membership. Specifically, the Reactors received higher scores on the symptoms of weakness, dizziness, light-headedness, and (marginally) nausea than did the Non-Reactors, thus indicating a greater presence (both in terms of frequency and duration) of these symptoms (see Table 3 for summary information pertaining to the Blood Donor Questionnaire). No significant difference was found on the symptom of disturbed or lost consciousness because only one subject, a Reactor, endorsed this symptom. Follow-up analyses indicated that the groups did not differ in terms of the phase of the donation procedure when syncope symptoms (if any) were first experienced.

The Reactor group on average reported a greater sense of threat regarding potential physical harm. The two groups did not differ significantly on their level of predonation anxiety, concern with social threat (e.g., fear of embarrassment), or their sense of control over either the situation or themselves (see Table 3).

Table 3

ANCOVA Comparisons between Reactors and Non-Reactors on Stage I State variables using sleep duration as a covariate

Variables	Reactors (n = 14) Mean	SD	Non-Reactors (n = 14) Mean	SD	F-value	p <
No. vasovagal symptoms experienced during donation	2.86	1.96	1.14	1.10	7.34	.02
Experience of weakness	.86	.77	.29	.47	9.80	.01
Experience of dizziness	.79	.80	.21	.58	4.28	.05
Experience of light-headedness	1.00	.68	.36	.63	4.08	.05
Experience of nausea	.43	.51	.07	.27	3.02	.10
Experience of disturbed or lost consciousness	.07	.27	.00	.00	1.91	NS
Period in which symptom(s) first noted[a]	1.93	.75	1.78	.63	< 1	NS
Predonation anxiety level	3.64	2.59	2.07	2.46	2.68	NS
Appraisal of harm potential	2.64	2.95	.57	.93	5.42	.03
Embarassment concern	1.07	1.59	.50	1.61	1.31	NS
Sense of situational control	5.93	2.56	6.57	2.68	< 1	NS
Sense of self control	6.36	2.56	8.21	2.63	2.66	NS

[a] Reactors n = 14; Non-Reactors n = 9

A chi square analysis revealed one significant sex difference with fewer women (7%) than men (50%) reporting that they were tired during the donation ($x^2 = 6.2$, $p < .01$).

Coping Measures. Analyses applied to the global version of the DCC indicate that Reactors endorsed self-referent statements reflecting both a withdrawal direction of coping and a self-focused coping style significantly more often than did the Non-Reactors. Clearly the difference between groups on the Direction of Coping dimension was mainly due to the Reactors endorsing significantly more statements associated with withdrawal than did the Non-Reactors because there was no significant difference between the groups on the endorsement of statements associated with approach. Reactors also endorsed a greater number of statements, suggesting more varied coping efforts (see Table 4).

The specific version of the DCC provided similar results. Reactors endorsed a withdrawal method of coping significantly more often than did the Non-Reactors and focused on themselves just prior to needle insertion more so than did the Non-Reactors. As with the Global version, the difference between groups on the Direction of Coping variable was mainly due to the Reactors greater endorsement of statements associated with withdrawal, not due to a difference in endorsements of statements associated with approach. Unlike the Global DCC, the two groups did not differ on the total number of statements they endorsed (see Table 4).

Affect. There were no significant differences for any effect in the analysis of the four dimensions of the Affect Scale (see Table 5).

Table 4

ANCOVA Comparisons between Reactors and Non-Reactors on Stage I DCC ratings using sleep duration as a covariate

Variables	Reactors (n = 14) Mean	SD	Non-Reactors (n = 14) Mean	SD	F-value	p <
Global version						
Direction of Coping (Approach vs Withdrawal)[a]	50.03	9.59	58.50	7.08	4.50	.05
Level of Withdrawal Coping (subscale)	27.92	16.13	10.39	10.61	10.44	.004
Level of Approach Coping (subscale)	27.98	14.84	27.38	13.65	< 1	NS
Level of Self-Focus Coping (subscale)	24.49	22.00	9.18	10.64	3.98	.05
No. statements endorsed	6.43	2.79	4.43	2.31	5.52	.03
Specific version						
Direction of Coping (Approach vs Withdrawal)[a]	47.38	10.54	57.79	11.07	6.18	.03
Level of Withdrawal Coping (subscale)	27.27	23.92	12.99	14.14	4.37	.05
Level of Approach Coping (subscale)	22.02	14.10	28.57	20.86	< 1	NS
Focus of Coping (Environment vs Self)[b]	52.49	12.10	62.64	11.94	4.58	.05
No. statements endorsed	5.64	3.75	4.86	3.25	< 1	NS

[a]scores above 50 indicate an Approach direction of coping
[b]scores above 50 indicate an Environment focus of coping

Table 5

ANCOVA Comparisons between Reactors and Non-Reactors on Stage I Affect Scale ratings using sleep duration as a covariate

	Reactors (n = 14)		Non-Reactors (n = 14)			
Dimension	Mean	SD	Mean	SD	F-value	p <
Positive	1.07	.73	1.50	.76	1.33	NS
Negative	.71	.83	.50	.76	< 1	NS
Pleasantness	1.43	.85	1.64	.74	< 1	NS
Engagement	.43	.51	.43	.65	< 1	NS

Stage II - Laboratory Data

Initial analyses of Stage II data involved two-way (Type X Sex) ANOVAS comparing the Reactor to the Non-Reactor groups and females to males with regard to all of the non-repeated non-physiological variables. Dichotomous variables were again analyzed by performing chi square analyses using Yates' correction for continuity due to the small sample size.

Research Participant Form. Analyses were conducted to see whether the groups were comparable on demographic and physical characteristics and on physical state variables affected by their behaviours during the 24 hours prior to their laboratory assessment. The only significant effects evident for these variables were interactions in terms of the amount of sleep prior to the experiment and the amount of coffee/tea consumed. Specifically the female Reactors ($\underline{M}$ = 7.6) reported the greatest sleep duration followed in decreasing order by the male Non-Reactors ($\underline{M}$ = 7.3), the female Non-Reactors ($\underline{M}$ = 6.3), and the male Reactors ($\underline{M}$ = 6.0; $\underline{F}$ = 9.72, $\underline{p}$ = .005). Regarding coffee consumption, the female Non-Reactors drank the most ($\underline{M}$ = 2.0), followed in order of decreasing intake by the male Reactors ($\underline{M}$ = 1.0), the female Reactors ($\underline{M}$ = 0.9), and the male Non-Reactors ($\underline{M}$ = 0.6; $\underline{F}$ = 3.39, $\underline{p}$ = .08).

Sleep duration again showed a trend toward negative correlation with the amount of coffee/tea consumed (r = -.24, $p < .11$), and a two-way ANCOVA applied to the amount of coffee/tea consumed, using sleep duration as a covariate, resulted in no significant effects (see Table 6). Despite no type differences in terms of sleep duration, this variable was retained as the covariate on the basis of the significant interaction and

Table 6

ANCOVA Comparisons between Reactors and Non-Reactors on Stage II physical state and recent behaviour variables

Variables	Reactors (n = 14) Mean	SD	Non-Reactors (n = 14) Mean	SD	F-value	p <
With sleep duration as a covariate						
Hours since last meal	3.50	3.16	4.86	4.38	< 1	NS
No. cups coffee/tea	.93	.73	1.29	1.54	< 1	NS
No. cigarettes smoked	.43	1.09	1.93	4.12	1.61	NS
With no covariate						
Sleep duration previous night	6.79	1.25	6.79	1.25	< 1	NS

on the basis of reasoning similar to that applied to the choice of a covariate in the analysis of Stage I data. (The non-significant findings of these analyses which are not presented in the text can be found in tabular form in Appendix H.)

Even with sleep duration as a covariate, no type differences were found on either the physical state or demographic variables which could have affected physiological responding during the laboratory assessments (see Tables 6 and 7). Of particular interest among these non-significant findings was the indication that the groups did not differ in terms of the number of subjects who had donated blood in the period between the first and second stages of the study. Another variable upon which it was important for the various groups to be equivalent was the level of recall they had of the actual blood donation procedure itself. No differences were found on the extent of recall as assessed by the Memory Test (Non-Reactors' $\underline{M}$ = 5.43, $\underline{SD}$ = 1.34, Reactors' $\underline{M}$ = 4.79, $\underline{SD}$ = 1.85; $\underline{F}$ (1,27) = 1.07, $\underline{p} < .31$).

Non-State Variables

Personal Illness Questionnaire. Results from the PIQ indicate that Reactors scored more highly on both the Medical Procedures Fear and the Somatic Sensitivity factors than did the Non-Reactors, but they did not differ from the Non-Reactors on the Disease Fear factor (see Table 8).

Ailment Questionnaire. There were no significant differences between Reactors and Non-Reactors on the experience of any of the 16 ailments assessed (see Table 9).

Mutilation Questionnaire. The only significant type difference which occurred on the MQ was that Reactors reported being bothered by

Table 7

Comparisons between Reactors and Non-Reactors on Stage II dichotomous physical state, background and recent behaviour variables

Variables	Reactors (n = 14) %	Non-Reactors (n = 14) %	Yates' X^2	p <
Tired today	21	14	.00	NS
Hungry today	43	14	1.58	NS
Medicated today	0	0	.00	NS
Blood donation since Stage I	14	29	.21	NS
Smoke cigarettes	21	29	.00	NS
Drink coffee/tea	79	86	.00	NS

Table 8

ANCOVA Comparisons between Reactors and Non-Reactors on PIQ ratings X 100

	Reactors (n = 14)		Non-Reactors (n = 14)			
Factor	Mean	SD	Mean	SD	F-value	p <
Somatic sensitivity	32.14	15.28	10.71	16.16	12.71	.002
Medical procedures fear	37.50	33.61	16.07	18.62	4.28	.05
Disease fear	10.71	16.16	19.64	24.37	1.34	NS

Table 9

ANCOVA Comparisons between Reactors and Non-Reactors on Ailment Scale ratings

	Reactors (n = 14)		Non-Reactors (n = 14)			
Ailment/Disturbance	Mean	SD	Mean	SD	F-value	p <
Irritable bowel syndrome	2.14	2.14	1.64	1.55	< 1	NS
Constipation	2.07	2.09	2.00	2.18	< 1	NS
Diarreha	1.86	1.03	2.36	1.98	< 1	NS
Muscle tension	3.57	2.74	3.14	1.96	< 1	NS
Acne	3.64	3.00	3.07	2.76	< 1	NS
Heart pounding/racing	4.00	2.54	2.57	2.95	1.86	NS
Asthma	.21	.58	.14	.53	< 1	NS
Indigestion	2.29	2.43	2.43	2.47	< 1	NS
Ulcers	.36	1.34	.07	.27	< 1	NS
Dry mouth	3.21	2.15	2.07	1.94	2.01	NS
Migraines	1.21	2.12	.64	.93	< 1	NS
Excessive sweating	2.36	2.31	2.57	3.41	< 1	NS
Raynaud's disease	1.29	2.49	1.79	2.83	< 1	NS
Motion sickness	1.50	2.88	1.64	2.02	< 1	NS
Tinnitus	2.07	1.98	1.29	2.01	1.09	NS
Feel faint when rising	3.64	2.56	2.57	2.41	1.25	NS
Average Ailment score	2.21	2.28	1.88	1.91	< 1	NS

receiving or watching someone else receive an injection significantly more than did the Non-Reactors (i.e., higher MQ-Inject scores; see Table 10).

The only other noteworthy finding was that the females had a higher total MQ score (M = 10.21, SD = 4.54), than did the males (M = 6.43, SD = 3.5; F = 5.06, $p < .05$).

Fear of Negative Evaluation Questionnaire. There were no significant effects on the FNE-Total score (e.g., Reactors M = 9.00, SD = 5.08; Non-Reactors M = 10.86, SD = 8.61; $F(25,1) < 1$, $p < .63$).

General Information Sheet. Reactors were found to have given blood significantly less often than Non-Reactors during the two year period prior to their participation in the present study. Reactors reported a greater frequency of dizziness or weakness associated with emotion both during their lifetime and during the past year. However, there were no significant differences between the groups in terms of fainting (i.e., loss of consciousness) or experiences with panic attacks (see Table 11).

More Reactors (64%) endorsed the statement about being frightened or bothered by animals or insects than did Non-Reactors (29%; $x^2 = 4.2$, $p < .05$). In terms of sex differences, more females (71%) reported a fear of small animals or insects than did males (21%; $x^2 = 7.7$, $p < .005$).

Nijmegen Questionnaire. Reactors obtained higher total Nijmegan scores, and higher scores on both the Shortness-of-Breath and Central Tetany dimensions than did the Non-Reactors (see Table 12).

State Variables

Situation Appraisal Rating Scales. Analyses of the four targets assessed by the Appraisal Ratings (i.e., potential for situational

Table 10

ANCOVA Comparisons between Reactors and Non-Reactors on Mutilation Questionnaire scores

	Reactors (n = 14)		Non-Reactors (n = 14)			
Variable	Mean	SD	Mean	SD	F-value	p <
MQ-Blood	.13	.17	.12	.18	< 1	NS
MQ-Accident	.57	.40	.55	.36	< 1	NS
MQ-Medical	.43	.32	.38	.29	< 1	NS
MQ-Inject	.25	.33	.00	.00	7.74	.01
MQ-Cut	.14	.17	.29	.39	1.64	NS
MQ-Total	8.07	4.53	8.57	4.47	< 1	NS

Table 11

ANCOVA Comparisons between Reactors and Non-Reactors on General Information Sheet answers

Variable	Reactors (n = 14) Mean	SD	Non-Reactors (n = 14) Mean	SD	F-value	p <
No. donations in past two years	1.93	.83	3.93	2.06	11.47	.002
No. dizzy episodes due to emotion	4.21	4.10	.14	.36	15.03	.001
No. dizzy episodes due to emotion in past year	.86	.66	.07	.26	16.50	.001
No. faint episodes due to emotion	.50	1.09	.07	.27	1.90	NS
No. faint episodes due to emotion in past year	.14	.36	.00	.00	2.00	NS
No. panic attacks in past year	1.14	1.92	.50	1.02	1.20	NS
No. panic attacks in past 3 weeks	.36	.84	.00	.00	2.50	NS

Dichotomous variable

Variables	Reactors (n = 14) %	Non-Reactors (n = 14) %	Yates' X^2	p <
Experienced panic attack	50	36	.18	NS
Ever dizzy due to emotion	86	21	9.19	.003
Ever faint due to emotion	21	7	.29	NS

Table 12

ANCOVA Comparisons between Reactors and Non-Reactors on Nijmegen Hyperventilation Questionnaire answers

	Reactors (n = 14)		Non-Reactors (n = 14)			
Variable	Mean	SD	Mean	SD	F-value	p <
NHQ total score	166.2	40.0	134.7	23.5	6.33	.02
Shortness of Breath factor	157.1	41.5	116.7	32.4	8.01	.01
Peripheral Tetany factor	164.3	46.5	142.9	35.6	1.67	.NS
Central Tetany factor	139.3	34.2	114.3	24.4	4.60	.05

control, self control, threat, challenge) completed before the video presentation revealed that the Reactors considered the upcoming situation potentially less safe and less as a type of challenge than did the Non-Reactors. No differences were revealed in terms of the subjects' appraisals of situational or self control (see Table 13).

Analysis of situational appraisals after completing the reliving experience revealed that the Non-Reactors had a greater tendency than the Reactors to see a re-experiencing as a challenge (see Table 13). The groups did not, however, differ on their overall appraisal of the threat potential of a repeat reliving experience, nor did they differ on their appraisals of their ability to control themselves or the upcoming situation (see Table 13).

There were no significant Sex or Interaction effects on the the SARS completed either before or after the video presentation.

Coping measures (DCC). Analyses applied to the Global version of the DCC completed during Stage II revealed no significant Type differences on the three primary coping dimensions (i.e., Focus, Direction, and Production). Analyses applied to the DCC subscales indicated, however, that, as in Stage I, Reactors tended to withdraw from the situation significantly more than the Non-Reactors and that they endorsed a marginally greater number of coping statements (see Table 14).

Results from the specific version of the DCC completed in Stage II show the Reactors to have endorsed both a Withdrawal direction of coping and a Self-focused coping style more often than did the Non-Reactors. As in Stage I, the difference between groups on the Direction of Coping variable was mainly due to the Reactors endorsing significantly more

Table 13

ANCOVA Comparisons between Reactors and Non-Reactors on the results of both applications of the SARS using sleep duration as a covariate

Variable	Reactors (n = 14) Mean	SD	Non-Reactors (n = 14) Mean	SD	F-value	p <
SARS completed before the video presentation						
Appraisal of threat potential[a]	3.33	.57	3.88	.62	5.91	.03
Appraisal of challenge	2.39	.63	3.14	.84	7.45	.02
Appraisal of situational control	3.24	.76	3.55	.61	1.47	NS
Appraisal of self control	3.89	.74	3.86	.69	< 1	NS
SARS completed after the video presentation						
Appraisal of threat potential[a]	3.86	.53	4.14	.48	2.00	NS
Appraisal of challenge	1.75	.70	2.86	.84	12.86	.002
Appraisal of situational control	3.43	.68	3.60	.54	< 1	NS
Appraisal of self control	4.04	.60	3.96	.93	< 1	NS

[a]lower score indicates appraisal of greater threat

Table 14

ANCOVA Comparisons between Reactors and Non-Reactors on Stage II DCC ratings using sleep duration as a covariate

Variables	Reactors (n = 14) Mean	SD	Non-Reactors (n = 14) Mean	SD	F-value	p <
Global version						
Focus of Coping (Environment vs Self)[a]	55.61	10.34	59.13	10.98	< 1	NS
Direction of Coping (Approach vs Withdrawal)[b]	62.47	8.83	65.61	7.13	1.10	NS
Level of withdrawal coping (subscale)	22.08	17.36	11.04	9.55	4.75	.04
No. statements endorsed	8.14	3.13	6.29	1.82	3.58	.08
Specific version						
Focus of Coping (Environment vs Self)[a]	51.59	9.15	63.78	8.87	16.81	.001
Direction of Coping (Approach vs Withdrawal)[b]	53.87	9.58	62.36	6.36	7.21	.02
Level of withdrawal coping (subscale)	28.57	18.48	10.39	8.63	10.96	.003
Level of approach coping (subscale)	36.31	12.06	35.12	16.40	< 1	NS
Level of self-focus coping (subscale)	35.71	21.52	15.31	13.10	10.71	.003
No. statements endorsed	7.57	2.87	5.36	2.68	4.31	.05

[a]scores above 50 indicate an environment focus of coping

[b]scores above 50 indicate an approach direction of coping

withdrawal associated statements than did the Non-Reactors, and there was again no significant difference between the groups on the endorsement of Approach associated statements. Reactors again endorsed a greater number of DCC statements than did the Non-Reactors (see Table 14).

Pearson correlations were calculated to compare responses on the respective versions of the DCC across the two study stages. The correlations between the two administrations of the DCC-Global indicated a marginally significant correlation associated with the Direction of Coping dimension and a significant correlation between the total number of statements endorsed in the two stages (see Table 15).

Regarding correlations between the two administrations of the specific version of the DCC, significant correlations were revealed for responses along both the Focus and the Direction of Coping dimensions. The total number of statements endorsed during the Stage I administration of the specific version was significantly correlated with the number endorsed during Stage II (see Table 15).

Affect. No significant differences of any kind were found along the four dimensions of the Affect Scale-Global (see Table 16). On the Affect Scale-Specific, Reactors gave lower ratings on the Pleasantness scale, and marginally higher ratings on the Engagement scale than did the Non-Reactors (see Table 16). There was a two-way interaction on the Positive Affect scale, with male Reactors reporting the highest scores (M = 1.71), followed by, in decreasing order, female Non-Reactors (M = 1.14), male Non-Reactors (1.00), and female Reactors (M = .71; F = 5.51, p < .03).

Pearson correlations were calculated to compare responses on the respective versions of the Affect Scale across the two study stages.

Table 15

Pearson Product Moment Correlations Between DCC Stage I and Stage II responses.

Variable	r	p<
	Global Version	
Focus of Coping	.18	NS
Direction of Coping	.32	.10
Production of Coping	.04	NS
No. of Statements Endorsed	.50	.01
	Specific Version	
Focus of Coping	.42	.03
Direction of Coping	.47	.02
Production of Coping	-.12	NS
No. of Statements Endorsed	.48	.01

Table 16

ANCOVA Comparisons between Reactors and Non-Reactors on Stage II Affect Scale ratings using sleep duration as a covariate

Dimension	Reactors (n = 14) Mean	SD	Non-Reactors (n = 14) Mean	SD	F-value	p <
			Global version			
Positive	.36	.63	.29	.61	< 1	NS
Negative	.79	.80	.50	.76	< 1	NS
Pleasantness	1.71	.47	1.93	.27	2.16	NS
Engagement	.29	.47	.43	.76	< 1	NS
			Specific version			
Positive	1.21	.89	1.07	.83	< 1	NS
Negative	1.29	.91	.71	.91	2.56	NS
Pleasantness	1.00	.96	1.79	.43	6.98	.02
Engagement	1.00	.68	.50	.76	3.01	.10

These analyses revealed a marginally significant correlation along the Negative Affect Scale (r = .35, p < .07) and a significant correlation along the Pleasantness scale (r = .46, p < .02).

