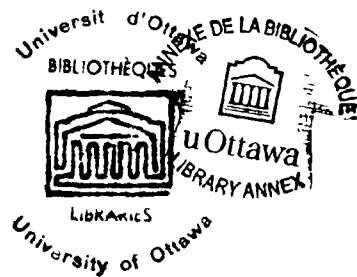


PHYSIOLOGICAL, COGNITIVE AND BEHAVIOURAL
COMPONENTS OF ANXIETY IN FLOODING:
AN ANALOGUE STUDY

by D. R. Henry

Thesis presented to the School of
Graduate Studies of the University
of Ottawa in partial fulfillment
of the requirements for the degree
of Doctor of Philosophy



Ottawa, Canada, 1974

© Donald R. Henry, Ottawa, Canada, 1975

UMI Number DC53407

INFORMATION TO USERS

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleed-through, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

UMI[®]

UMI Microform DC53407
Copyright 2011 by ProQuest LLC
All rights reserved. This microform edition is protected against
unauthorized copying under Title 17, United States Code

ProQuest LLC
789 East Eisenhower Parkway
P O Box 1346
Ann Arbor, MI 48106-1346

ACKNOWLEDGEMENTS

The author wishes to express his gratitude to Dr. Michel Girodo for his guidance and encouragement throughout the entire period the thesis was in preparation. Appreciation is extended also to Mr. Ed Achorn and the staff of the Experimental Department of the Faculty of Psychology for their ever-willing assistance. Finally, indebtedness is expressed to the author's wife, Mary, for her continuing support and understanding.

CURRICULUM STUDIORUM

Donald R. Henry was born January 3, 1933, in Picton, Ontario, Canada. He received the Bachelor of Arts degree from Waterloo Lutheran University, Waterloo, Ontario, in 1966, and the Master of Applied Sciences degree from the University of Waterloo, Waterloo, Ontario, 1969. The title of his research paper was Job Satisfaction as a Function of Job Orientation, Social Status and Self-esteem.

TABLE OF CONTENTS

	page
LIST OF TABLES	vii
LIST OF FIGURES	viii
Chapter	
I. INTRODUCTION AND REVIEW OF THE LITERATURE	1
Section 1 - Introduction	1
Section 2 - Empirical Evidence	10
(1) Animal studies	10
(2) Human Analogue Studies	12
(3) Human Clinical Studies	18
Section 3 - Factors Involved	25
Hypotheses	35
II. METHOD	37
Subjects	37
Criterion Measures of Fear	38
Procedure	41
III. RESULTS	46
IV. DISCUSSION	65
Summary	79
REFERENCES	80
Appendix	
1. Snake Fear Survey Questionnaire	88
2. Behavioural Avoidance Test	89
3. Self-perception Questionnaire	90
4. Snake Evaluation Questionnaire	91
5. Eysenck Personality Inventory - Form A	92
6. Instructions	93
7. Instructions	94
8. Instructions	95
9. Instructions	97

LIST OF TABLES

Table	page
1. One-way Analysis of Variance on Change Scores for Each of the Dependent Measures	47
2. One-way Analysis of Variance on Self-perception Questionnaire at Three 10-minute Intervals throughout the Flooding Procedure	51
3. One-way Analysis of Variance on Snake Evaluation Questionnaire at Three 10-minute Intervals throughout the Flooding Procedure	54
4. \bar{t} Tests of Means of Correlated Samples on Pre- to Post-treatment Change Scores	55
5. Two-way Analysis of Variance Repeated Measures on HR Change Scores	57
6. \bar{t} Tests of Means of Correlated Samples on HR Change Scores Time Block 1 to Time Block 3	60
7. Pearson Product Moment Correlation Coefficients on Dependent Variables at Various Assessment Periods	61
8. Pearson Product Moment Correlation Coefficients on Eysenck Personality Inventory and Several Dependent Variables	64

LIST OF FIGURES

Figure	page
1. Mean Pretest and Posttest Behavioural Avoidance Scores (BAT) for Four Groups of Subjects	48
2. Mean Self-perception Questionnaire Scores for Pretest and Posttest and at Three Time Intervals between Pretest and Posttest for Four Groups of Subjects	49
3. Mean Heart Rate Change Scores at Three 10-Minute Intervals for Four Groups of Subjects Combined	59

CHAPTER I

INTRODUCTION AND REVIEW OF THE LITERATURE

Section 1 - Introduction

Behaviour therapy¹ is a collective term referring to a group of therapeutic procedures (e.g. Wolpe's systematic desensitization, Bandura's modelling, Stampfl and Levi's implosion) all having one thing in common, a respect for the experimental approach to behavioural assessment and behaviour change. In contrast to the more traditional, psychotherapeutic procedures which emphasize unconscious forces of motivation, behaviour therapy makes no allusion to unconscious forces or dynamic causes, but instead focuses directly upon the behaviour itself. It claims that the symptoms of the maladaptive behaviour are the behaviours that are to be altered.

Behaviour therapy grew out of the experimental laboratory studies on conditioning. Yates (1970) writes that experiments by Pavlov on classical conditioning and by Bekhterev on instrumental conditioning exercised a profound influence on the development of experimental psychology in the first three decades of this century. The efforts of these men were almost immediately applied to the area of

¹Called also Behaviour Modification.

abnormal behaviour. Yates cites 27 studies conducted in the 1920's and 1930's where American and Russian authors attempted ". . . the application of controlled, objective experimentation to the investigation and treatment of a wide variety of forms of abnormal behaviour [p. 15]." The work of Hull was an attempt to combine both classical and instrumental conditioning under a single theoretical framework. Gradually, tightly defined constructs allowed more integration of theory with empirical facts and the term learning theory came into use. Prominent names in this historical period are Thorndike, Watson, Guthrie, Estes, Mowrer, Skinner, Dollard and Miller.

The classic paper by Watson and Rayner (1920) demonstrated how Pavlovian, classical conditioning could explain the development of some fear reactions. In this instance a previously neutral stimulus was presented to a child in association with the noxious stimulus of a loud noise. It was shown that the emotional reaction which followed presentation of the noxious stimulus, or unconditioned stimulus (UCS) as it is called, could in time be elicited by a previously neutral stimulus, which had now become the conditioned stimulus (CS). It was hypothesized that the genesis of many phobias could be explained by this paradigm.

Another aspect of learning theory is best represented by the work of B. F. Skinner. Commonly known as operant or instrumental conditioning, this "theory" places a great deal of emphasis upon the importance of reward which acts as a reinforcement for behaviour. Stated briefly, Skinner's work rests heavily upon the Thorndike or Empirical Law of Effect. In short, this law states that an act which is followed by a reward is more apt to be repeated than one which is not followed by reward. It is a simple matter to foresee how learning could be enhanced using this paradigm. Choose a task you wish the organism to engage in and, using a reward that is "meaningful" to that organism (e.g. "smarties" to a young child), reinforce behaviour as it approximates the desired learning. Under these circumstances, that rewarded behaviour is more likely to recur, Ullmann and Krasner (1965) have shown how learning theory, in the hands of innovative researchers and clinicians, has been applied to the treatment of a wide variety of behaviour disorders. Successful treatment has been reported in cases of enuresis, tics, stuttering, obsessional neurosis, anorexia, phobias, thumbsucking, sexual inadequacy, fetishism, exhibitionism, and mental deficiency.

Not only has there been a variety of behavioural anomalies treated by behaviour therapy but also a variety of techniques has emerged, and many of these rely upon

learning theory as the explanatory base. Wolpe (1958) has been most influential in the treatment of phobic behaviour via his method of reciprocal inhibition.² Operant techniques rely mainly upon the concept of positive reinforcement which increases the probability of appropriate behaviour occurring because it has been rewarded. Aversive techniques, on the other hand, attempt to extinguish inappropriate behaviour (e.g. alcoholism, homosexuality) by negative reinforcement or suppressed by punishment (e.g. electric shock) when that behaviour is displayed. Bandura (1969) has been most prominent in his insistence that the use of a model, whose behaviour the client can imitate, will enhance the effect of operant techniques in modifying maladaptive behaviour. This list is not complete. There are many more behaviour therapy techniques and, as well, variations of each. However, the keynote of all these behaviour therapy procedures is the attack against the symptom itself. Whereas the psychodynamic, client-centered and insight-oriented therapies might look deeper for the underlying cause of the behaviour, behaviour therapy, in contrast, treats the behaviour anomaly directly.

Despite the fact that most behaviourists have deplored the use of psychodynamic theory, there are,

²Known also as systematic desensitization.

nonetheless, some therapists who believe some of the psychodynamic formulations may be appropriate. An interesting therapeutic procedure is that developed by Stampfl and Levis (1967) called implosive therapy. It is unique in that, according to Stampfl and Levis, it is a learning theory-based, psychodynamic behaviour therapy. In some ways it marks the fruition of attempts by earlier writers to amalgamate psychodynamic formulations with learning theory (e.g. French, 1933; Dollard & Miller, 1950; Alexander, 1963). The chief interest in implosive therapy here is in its similarity to the behaviour therapy of flooding. It seems appropriate, therefore, to explain briefly what implosive therapy is with the goal of arriving at a formulation of flooding procedures and how they are the central point of interest in this paper.

The learning theory strategy employed by Stampfl follows the two-factor model of learning as proposed by Mowrer (1951). Stated in its simplest form the two-factor model employs classical, Pavlovian conditioning theory to explain how fears or phobias develop and then utilizes instrumental conditioning to explain how the phobic behaviour is maintained. A neutral stimulus, for example, may gain aversive properties by being paired with a noxious stimulus. Stampfl and Levis (1968) state that aversive events may be primary natural events such as injuries occurring from

falling, being burned or cut. Aversive events may also be early training experiences with parents which involved spanking, slapping or deprivation. The stimuli correlated with these events provoke feelings of fear or anxiety in the individual. The person then attempts to reduce this fear or anxiety by escaping the situation, avoiding the stimuli or "repressing" the thoughts associated with same. This behaviour is symptomatic and can be likened to instrumental conditioning in that escape reduces the unpleasantness of fear or anxiety, and this reinforces avoidant behaviour. It is the assumption of Stampfl and Levis that aversive conditioning occurring in childhood may be important in symptom formation. It is their belief that traumatic environmental events stressed by Freud in his theory of psychosexual development are relevant. Consequently, Stampfl and Levis incorporate psychodynamic cues into implosive therapy on the sole basis of this assumption.