Variables Repeatedly Assessed During The Video Presentation

The video presentation consisted of eight phases, beginning with the baseline assessment at the end of the 10 minute rest period. The other seven phases corresponded to the points in the video presentation immediately preceding the periods during which physiological measures were recorded (i.e., I.D. check, the finger-tip blood sample, needle insertion, 85 seconds into phlebotomy, 3 1/2 minutes into phlebotomy, needle removal, rest cot period).

Initial analysis compared the groups on their self-reported levels of reliving. This analysis indicated no differences in terms of subjects' levels of involvement in the video presentation, or their levels of reliving the blood donation experience (see Table 17).

A series of 2 X 2 X 8 (Type X Sex X Phase) repeated measures multivariate analyses of covariance (MANCOVAs) using sleep duration as a covariate and 2 X 2 X 7 (Type X Sex X Phase) repeated measures MANCOVAs using sleep duration and baseline values as covariates were then performed to examine the physiological activity and reactivity, coping efforts, and anxiety/arousal/distress levels of subjects during the video viewing. Baseline values were included as covariates when analyses of the subjects' responses as changes relative to baseline were desired. Values derived from the use of both covariates will be referred to as relative scores (i.e., relative to the baseline levels), whereas values derived from analyses with just sleep duration as the covariate will be

Table 17

ANCOVA Comparisons between Reactors and Non-Reactors on Stage II Reliving Ratings using sleep duration as a covariate

Variable	Reactors (n = 14) Mean	SD	Non-Reactors (n = 14) Mean	SD	F-value	p <
Degree of recall of donation experience	6.71	1.77	7.57	2.28	1.22	NS
Highest degree of reliving	5.21	3.33	5.43	2.93	< 1	NS
Average degree of reliving	3.43	2.74	3.86	2.57	< 1	NS
Total absorption score	5.12	1.92	5.62	2.07	< 1	NS

called absolute scores. All repeated MANCOVA significance values were modified by applying the Greenhouse-Geisser correction for violations of the symmetry assumption (Vasey & Thayer,1987).

Coping and Anxiety Variables

Abbreviated Dimensional Coping Checklist (Brief-DCC). Repeated measures MANCOVA conducted on the Brief-DCC measure revealed significant Phase effects for all four bipolar items (all $p < .01$; refer to Appendix F for all tables pertaining to repeated measures MANCOVA). A significant Type effect ($p < .05$) was revealed for the third Brief-DCC statement with the Reactors endorsing withdrawal more than the Non-Reactors (see Figure 2). No other significant Type, Sex, or Interaction effects were demonstrated. Individual ANCOVAs conducted on the responses to the third Brief-DCC statement at each assessment point indicate, however, that the Reactors endorsed withdrawal more during the check-in, fingertip blood sample, 85 second and 3.5 minute post-phlebotomy (phlebotomy I and II) video segments (all $p < .05$).

Relative State Ratings. Three independent repeated measures MANCOVAs conducted on the subjects' anxiety, physiological arousal, and distress ratings revealed significant Type ($p < .05$) and Phase ($p < .01$) effects for all three ratings. The Reactors reported higher levels of anxiety, arousal, and distress compared to their "at home" levels than did the Non-Reactors. The patterns displayed over the course of the video presentation for all three types of self-ratings were very similar. Whereas the Non-Reactors' anxiety, arousal, and distress ratings all peaked at the point of the finger-tip blood sample and then steadily decreased, the Reactors peaked later, at the needle insertion scene, and

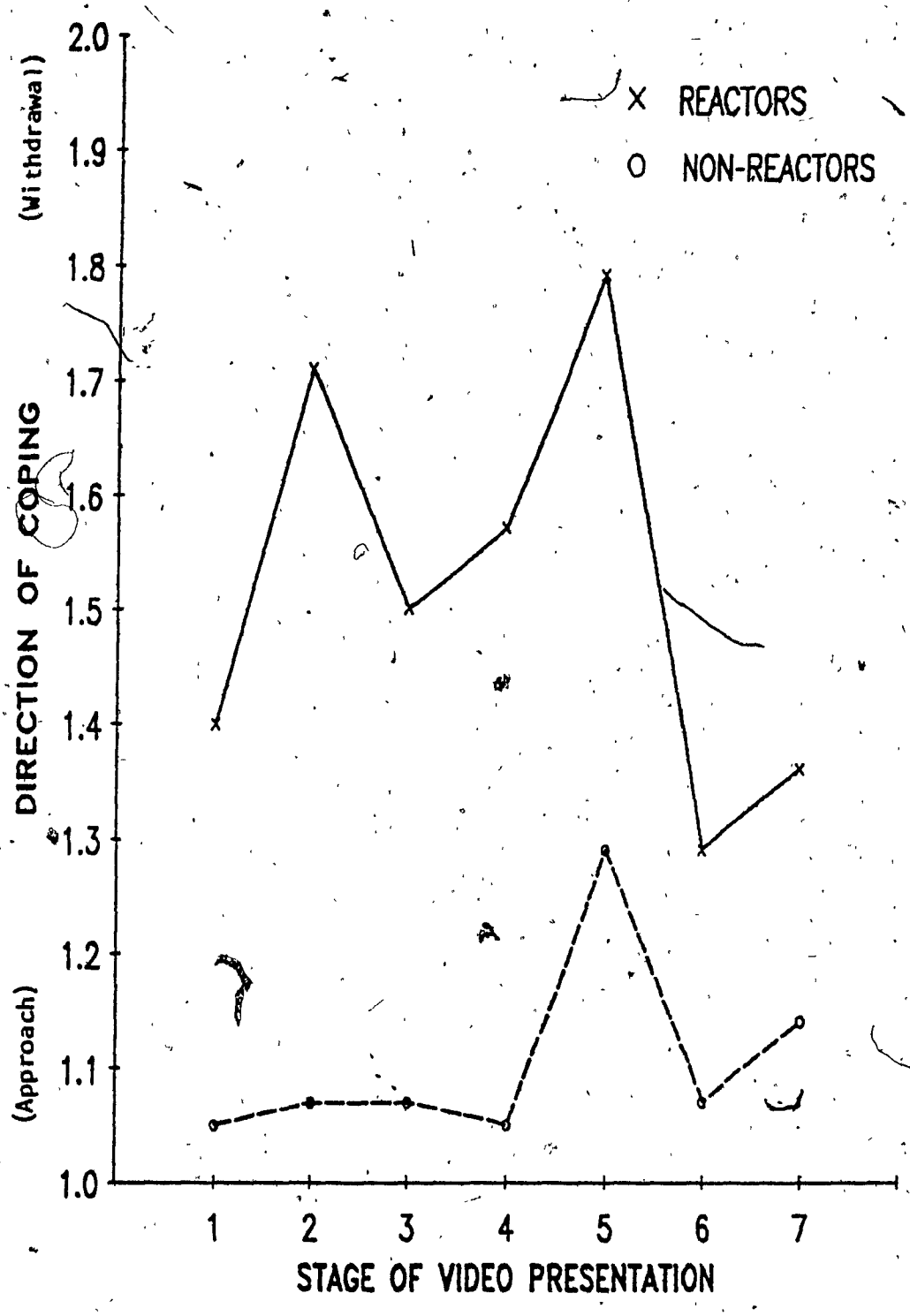


Figure 2. Reactor and Non-Reactor Brief-DCC Direction of Coping scores (derived from the third bipolar statement) across the video presentation.

then decreased (see Figure 3 which is representative of all three ratings.

Physiological Variables Repeatedly Assessed During the Video Presentation

Heart rate data. There was only a significant Phase effect for the repeated measures MANCOVA conducted on the absolute heart rate beats per minute (HR-BPM) data collected over the video presentation ($p < .05$; see Figure 4). Relative score analyses were not performed on heart rate derived measures because examination of the heart rate data indicated that the depressor response began even before the baseline sample period and use of baseline scores as covariates would result in the loss of important information.

The MANCOVA applied to HR variability data revealed a marginally significant 3-way interaction ($p < .07$). As can be seen in Figure 5, this may be attributed to the fact that the female Non-Reactors' pattern of HR variability was different from the other three subgroups. There was also a marginally significant Sex effect, with the males having lower average HR variablity than the females ($p < .10$).

The only significant effect uncovered through an analysis of the heart rate cycle amplitude data was a marginal 3-way interaction ($p < .10$). This interaction appears to be due to the female Reactors' pattern of amplitude values being different from the other three groups (see Figure 6).

Skin conductance data. Analysis of both the skin conductance level (SCL) and skin conductance response (SCR) data via repeated measures MANCOVAs indicated only significant Phase effects with both absolute or relative score analyses ($p < .001$; see Figures 7 and 8). The subjects'

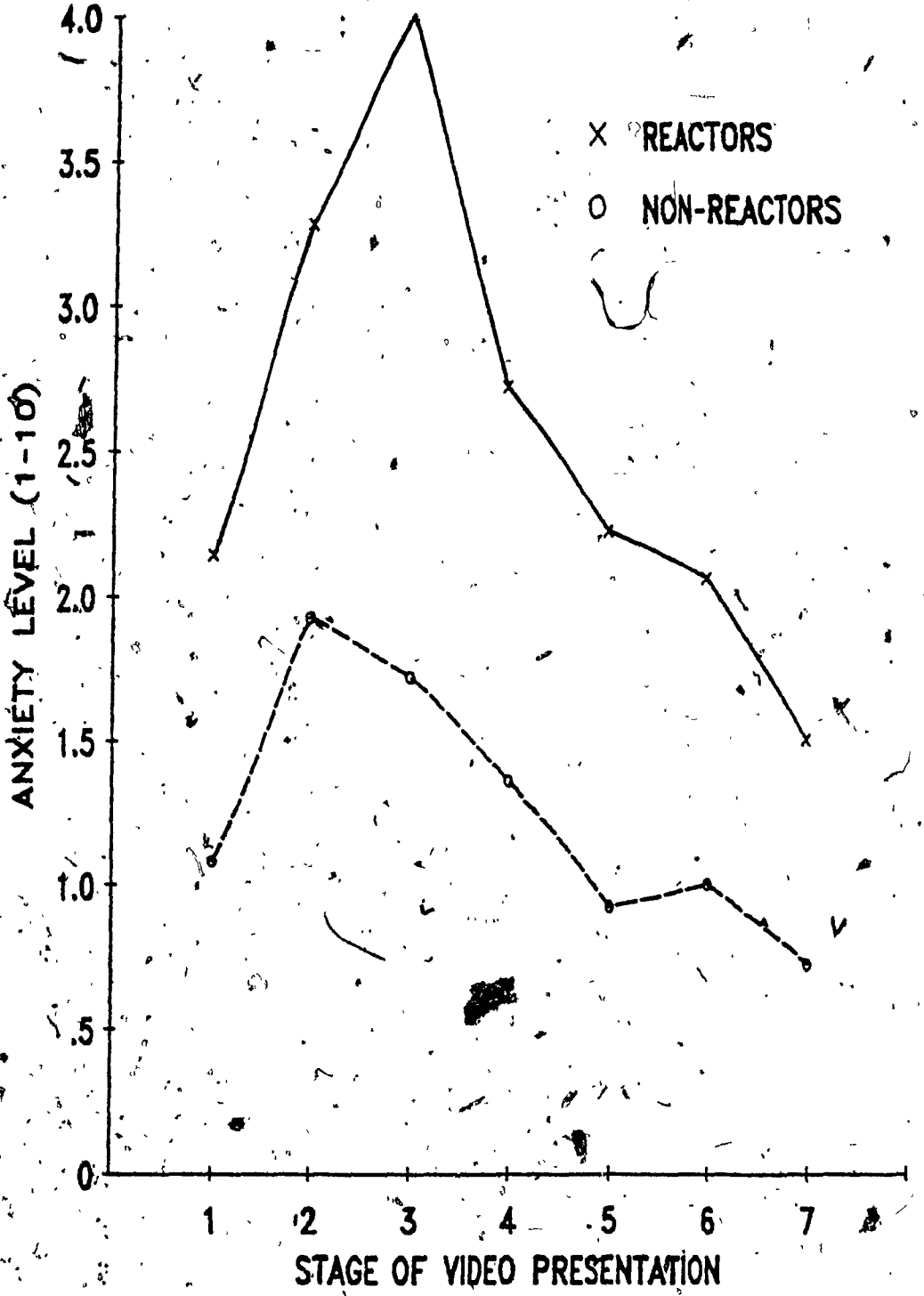


Figure 3. Reactor and Non-Reactor Relative State ratings of anxiety levels across the video presentation.

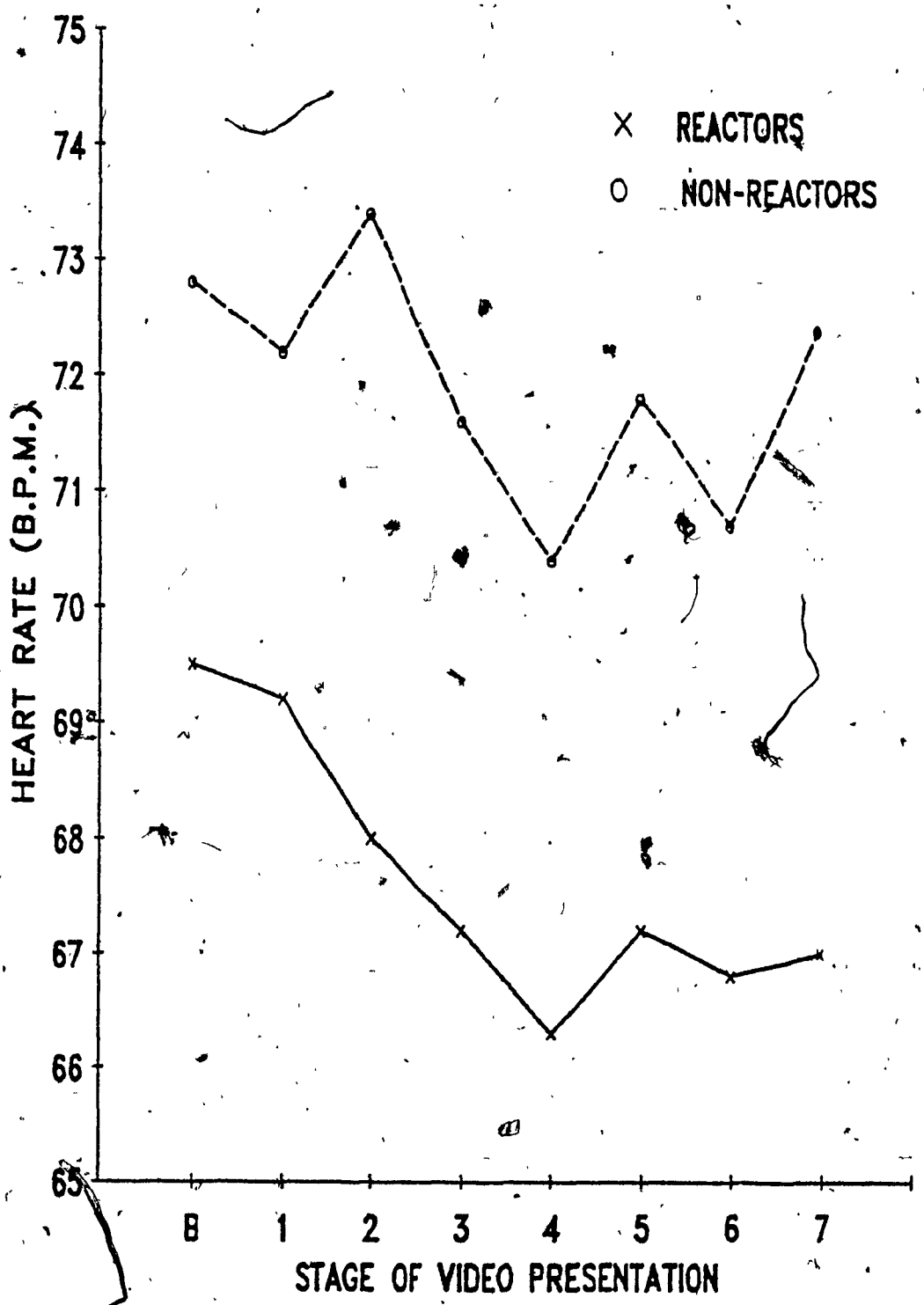


Figure 4. Reactor and Non-Reactor heart rate levels across the video presentation.

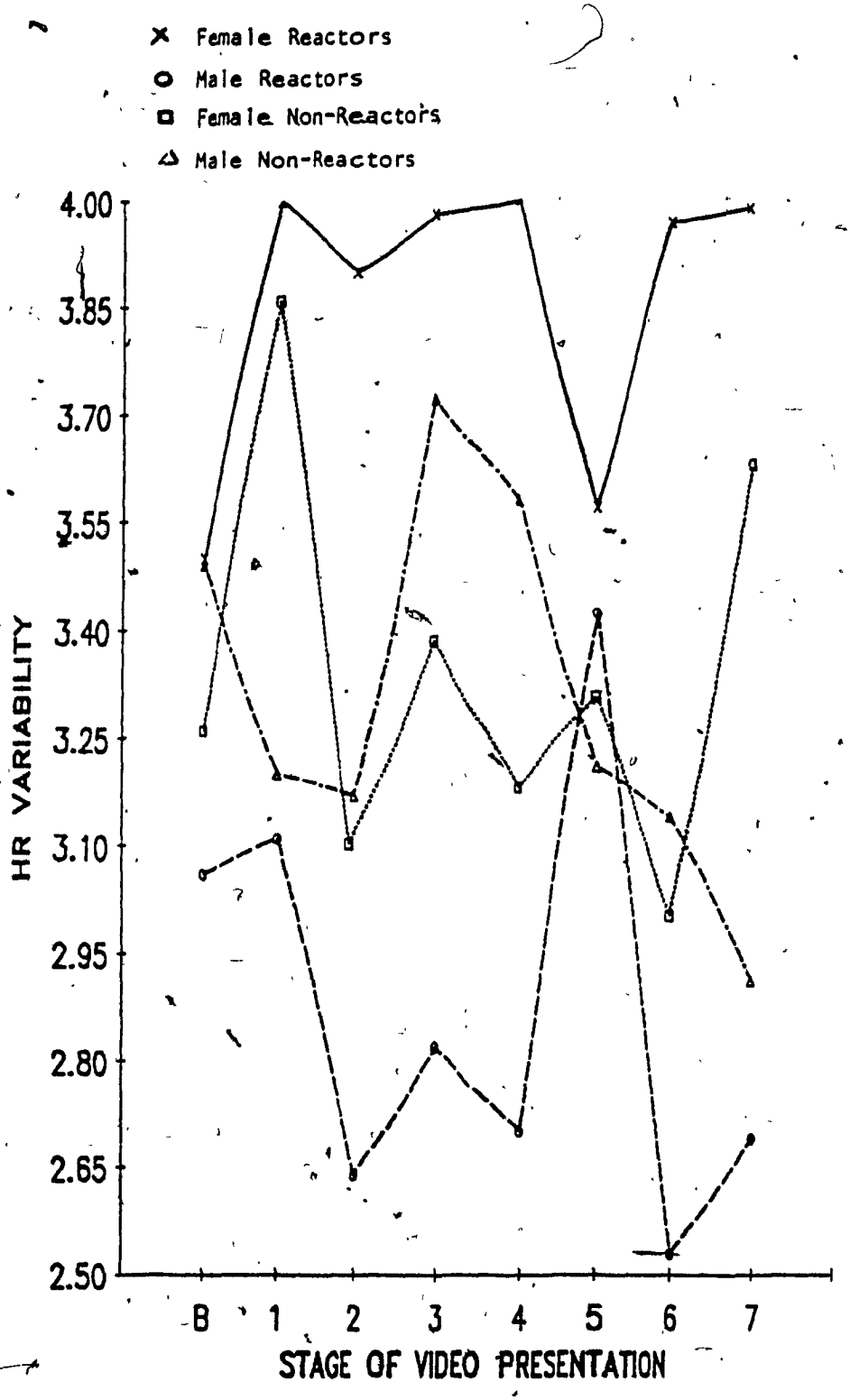


Figure 5. Male and Female Reactors' and Non-Reactors' heart rate variability levels across the video presentation.