Implosive therapy may proceed in vivo (real life) or in fantasy. If in fantasy, the client would be asked to visualize scenes which produce high levels of anxiety. These scenes would be enmeshed with psychodynamic cues believed associated with the behaviour anomaly. Every attempt would be made by the therapist to maintain this high level of arousal over a prolonged period of time. Hence, by forcibly facing the mental images of that which

is feared, it has been shown that the perpetuating, vicious cycle maintaining anxiety can be broken and the maladaptive behaviour altered. Hogan and Kirchner (1967) point out that "implosion" implies a bursting from within. "It was chosen to depict the onslaught of the cues and the subsequent intense anxiety reaction which is followed by the collapse of symptoms because of the extinction of the anxiety which supports them [pp. 106-107]."

A number of terms have been used by various experimenters to describe the extinction-like procedures of implosion. The following is a list of these terms denoting the experimenter who uses it:

- Exhaustion - Kimble and Kendall (1953)
- Response Prevention - Page (1955); Baum (1970)
- Flooding - Polin (1959); Baum (1970)
- Blocking - Benline and Simmel (1967);
Coulter, Riccio and Page (1969)
- Forced Reality Testing - Baum and Gordon (1970)
- Prolonged Exposure - Lamontagne and Marks (1973)

For the purposes of this study it is felt the term flooding is the most appropriate since it denotes a procedure of full intensity exposure to a phobic object but without recourse to the use of psychodynamic cues, either in the procedure or in terms of explanation for its success as a behaviour therapy.

Before proceeding to a detailed investigation of the experimental evidence surrounding flooding theory it may be appropriate to state briefly that other therapeutic

techniques exist which bear some resemblance to flooding. Frankl (1960) has developed a procedure which he calls paradoxical intention. It is Frankl's contention that when a person has a fear of an object or event he is possessed of an anticipatory anxiety. The characteristic of this anxiety is that it is a fearful state very much similar to the actual fear the individual would experience were he confronted with that phobic object. Paradoxical intention is Frankl's therapeutic technique for dealing with anticipatory anxiety. Essentially, it involves the individual inviting or intending, if only for a moment, the thought of the very object he fears. By doing so, excitation is built up after which, according to observation of human neurophysiology, an opposite process of inhibition occurs. It is in this state of inhibition that the individual can now approach the phobic object.

A somewhat similar therapeutic procedure to implosive therapy and paradoxical intention is the psychoanalytic emphasis upon abreaction. Basically, this therapeutic technique requires the therapist to assist the patient in trying to "re-live" the emotions that have been repressed for some traumatic experience. It is believed that in having the patient "face up" to the unpleasant thoughts associated with that trauma that eventually the fear or anxiety correlated with the event will dissipate.

Sippelle (1967) has developed a related technique which he calls "induced anxiety." He describes this procedure as ". . . a psychotherapeutic technique which combines the methods of direct manipulation of behaviour with the methods of more pervasive modifications of personality such as insight [p. 36]." Basically, this method involves elicitation of anxiety only after the client has achieved a state of hypnotically induced relaxation. The client is encouraged to associate the anxiety state with suggestions of relaxation. The session ends with the client being instructed to awaken in a relaxed, refreshed state. Sippelle offers the procedure as one with considerable potential and he hopes others will ". . . improve upon technique, terminology and evaluation of therapeutic effectiveness [p. 40]."

This section has explained briefly what behaviour therapy is; it has shown that there are a variety of techniques all of which employ learning theory as the theoretical foundation and all of which may be considered behaviour therapies. This section has considered a special type of behaviour therapy, implosive therapy, and the inference has been made that if it were stripped of its psychodynamic attachments it is identical to flooding. Flooding is a learning theory term implying forced exposure to a phobic object, for a prolonged period, without opportunity for escape, which will lead eventually to extinction. Section 2

will consider the evidence for and against implosive and flooding procedures.

Section 2

Empirical Evidence

The clinical management of anxiety remains a problem to clinicians. Assuming that anxiety is a state of physiological arousal to which the individual has attached a cognition of unpleasant emotion, it is the task of the clinician to aid the client either by directly lowering the state of arousal or by altering the cognition of the emotional state. One particularly effective means for controlling anxiety is the use of implosive and flooding procedures. Evidence for the efficacy of this procedure comes chiefly from three sources, (1) animal studies; (2) human analogue studies; and (3) human clinical studies, both case study and laboratory. This section will review the literature under these three groupings.

(1) Animal Studies

Traditional extinction procedures require that a CS be presented in the absence of the UCS with the result that in time, and after perhaps many trials, the organism will cease to emit the conditioned response (CR). If the task

were to extinguish a response to an aversive stimulus then the CS would be presented unaccompanied by the UCS (e.g. shock) so that in time the conditioned avoidance response would extinguish. A host of investigators have been able to provide evidence for this phenomenon (cf. Baum, 1970; Benline & Simmel, 1967; Berman & Katzev, 1972; Black, 1958; Heath, 1968; Page & Hall, 1953; Polin, 1959; Shearman, 1970; Uno, Greer & Goates, 1973; Weinberger, 1965; Williams & Williams, 1943). These studies are cited as evidence that from the experimental laboratory some understanding can be gained into the laws of learning that will encourage extrapolation attempts to the human condition. Through animal experimentation evidence has been gathered which indicates that flooding is an effective means for extinguishing conditioned avoidant behaviour. However, it may be stated also that three other important discoveries have emerged from these animal studies. Firstly, Baum (1970) noticed that the flooding extinction procedure may evoke an alternative response of fear-like crouching requiring the use of non-shocked animals to serve as models for adaptive behaviour. Secondly, it has been found by a number of investigators (cf. Baum, 1969; Carlson & Black, 1959; Coulter, Riccio & Page, 1969; Hughes, 1970; Shearman, 1970; and Siegeltuch & Baum, 1971) that CS exposure is an important condition for effective extinction with extended sessions being preferable

to brief sessions. Finally, the research of Baum and Gordon (1970) and Lederhendler and Baum (1970) suggests that the intensity of the CS will in part determine the need for extended or brief extinction sessions.

(2) Human Analogue Studies

An analogue study is one in which the human subjects are treated for a phobic condition which does not interfere with their regular daily functioning. Clinical phobic patients, on the other hand, have some disruption in effective adjustment to their environment. Whether or not the results from the analogue study can provide valuable insights into the clinical management of phobias, fears, and anxiety has been a moot point (see Cooper, Furst & Bridger, 1969) upon which there now seems to be favourable agreement. Malleon (1959), writing from the clinician's point of view, stated that ". . . ideas of more general importance can sometimes evolve from consideration of quite limited problems [p. 225]." He then proceeded to demonstrate in a case study how successful treatment of a patient with severe test anxiety could lead to a treatment procedure for even more crippling types of phobias. Lang, Lazovik and Reynolds (1965) have presented the clearest statement of the advantages of analogue research:

Treatment can be specific. The number of sessions may be arbitrarily controlled. The moral responsibility to choose the best treatment is not involved. As this phobia is not a central life problem and these subjects were generally more stable than patients, extratherapeutic incidents less frequently interfere with the therapy process. Most important, the necessary rigor of experimental procedure can be closely respected [p. 396].

Hogan and Kirchner (1968) endorse the procedure as do Bernstein and Paul (1971). These latter writers state that:

Experimental analogues may be especially useful in narrowing parameters of influence, determining probable mechanisms of change, developing techniques and explanatory principles, and determining parameters from which new therapeutic techniques may be derived [p. 225].

One of the earlier analogue studies is the dissertation by Strahley (1965). Using snake phobic volunteers he found that when exposure to the feared stimulus was at a forced pace that much anxiety ensued with the subsequent desire to escape. By prevention of escape it was found the procedure led to rapid improvement. In reviewing the literature, Marks (1972) said of Strahley's study:

The role of anxiety here . . . is moot. It is quite possible that anxiety is an unfortunate byproduct of forced exposure rather than the therapeutic agent itself. This crucial question remains to be settled [p. 131].

This question is central to the investigation to be presented here and therefore reference will be made to it subsequently.

Wolpin and Raines (1966), as part of an analogue study investigating various parameters of Wolpe's desensitization procedure, utilized a condition very much akin to implosive procedures. Some of the subjects (Ss), with no training or instruction to relax or be tense, received four intense sessions of imagining scenes at the top of a snake hierarchy. Results showed some improvement in their being able to handle and fondle the originally feared snake, a finding which held up at follow up. However, while the results are encouraging, it is important to note these two detrimental factors: (1) the sample was extremely small with $N=2$; and (2) as Bandura (1969) points out, the study failed to account for the confounding effects of modelling during the initial avoidance test.

An analogue study on the phobic fear of rats by Kirchner and Hogan (1966) demonstrated that in one taped session 62% of the experimental Ss were able to pick up the rat during posttesting as compared with only 26% of the control Ss.

Again using only one session, the same investigators (Hogan & Kirchner, 1967) found that 21 implosively treated Ss were superior to 22 non-treated controls on the criterion of picking up a rat. In this study the length of session varied from individual to individual, with the average testing time being 39 minutes for experimental Ss and 30

minutes for controls. Consequently, in their next study these same two experimenters (Hogan & Kirchner, 1969) controlled for the duration of the single, taped session making it 45 minutes. It was found that there was no significant difference between those Ss treated by implosion and those receiving verbal eclectic treatment. Both groups, however, were significantly superior to those treated by bibliotherapy (reading facts about snakes) in picking up the snake.