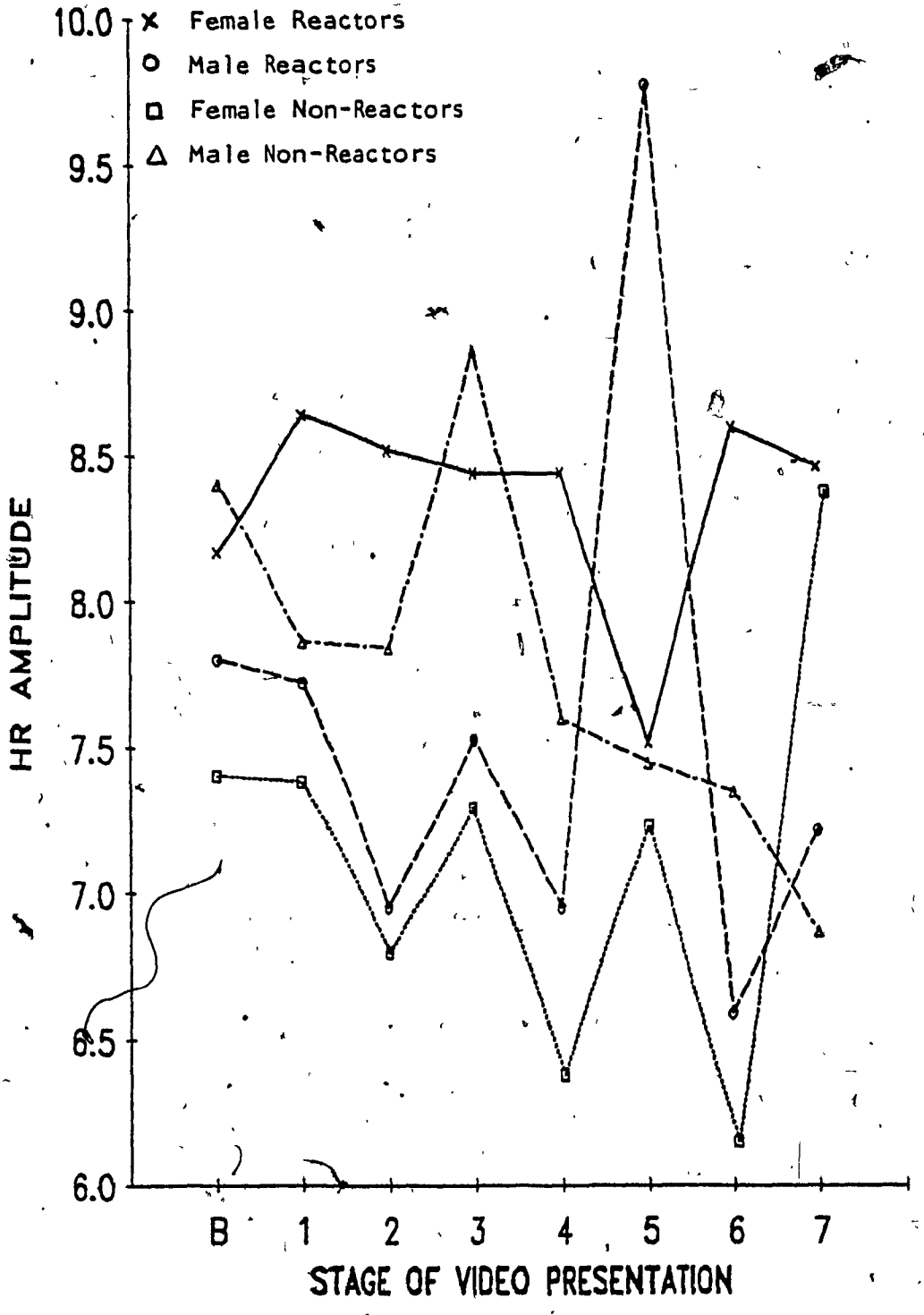


Figure 6. Male and female Reactors' and Non-Reactors' heart rate amplitude levels across the video presentation.

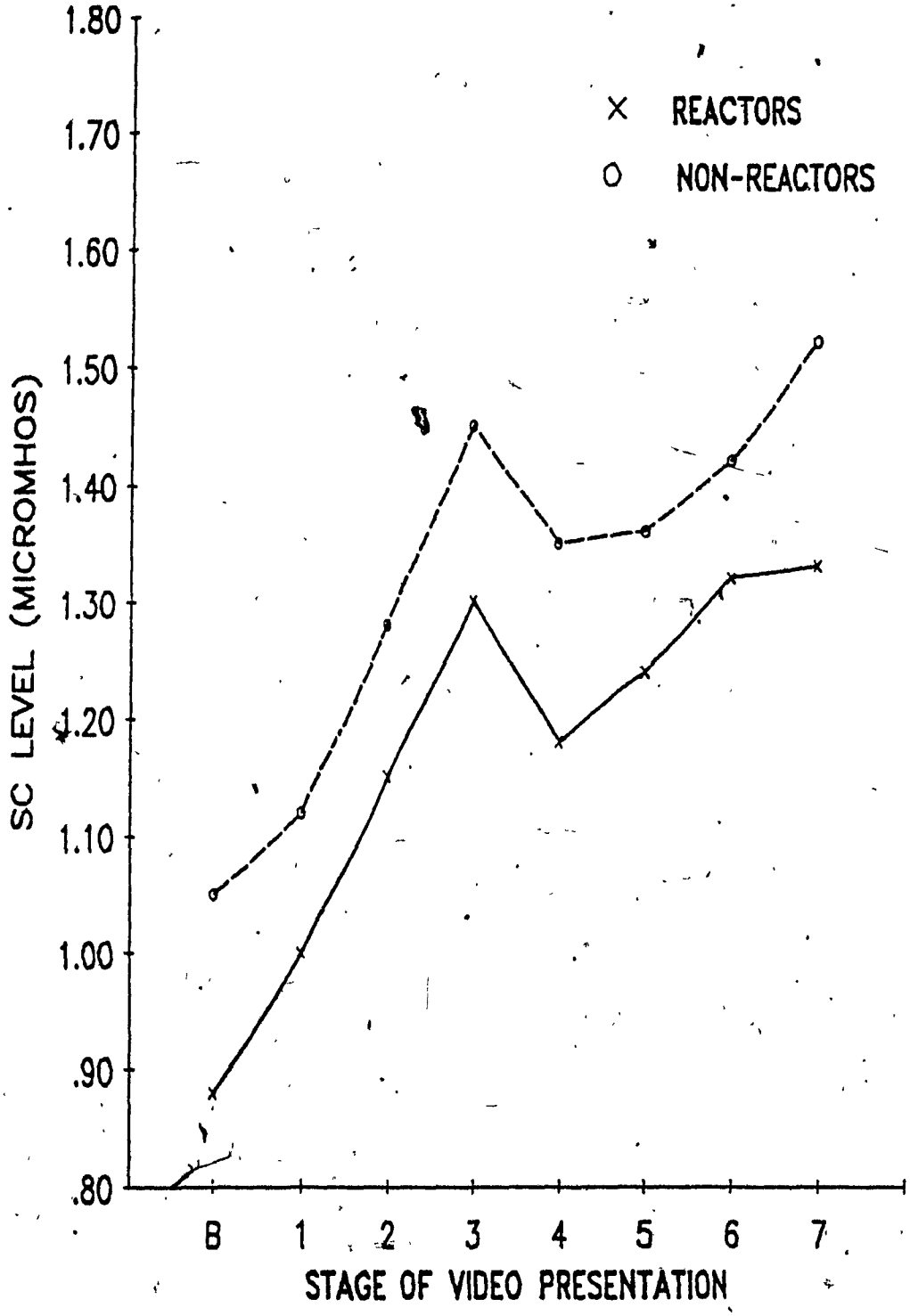


Figure 7. Reactor and Non-Reactor skin conductance levels across the video presentation.

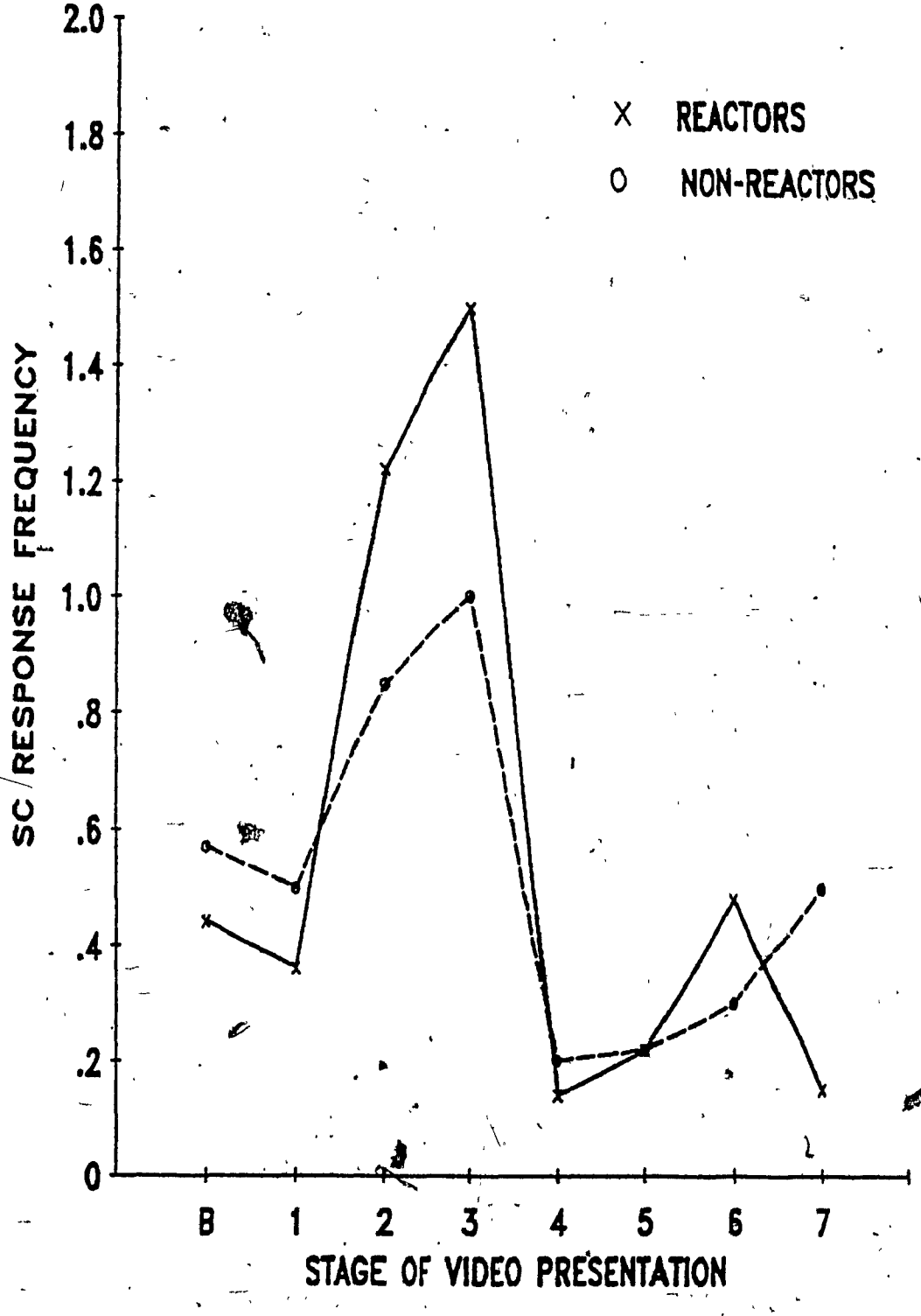


Figure 8. Reactor and Non-Reactor skin conductance response frequencies across the video presentation.

average SCL rose from its level at the check-in phase of the video presentation until it reached its first peak at the needle insertion phase. The SCL showed a drop from this first peak at the video segment which includes the 85 second point of phlebotomy and then rose over the next three sampling points until it reached its highest level during the Rest-Cot period sampling phase. The first part of the SCR-Freq pattern was similar to that of the SCL in that the average number of responses rose from the sample taken during the check-in phase to peak at the needle insertion phase. The number of responses then dropped to near zero when sampled 85 seconds into the phlebotomy and rose again over the next two phases.

Analyses of the skin conductance rise rate (SCR-Rise) data not only revealed a significant Phase effect ($p < .001$), but also a significant sex effect ($p < .05$), again with either absolute or relative score analyses (see Figure 9). The Phase pattern for the SCR-Rise data matched that obtained for the SCR data. In terms of the Sex effect the females were found to have significantly lower average SCR-Rise rates.

Digit temperature data. Analyses of the DT-Level data showed only a significant Phase effect with both absolute and relative score analyses ($p < .001$). As can be seen in Figure 10, the subjects' average digit temperature level decreased steadily from its baseline level until 3 1/2 minutes into the phlebotomy.

Analyses of the DT-Inc data revealed significant Phase ($p < .01$), Sex ($p < .05$), and Type ($p < .05$) effects with either absolute or relative score analyses (see Figure 11). The Non-Reactors had higher increase values than did the Reactors.

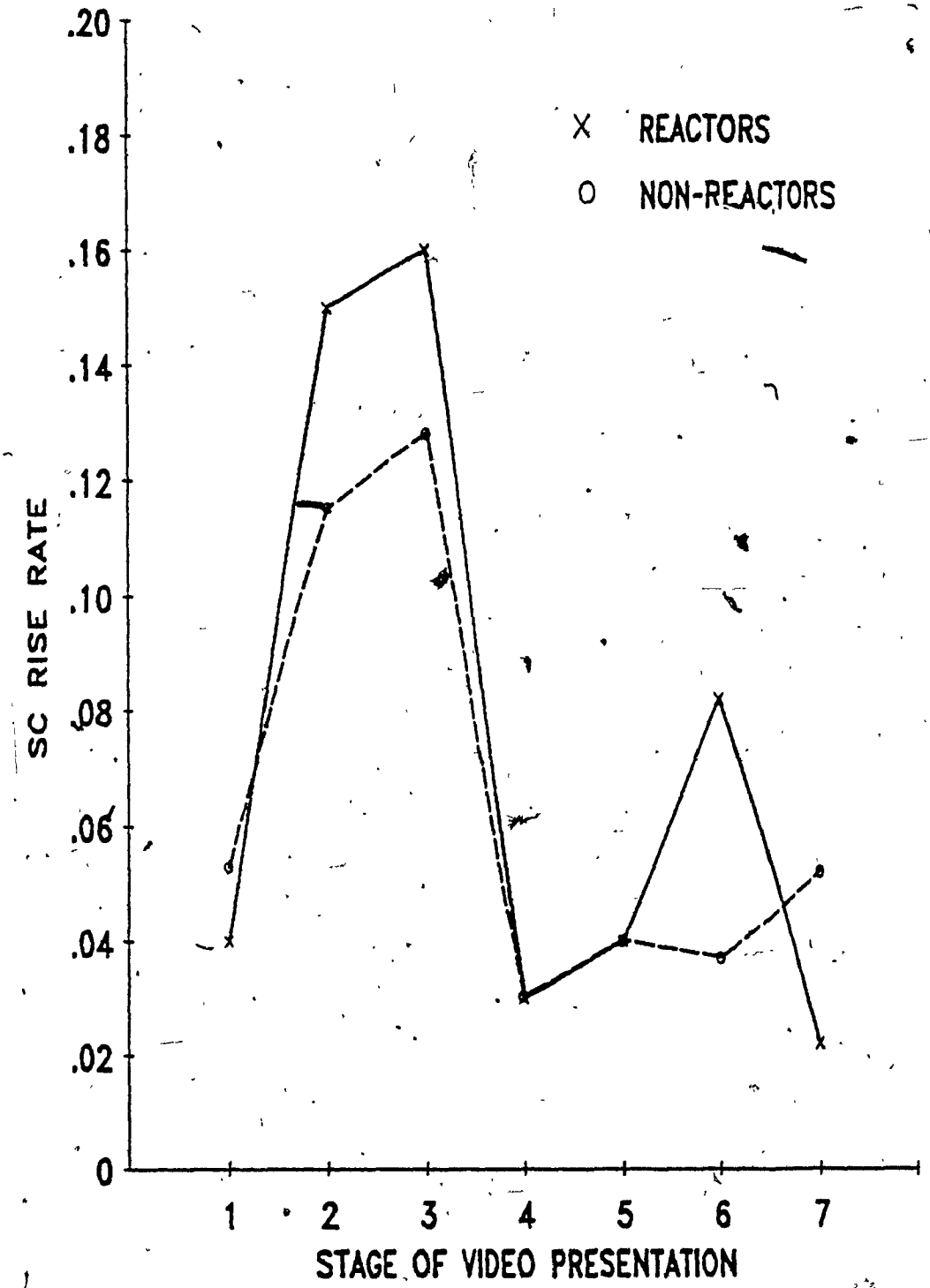


Figure 9. Reactor and Non-Reactor skin conductance rise rates across the video presentation.

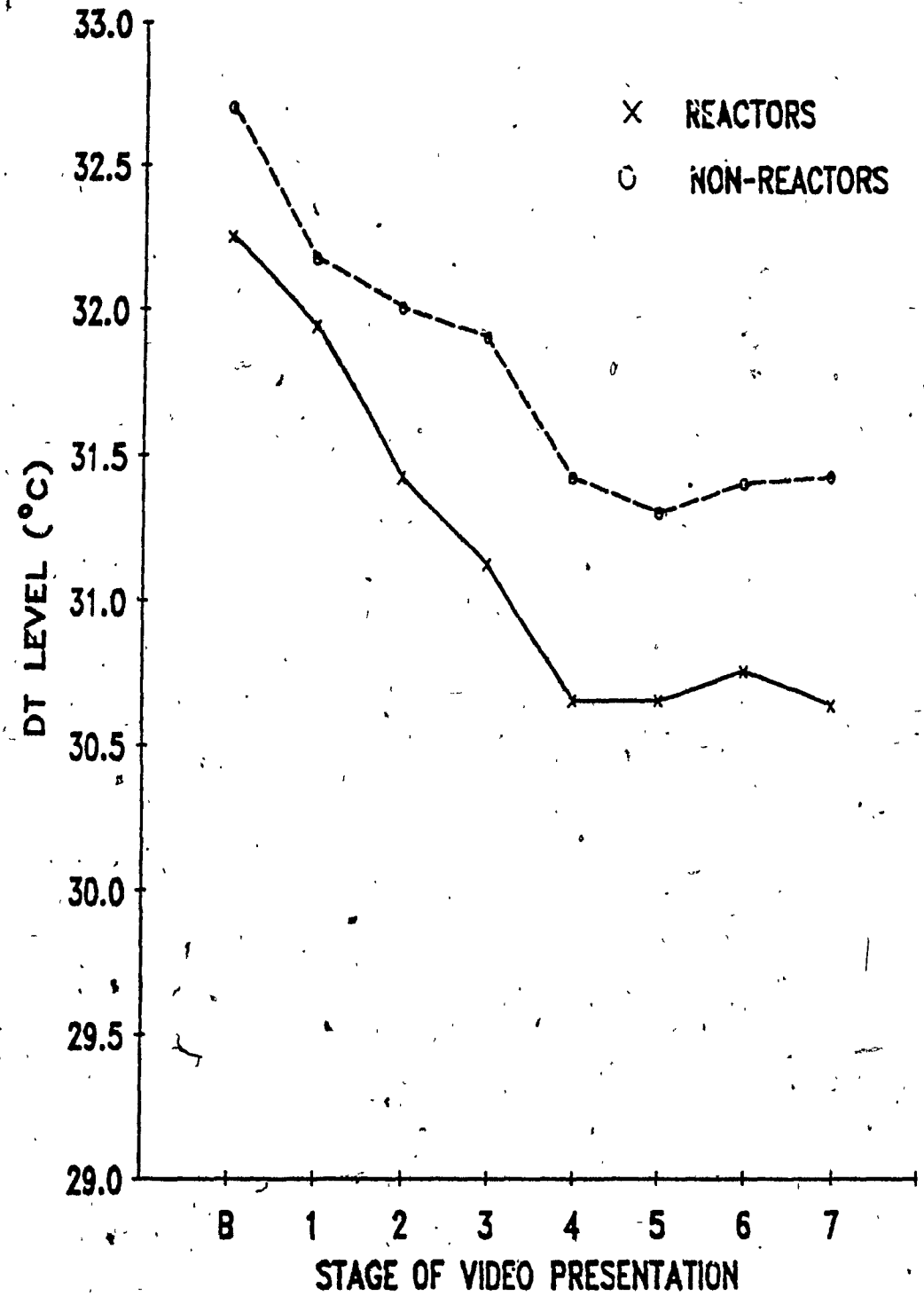


Figure 10. Reactor and Non-Reactor digit temperature levels across the video presentation.

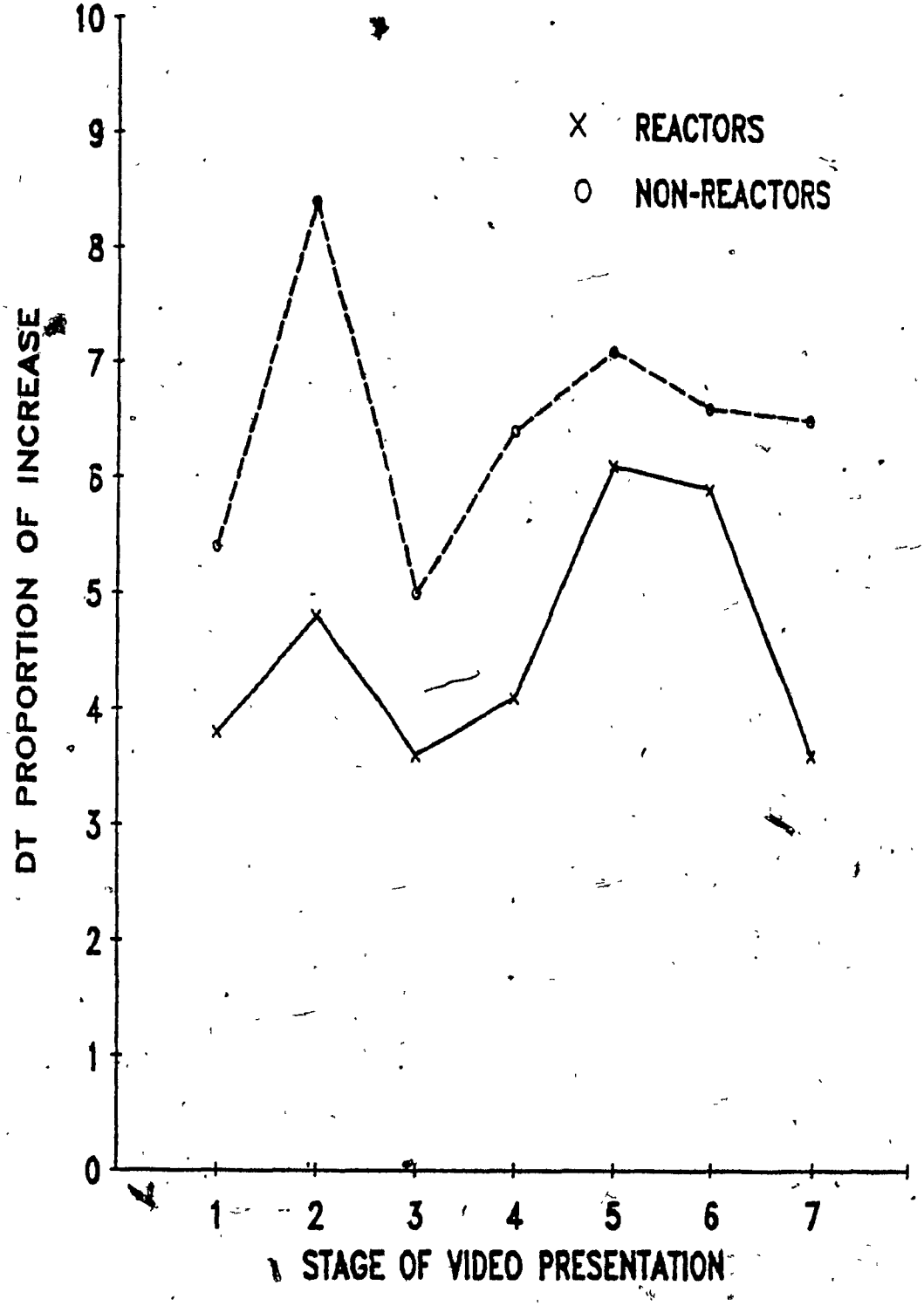


Figure 11. Reactor and Non-Reactor digit temperature proportion of increase levels across the video presentation.

Follow-up ANCOVA on Repeated Measures MANCOVA. There being significant Type effects on the assessments of anxiety, arousal, distress and DT-Inc univariate ANCOVA comparisons between Reactors and Non-Reactors were conducted to ascertain which points of the video presentation elicited the divergent reactions. The Reactors reported greater anxiety than the Non-Reactors at the video depictions of the finger-tip sample and phlebotomy I (both $p < .05$). The Reactors reported greater arousal and distress at four points of the video presentation: finger-tip sample, insertion, phlebotomy I and II (all $p < .05$). Reactors demonstrated lower DT-Inc levels at finger-tip, insertion, phlebotomy I and rest cot recovery points of the presentation (all $p < .05$).

Paired t-tests comparing the Reactors' HR, SC, and DT levels at baseline to their levels at each successive phase during the video presentation revealed that their HR levels fell significantly below their baseline values at the phlebotomy I, phlebotomy II, needle removal, and rest cot phases (all $p < .05$). The Reactors' SC levels were significantly higher (all $p < .01$) and their DT levels significantly lower (all $p < .02$) than their baseline values throughout the video presentation.

Paired t-tests comparing the Non-Reactors' HR, SC, and DT levels at baseline to their levels at each successive phase during the video presentation revealed that their HR levels fell significantly below their baseline values only at the phlebotomy I phase ($p < .05$). The Non-Reactors' SC levels were significantly higher than their baseline values from the finger-tip sample phase onwards (all $p < .01$) and their DT

levels were lower than their baseline values throughout the video presentation (all $p < .02$).

Closer examination of the DT level data by conducting paired t-tests revealed that the Reactors' DT levels were significantly lower at check-in as compared to baseline ($p < .05$), finger-tip as compared to check-in ($p < .001$), and needle insertion as compared to check-in ($p < .001$). The Non-Reactors' levels, on the otherhand, were lower only at check-in as compared to baseline ($p < .01$), and needle insertion as compared to check-in ($p < .05$).

Valsalva Maneuver Data. All statistical analyses conducted on the Valsalva data used sleep duration as a covariate. A repeated measures MANCOVA conducted on the five HR values calculated from the primary Valsalva period (i.e., Baseline, Minimum Phase I, Maximum Phase II, Maximum Phase III, Minimum Phase IV) did not reveal any significant effects (see Figure 12 and Appendix F). Similar analyses comparing reactor types within sexes also did not reveal any significant effects.

The subjects' heart rate variability during the Valsalva maneuver was analyzed in two ways. The first index of heart rate variation was derived from the Coghlan et al. (1979) study, using the formula: ((maximum HR - minimum HR)/minimum HR) X 100. A repeated measures MANCOVA conducted on the HR variation values calculated from the four Valsalva periods (i.e., Baseline, expiration, 50 to 80 seconds post-expiration, 115 to 145 seconds post-expiration) indicated that the Reactors ($M = 54$, $SD = 46$) tended to have marginally lesser degrees of HR variation than did the Non-Reactors ($M = 67$, $SD = 50$; $F = 3.07$, $p < .10$).

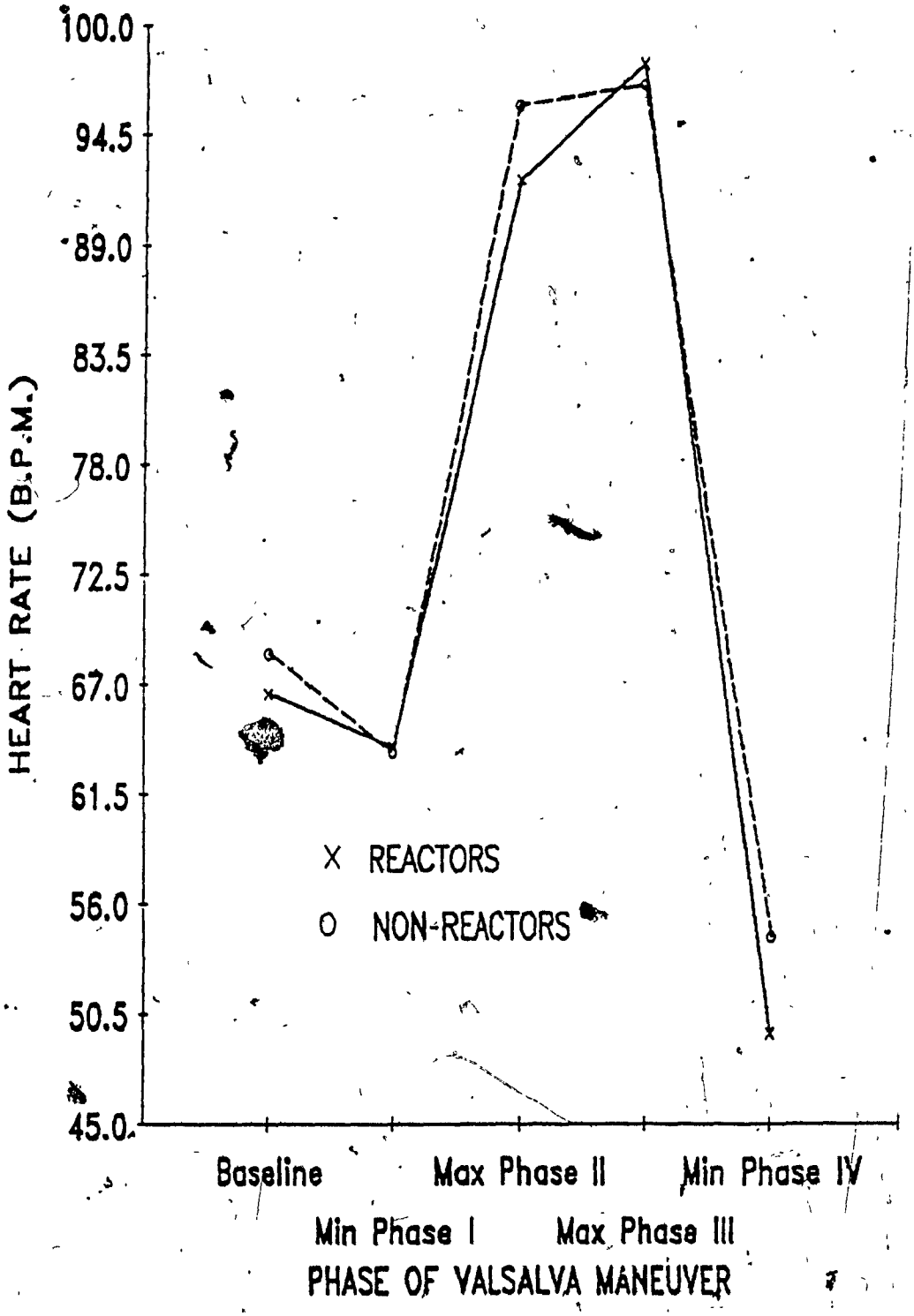


Figure 12. Reactor and Non-Reactor heart rate values across the five Valsalva manuever periods.

The second index of heart rate variability was calculated in terms of the mean successive absolute difference between values sampled at one second intervals. A repeated measures MANCOVA on the average HR variability over the four Valsalva periods failed to reveal any significant differences between Reactors (M = 3.58, SD = 1.48) and Non-Reactors (M = 4.19, SD = 1.58; F = 1.93, p = NS).

An ANCOVA comparison of the groups' mean increases in heart rate from baseline to peak strain values revealed no significant differences between Reactors (M = 27.14) and Non-Reactors (M = 19.83; $F < 1$, p = NS).

An assessment of post-strain bradycardia involved calculating the degree to which heart rate dropped during the 15 seconds after release when compared to baseline values. ANCOVA revealed no significant effects (Reactors' M = 15.97; Non-Reactors' M = 24.06; F = 1.72, p = NS).

ANCOVA conducted on the amount of time it took for subjects' heart rates to return to their pre-maneuver baseline values revealed no significant differences between Reactors (M = 103.21) and Non-Reactors (M = 87.50; F = 1.04, p = NS).

Valsalva Questionnaire. There was only one significant reactor type difference in the ratings of the degree of physical changes during the Valsalva maneuver. The Reactors reported a greater change in the resistance to breathing during the Valsalva maneuver than did the Non-Reactors. Differences in terms of the other four sensations which could have occurred during the Valsalva maneuver were, however, in the expected direction, with Reactors reporting greater changes (see Table 18). The females reported marginally greater changes than did the males in the strength of their heart beats and the occurrence of a hot or flushed

Table 18

ANCOVA Comparisons between Reactors and Non-Reactors on Stage II Valsalva Questionnaire scores using sleep duration as a covariate

Variable	Reactors (n = 14) Mean	SD	Non-Reactors (n = 14) Mean	SD	F-value	p <
Strength of heart beat (intensity)	5.93	2.06	4.71	2.79	1.85	NS
Speed of heart beat (frequency)	5.57	1.99	4.93	2.95	< 1	NS
Resistance to breathing	6.64	1.86	4.07	3.36	6.05	.03
Face flushed or hot	3.71	3.15	3.50	2.62	< 1	NS
Stretching of facial muscles	6.14	2.77	5.79	2.61	< 1	NS
Mean VQ score	5.60	1.59	4.60	2.31	1.81	NS

face, as well as on an average of the ratings across the five physical sensations assessed (all $p < .10$).

Further Reactor Type Differentiating Analyses. A discriminant analysis was conducted as a means to differentiate Reactors from Non-Reactors. The set of predictor variables was comprised of the following: number of blood donations in the past two years, the appraisal of the potential for physical harm during blood donation, scores on the Somatic sensitivity scale of the PIQ. These variables were chosen due to the ease with which they could be assessed during future blood donation clinics - an important feature if they are to play a role in upcoming predonation screening programs. A significant discriminant function ($p < .002$) was based on these three variables. Reactors were identified by fewer blood donations, greater potential harm appraisals, and higher scores on the Somatic sensitivity scale of the PIQ (Beta weights were -.59, +.34, and +.64 respectively). Classification of individual subjects on the basis of this function was 89.3% accurate overall, with 85.7 and 92.2% accurate classification of donors in the Reactor and Non-Reactor groups, respectively.

Discussion

The main goal of the present study was to determine how Reactors and Non-Reactors differed on variables theoretically associated with the causation of vasovagal reactions. Dependent measures addressed demographic, physical, and physical state characteristics, coping and affective variables, autonomic nervous system balance, hyperventilation, somatic sensitivity, and the experience of panic attacks.

Demographic, Physical, and Physical State Considerations. The results of analyses applied to demographic, physical, and physical state characteristics were largely nonsignificant. At most, marginally significant effects were found with regard to sleep duration and coffee consumption. This result was unexpected because past studies have consistently found that physical state variables do not distinguish Reactors from Non-Reactors (Kaloupek et al., 1984; 1985). Given the weak effects and previous findings of no differences it is doubtful that they are major factors in the causation of vasovagal reactions during blood donation.

Consistent with previous work (Kaloupek et al., 1984; 1985), Reactors were found to have more extensive histories of previous vasovagal reactions. In addition, Reactors (and Non-Reactors) reported experiencing vasovagal reactions in various BI and SE situations, indicating that mild forms of the reaction pattern are not restricted to blood donation situations.

Although attempts had been made to match groups in terms of blood

donation experience, the Reactors donated blood fewer times than the Non-Reactors. Three related factors associated with donation inexperience may play a role in enhancing a donor's susceptibility to syncope. Firstly, an inexperienced donor is less aware of the nature of the donation procedure and thus is subject to misinformation and misperceptions which can lead to appraisals of the situation as more threatening than it actually is. Secondly, without direct experience with the demands of the blood donation procedure, the novice donor may not have had the opportunity to develop the required coping skills. Thirdly, awareness of a lack of experience may also increase threat appraisal.

As anticipated, the groups did not differ in terms of the number of subjects who had donated blood again in the interim between the study's stages; this equivalency is thought to be due to the short period (four months) between the stages. Had the two stages been separated by a greater amount of time, the Reactors may have given blood significantly less often than the Non-Reactors.

Fears and Situational Appraisals. Reactors were expected to score more highly on the MQ, the FNE, and the appraisals of the potential for embarrassment, and to report having had vasovagal reactions in BI and SE fear eliciting situations more often than the Non-Reactors. The lack of significant group differences on any of these measures indicates that general BI and SE fears are not central factors in the causation of vasovagal reactions for the present sample of blood donors.

Rather, it seems that more specific fears are involved, particularly

fear of injections and medical procedures. These circumscribed fears are consistent with the Reactor group's greater tendency to appraise the situations encountered during the present study as potentially physically harmful. Given additional evidence that neither appraisals of self nor situational control differentiated Reactors from Non-Reactors, it appears necessary to re-examine the theoretical accounts that emphasize the role of generalized fears and perception of (non)control as factors influencing vasovagal reactions.

On the other hand, before dismissing the importance of generalized BI fear, two things should be mentioned. First, the Reactor group showed greater endorsement of the fear of insects and small animals, a characteristic of individuals who have been found to have higher levels of BI fear (Kaloupek et al., 1986). It is possible that insect/small animal fear is often indicative of more general fear of physical harm (Ohman, 1986). Second, examination of the MQ items suggests that it may not provide a good assessment of general bodily-injury fear because it is limited to situations which involve witnessing injury to others rather than to those which involve direct personal injury.

Finally, Reactors endorsed both higher threat appraisals and lower challenge appraisals than did the Non-Reactors. These results may reflect a basic incompatibility between threat and challenge appraisals. For example, Lazarus and Folkman (1984) report that challenge appraisals are characterized by pleasurable emotions, whereas threat appraisals are characterized by negative emotions. Simultaneous high threat and high

challenge appraisals seem unlikely.

Coping Issues. In light of the significant Type differences regarding situational appraisals, it is not surprising to find such differences in terms of the coping method endorsements. The pattern of differences across both versions of the DCC and across both stages was quite consistent. Overall, the Reactors tended to focus on themselves more, withdraw more, and endorse a greater number of DCC statements than the Non-Reactors.

Consistent with previous findings (Kaloupek et al., 1984), the present study indicates that self-focused coping methods are associated with the experience of vasovagal reactions. This suggests that focusing on oneself while donating blood is either an ineffective coping strategy or a consequence of a vasovagal reaction.

Earlier findings of a negative relationship between the use of avoidant coping methods and affective ratings (e.g., anxiety), led to the expectation that the Reactors would use more approach forms of coping in the present study. The opposite result may indicate that the DCC does not assess the same construct previously assessed by measures used to assess approach methods of coping. Items which form the DCC Direction of Coping factor are in fact similar to those used to form the Suppression coping method factor in the Kaloupek et al. (1985) study. Items composing both the withdrawal and suppression factors address subject's attempts to calm their physical reactions, not think about the situation, imagine that they are elsewhere, and distract themselves. In the Kaloupek et al. (1985) study higher Suppression scores were associated

with membership in the Reactor group. As such, it seems the use of suppression as a form of withdrawal is associated with the occurrence of vasovagal reactions.

The fact that the Production dimension of coping did not differentiate between the groups suggests that the subjects' relative active/passive coping does not have a significant effect on physiological responding in the situations under study.

The Reactors' use of a greater number of coping methods is interpreted as a reflection of a trial-and-error process on their part to discover effective ways of coping with the stress at hand. The less variability on the part of the Non-Reactors indicates that, being less disturbed by the situation, they are staying with the coping methods that seem to be working for them. Folkman and Lazarus (1985) wondered how coping variability may influence coping effectiveness. The present results suggest that increased variability in face of one type of stressor (e.g., needle insertion) is associated with ineffectiveness. A major feature of the study was the use of repeated assessments of coping across different points of a video presentation. The multiple assessments make possible the examination of fluctuations in coping methods used as the situation unfolds. While traditional measures of coping have generally been developed around trait concepts (e.g., Byrne, 1961) based on the assumption that individuals exhibit relatively stable styles of coping across and within situations, the four dimensions of coping showed significant phase effects, reflecting the process character of coping.

It is important to note that although the Brief-DCC was constructed

to supply a much quicker assessment of the same coping dimensions as the DCC, it may do so at a loss of accuracy. Whereas the DCC gives the subject a choice of 24 coping methods to choose from as representative of those they themselves used, the Brief-DCC has only four bipolar items. Thus, although the Brief-DCC enabled rapid assessment of the subjects' coping efforts, it may lack the ability to accurately reflect the various forms coping may take.

Affect. The lack of significant differences in Affect ratings along both Global versions of the Affect Scale indicates that, averaged over the entire situations, the Reactors and Non-Reactors did not experience different affective reactions. The Reactors' lower pleasantness and higher engagement ratings on the specific version of the scale supports the proposal that fear of needles is a central feature distinguishing Reactors from Non-Reactors. This is because the needle insertion phase was perceived as less pleasant and more arousing for the Reactors, whereas the donation procedure as a whole was not.