A number of analogue investigations have concerned themselves with a comparison of flooding or implosive-like procedures and systematic desensitization (SD) or, as some prefer to call SD, reciprocal inhibition. These studies, while interesting in themselves, contribute little to an understanding of the component processes that can be used to explain why either procedure is an effective technique in reducing anxiety. Studies by Barrett (1969), Borkovec (1972), Brock (1967), DeMoor (1970), Jacobson (1970), Kirts (1968), Mylar and Clement (1972) all serve to indicate that very little difference exists between SD and flooding in regard to their effectiveness, with both methods being superior to non-treated controls. Comparative studies by McGlynn (1968) and Carek (1969) failed to indicate either SD or flooding was effective. The major significance of these findings is that it is essential to be able to

demonstrate a particular therapeutic procedure is effective before it is possible to determine the component aspects of the procedure that cause it to be effective.

Two other aspects of flooding therapy have emerged from the analogue studies. Stampfl and Levis (1967) make it quite clear that demand characteristics and expectancy effects are essential in the implementation of implosive techniques. Borkovec (1972) found a strong expectancy effect on overt behavioural measures of fear. However, Layne (1970) tried to study expectancy effects and had little success. Hodgson and Rachman (1970), in an effort to control for expectancy effects, did not inform their SS they were receiving treatment, and subsequently, were unable to show flooding to be effective. It seems analogue studies should attempt to control for this factor in the event it is a major component contributing to the effectiveness of flooding therapy.

Another aspect of flooding relates to whether or not treatment for phobic avoidance should be conducted using imaginal scenes or in vivo presentation of the phobic stimulus. Jacobson (1970), Miller and Levis (1971), and Stadter (1973) all provide evidence to suggest that in vivo presentation is a viable method which has the advantage over scenes in fantasy in that it is not necessary to check for generalization effects from the imaginal scenes to the real-life stimulus.

The literature contains some studies which have shown flooding and implosive-like procedures to be ineffective. Rachman (1966) used only three Ss who were spider-phobic and in treatment he exposed them for 10 sessions of only two minutes duration each. Willis and Edwards (1969), in treating female snake-phobic Ss, admit they may have committed the same methodological error as Rachman by terminating treatment prematurely before Ss had experienced a diminution in anxiety. Mealiea and Nawas (1971) may have committed a similar error for by randomizing the scene presentation it is possible the Ss could not feel a steadily decreasing level of anxiety and may have become more sensitized. Fazio (1970), in two experiments, did not find flooding effective either. He used taped therapy sessions and although these have been used successfully by Stadter (1973), Hogan and Kirchner (1967), Kirchner and Hogan (1966), taped sessions may not be the most efficacious method for as these latter authors point out "the cues presented on the tape . . . were deliberately designed to elicit less anxiety than would have been maximally possible [p. 104]." It may well be that the elicitation of anxiety in flooding procedures is a factor of crucial concern.

In view of some of the discrepant findings, Kotila (1969), using 50 snake-phobic Ss, attempted to discover possible explanations for instances when flooding has

failed. In particular, he focused upon two factors, duration of exposure to the phobic object and continuous versus interrupted exposure. Apart from the surprising finding that a group who simply were educated about snakes showed the most improvement, the flooding group with longest, uninterrupted exposure showed the most reduced fear behaviour toward a harmless snake. It was concluded that the use of extinction as an explanatory principle for flooding was appropriate.

(3) Human Clinical Studies

As has been stated, the analogue studies have an advantage over clinical studies in that certain variables can be held constant while other variables can be manipulated and their effects measured. In clinical studies it is sometimes difficult to attribute improvement to a specific treatment since the client may have been receiving other forms of assistance such as chemotherapy, psychotherapy, or occupational therapy. However, when attempting to demonstrate the utility of any therapeutic procedure it seems well to consider relevant data no matter what the source. Thus, it is that the effects of flooding procedures have been studied on various clinical populations with generally positive results.

One of the most often cited reports is that by Malleon (1959) where he successfully treated a student with intense examination anxiety. Although this study preceded the development of implosive therapy (Stampfl & Levis, 1967), because of the technique involved, it has much in common with implosion. Malleon encouraged his client to avoid attempts at escaping what he dreaded. By facing the fear, and even wishing it to occur, it seems the affect associated with examination failure exhausted and the client reported himself ". . . almost totally unable to feel frightened [p. 225]."

Hogan (1966) reports two case studies wherein implosive techniques were successful with one and not with the other. Failure for the one case was credited to the long-time effects of hospitalization, the opportunity to learn new behaviours, and the degree of original disturbance. In the same paper, Hogan reports the results of a study conducted on 50 patients from the intensive treatment ward of a state hospital. The results showed a shift away from pathology for the group receiving implosive therapy whereas there were no significant changes for the control group.