The lack of significant differences along the Positive and Negative dimensions of the Affect Scale's specific version may be due to the novelty of the scale's design. Many subjects had initial difficulties understanding the scale's tasks and, although additional information was provided, the information obtained may not properly represent the subjects' experiences.

Examination of the anxiety ratings made during the video reveals that the Non-Reactors peak earlier than the Reactors. This parallels the findings of Fenz et al. (1967) who found that the peak of fear occurred earlier for experienced parachutists than for novices, and that the

experienced jumpers peaked before rather than at the goal act. According to Fenz et al. this can be interpreted as reflecting an ability to more quickly cope effectively with the stressors.

Autonomic Nervous System Imbalance and Somatic Perception Issues. The present results seem to indicate that an over-reactive or imbalanced autonomic nervous system is not characteristic of blood donors who experience vasovagal symptoms during donation. Although one of the indexes of heart rate variability during the Valsalva maneuver indicated the Reactors had marginally lower variation - a unexpected and difficult to interpret finding - as a whole the Valsalva data did not indicate any clear differences between Reactors and Non-Reactors in terms of reactivity to physical challenge. Similarly, the Ailment Questionnaire results suggest that Reactors do not experience an overactive sympathetic or parasympathetic nervous system to a greater extent than Non-Reactors.

The groups also did not differ in terms of the phase of the donation procedure when syncope symptoms (if any) were first noted. As such, the hypothesis that Reactors are slower in becoming aware of their physiological responses is not supported. It should be noted, however, that the measure used to assess this factor was probably rather imprecise, and a finer assessment offering subjects more choice as to when they first noticed aberrant reactions would better address the hypothesis. A second limitation regarding this analysis is that a smaller sample was used (i.e., 9 Non-Reactors and 14 Reactors).

The motor inhibition account of syncope causation is supported by the results indicating that the Reactors first noted physiological reactions before or during the actual phlebotomy. This account is

further supported by the finding that the sympathetic and parasympathetic systems seem to be aroused concurrently during the video presentation (i.e., increased sympathetic activity is reflected in the Reactors' increased SCL and decreased DT throughout the video presentation, while increased parasympathetic activity is reflected by their decreased HR during the phlebotomy I, phlebotomy II, needle removal, and rest cot phases). Records of individual subjects indicate that only two of the 14 Reactors reported having first noticed vasovagal-type symptoms after removal of the needle, as would be predicted by the sympathetic abatement hypothesis. It may well be that the motor inhibition account explains the psychological/physiological interactions best for most fainting blood donors, but that a small percentage of cases is best accounted for by the abatement hypothesis.

Hyperventilation. The hypothesis that faulty breathing patterns or even the propensity to hyperventilate may be contributing factors in vasovagal reactions is supported by the Reactors' higher Nijmegan Total scores, and their reporting greater change in the resistance to breathing during the Valsalva maneuver. Insight as to how respiration can be linked to vasovagal reactions is offerred by Holmes et al.'s (1978) proposal that there are three reasons to believe that controlling respiration may be an effective means of controlling responses to threat. Holmes et al. note that respiration has a strong influence on heart rate (e.g., the sinus arrhythmia), therefore if one can control respiration in a manner which results in a lower heart rate, perhaps one will experience less anxiety due to the reduction of physiological cues. Secondly, the authors point out that the control of respiration is an important feature

of meditation techniques which are supposed to be effective in reducing anxiety. Thirdly, unlike heart rate, skin conductance, and other physiological functions influenced by and indicative of stress, respiration is relatively easily controlled and thus can be seen as a likely focal point in the attempt to control one's physiological responses to stress. Therefore, abberant breathing patterns (e.g., hyperventilation) may lead to both increased anxiety and disregulating influences on the cardiovascular system - both which may contribute to the initiation of vasovagal reactions.

Somatic Sensitivity. The possibility that once Reactors perceive somatic sensations they are more sensitive and concerned by them, is supported by their scoring more highly than the Non-Reactors on the somatic sensitivity factor of the PIQ. The results from the Valsalva questionnaire do not, however, provide strong support that the Reactors' are over-concerned with their physiological responses to a physical challenge. Although Reactors did report greater change in the resistance to breathing during the maneuver and, although all other differences on this questionnaire were in the expected direction, the differences altogether were not great. The significant difference between Reactors and Non-Reactors on one assessment and not the others may be due to a difference between general versus specific somatic sensitivity. Reactors may not report greater sensitivity after experiencing specific physiological responses (e.g., face flush) but may do so when reviewing their responses in general. Furthermore, the Valsalva maneuver provides a clear attributional target, whereas most in vivo somatic sensations have ambiguous causality. As such, the ability to attribute

physiological responses to a particular event may lessen the chances of misinterpretation or exaggeration of effect.

Panic Attacks. As previously mentioned, one can conceptualize that the psychological and physiological factors important in the causation of syncope reactions are similar to those theorized as being central in the triggering of a panic attack. The present results suggest that, as with panic attacks, hyperventilation problems may contribute to the onset of vasovagal reactions. In addition, the hypothesis that Reactors tend to be over-concerned with physiological responses - a central feature of a panicker's psychological processes during an attack (Clark, 1986) - did receive some support from the present findings (i.e., greater somatic sensitivity). As such, the evidence suggests that panic attacks and vasovagal reactions have commonalities in terms of the psychological processes involved. The recognition of these similarities may lead to the sharing of ideas between researchers studying the two reactions. Although the difference is in the expected direction, the logical extrapolation from this information to a prediction that Reactors would have a greater history of panic attacks was not supported.

Design Issues. The method used for identifying Reactors and their controls was well supported by the results indicating the Reactors reported experiencing significantly more vasovagal symptoms than did the Non-Reactors.

The value of the data collected during the video presentation may be seen as depending somewhat upon the success of the Reliving paradigm used. The paradigm was based on the hypothesis that a film depicting a blood donation procedure could stimulate psychological and physiological

responding mirroring that which occurred during the actual donation experience. The extent of reliving was reflected in the significant correlations between subjects' coping efforts between the Stage I and Stage II assessments along the Direction of Coping dimension, for the DCC-Global, and along both the Direction and the Focus of Coping dimension for the DCC-Specific. The significant correlations between the two stages on two of the four Affect scales provides further evidence that subjects relived their donation experience.

The non-significant Type differences regarding Reliving ratings and Donor Memory Test scores indicates group equivalency in terms of memories of the donation procedure and reliving of the experience. Consequently, any differential response patterns would not be attributable to differences in the subjects' reliving or absorption levels.

Other data which reinforce the confidence in the Reliving paradigm are the significant Phase effects for virtually all the indices which were repeatedly assessed during the video presentation. These effects indicate that the video did have an impact on both the subjects' physiological and psychological reactions. In addition, the patterns of most of these responses were similar to what was expected, i.e., strong responses occurred at what are considered high-fear points (e.g., needle insertion). Furthermore, the paired t-tests comparing the subjects' HR, SC, and DT levels at baseline to their levels at each successive phase of the video presentation revealed different patterns for Reactors as compared to Non-Reactors. The Reactors' HR levels were significantly below and their SC levels significantly above their baseline values for a greater number of phases as compared to the Non-Reactors. This suggests

that the Reactors demonstrated greater reactivity to the video stimulus.

Although there is evidence that the subjects' original blood donation responses were recued during the video presentation, significant Type differences in terms of coping and physiological responding during the video were not uncovered via the MANCOVA analyses. As such, it is not totally clear to what extent the subjects relived their blood donation experiences. It should be kept in mind, however, that there were substantial similarities across certain responses to both situations. Furthermore, what is important is that the evidence indicates that a relevant and appropriate stressor was used to examine what factors differentiate people who experience vasovagal reactions while donating blood from those who do not.

An interesting finding was noted regarding questionnaire design - the specific versions of both the Affect scale and DCC revealed more significant effects than the global versions. This implies that limiting the subjects' ratings to discrete or circumscribed periods may enhance the reliability of their assessments, and that the use of global or general recall tasks result in less precise information.

Three other points should be discussed regarding the limitations of the present study. Firstly, the sample size used in the investigation was quite small due to the limited subject pool. Secondly, no corrections were made to account for the fact that multiple tests of significance were performed, thus increasing the probability of Type I errors. Such corrective measures were not taken due to the lack of power afforded by the small sample size obtained in the study. Thirdly, it seems that the Reactor group consisted mainly of mild Reactors. This

belief is based on the fact that only one subject, a Reactor, endorsed the symptom of disturbed or lost consciousness and that the groups did not differ in terms of the life-time frequency of being faint to the point of unconsciousness. The selection of milder Reactors is probably due to a self-selection bias resulting from those with a history of severe vasovagal reactions being less likely to volunteer to donate blood. This bias may have reduced the extent or strength of differences between the Reactors and Non-Reactors.

Lack of Physiological Reflection of Self-Reported Arousal. Analysis of the State Ratings revealed, as was expected, that the Reactors experienced greater levels of anxiety, subjective physiological arousal, and distress during the video presentation, than did the Non-Reactors. This is understandable in light of their greater fears of injections (needles) and medical procedures and in light of their appraisals of a greater potential of physical harm. Less understandable, at least initially, is that the Reactors' experiences of greater arousal were not reflected in the physiological data.

A possible explanation is that, as per the motor inhibition hypothesis, it may be the "see-saw" battle between the two ANS branches which actually produces unpleasant physical sensations. The subject experiencing such sensations labels them as, or attributes them to anxiety. Furthermore, when the subject is asked to assess the level of their physiological arousal, it may be the degree of simultaneous activity in both branches of the ANS which helps determine the level of arousal reported. Thus, even though a subject's heart rate may actually be lower than his/her baseline level, if that lower heart rate is a

result of high sympathetic activity combined with even stronger parasympathetic activity, the subject will report a high degree of physiological arousal. The female Reactors, for example, reported the highest anxiety levels, while demonstrating the lowest HR and SC levels along with the highest HR variability as well as the lowest DT levels (although not significantly lower). This suggests a simultaneous high parasympathetic activity and an associated high level of anxiety.

Another issue that requires clarification is how one can reconcile the evidence for simultaneous activation of both branches of the ANS. The two branches of the ANS are commonly conceptualized as working in a tug-of-war-like manner over control of the systems they innervate, with one branch necessarily losing control as the other wins control. However, the ANS is two separate systems which, although in communication, operate on separate pathways producing an array of possibile control gradations. As such, one can have a simultaneous increase in the activity of both branches (Barr & Kiernan, 1983). Furthermore, separate physiological systems may be more influenced by one branch of the ANS at one time than the other, while simultaneously another physiological system may be influenced more by the other branch (Barr & Kiernan, 1983). For example, in the present study it is possible that while the average subject's heart was being influenced to a greater degree by the parasympathetic branch, the systems assessed by skin conductance and digit temperature recordings were being influenced to a greater degree by the sympathetic branch. This is most likely regarding the sweat glands because they receive only sympathetic innervation.

Sex Differences. The current results support previous findings that

females report more BI fear (Kaloupek, Peterson, & Levis, 1981) and greater frequencies of vasovagal reactions than males (Kleinknecht, 1987). On various physiological indices assessed during the video presentation the female Reactor group had reactions divergent from the other three groups. As previously mentioned there were significant 3-way interactions which indicated that the female Reactors had higher HR variability and amplitude values than the other groups. Furthermore, although not significant, they also had lower HR-BPM, DT, and SC scores. These differences may have either been due to inherent differences in the physiological responding of female Reactors or perhaps to the situational factor of having only a male experimenter involved in the second stage of the experiment. Although attempts were made to convince all subjects that there was a female co-experimenter in the adjoining room, the physical presence of only a male may have been anxiety provoking for some females - especially those with high physical threat fear. Although highly speculative, this may help account for the females reporting a lesser sense of situational control. This added fear factor may have been enough to cause the female Reactors' more pronounced physiological responses.

Summary and Conclusions. The present study attempted to advance the understanding of the differences between individuals who experience vasovagal reactions while donating blood and those who donate without such reaction. This investigation focused on factors previously cited as potentially central in the causation of vasovagal reactions such as fears, autonomic system imbalances, appraisal and coping methods. The results indicate that whereas fears do seem to play a central role in

differentiating Reactors from Non-Reactors, the Reactors do not seem to be more fearful in terms of very broad or general fear categories (i.e., SE or BI fear). Rather, the results indicate differences on more circumscribed fears (e.g., fear of injections). If true of most emotional syncope reactions, this may bear well for future behavioural treatment programs because circumscribed fears may be more readily treated than diffuse fears.

The finding that Reactors differed from Non-Reactors in terms of coping methods suggests that an interactional process may be occurring between coping and physiological activity. It seems that suppression in the form of withdrawal and self-focused coping are associated with the occurrence of vasovagal reactions. Although differences in coping may have been due to differences in the physiological and affective states being experienced, cursory examination of the patterns of coping and anxiety ratings assessed during the video presentation indicated that coping differences at times preceded differences in anxiety. Further refinement and expansion of coping measures is needed to enable the further investigation of coping effects on physiological and psychological responses during blood donation.

Although the present results do not support the hypothesis that Reactors are prone to vasovagal reactions due to an imbalanced or over-reactive autonomic nervous system, there is evidence that faulty breathing patterns or the propensity to hyperventilate may be linked to vasovagal reactions. Furthermore, parallels were drawn between vasovagal reactions and panic attacks in terms of breathing, somatic sensitivity, and arousal interpretation issues. These results suggest new directions

in syncope treatment programs focusing on modifying aberrant breathing and the tendency to misinterpret somatic sensations due to an overconcern with potential threats to personal physical integrity.

The information provided by this study regarding the differences between Reactors and Non-Reactors may prove important both in the eventual ability to successfully identify individuals as prone to vasovagal reactions prior to their actual blood donations and in the efforts to prevent the occurrence of such reactions. For example, the significant discriminant function obtained using predictor variables easily assessed during a donor clinic can be seen as a first step in the construction of a pre-donation screening form.

Emotional fainting causation may be a case of necessary but not sufficient factors. In other words, the single presence of any one of the factors hypothesized to predispose individuals to syncope reactions may not be enough to cause syncope, but may be necessary in combination with other factors to result in a reaction. As such, future research should strive to determine which factors are most relevant in determining an individual's potential to experience vasovagal reactions and correspondingly tailor treatment programs to take this new information into account.

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Appendix A: Clinic Consent Form

Blood Donor Questionnaire

Dimensional Coping Checklist
(Global and Specific versions)

Affect Scale

Future Contact Consent Form

CLINIC CONSENT FORM

Dr. Kaloupek of the Concordia University Department of Psychology and his assistants are conducting research projects involving Red Cross blood donors. The present project concerns the occurence of psychological and physical reactions during the donation procedure. We would like you to participate in this project.

Your participation is completely voluntary and is not required as part of the donation program of the Red Cross. Also, if you decide to participate and later change your mind, you can withdraw at any time by simply returning the incomplete forms.

As part of the project you will be asked to do the following:

(1) Provide some information concerning your age, previous blood donations, and experience with fainting.

(2) Complete checklists that ask about your thoughts, actions, and sensations during blood donation today.

(3) Rate your emotional state during blood donation.

Please note that all information collected about you is confidential. To insure this fact, your identity is guarded by a numerical coding system.

Questions about the project can be addressed to a project member who is identified by a badge.

If you are interested in participating in the project, please complete the section below. Your signature indicates that you have read and understood this form, and that you volunteer your participation.

Name (please print):_____

Your Signature:_____

Date:_____ Witness:_____

(Thank you for your time and help in our research efforts.)

Blood Donor Questionnaire #_____

1. Age: _____

2. Sex (circle): Male | Female Approximate time:_____

3. Height: _____ inches or _____ cm. 4. Weight: _____ pounds or _____ kg.

5. How many times have you donated blood, including this time? _____

6. Please indicate whether you experienced any of the sensations listed below since arriving at this blood donor clinic. Read through the list three times. The first time, place a "B" beside all sensations that occurred before the needle was inserted in your arm. The second time, place a "D" beside all sensations that occurred during the actual donation. The third time, place an "A" beside all sensations that occurred anytime after the needle was removed.

_____nausea / upset stomach
_____weakness
_____dizziness
_____blurred vision
_____difficulty hearing
_____disturbance or loss of consciousness
_____lightheadedness
_____rapid or pounding heart beat
_____excessive perspiration
_____rapid or difficult breathing
_____hot flushes (in face, neck, arms or legs)

7. People sometimes feel faint (e.g., weak; dizzy) or become unconscious due to emotional reactions. Often this occurs in medical situations or after accidents that involve physical injury. Physical factors such as illness, poor eating habits, or even a hot room may add to the effect.

Prior to today, how many times have you felt weak or dizzy in this way? _____

Prior to today, how many times have you become unconscious in this way? _____

8. Please indicate the circumstances in which you have felt faint or become unconscious for emotional reasons (even if physical factors added to the effect). Read through the following list twice. The first time, place a "D" beside all situations in which you have felt dizzy. Next, place a "U" beside all situations in which you have become unconscious.

_____receiving an injection
_____visiting in a hospital
_____being in danger of injury
_____being rejected
_____performing in public
_____seeing blood
_____hearing details of a disease
_____hearing about or seeing death
_____being angry: in an argument
_____specify any others:_____

For each of the following questions, make a vertical mark through the scale at the point that indicates your answer.

9. How anxious or nervous were you when blood was being taken from your finger (before you went to the donor chair)?

not anxious |_____| extremely anxious

10. During blood donation, how much were you concerned that something embarrassing might happen?

not concerned |_____| extremely concerned

11. During blood donation, how much were you concerned that something physically harmful might happen?

not concerned |_____| extremely concerned

12. During blood donation, how much influence or control did you feel you had over the situation?

no control |_____| complete control

13. During blood donation, how much influence or control did you feel you had over yourself?

no control |_____| complete control

14. When did you last eat? _____ hours ago

15. Do you smoke cigarettes? Yes | No If yes, how many today? _____

16. Do you drink coffee or tea which contains caffeine? Yes | No
If yes, how many cups today? _____

17. Were you tired when you came to donate blood? Yes | No
Approximately how long did you sleep last night? _____ hr.

18. Do you have any kind of physical condition or illness?
(Please check all which apply):

_____flu _____cold

_____menstruation

_____anemia _____diabetes

_____epilepsy _____hypertension

_____heart ailments

other: _____

DIMENSIONAL COPING CHECKLIST #_____
(Global Version)

INSTRUCTIONS: Please place an "X" beside all phrases that describe your thoughts or actions during the preceding blood donation.

I was...

_____ watching things happen around me.
_____ distracting myself.
_____ paying attention to my emotions.
_____ asking someone for help or support.
_____ turning away from the situation.
_____ doing whatever I was told.
_____ trying to find out more information.
_____ stopping my unpleasant thoughts.
_____ hoping things would work out.
_____ analyzing details of the situation.
_____ holding back my emotions.
_____ accepting things as they happened.
_____ noticing my body sensations.
_____ praying silently for help or guidance.
_____ trying to see the positive side.
_____ preparing myself for things to come.
_____ letting things happen.
_____ rehearsing plans in my mind.
_____ controlling my actions.
_____ showing my emotions.
_____ avoiding unpleasant sights or sounds.
_____ changing things to better suit me.
_____ calming my physical reactions.
_____ imagining that I was elsewhere.

DIMENSIONAL COPING CHECKLIST
(Specific Version)

INSTRUCTIONS: Please place an "X" beside all phrases that describe your thoughts or actions when the nurse was making preparations to insert the needle.

I was...

_____ watching things happen around me.

_____ distracting myself.

_____ paying attention to my emotions.

_____ asking someone for help or support.

_____ turning away from the situation.

_____ doing whatever I was told.

_____ trying to find out more information.

_____ stopping my unpleasant thoughts.

_____ hoping things would work out.

_____ analyzing details of the situation.

_____ holding back my emotions.

_____ accepting things as they happened.

_____ noticing my body sensations.

_____ praying silently for help or guidance.

_____ trying to see the positive side.

_____ preparing myself for things to come.

_____ letting things happen.

_____ rehearsing plans in my mind.

_____ controlling my actions.

_____ showing my emotions.

_____ avoiding unpleasant sights or sounds.

_____ changing things to better suit me.

_____ calming my physical reactions.

_____ imagining that I was elsewhere.

DIMENSIONAL COPING CHECKLIST - KEY (Jan. 1987)

This is the revised version of the preliminary coding scheme. It is based on orignal item selection and factor analysis of data from simulated blood donors.