A similar study to the above was conducted by Levis and Carrera (1967). They too found that the implosively treated group ". . . showed a consistent trend to shift away from psychopathology as measured by the MMPI [p. 504]."

Hogan (1968) reports a case study where implosive therapy conducted on a patient suffering severe depression resulted in a significant drop on all scales of the MMPI. Smith and Sharpe (1970) successfully treated a 13-year old boy who had a severe school phobia. Baum and Poser (1971) report two case studies which responded positively to an implosive procedure. One was a 41-year old female suffering a severe obsessive-compulsive neurosis and the other was a 19-year old schizophrenic male suffering depersonalization and depression.

It was noted in the animal experiments of Kimble and Kendall (1953), Polin (1959), and Baum (1970) that the duration and intensity of the anxiety-provoking stimulus are of paramount importance in flooding. Rachman (1966), following his unsuccessful attempt to demonstrate the effectiveness of implosive techniques using 2-minute exposures, concluded that the crucial element in implosion may be prolonged exposure. In an extended series of experiments Marks and his co-workers have investigated this variable as well as others.

Boulougouris, Marks and Marset (1971) conducted a clinical study on 16 psychiatric patients with phobic disorders. They concluded "it is quite possible that one crucial component of flooding is prolonged exposure without avoidance . . . [p. 15]." At the same time these authors

questioned the necessity for the evocation of anxiety which is contrary to the prescription of Stampfl and Levis (1967) and Hogan and Kirchner (1967).

In an attempt to understand the mechanisms which contributed to successful flooding, Watson and Marks (1971) conducted a study on 16 hospitalized patients, all of whom had phobic disorders as their dominant problem. The main variable under investigation was the use of relevant versus irrelevant fear in the implosive procedure. Previously, Rachman (1969) had suggested that if extinction is the process by which implosion is successful, then it would be important to ". . . discover whether or not the patient or subject has to be saturated with images that are relevant to the target behaviour, or, whether one can achieve much the same result by evoking high levels of anxiety using standard (even tape-recorded) instructions [p. 300]." Watson and Marks found that flooding procedures were equally effective no matter whether the anxiety was aroused by scenes relevant to the fear or irrelevant. Consequently, they tentatively concluded that flooding is effective, not because of abreaction but because of habituation to the phobic object. In either case, the production of anxiety is involved. This conclusion is at variance with that of the previously cited study by Boulougouris, Marks and Marset (1971) where the necessity for the evocation of

anxiety was questioned. In that study it was felt that prolonged exposure without avoidance may be the crucial element in successful flooding. At the very least it may be said the interaction of these two variables, anxiety and exposure duration in flooding, is not well understood at this time.

Pursuing the concept of prolonged exposure, a series of studies in which Marks is co-author has indicated that exposure duration to the feared object is an important variable in successful flooding. Rachman, Hodgson and Marks (1971) conducted an experiment on 10 patients with chronic obsessive-compulsive neurosis. No difference was found between modelling and flooding procedures with both therapies being superior to a relaxation control treatment. Finding both methods successful, the authors hypothesized that there may be a common factor responsible, namely, habituation.

Watson, Gaidnd and Marks (1972) studied the effects of prolonged exposure on 10 phobic patients. It was found that "prolonged exposure of phobic patients can produce great clinical and behavioural improvement . . . [p. 277]." Treatment was conducted by tape-recorded flooding themes and lasted about two hours. These authors noted that cognitive changes (i.e. the person's subjective report of anxiety) tended to follow rather than precede physiological

change. Finally, just as in the studies of Boulougouris, Marks and Marset (1971) and Watson and Marks (1971), it was found that ". . . too rapid exposure with the production of excessive phobic anxiety during treatment seemed to retard progress [p. 278]." The authors concluded that "the role of anxiety in exposure treatment requires further study [p. 278]."

Two case studies conducted by Lamontagne and Marks (1973) indicated successful treatment of chronic urinary retention. The procedure combined the variables of anxiety, prolonged exposure, and in vivo treatment. Both cases reported increased self-esteem and a more active social life.

In a more detailed investigation of the effects of exposure duration to the feared object, Stern and Marks (1973) treated 16 agoraphobic and social phobic patients. There were four treatment sessions administered twice weekly. Each patient received long practice for two days and short practice for two days. Treatment was both in vivo and in fantasy. Scenes in fantasy were tape-recorded as in the Watson, Gaid and Marks (1972) study, and lasted two hours. Half the sessions consisted of 80 minutes of flooding scenes followed by 40 minutes of neutral scenes. The other half consisted of 10-minute segments of flooding, followed by five minutes of neutral material, followed by 10 minutes of flooding until the two hours had

elapsed. Patients were encouraged to tolerate the unpleasantness of the treatment just as is customary with flooding. Supported by clinical ratings of a "blind" assessor, patient's self-ratings (i.e. level of anxiety and attitude toward the phobic object) and heart rate decrement, extended exposure to the phobic object was more effective than short exposure periods. Scenes presented in fantasy by tape-recorder were relatively ineffective compared with in vivo treatment which was an effective means for reducing fear of a phobic object.