I was...		Focus	Direction	Production
1._____	watching things happen around me.	(En)	(Ap)	[Ps]
2._____	distracting myself.		[Wd]	
3._____	paying attention to my emotions.	[Sf]	(Ap)	(Ac)
4._____	asking someone for help or support.	[Sf]	(Ap)	(Ac)
5._____	turning away from the situation.		[Wd]	
6._____	doing whatever I was told.	(En)	(Ap)	[Ps]
7._____	trying to find out more information.	(En)	(Ap)	(Ac)
8._____	stopping my unpleasant thoughts.		[Wd]	
9._____	hoping things would work out.		[Wd]	
10._____	analyzing details of the situation.	(En)	(Ap)	(Ac)
11._____	holding back my emotions.	[Sf]	[Wd]	
12._____	accepting things as they happened.	(En)	(Ap)	[Ps]
13._____	noticing my body sensations.	[Sf]	[Wd]	
14._____	praying silently for help or guidance.		[Wd]	
15._____	trying to see the positive side.		[Wd]	
16._____	preparing myself for things to come.	(En)	(Ap)	(Ac)
17._____	letting things happen.	(En)	(Ap)	[Ps]
18._____	rehearsing plans in my mind.	(En)	(Ap)	(Ac)
19._____	controlling my actions.	[Sf]	[Wd]	
20._____	showing my emotions.	[Sf]	(Ap)	(Ac)
21._____	avoiding unpleasant sights or sounds.		[Wd]	
22._____	changing things to better suit me.	(En)	(Ap)	(Ac)
23._____	calming my physical reactions.	[Sf]	[Wd]	
24._____	imagining that I was elsewhere.		[Wd]	

Scoring instructions are on a separate sheet.

Definitions for Coping Classification
(Revised January 1987)

Three scores are calculated for each DCC form. The first score indicates the object of focus (environment vs. self). The second indicates the primary direction of coping relative to the object of focus (approach vs. withdrawal). The third addresses the production of coping (active vs. passive).

Focus of Coping:

Environment = Coping that is oriented toward surrounding situational features. These features may provide information, require action, and/or elicit emotional responding.

Examples: * Examining the situational features
* Planning action aimed at the situation
* Altering the situational features

Self = Coping that is oriented toward aspects of the individual. These aspects include emotional reactions, bodily sensations, thoughts, and actions.

Examples: * Attending to emotions, physical sensations, or behavior
* Altering emotional reactions, physical sensations, or behavior
* Displaying emotion
* Requesting assistance

Direction of Coping:

Approach = Indications of moving toward or allowing the approach of the object of focus.

Examples: * Approach behavior
* Information seeking
* Preparation for action
* Displaying emotion

Withdraw = Indications of moving away from or not allowing approach of the object of focus.

Examples: * Escape or avoidance behavior
* Distraction or inattention
* Inhibition of responding

Production of Coping:

Active = Specific initiation of action relative to the object of focus.

Examples: * Approach
* Withdrawal
* Inhibition
* Direct information seeking

Passive = Specific failure to initiate independent action relative to the object of focus.

Examples: * Allowing events to transpire without acting
* Monitoring events without acting

PRELIMINARY SCORING FOR THE DIMENSIONAL COPING CHECKLIST

Each item on the scale has the potential to contribute to one or more of the coping dimensions. The preliminary contributions, based on analysis of simulated blood donor data, are indicated on the companion sheet that has columns to the right of the item listings that correspond to the three coping dimensions.

Focus: The environmental focus is indicated by "(En)" after the respective items. Self focus is indicated by the "[Sf]".

Divide the number of items endorsed for environment by the total number of possible environmental focus items, 9 in this version of the scale. Do the same for self-focus, for which there are 7 possible items in this version. These values reflect the proportions of total items endorsed for each focus. Next, subtract the proportion for self focus from the proportion for environmental focus, then add 1 to this value, and finally, multiply by 50. The resulting score is used to represent the focus variable in analyses. Scored in this way, potential focus scores range from 0 to 100, with scores above 50 indicating a relatively greater endorsement of environmental focus.

The other two dimensions are scored in an analogous fashion, with final scores reflecting the relative balance/imbalance of the two categories in question. Indicators for initial item classifications are as follows:

Direction: Approach is indicated by "(Ap)" and withdrawal is indicated by "[Wd]".

The final direction score is based on the proportion for withdrawal (12 possible items) subtracted from the proportion for approach (12 possible items), adding 1, and multiplying by 50. Scores above 50 indicate relatively greater endorsement of approach as the direction of coping.

Production: Active is indicated by "(Ac)" and passive is indicated by "[Ps]".

The final production score is based on the proportion for passive (4 possible items) subtracted from the proportion for active (8 possible items), adding 1, and multiplying by 50. Scores above 50 indicate relatively greater endorsement of active production of coping.

Total Item Endorsement:

An additional index that may be of value is the total number of items endorsed. Eventually, it may be possible to devise a scoring format that takes this into account in calculating the individual dimension scores. For now, this index alone may provide meaningful information about the relative precision (or diversity) of the individual's coping efforts.

AFFECT SCALE
(Specific Version)

INSTRUCTIONS: Complete this scale in two steps.

1. Circle all words that describe your feelings <u>when the nurse was making preparations to insert the needle</u>. (Examine all words on the left side of the page before proceeding to those on the right.)

2. After circling all appropriate words, mark across the solid line to indicate the degree to which the words at one end better describe your feelings at that time compared to the words at the other end. Be sure to mark each line.

Drowsy Dull	+----------	Active Elated Enthusiastic
Sleepy Sluggish		Excited Peppy Strong
At Rest Calm	+----------	Distressed Fearful Hostile
Placid Relaxed		Jittery Nervous Scornful
Blue Grouchy Lonely	+----------	Content Happy Kindly
Sad Sorry Unhappy		Pleased Satisfied Warmhearted
Quiescent Quiet	+----------	Aroused Astonished
Still		Surprised

AFFECT SCALE - KEY

SCORING: Each scale is oriented so that the words on the right-side pole are associated with endorsement of the primary scale attribute (e.g., positive affect). A 3-point (0 - 1 - 2) coding system is intended to reflect the degree to which both the number of circled words and the analogue ratings indicate that an attribute has been endorsed. Specific scoring criteria are as follows:

1. - In terms of the frequency of circled words, a simple comparison is made between the two poles of each scale to determine which has the greater number of endorsements.

2. In terms of analogue ratings, the mark must be more than 1 cm from the center of the scale to be considered an endorsement for one pole over the other. Otherwise, it is considered a tie.

3. Congruent endorsements of the left pole based on both criteria are coded "0"; congruent endorsements of the right pole are coded "2".

4. If the same number of words are circled at both ends of a scale, analogue ratings that are greater than 1 cm to the left of center cause the response to be coded "0". When the analogue ratings are greater than 1 cm to the right of center the responses are coded "1". When analogue ratings are in the center of the scale (± 1 cm) the responses also are coded "1".

6. If one pole exceeds the other by only one circled word, analogue ratings that are in the center of the scale (± 1 cm) or are toward the other pole cause the response to be coded "1".

7. If one pole exceeds the other by two or more circled words, analogue ratings that are in the center of the scale (± 1 cm) are considered congruent with the endorsed pole. Accordingly, responses are coded "0" if the left pole has the excess of circled words and "2" if the right pole has the excess.

The examples on the following page reflect the scoring criteria. In these examples, Positive Affect would be coded "1" (see criterion #6)...Negative Affect would be coded "0" (see criterion #7)...Pleasantness would be coded "2" (see criterion #3)...Engagement would be coded "1" (see criterion #6).

EXAMPLE:

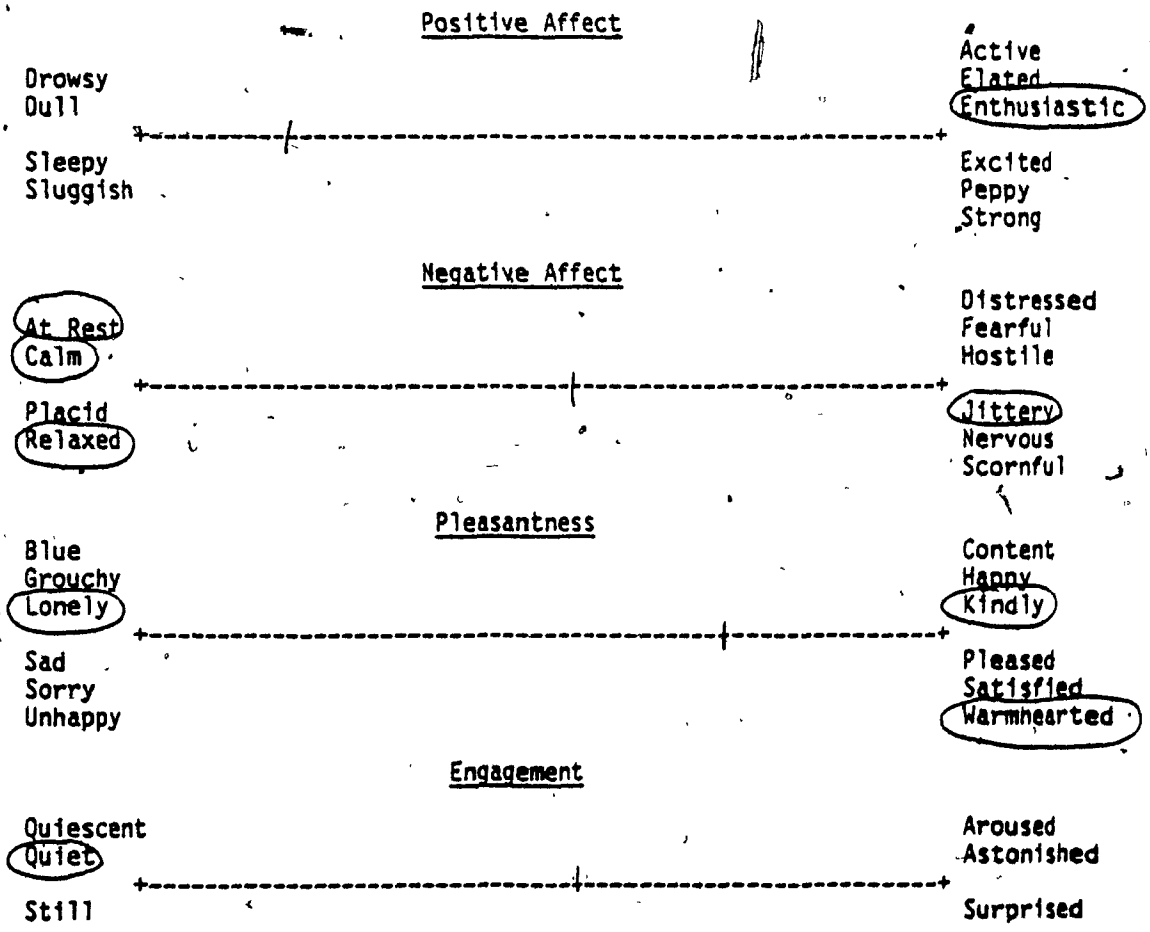
AFFECT SCALE

INSTRUCTIONS: Complete this scale in two steps.

Step 1: Circle all words that describe your feelings (at this time)*. Begin by examining all words on the left side of the page before proceeding to those on the right.

Please complete step 1 before reading about step 2.

Step 2: Mark once across each solid line to indicate the degree to which the words at one end better describe your feelings compared to the words at the other end. Place the mark closer to the group of words which is closer to your feelings. Be sure to place one mark across each line, even if you have not circled any words at either end.



*The temporal reference point, indicated in parenthesis, may be reworded to suit procedural considerations (e.g., to reflect past feelings).

#_____

FUTURE CONTACT CONSENT FORM

Thank you very much for your help in our research efforts. Depending on the outcome of this study, future research studies may be called for. Accordingly, we would like to take this opportunity to obtain your written permission to contact you at a future date. Please note that granting this permission does not obligate you in any way to participate in the future research. It only indicates that you are willing to be contacted. You are free to decline or accept participation at the time of contact.

If you are willing to be contacted please provide the information below which will enable us to reach you.

Thank you.

Name (please print):_____

Telephone: (please provide more than one if possible)

_____

Best times to contact you:_____

_____

Your signature:_____

THIS SHEET WILL BE REMOVED FROM ANY ACCOMPANYING QUESTIONNAIRES AND STORED IN A SECURE LOCATION SO THAT THE CONFIDENTIALITY OF THE INFORMATION IS PROTECTED.

Appendix B: Contact Statement

Laboratory Consent Form

Research Participant Form

Personal Illness Questionnaire

Donor Memory Test

Situation Appraisal Rating Scale

Contact Statement

Hello (subject's name), my name is (experimenter's name) and I am a graduate student in psychology at Concordia University. Do you remember taking part in a psychology study after giving blood at the Concordia Blood Drive last November? Well at that time you indicated that you might be interested in participating in some future paid research. Well we are now beginning a study related to the questions we asked you during the blood drive. We would like you to participate in the present study which would pay you $10 for about 1 1/2 hours of your time; we are very flexible regarding appointment times.

The study involves having you come to Dr. Kaloupek's research offices. You will be asked to watch a video which depicts the progress of someone going through the same blood donation procedure you went through. I can't give you more details over the phone, but if you come to our offices you will receive a complete description of the study. If, after having heard the more detailed explanation you decide not to participate, we will pay you $2 for coming in to find out more about the study. We will pay you $10 if you participate. Would you like to set up an appointment?

** If yes, ask subjects not to consume any products containing caffeine, nicotine, or alcohol for the 2 hours prior to their appointment.

Then ask them to get a pencil and paper to copy the following information:

-Address: 2155 Guy St. (Guy Towers)
2nd floor (i.e. press #2 in the elevator)
Room 201-10

-Lab Phone # in case Subject needs to contact experimenter:
848-7546
-Name of experimenter speaking with.

Laboratory Consent Form #_____

In this experiment, we are interested in examining your physiological and subjective responses to a video presentation depicting an individual going through a Red Cross blood donor clinic. Before the video presentation, stick-on discs will be attached to your ankles, one shoulder, and the palm of one hand in order to record the physiological reactions of your heart and skin. A small temperature-sensitive device will be placed on the middle finger of one hand to record your body surface temperature. A video camera will also be used to record your reactions during the presentation. At the beginning of the session you will be asked to sit quietly with your eyes open for a 10-minute rest period, during which you will be asked to complete some ratings scales. The rest period will be followed by a short period in which you will practice completing rating scales to be used during the donation video presentation.

During the presentation, your task will be to use the video as an aid in remembering your own experience giving blood last November. As the video progresses, you are to try to recall what you experienced at the same stages of the procedure as are being shown. At various times during the presentation you will be asked to complete questionnaires and provide ratings about your feelings and reactions.

The video presentation will be followed by a rest period during which additional questionnaires and rating scales are to be completed. The final part of the study will have you perform a simple physical task of blowing into a specially designed tube for a period of approximately 15 seconds.

The entire procedure takes approximately 90 minutes. All data gathered during the course of this study are confidential. Your identity is protected by a numerical coding system used on all materials. The video recording made of you will be erased immediately after it is reviewed.

Your participation in the study is completely voluntary. If you decide to participate and later change your mind, <u>you are free to withdraw from the study at any time without penalty</u>. You will receive a $10 payment for your participation whether or not you complete the entire study.

Please answer the following questions about procedures described on the consent form.

1. What type of physiological reactions will be measured?

_____

2. What will the video presentation show?

_____

3. When may you terminate the experiment if you consider it necessary?

_____

I HAVE READ AND UNDERSTOOD THIS AGREEMENT. MY SIGNATURE BELOW INDICATES THAT I FREELY CONSENT TO PARTICIPATE IN THE STUDY.

NAME (Please Print)_____

SIGNATURE_____

WITNESS SIGNATURE_____

DATE_____

_____

RESEARCH PARTICIPANT FORM

All information provided on this questionnaire will be confidential and used only for research purposes.

Date _____ Approximate Time:_____

PLEASE ANSWER ALL OF THE FOLLOWING QUESTIONS:

1) Sex: Male | Female

2) Age: _____yr.

3) When did you last eat? _____ hours ago

4) Are you hungry at this moment? Yes | No

5) Do you smoke cigarettes? Yes | No

6) If yes, how many today? _____

7) Do you drink coffee or tea which contains caffeine? Yes | No

8) If yes, how many cups today? _____

9) Are you tired at this moment? Yes | No

10) Approximately how long did you sleep last night? _____ hr.

11) Have you given blood since your donation in November? Yes | No

12) Do you have any kind of physical condition or illness? (Please check all which apply):

_____ anemia
_____ diabetes
_____ epilepsy
_____ hypertension
_____ heart ailments
_____ flu
_____ cold
_____ menstruation
_____ other (please specify)

_____

_____

13) Have you ever had heart trouble of any kind? Yes | No

If yes please specify _____

Please list any medication that you are presently taking and the reason for it.

_____

_____

Identification # _____

PERSONAL ILLNESS QUESTIONNAIRE

Please read each statement and indicate whether it is True or False as it applies to you. Circle the letter which corresponds to your answer.

1. I tend to get upset and anxious about the prospect of receiving an injection..... T F

2. When I am ill with a cold or flu, it seems that I take longer than my friends to recover and get back to work or school..... T F

3. Sometimes I notice small pains or irregularities which I think might be signs of serious illness..... T F

4. When things are not going well in my life, I tend to feel physically upset or ill..... T F

5. It often makes me uncomfortable when someone gives a detailed description of a serious injury or major medical procedure..... T F

6. I find that when a doctor talks to me after an examination I am tense because I am anticipating the discovery of a serious disorder..... T F

7. I often have minor illnesses or small physical upsets.... T F

8. It troubles me to have a blood sample drawn..... T F

9. My strongest fears involve the prospect of me having a serious disorder such as a heart attack or cancer..... T F

10. Sometimes I have to make myself stop thinking about or imagining things which might be wrong with me..... T F

11. If I really think about or imagine the physical process involved in a disorder such as a brain tumor, my heart races and my palms sweat..... T F

12. In medical situations I often have to take deep breaths to calm myself..... T F

13. When I don't eat well or sleep enough my body feels like it does during the early stages of the flu..... T F

14. Even though I try very hard to keep my emotions or bodily reactions under control, I often notice little details of medical procedures which make my heart race... T F

PIQ scoring details

Medical Procedures Fear Score	= ((of following statements the no. endorsed: 1,5,8,12) ÷ 4) X 100
Disease Fear Score	= ((of following statements the no. endorsed: 6,9,10,11) ÷ 4) X 100
Somatic Sensitivity Score	= ((of following statements the no. endorsed: 2,4,7,13) ÷ 4) X 100

#_____

Donor Memory Test

INSTRUCTIONS: Please read each statement below and check off those which you remember experiencing while giving blood last November.

_____ after needle removal, being told to apply pressure to your arm at the point of the puncture wound

_____ the nurse placing a stethoscope on your arm while inflating a blood pressure cuff

_____ walking from the check-in table to the finger-tip blood sample table

_____ receiving a band-aid to cover the puncture wound after needle removal

_____ after the first half-pint bag filled with blood, the nurse replacing it with an empty one for you to fill

_____ receiving an information pamphlet on the history of the Canadian Red Cross.

_____ presenting your Red Cross donor card or completing information forms at the check-in table

_____ walking from the check-in table to the waiting area

_____ upon needle removal, the nurse putting a cotton ball on the puncture wound

_____ presenting your Medicare card at the check-in table

_____ having your blood pressure taken by the person at the finger-tip blood sample table

_____ the nurse swabbing your arm before inserting the needle

_____ the nurse asking you not to eat anything for one hour after donation

_____ receiving an information pamphlet on A.I.D.S. at the check-in table

_____ the person at the finger-tip blood sample table asking you questions relating to recent illness history

Donor Memory Test - Scoring Details

INSTRUCTIONS: Please read each statement below and check off those which you remember experiencing while giving blood last November.

__T__ after needle removal, being told to apply pressure to your arm at the point of the puncture wound

__F__ the nurse placing a stethoscope on your arm while inflating a blood pressure cuff

__T__ walking from the check-in table to the finger-tip blood sample table

__T__ receiving a band-aid to cover the puncture wound after needle removal

__F__ after the first half-pint bag filled with blood, the nurse replacing it with an empty one for you to fill

__F__ receiving an information pamphlet on the history of the Canadian Red Cross.

__T__ presenting your Red Cross donor card or completing information forms at the check-in table

__F__ walking from the check-in table to the waiting area

__T__ upon needle removal, the nurse putting a cotton ball on the puncture wound

__F__ presenting your Medicare card at the check-in table

__F__ having your blood pressure taken by the person at the finger-tip blood sample table

__T__ the nurse swabbing your arm before inserting the needle

__F__ the nurse asking you not to eat anything for one hour after donation

__T__ receiving an information pamphlet on A.I.D.S. at the check-in table

__T__ the person at the finger-tip blood sample table asking you questions relating to recent illness history

Scoring Formula: # correct - # incorrect = score
N.B.: Negative scores changed to zero scores

#_____

SITUATION APPRAISAL RATING SCALE

Situation: Watching the upcoming video presentation which depicts an individual going through a Red Cross blood donation procedure.

INSTRUCTIONS: Below are 10 pairs of statements presented at the ends of solid lines. Please read both statements in a pair and then place a mark across the line to indicate the degree to which one statement better reflects your view regarding the situation listed above. Place the mark closer to the statement that is closer to your view. Please mark once across each line.

In this situation...

I can influence what happens.	|----------|	Others control what happens.
I may be in physical danger.	|----------|	I will be completely safe.
I am not concerned about how I may behave.	|----------|	I may embarrass myself.
My opinion of myself will not change.	|----------|	I will feel better about myself afterward.
I must rely on others to make me comfortable.	|----------|	I can do things to make myself comfortable.
I wonder what will happen to me.	|----------|	I know what to expect.
If I get upset, I can do little to help myself.	|----------|	If I get upset, I can still control myself.
I welcome this as a challenge.	|----------|	I do not see a positive side.
The experience will be pleasant.	|----------|	I may experience discomfort or pain.
I chose to become involved.	|----------|	I was influenced by outside forces.

SITUATION APPRAISAL RATING SCALE - Repeat Version #_____

Situation: Imagine that you are going to have a repeat viewing of the blood donation video presentation.

INSTRUCTIONS: Below are 10 pairs of statements presented at the ends of solid lines. Please read both statements in a pair and then place a mark across the line to indicate the degree to which one statement better reflects your view regarding the situation listed above. Place the mark closer to the statement that is closer to your view. Please mark once across each line.

In this situation...

I can influence what happens.	|----------|	Others control what happens.
I may be in physical danger.	|----------|	I will be completely safe.
I am not concerned about how I may behave.	|----------|	I may embarrass myself.
My opinion of myself will not change.	|----------|	I will feel better about myself afterward.
I must rely on others to make me comfortable.	|----------|	I can do things to make myself comfortable.
I wonder what will happen to me.	|----------|	I know what to expect.
If I get upset, I can do little to help myself.	|----------|	If I get upset, I can still control myself.
I welcome this as a challenge.	|----------|	I do not see a positive side.
The experience will be pleasant.	|----------|	I may experience discomfort or pain.
I chose to become involved.	|----------|	I was influenced by outside forces.

SARS Scoring Key

There are four tentative appraisal targets represented on this scale: Potential for Situational Control (items 1,5,10); Potential for Self Control (items 3,7); Threat (items 2,6,9); Challenge (items 4,8). The ratings are coded using a 5-point scale (1-2-3-4-5). The statement indicated by an "X" on the scales in the examples below is the choice which represents the target in question. The "X" is always in the segment which would be scored as a 5.

I can influence what happens.	|-X----------|	Others control what happens.
I may be in physical danger.	|-X----------|	I will be completely safe.
I am not concerned about how I may behave.	|-X----------|	I may embarrass myself.
My opinion of myself will not change.	|----------X-|	I will feel better about myself afterward.
I must rely on others to make me comfortable.	|----------X-|	I can do things to make myself comfortable.
I wonder what will happen to me.	|-X----------|	I know what to expect.
If I get upset, I can do little to help myself.	|----------X-|	If I get upset, I can still control myself.
I welcome this as a challenge.	|-X----------|	I do not see a positive side.
The experience will be pleasant.	|----------X-|	I may experience discomfort or pain.
I chose to become involved.	|-X----------|	I was influenced by outside forces.

Appendix C: Abbreviated Dimensional Coping Scale (Brief-DCC) (Practice Form)

Subjective State Ratings (Practice Form)

Abbreviated Dimensional Coping Scale (Brief-DCC) (Rest Period Form)

Subjective State Ratings (Rest Period Form)

Video Description

ADCS (Brief-DCC)

Relative State Ratings

Abbreviated DCS (Brief DCC) - Practice Form _____

INSTRUCTIONS: Below are 4 pairs of statements presented at the ends of lines. Please read both statements in a pair and then place a mark across the line to indicate which phrase better describes your thoughts or actions during the last two minutes of the video presentation.

I WAS...

1. preparing myself for things to come.	|----------|	letting things happen.
2. paying attention to my emotions.	|----------|	analyzing details of the situation.
3. holding back my emotions.	|----------|	showing my emotions.
4. watching things happen in the video.	|----------|	distracting myself from the video.

Abbreviated DCS (Brief DCC) - Scoring Key

The ratings are coded using a 3-point scale (2-1-0). The lines are divided into 3 segments of equal length and the "X' on each line below represents the coping target and is in the segment which would be scored as a 2.

Production Scale

1. preparing myself for things to come.	|-X----------|	letting things happen.

Focus Scale

2. paying attention to my emotions.	|-X----------|	analyzing details of the situation.

Direction Scale A

3. holding back my emotions.	|-X----------|	showing my emotions.

Direction Scale B

4. watching things happen in the video.	|----------X-|	distracting myself from the video.

N.B.: The two Direction Scales were combined in the analyses;

(score Direction Scale A + score Direction Scale B)/2 = new Direction Score

SUBJECTIVE STATE RATINGS (Practice) #_____

INSTRUCTIONS: For each of the following questions, make a vertical mark through the scale at the point that indicates your answer.

1. Please indicate how anxious or nervous you feel now, compared to how you feel while relaxing quietly at home.

much less anxious or nervous |----------| much more anxious or nervous

2. Please indicate how anxious or nervous you feel now.

not at all anxious or nervous |----------| very anxious or nervous

3. Please indicate how much physiological arousal or activity you are feeling now, compared to how you feel while relaxing quietly at home.

much less arousal or activity |----------| much more arousal or activity

4. Please indicate how much physiological arousal or activity you are feeling now.

no arousal or activity |----------| much arousal or activity

5. Please indicate how distressed you feel now compared to how you feel while relaxing quietly at home.

much less distressed |----------| much more distressed

6. Please indicate how distressed you feel now.

not at all distressed |----------| very distressed

#_____

Abbreviated DCS (Brief DCC) - Rest Period Form

INSTRUCTIONS: Below are 4 pairs of statements presented at the ends of lines. Please read both statements in a pair and then place a mark across the line to indicate which phrase better describes your thoughts or actions during the last two minutes of the rest period.

I WAS...

1. preparing myself for things to come.	|----------|	letting things happen.
2. paying attention to my emotions.	|----------|	analyzing details of the situation.
3. holding back my emotions.	|----------|	showing my emotions.
4. watching things happen.	|----------|	distracting myself.

SUBJECTIVE STATE RATINGS (Rest Period) #_____

INSTRUCTIONS: For each of the following questions, make a vertical mark through the scale at the point that indicates your answer.

1. Please indicate how anxious or nervous you feel now, compared to how you feel while relaxing quietly at home.

much less anxious or nervous |----------| much more anxious or nervous

2. Please indicate how anxious or nervous you feel now.

not at all anxious or nervous |----------| very anxious or nervous

3. Please indicate how much physiological arousal or activity you are feeling now, compared to how you feel while relaxing quietly at home.

much less arousal or activity |----------| much more arousal or activity

4. Please indicate how much physiological arousal or activity you are feeling now.

no arousal or activity |----------| much arousal or activity

5. Please indicate how distressed you feel now compared to how you feel while relaxing quietly at home.

much less distressed |----------| much more distressed

6. Please indicate how distressed you feel now.

not at all distressed |----------| very distressed

Video Description

The video was recorded at the same Red Cross Mobile clinic from which the subjects were selected. The camera eye followed the perspective of a blood donor passing through the entire donation procedure. All clinic personnel involved in the video were asked to treat the video donor exactly as any other donor. The video soundtrack consists mainly of the actual background noise of the clinic along with very brief narration explaining the character's current position in the procedure. The narration was kept to a minimum to allow a greater possibility of the viewers adapting the scene to match their own experiences. The same video footage was used with all subjects. The video presentation ran approximately 27 minutes. The presentation consisted of eight seperate segments, each followed by a segment of a blank screen presentation during which subjects completed the necessary questionnaires. The video began with a two minute segment presenting the initial check-in procedure (e.g., I.D. check and donor card update). This was followed by a 12.5 minute blank screen presentation during which the Rest Period, baseline measures, and self-ratings occurred. The durations of the remaining video segments were as follows: two minutes for the continuation of the I.D. check and form signing; two minutes for the preliminary finger-tip blood sample; a two minute waiting period; 12 minutes for venipuncture and phlebotomy; and two minutes of the post-phlebotomy rest on a cot (at the start of which the narration informed the viewer that the donation procedure was over and he/she could relax on the cot). At the end of each blank screen presentation - which begin after each of 7 one-minute physiological sampling periods - a 5 second clip of the action which transpired before the break was be reshown to help subjects "pick-up" the reliving pattern.

#_____

ADCS - BRIEF DCC

INSTRUCTIONS: Below are 4 pairs of statements presented at the ends of lines. Please read both statements in a pair and then place a mark across the line to indicate which phrase better describes your thoughts or actions during the last segment of the video presentation.

I WAS...

1. preparing myself for things to come.	|----------	letting things happen.
2. paying attention to my emotions.	|----------	analyzing details of the situation.
3. holding back my emotions.	|----------	showing my emotions.
4. watching things happen in the video.	|----------	distracting myself from the video.

RELATIVE STATE RATINGS #_____

INSTRUCTIONS: For each of the following questions, make a vertical mark through the scale at the point that indicates your answer.

Compared to how you felt <u>at the end of the rest period</u>, please indicate...:

1. ...<u>how anxious or nervous</u> you feel now.

same or less anxious or nervous	|----------	much more anxious or nervous

2. ...<u>how much physiological arousal or activity</u> you are feeling now.

same or less arousal or activity	|----------	much more arousal or activity

3. ...<u>how distressed</u> you feel now.

same or less distressed	|----------	much more distressed

Appendix D: Dimensional Coping Checklist
(Global and Specific Versions)

Affect Scales
(Revised Global and Specific Versions)

Ailment Questionnaire

Reliving Ratings

Valsalva Questionnaire

DIMENSIONAL COPING CHECKLIST
(Global Version)

#_____

INSTRUCTIONS: Please place an "X" beside all phrases that describe your thoughts or actions during the preceding video presentation.

I was...

_____ watching things happen around me.
_____ distracting myself.
_____ paying attention to my emotions.
_____ asking someone for help or support.
_____ turning away from the situation.
_____ doing whatever I was told.
_____ trying to find out more information.
_____ stopping my unpleasant thoughts.
_____ hoping things would work out.
_____ analyzing details of the situation.
_____ holding back my emotions.
_____ accepting things as they happened.
_____ noticing my body sensations.
_____ praying silently for help or guidance.
_____ trying to see the positive side.
_____ preparing myself for things to come.
_____ letting things happen.
_____ rehearsing plans in my mind.
_____ controlling my actions.
_____ showing my emotions.
_____ avoiding unpleasant sights or sounds.
_____ changing things to better suit me.
_____ calming my physical reactions.
_____ imagining that I was elsewhere.

DIMENSIONAL COPING CHECKLIST
(Specific Version)

#_____

INSTRUCTIONS: Please place an "X" beside all phrases that describe your thoughts or actions <u>when the nurse was making preparations to insert the needle</u>.

I was...

_____ watching things happen around me.

_____ distracting myself.

_____ paying attention to my emotions.

_____ asking someone for help or support.

_____ turning away from the situation.

_____ doing whatever I was told.

_____ trying to find out more information.

_____ stopping my unpleasant thoughts.

_____ hoping things would work out.

_____ analyzing details of the situation.

_____ holding back my emotions.

_____ accepting things as they happened.

_____ noticing my body sensations.

_____ praying silently for help or guidance.

_____ trying to see the positive side.

_____ preparing myself for things to come.

_____ letting things happen.

_____ rehearsing plans in my mind.

_____ controlling my actions.

_____ showing my emotions.

_____ avoiding unpleasant sights or sounds.

_____ changing things to better suit me.

_____ calming my physical reactions.

_____ imagining that I was elsewhere.

AFFECT SCALE
(Revised Specific Version)

#_____

INSTRUCTIONS: Complete this scale in two steps.

Step 1: Circle all words that describe your feelings when the nurse was making preparations to insert the needle. Begin by examining all words on the left side of the page before proceeding to those on the right.

Please complete step 1 before reading about step 2.

Step 2: Mark once across each solid line to indicate the degree to which the words at one end better describe your feelings at that time compared to the words at the other end. Place the mark closer to the group of words which is closer to your feelings. Be sure to place one mark across each line, even if you have not circled any words at either end.

Drowsy Dull	+----------+	Active Elated Enthusiastic
Sleepy Sluggish		Excited Peppy Strong
At Rest Calm	+----------+	Distressed Fearful Hostile
Placid Relaxed		Jittery Nervous Scornful
Blue Grouchy Lonely	+----------+	Content Happy Kindly
Sad Sorry Unhappy		Pleased Satisfied Warmhearted
Quiescent Quiet	+----------+	Aroused Astonished
Still		Surprised

AFFECT SCALE
(Revised Global Version)

INSTRUCTIONS: Complete this scale in two steps.

Step 1: Circle all words that describe your feelings during the preceding video presentation. Begin by examining all words on the left side of the page before proceeding to those on the right.

Please complete step 1 before reading about step 2.

Step 2: Mark once across each solid line to indicate the degree to which the words at one end better describe your feelings during that time compared to the words at the other end. Place the mark closer to the group of words which is closer to your feelings. Be sure to place one mark across each line, even if you have not circled any words at either end.

Drowsy Dull	+----------	Active Elated Enthusiastic
Sleepy Sluggish		Excited Peppy Strong
At Rest Calm	+----------	Distressed Fearful Hostile
Placid Relaxed		Jittery Nervous Scornful
Blue Grouchy Lonely	+----------	Content Happy Kindly
Sad Sorry Unhappy		Pleased Satisfied Warmhearted
Quiescent Quiet	+----------	Aroused Astonished
Still		Surprised

#_____

DONOR RELIVING STUDY

Ailment Questionnaire

INSTRUCTIONS: Please indicate on the scales below the degree to which you have, in your past, experienced the following ailments by placing a vertical mark through the scale at the appropriate point.

1. Irritable Bowel Syndrome

never |----------| always

2. Constipation

never |----------| always

3. Diarreha

never |----------| always

4. Muscle Tension

never |----------| always

5. Acne

never |----------| always

6. Heart Pounding or Racing

never |----------| always

7. Asthma

never |----------| always

8. Indigestion ("Heartburn")

never |----------| always

Please continue on next page

Ailment Questionnaire (continued)

9. Ulcers

never |----------| always

10. Dry-mouth

never |----------| always

11. Migrane Headache

never |----------| always

12. Excessive Sweating

never |----------| always

13. Raynaud's Disease (Painfully cold hands)

never |----------| always

14. Motion-Sickness ("Car-sick" or "Sea-Sick")

never |----------| always

15. Tinnitus (Ear-Ringing)

never |----------| always

16. Feeling Faint When Rising Quickly

never |----------| always

#_____

DONOR RELIVING STUDY

RELIVING RATINGS

INSTRUCTIONS: For each of the following questions, make a vertical mark through the scale at the point that indicates your answer.

1. Please indicate the degree to which you were able to recall your blood donation experience in November, while watching the video presentation.

No recall |----------| Remembered every detail.

2. Please indicate the <u>highest</u> degree to which you felt as if you were actually re-experiencing your blood donation experience in November, at <u>any point</u> during the video presentation.

Felt totally detached. |----------| Felt as if it was actually happening to me.

3. Please indicate the <u>average</u> degree to which you felt as if you were actually re-experiencing your blood donation experience in November, <u>throughout</u> the video presentation.

Felt totally detached. |----------| Felt as if it was actually happening to me.

DONOR RELIVING STUDY #_____

VALSALVA QUESTIONNAIRE

INSTRUCTIONS: For each of the following questions, make a vertical mark through the line at the point that indicates your answer.

To what degree did you notice physical changes during the Valsalva Manuever in the following areas? :

Strength of heart beat (intensity)

no change |----------| large change

Speed of heart beat (frequency)

no change |----------| large change

Resistance to breathing (pressure in chest)

no change |----------| large change

Face flushed or hot

no change |----------| large change

Stretching of facial muscles

no change |----------| large change

Appendix E: Mass Testing Battery

Identification #_____

MQ - Original Version

Please read each statement and indicate whether it is True or False as it applies to you. Circle the letter that corresponds to your answer.

1. I could not remove the hook from a fish that was caught..... T F
2. I would feel some revulsion looking at a preserved brain in a bottle..... T F
3. If a badly injured person appears on TV, I turn my head away.... T F
4. I dislike looking at pictures of accidents or injuries in magazines..... T F
5. I do not mind visiting a hospital and seeing ill or injured persons..... T F
6. Medical odors make me tense and uncomfortable..... T F
7. I would not go hunting because I could not stand the sight of a dead animal..... T F
8. Watching a butcher at work would make me anxious..... T F
9. A career as a doctor or nurse is very attractive to me..... T F
10. I would feel faint if I saw someone with a wound in the eye..... T F
11. Watching people use sharp power tools makes me nervous..... T F
12. The prospect of getting an injection or seeing someone else get one bothers me quite a bit..... T F
13. I feel sick or faint at the sight of blood..... T F
14. I enjoy reading articles about modern medical techniques..... T F
15. Injuries, accidents, blood, etc. bother me more than anything else..... T F
16. Under no circumstances would I accept an invitation to watch a surgical operation..... T F
17. When I see an accident, I feel tense..... T F
18. It would not bother me to see a bad cut as long as it had been cleaned and stitched..... T F
19. Using very sharp knives makes me nervous..... T F

(continued on the next page.....)

(MQ continued.....)

20. Not only do cuts and wounds upset me, but the sight of people with amputated limbs, large scars, or plastic surgery also bothers me..... T F

21. If instruments were available, it would be interesting to see the action of the internal organs in a living body..... T F

22. I am frightened at the idea of someone drawing a blood sample from me..... T F

23. I don't believe anyone could help a person with a bloody wound without feeling at least a little upset..... T F

24. I am terrified by the idea of having surgery..... T F

25. I am frightened by the thought that I might some day have to help a person badly hurt in a car wreck..... T F

26. I shudder when I think of accidently cutting myself..... T F

27. The sight of dried blood is repulsive..... T F

28. Blood and gore upset me no more than the average person..... T F

29. The sight of an open wound nauseates me..... T F

30. I could never swab out a wound..... T F

Identification # _____

FNE - Original Version

Please read each statement and indicate whether it is True or False as it applies to you. Circle the letter which corresponds to your answer.

1. I rarely worry about seeming foolish to others..... T F
2. I worry about what people will think of me even when I know it doesn't make any difference..... T F
3. I become tense and jittery if I know someone is sizing me up.... T F
4. I am unconcerned even if I know people are forming an unfavorable impression of me..... T F
5. I feel very upset when I commit some social error..... T F
6. The opinions that important people have of me cause me little concern..... T F
7. I am often afraid that I may look ridiculous or make a fool of myself..... T F
8. I react very little when other people disapprove of me..... T F
9. I am frequently afraid of other people noticing my shortcomings. T F
10. The disapproval of others would have little effect on me..... T F
11. If someone is evaluating me I tend to expect the worst..... T F
12. I rarely worry about what kind of impression I am making on someone..... T F
13. I am afraid that others will not approve of me..... T F
14. I am afraid that people will find fault with me..... T F
15. Other people's opinions of me do not bother me..... T F
16. I am not necessarily upset if I do not please someone..... T F
17. When I am talking to someone, I worry about what they may be thinking about me..... T F
18. I feel that you can't help making social errors sometimes, so why worry about it..... T F
19. I am usually worried about what kind of impression I make..... T F

(continued on the next page.....)

(FNE continued.....)

20. I worry a lot about what my superiors think of me..... T F

21. If I know someone is judging me, it has little effect on me..... T F

22. I worry that others will think I am not worthwhile..... T F

23. I worry very little about what others may think of me..... T F

24. Sometimes I think I am too concerned with what other people think of me..... T F

25. I often worry that I will say or do the wrong things..... T F

26. I am often indifferent to the opinions others have of me..... T F

27. I am usually confident that others will have a favorable impression of me..... T F

28. I often worry that people who are important to me won't think very much of me..... T F

29. I brood about the opinions my friends have about me..... T F

30. I become tense and jittery if I know I am being judged by my superiors..... T F

Identification #_____

GENERAL INFORMATION SHEET II

1. Sex: Male / Female

   Age: _____ yr.

2. Do you have any chronic illnesses? Yes / No

   If you do, please explain briefly:_____

3. Do you take any medications once per week or more? Yes / No

   If you do, please explain briefly:_____

4. Sometimes people become faint for emotional reasons in situations such as during injections, when hearing about or seeing physical injuries, or in confining public places. Have you ever felt faint (e.g., weak; dizzy) or become unconscious due to emotional reactions? Please indicate "yes" even if physical factors such as illness or heavy clothing added to the effect of emotion.