Finally, just as with the analogue studies so also with clinical cases, some comparison has been made between SD and flooding procedures. These are significant, not because they may show one procedure more effective than the other, but because some factors may emerge which could help explain the mechanisms involved in successful treatment outcome. From the Calef and MacLean (1970) comparison study nothing very significant was discovered other than it appeared as if flooding was a more efficient method than SD since it was a simpler procedure to administer. In the Boulougouris, Marks and Marset (1971) study, already cited, the investigators suggest that the essential therapeutic components of flooding may be prolonged exposure but that the cognitive aspects of flooding need to be examined. The comparison study by Boudewyn and Wilson (1972) pointed out

the need for recording physiological indices in order to substantiate the results of treatment obtained through cognitive self-report and objective observer ratings. Everaerd, Rijken and Emmelkamp (1973) compared flooding with the method of successive approximations. In addition to both methods appearing to be effective, these investigators concluded that the experience of anxiety may not be essential to successful treatment. When Crowe, Marks, Agras and Leitenberg (1972) compared flooding with SD and shaping (i.e. reinforced practice) they found that physiological, cognitive, and behavioural indices of the phobic response are poorly correlated with one another and that there is a possibility that anxiety reduction is not essential to successful treatment outcome. However, the phenomenon of, and components of, anxiety require investigation in order to test the validity of this statement.

Section 3 - Factors Involved

Through animal research, analogue studies, case studies, and clinical investigation, it has been shown that flooding and flooding-type (most notably implosion) procedures are effective means for reducing phobic avoidance. What has not been clearly demonstrated is what are the factors or mechanisms responsible for or essential to

successful flooding. And yet, it may be seen that beginning attempts were being made in an effort to isolate the factor or factors responsible for the effectiveness of flooding in reducing fear and anxiety towards a phobic event or object. As far back as 1966 Rachman had suggested that the crucial variable may be the duration of continuous exposure which the individual experiences to the fear-provoking stimulus. It had been already well established that duration of exposure to the conditioned stimulus is an important variable in extinguishing fearful avoidant behaviour in animals. Relevant studies here are those by Polin (1959), Berman and Katzev (1972), Shearman (1970), Page and his co-workers in the 50's and 60's and finally Baum (1969). Several investigators have examined this variable of exposure duration in the treatment of human subjects and patients. Here, relevant studies are those by Levis and Carrera (1967), Kotila (1969), Baum and Poser (1971), Rachman, Hodgson and Marks (1971), Miller and Levis (1971), Stern and Marks (1973), Lamontagne and Marks (1973) and, most notably, Boulougouris, Marks and Maset (1971), who concluded that "duration of flooding sessions may be a crucial variable" in the successful treatment of phobias by flooding. However, even if duration of exposure were isolated as a crucial variable, we still could not be satisfied with that as an explanatory construct. Duration

is a time variable and does not refer to a psychological process. What needs to be studied are the cognitive and physiological intervening variables that can account for what takes place during forced exposure in cases of successful flooding.

Still other studies have examined other aspects of the flooding procedure with a view toward discovering if they were the mechanisms responsible for successful outcome following treatment for phobic behaviour. Hogan and Kirchner (1966) presented scenes for imagining via the use of tape-recorder in an effort to reduce the effect a therapist might have by presenting the scenes "live." They found that tape-recorded scenes were adequate to achieve successful outcome following implosion. Stadter (1973) was able to replicate this finding. However, Dee (1970) had found evidence to the contrary. The conclusion to be drawn from these divergent results is that it is still not known whether the therapist variable, in the form of positive expectancy effects, is a crucial variable as stated by Stampfl and Levis (1967); however, Borkovec (1972) was able to show that snake phobic Ss who had been given positive expectancy of procedural effects showed improvement over a group without such expectancy.

In a continuation of this search for the mechanisms responsible for reduced fear of a phobic object following

flooding procedures, Rachman (1969) suggested it would be interesting to investigate the effects of flooding using imaginal scenes relevant versus irrelevant to the phobic event itself. Watson and Marks (1971) studied the use of relevant and irrelevant fears and found that flooding on relevant or irrelevant phobic stimuli was equally effective in decreasing heart rate and skin conductance. This study is particularly significant for it seems to be the first time that Marks and his co-workers began to consider the possible significance of anxiety and anxiety reduction in the flooding procedure. In another publication about the same time, Marks (1972) questioned the role of anxiety. He felt that anxiety may be an unfortunate byproduct of flooding rather than the therapeutic agent itself. This seems to be a somewhat contrary position to arrive at, particularly since Stampfl and Levis (1967) have stated that evocation of intense anxiety is crucial for successful outcome. These latter authors even predicted that more physiological stress (anxiety) produced during therapy leads to more rapid extinction. Support for this contention is evident in the already-cited paper by Watson and Marks (1971) who noted ". . . heightened physiological arousal before treatment (heart rate and skin conductance) correlated with a good outcome to flooding . . . [p. 291]." Similarly, Marks, Boulougouris and Maset (1971) found that the higher the

initial levels of arousal, the better the chances for positive outcome. Related to this finding is that of Watson, Gaidnd and Marks (1972) who noted that cognitive changes (i.e. the person's subjective report of anxiety) tended to follow rather than precede physiological change in the flooding procedure for phobias.