   (a) Weak or dizzy: Yes / No

   (b) Unconscious: Yes / No

If you answered "yes" to either one or both of the options above:

How many times has this happened to you? _____

How many times during the past year? _____

How long ago was the first time it happened? _____ years

Please provide a brief description of the circumstances in which this happens:

_____

_____

5. Do you make regular visits for dental examination and care? Yes / No

   How long has it been since your last dental visit? _____ months.

6. Do you seek out opportunities to attend parties? Yes / No

   How many parties or other private social gatherings involving at least 10 people have you attended in the past 3 months? _____

(continued on the next page.....)

(General Information Sheet cont.....)

7. Have you ever donated blood to an agency such as the Red Cross? Yes / No

   How many times have you donated blood within the past two years? _____

8. Have you ever given a speech before a group of 10 or more people? Yes / No

   How many times have you given such a speech in the past two years?_____

Please indicate whether the following statements are True or False for you:

9. I am fearful or anxious in the presence of animals or insects such as snakes, mice, spiders, or wasps..... T F

10. High or enclosed places make me tense or afraid..... T F

11. Lately I feel sad, tired, discouraged and unable to concentrate.... T F

12. I have recurring thoughts which I can't control..... T F

13. I am under pressure regarding school, family, or work..... T F

14. I wish I could stop worrying so much..... T F

15. I experience discomfort in (and often avoid) public places where there are many people or where leaving may be difficult..... T F

16. As a young child I was shy with strangers and timid in unfamiliar situations..... T F

17. I have experienced a psychological trauma about which I have not told anyone..... T F

18. When I go for a medical examination, I work to stay physically relaxed by not thinking about the situation..... T F

Please use the following definition to answer questions 19 and 20 :

"A panic attack is the sudden onset of intense apprehension, fear, or terror, often associated with feelings of impending doom. Some of the most common symptoms during an attack are dizziness, shortness of breath, chest pain or discomfort, and trembling or shaking."

19. Have you ever experienced a panic attack? Yes / No

If you answered "yes" to question 19:

20. How many panic attacks have you experienced in the past year?_____

    How many panic attacks during the past 3 weeks?_____

    How long ago was your first panic attack?_____

Identification # _____

ZUNG INVENTORY

Please read each statement below and indicate on the adjacent scale how frequently it applies to you. Use your past experience as a guide as much as possible. Circle the number on the scale which corresponds to your answer.

1	2	3	4
None or A little of the time	Some of the time	Good part of the time	Most or All of the time

1.	I feel down-hearted, blue and sad	1	2	3	4
2.	Morning is when I feel the best	1	2	3	4
3.	I have crying spells or feel like it	1	2	3	4
4.	I have trouble sleeping through the night	1	2	3	4
5.	I eat as much as I used to	1	2	3	4
6.	I enjoy looking at, talking to and being with attractive women / men	1	2	3	4
7.	I notice that I am losing weight	1	2	3	4
8.	I have trouble with constipation	1	2	3	4
9.	My heart beats faster than usual	1	2	3	4
10.	I get tired for no reason	1	2	3	4
11.	My mind is as clear as it used to be	1	2	3	4
12.	I find it easy to do the things I used to do	1	2	3	4
13.	I am restless and can't keep still	1	2	3	4
14.	I feel hopeful about the future	1	2	3	4
15.	I am more irritable than usual	1	2	3	4
16.	I find it easy to make decisions	1	2	3	4
17.	I feel that I am useful and needed	1	2	3	4
18.	My life is pretty full	1	2	3	4
19.	I feel that others would be better off if I were dead	1	2	3	4
20.	I still enjoy the things I used to do	1	2	3	4

Identification # _____

NIJMEGEN QUESTIONNAIRE

Consider each of the feelings or sensations listed below in terms of the frequency of their occurrence for you. Make the judgment based on a recent two week period during which you were not physically ill or menstruating. Circle the number that corresponds to your estimate of frequency. Use this scale as a guide:

1----------2----------3----------4----------5
Never Very Frequently

1.	Chest pain	1--------2--------3--------4--------5
2.	Feeling tense	1--------2--------3--------4--------5
3.	Blurred vision	1--------2--------3--------4--------5
4.	Dizzy spells	1--------2--------3--------4--------5
5.	Being confused; losing touch with the environment	1--------2--------3--------4--------5
6.	Accelerated or deepened breathing	1--------2--------3--------4--------5
7.	Shortness of breath	1--------2--------3--------4--------5
8.	Constricted chest	1--------2--------3--------4--------5
9.	Bloated abdominal sensations	1--------2--------3--------4--------5
10.	Tingling fingers	1--------2--------3--------4--------5
11.	Unable to breath deeply	1--------2--------3--------4--------5
12.	Stiffness of arms or fingers	1--------2--------3--------4--------5
13.	Tightness around the mouth	1--------2--------3--------4--------5
14.	Cold hands or feet	1--------2--------3--------4--------5
15.	Palpitations	1--------2--------3--------4--------5

If you have a chronic physical condition that produces any of the feelings listed above, please list it here _____ and list the item number for any feeling(s) that this condition causes for you

_____

Appendix F: Repeated Measures MANCOVAs

Repeated Measures MANCOVA Comparisons between Reactors and Non-Reactors on Brief-DCC Ratings (Production Dimension) Using Absolute Score Analysis

Source	SS	df	MS	F	p	G-G p
covariate	3.98E0[a]	1,23	3.98E0	0.70	.41	
Sex	4.00E0	1,23	4.00E0	0.70	.41	
Type	0.45E0	1,23	0.45E0	0.08	.78	
SxT	0.53E0	1,23	0.53E0	0.09	.76	
$Error_1$	1.31E2		5.68E0			
Phase	1.84E1	7,168	2.62E0	4.36	.0002	.003
PxS	4.84E0	7,168	0.69E0	1.15	.33	.34
PxT	2.69E0	7,168	0.39E0	0.64	.72	.64
PxSxT	4.86E0	7,168	0.69E0	1.15	.33	.34
$Error_2$	1.01E2		0.60E0			

[a] "E" represents exponential notation

Repeated Measures MANCOVA Comparisons between Reactors and Non-Reactors on Brief-DCC Ratings (Focus Dimension) Using Absolute Score Analysis

Source	SS	df	MS	F	p	G-G p
covariate	6.08E0[a]	1,23	6.08E0	1.85	.19	
Sex	1.38E0	1,23	1.38E0	0.42	.52	
Type	7.50E0	1,23	7.50E0	2.28	.15	
SxT	0.72E-2	1,23	0.72E-2	0.00	.96	
$Error_1$	7.56E1		3.29E0			
Phase	2.26E1	7,168	3.23E0	3.41	.002	.007
PxS	5.39E0	7,168	0.76E0	0.81	.58	.54
PxT	5.96E0	7,168	0.85E0	0.90	.51	.48
PxSxT	1.53E0	7,168	0.22E0	0.23	.98	.94
$Error_2$	1.59E2		0.95E0			

[a] "E" represents exponential notation

Repeated Measures MANCOVA Comparisons between Reactors and Non-Reactors on Brief-DCC Ratings (Direction Dimension-a) Using Absolute Score Analysis

Source	SS	df	MS	F	p	G-G p
covariate	4.05E0[a]	1,23	4.05E0	2.04	.16	
Sex	3.25E0	1,23	3.25E0	1.64	.21	
Type	9.86E0	1,23	9.86E0	4.97	.04	
SxT	2.18E0	1,23	2.18E0	1.10	.30	
$Error_1$	4.56E1		1.98E0			
Phase	9.92E1	7,168	1.42E1	39.90	.0000	.0000
PxS	8.24E0	7,168	1.18E0	2.65	.02	.07
PxT	1.17E0	7,168	0.17E0	0.38	.92	.74
PxSxT	2.10E0	7,168	0.30E0	0.68	.70	.55
$Error_2$	7.46E1		0.44E0			

Repeated Measures MANCOVA Comparisons between Reactors and Non-Reactors on Brief-DCC Ratings (Direction Dimension-b) Using Absolute Score Analysis

Source	SS	df	MS	F	p	G-G p
covariate	1.80E0[a]	1,23	1.80E0	0.21	.65	
Sex	7.66E0	1,23	7.66E0	0.91	.35	
Type	0.54E0	1,23	0.54E0	0.06	.80	
SxT	1.00E1	1,23	1.00E1	1.19	.28	
$Error_1$	1.94E2		8.45E0			
Phase	5.78E0	7,168	0.83E0	2.21	.04	.05
PxS	2.46E0	7,168	0.35E0	0.94	.48	.44
PxT	1.28E0	7,168	0.18E0	0.49	.84	.74
PxSxT	1.42E0	7,168	0.20E0	0.55	.80	.71
$Error_2$	6.27E1		0.37E0			

[a] "E" represents exponential notation

Repeated Measures MANCOVA Comparisons between Reactors and Non-Reactors on Relative Anxiety Ratings Using Absolute Score Analysis

Source	SS	df	MS	F	p	G-G p
covariate	0.13E0[a]	1,23	0.13E0	0.01	.93	
Sex	1.33E0	1,23	1.33E0	0.09	.77	
Type	8.49E1	1,23	8.49E1	5.63	.03	
SxT	0.35E0	1,23	0.35E0	0.02	.88	
$Error_1$	3.47E2		1.51E1			
Phase	6.69E1	6,144	1.11E1	5.21	.0001	.002
PxS	1.51E1	6,144	2.52E0	1.18	.32	.33
PxT	9.41E0	6,144	1,57E0	0.73	.62	.56
PxSxT	1.90E1	6,144	3.17E0	1.48	.19	.22
$Error_2$	3.08E2		2.14E0			

[a] "E" represents exponential notation

Repeated Measures MANCOVA Comparisons between Reactors and Non-Reactors on Heart Rate Data Using Absolute Score Analysis

Source	SS	df	MS	F	p	G-G p
covariate	1.90E3[a]	1,23	1.90E3	2.46	.13	
Sex	2.45E3	1,23	2.45E3	2.90	.10	
Type	1.03E3	1,23	1.03E3	1.33	.26	
SxT	1.13E3	1,23	1.13E3	1.46	.24	
$Error_1$	1.78E4		7.75E2			
Phase	1.90E2	7,168	2.72E1	2.84	.008	.02
PxS	5.26E1	7,168	7.51E0	0.78	.60	.55
PxT	3.71E1	7,168	5.31E0	0.55	.79	.72
PxSxT	1.03E2	7,168	1.47E1	1.53	.15	.19
$Error_2$	1.61E3		9.57E0			

[a] "E" represents exponential notation

Repeated Measures MANCOVA Comparisons between Reactors and Non-Reactors on Heart Rate Variability Data Using Absolute Score Analysis

Source	SS	df	MS	F	p	G-G p
covariate	1.38E2[a]	1,23	6.89E1	20.33	.80	
Sex	1.39E1	1,23	1.39E1	1.34	.26	
Type	0.15E0	1,23	0.15E0	0.01	.91	
SxT	6.96E0	1,23	6.96E0	0.67	.42	
$Error_1$	2.38E2		1.04E1			
Phase	3.12E0	7,168	0.45E0	1.42	.20	.24
PxS	4.61E0	7,168	0.68E0	2.09	.05	.10
PxT	0.82E0	7,168	0.11E0	0.37	.91	.82
PxSxT	5.20E0	7,168	0.74E0	2.36	.03	.07
$Error_2$	4.06E1		0.28E0			

[a] "E" represents exponential notation

Repeated Measures MANCOVA Comparisons between Reactors and Non-Reactors on Heart Rate Cycle Amplitude Data Using Absolute Score Analysis

Source	SS	df	MS	F	p	G-G p
covariate	0.26E2[a]	1,23	0.26E2	0.00	.98	
Sex	0.20E1	1,23	0.20E1	0.00	.96	
Type	1.43E1	1,23	1.43E1	0.21	.65	
SxT	2.00E1	1,23	2.00E1	0.29	.60	
$Error_1$	1.55E3		6.78E1			
Phase	2.03E1	7,168	320910	0.94	.48	.44
PxS	2.75E1	7,168	3.92E0	1.27	.27	.29
PxT	9.86E0	7,168	1.41E0	0.46	.87	.78
PxSxT	3.87E1	7,168	5.54E0	1.79	.10	.14
$Error_2$	5.18E2		3.09E0			

[a] "E" represents exponential notation

Repeated Measures MANCOVA Comparisons between Reactors and Non-Reactors on Skin Conductance Level Data Using Absolute Score Analysis

Source	SS	df	MS	F	p	G-G p
covariate	1.18E1[a]	1,23	1.18E1	1.70	.21	
Sex	4.76E0	1,23	4.76E0	0.68	.42	
Type	1.06E0	1,23	1.06E0	0.15	.70	
SxT	1.22E1	1,23	1.22E1	1.75	.20	
$Error_1$	1.60E2		6.94E0			
Phase	4.88E0	7,168	0.70E0	24.79	.0000	.0000
PxS	0.36E-1	7,168	0.51E-2	0.18	.99	.93
PxT	0.46E-1	7,168	0.66E-2	0.23	.98	.89
PxSxT	0.13E0	7,168	0.18E-1	0.64	.74	.61
$Error_2$	4.73E0		0.28E-1			

[a] "E" represents exponential notation

Repeated Measures MANCOVA Comparisons between Reactors and Non-Reactors on Skin Conductance Response Data Using Absolute Score Analysis

Source	SS	df	MS	F	p	G-G p
covariate	5.90E0[a]	1,23	5.90E0	1.76	.20	
Sex	9.32E0	1,23	9.32E0	2.78	.11	
Type	0.12E0	1,23	0.12E0	0.03	.86	
SxT	0.80E0	1,23	0.80E0	0.24	.63	
$Error_1$	7.72E1		3.36E0			
Phase	3.00E1	7,168	4.30E0	6.71	.0000	.0004
PxS	1.96E0	7,168	0.28E0	0.44	.88	.74
PxT	4.07E0	7,168	0.58E0	0.91	.50	.44
PxSxT	4.96E0	7,168	0.71E0	1.11	.36	.36
$Error_2$	1.07E2		0.71E0			

[a] "E" represents exponential notation

Repeated Measures MANCOVA Comparisons between Reactors and Non-Reactors on Skin Conductance Rise Data Using Absolute Score Analysis

Source	SS	df	MS	F	p	G-G p
covariate	0.91E-1[a]	1,23	0.91E-1	2.47	.13	
Sex	0.19E0	1,23	0.19E0	5.09	.04	
Type	0.33E-3	1,23	0.33E-3	0.01	.93	
SxT	0.13E-3	1,23	0.13E-3	0.00	.96	
$Error_1$	0.84E0		0.37E-1			
Phase	0.38E0	7,168	0.54E-1	5.99	.0000	.0002
PxS	0.83E-1	7,168	0.12E-1	1.32	.24	.27
PxT	0.38E-1	7,168	0.54E-2	0.60	.76	.67
PxSxT	0.46E-1	7,168	0.66E-2	0.73	.65	.58
$Error_2$	1.51E0		0.66E-2			

[a] "E" represents exponential notation

Repeated Measures MANCOVA Comparisons between Reactors and Non-Reactors on Digit Temperature Level Data Using Absolute Score Analysis

Source	SS	df	MS	F	p	G-G p
covariate	2.63E0[a]	1,23	2.63E0	0.02	.90	
Sex	1.19E2	1,23	1.19E2	0.79	.39	
Type	2.10E1	1,23	2.10E1	0.14	.72	
SxT	8.30E0	1,23	8.30E0	0.06	.82	
$Error_1$	3.44E3		1.50E2			
Phase	5.92E1	7,168	8.46E0	17.70	.0000	.0000
PxS	3.06E0	7,168	0.44E0	0.91	.50	.39
PxT	2.16E0	7,168	0.31E0	0.65	.72	.50
PxSxT	0.18E0	7,168	0.26E-1	0.05	.99	.92
$Error_2$	8.03E1		0.48E0			

[a] "E" represents exponential notation

Repeated Measures MANCOVA Comparisons between Reactors and Non-Reactors on Digit Temperature Increase Data Using Absolute Score Analysis

Source	SS	df	MS	F	p	G-G p
covariate	0.28E-2[a]	1,23	0.28E-2	0.42	.53	
Sex	0.31E-1	1,23	0.31E-1	4.66	.05	
Type	0.39E-1	1,23	0.39E-1	5.78	.03	
SxT	0.15E-1	1,23	0.15E-1	2.23	.15	
$Error_1$	0.15E0		0.67E-2			
Phase	0.15E-1	7,168	0.22E-2	3.09	.005	.01
PxS	0.15E-2	7,168	0.22E-3	0.30	.96	.92
PxT	0.43E-2	7,168	0.61E-3	0.85	.55	.53
PxSxT	0.11E-1	7,168	0.15E-2	2.05	.05	.07
$Error_2$	0.12E0		0.72E-3			

[a] "E" represents exponential notation

Sample of one of the Repeated Measures MANCOVA Comparisons between Reactors and Non-Reactors on Valsalva maneuver Heart Rate Data Using Labsleep as a Covariate

Source	SS	df	MS	F	p	G-G p
covariate	1.99E0[a]	1,22	1.99E0	0.01	943	
Sex	1.73E2	1,22	1.73E2	0.53	.47	
Type	5.88E0	1,22	5.88E0	0.02	.90	
SxT	1.21E2	1,22	1.21E2	0.37	.55	
$Error_1$	7.16E3		3.25E2			
Phase	4.75E4	4,92	1.18E4	161.1	.0000	.0000
PxS	3.92E1	4,92	9.80E0	0.13	.97	.90
PxT	1.61E2	4,92	4.04E1	0.55	.70	.61
PxSxT	3.11E2	4,92	7.78E1	1.06	.39	.37
$Error_2$	6.78E3		7.37E1			

[a] "E" represents exponential notation

Appendix G: Stage I Non-Significant Results Not Presented in the Text

ANCOVA Comparisons between Reactors and Non-Reactors using sleep duration as a covariate

Variables	Reactors (n = 14) Mean	SD	Non-Reactors (n = 14) Mean	SD	F-value	p <
Symptoms experienced during donation						
Blurred vision	.29	.47	.14	.36	< 1	NS
Difficulty hearing	.07	.27	.00	.00	< 1	NS
Rapid/pounding heart beat	.43	.64	.43	.85	< 1	NS
Excessive perspiration	.29	.61	.07	.27	< 1	NS
Rapid/difficult breathing	.00	.00	.00	.00	< 1	NS
Hot flushes	.50	.76	.07	.27	1.41	NS

ANCOVA Comparisons between Reactors and Non-Reactors on Stage I DCC ratings using sleep duration as a covariate

Variables	Reactors (n = 14) Mean	SD	Non-Reactors (n = 14) Mean	SD	F-value	p <
Global version						
Production of Coping (Active vs Passive)	26.79	10.81	19.64	13.40	< 1	NS
Focus of Coping (Self vs Environment)	54.02	11.63	63.27	8.41	2.69	NS
Level of Active Coping (subscale)	12.50	12.97	7.14	10.65	1.47	NS
Level of Passive Coping (subscale)	58.93	25.21	67.86	28.47	< 1	NS
Level of Environment Focus Coping (subscale)	32.54	17.13	35.71	16.41	< 1	NS
Specific version						
Production of Coping (Active vs Passive)	34.38	9.42	29.91	13.01	1.14	NS
Level of Environment Coping (subscale)	25.40	16.55	36.51	25.94	< 1	NS
Level of Self-Focus Coping (subscale)	20.41	24.24	11.22	12.75	1.44	NS
Level of Active Coping (subscale)	11.61	10.36	15.18	15.64	< 1	NS
Level of Passive Coping (subscale)	42.86	24.86	55.36	35.60	< 1	NS

Appendix H: Stage II Non-Significant Results Not Presented in the Text

ANCOVA Comparisons between Reactors and Non-Reactors on Stage II DCC ratings using sleep duration as a covariate

Variables	Reactors (n = 14) Mean	SD	Non-Reactors (n = 14) Mean	SD	F-value	p <
Global version						
Level of Active Coping (subscale)	30.36	17.48	25.89	12.47	< 1	NS
Level of Passive Coping (subscale)	80.36	17.48	75.00	24.02	< 1	NS
Level of Environment Focus Coping (subscale)	50.00	12.89	46.83	15.20	< 1	NS
Level of Self-Focus Coping (subscale)	38.78	24.05	28.57	15.84	1.63	NS
Level of Approach Coping (subscale)	47.02	14.10	42.26	11.54	< 1	NS
Specific version						
Level of Environment Coping (subscale)	38.89	11.32	42.86	20.38	< 1	NS
Level of Active Coping (subscale)	25.00	13.87	22.32	16.39	< 1	NS
Level of Passive Coping (subscale)	58.93	21.05	60.71	30.56	< 1	NS