Marks (1973) has suggested that what may happen during flooding procedures is that the individual may "get used to" the phobic stimulus. What he seems to be saying is that the individual, in time, with continuous, uninterrupted exposure may become accustomed to the phobic object. It is as though the individual's physiological constitution is capable of intense arousal for but a limited period of time, after which there is a return to a more normal state of arousal. This would be experienced as a pleasant change and the individual would be able to associate this lowered physiological state with the still-present phobic stimulus. This cognitive awareness of lowered physiological arousal might then lead to behavioural changes such that the individual would not exhibit as much fear or phobic avoidance compared with his approach behaviour prior to the procedure. Thus it would seem as if physiological and cognitive factors can come to play an important role in an explanation for the effectiveness of flooding.

The importance of the role of cognition in determining avoidance of a phobic stimulus may be seen in terms of the inferences a person makes about how anxious he is based upon his physiological state. Cognitive theory (Schachter & Singer, 1962) states that a person's attitude about an event tends to follow his emotional state. That is to say, the individual is first aware of his own physiological state and thereafter he derives hypotheses (cognitions and attitudes) about the event based upon his own physiology. It is the physiological arousal which initiates this cognitive search for reasons to account for the arousal. Depending upon experience and environmental effects, the individual would then interpret the cause for the arousal and would label the emotion accordingly. This may be then what Marks had in mind when he said the individual "gets used to" the phobic stimulus. It could be he is implying that avoidance or escape attempts from the phobic object must be blocked until the individual has had sufficient opportunity to experience a decrease in physiological arousal. The individual may then interpret the reason for this decreased arousal as less fear of the phobic object. By "getting used to" the phobic stimulus the individual may have made some cognitive deduction to the effect, "Gee, this isn't so bad after all." It would seem, therefore, that a great need exists to study the roles of physiological

and cognitive states jointly in the course of a flooding procedure.

The purpose of the present investigation is to measure the relationship that exists between physiological, cognitive, and behavioural components in the avoidance of a phobic stimulus. It is well recognized that there are several components of anxiety. Buss (1966) has isolated four components of anxiety. These are somatic (physiological), cognitive, motor (behavioural), and affective. In order to appreciate the role of anxiety reduction in flooding procedures it would seem necessary to study the relative changes which take place in the components of anxiety. When Marks stated in rather global and general terms that the individual slowly "gets used to" the phobic object, perhaps he meant there is a decrement in physiological arousal, or, changes in the individual's evaluation of the aversiveness of the stimulus event, or, changes in the individual's perception of how he is reacting to the phobic event, or, perhaps an interaction among all three factors. It may be argued, for example, that while physiological arousal may decrease following prolonged exposure to a phobic object, unless the individual comes to believe that he is reacting with less aversion, less repulsion, or less anxiety, there may be no ensuing behavioural change. Alternatively, it may be that a person's physiological arousal remains at a

high level throughout prolonged exposure but that his cognitions or beliefs about the disturbing nature of the internal reactions to the stimulus may be the crucial factor which has to be altered in modifying behavioural avoidance. Thus, what is needed initially, is a study which would elucidate the nature of the physiological and cognitive changes which take place during prolonged exposure to a phobic stimulus and the relationship between these two and behavioural avoidance of a phobic object.

It would seem then, in using a procedure where the individual is exposed to a phobic event for an extended period of time, that one should monitor the physiological and cognitive components of the fear or anxiety. One way of assessing cognitive procedures is to request from the S a verbal report describing his thoughts (i.e. free associations) concerning his reactions throughout the prolonged exposure episode. Not only would one think this method cumbersome and unreliable, but one could question the accuracy and veridicality of these reconstructed events. And yet, the manner in which one evaluates one's experiences of a prolonged exposure to a phobic event may be an important determinant of subsequent approach/avoidant behaviour towards that phobic object. Thus it would seem one should assess both the cognitive changes during prolonged exposure as well as the S's subsequent evaluation at the end of the

exposure experience. One way of satisfying both of these requirements is to obtain indices of cognitive changes at discrete points during the flooding procedure using rating scales that are designed to focus upon specific cognitions related to anxiety changes. Since it has been demonstrated (cf. Kotila, 1969) that short exposure periods are relatively unsuccessful in reducing anxiety and increasing approach behaviour toward a phobic stimulus, it would seem important to use short exposure periods to check further on the nature of cognitive changes which take place in order to account for the lack of success under conditions of short duration flooding. Furthermore, one could distinguish at least two kinds of cognitive factors, (1) those pertaining to the S's perception of his own internal reactions, and (2) his evaluation of the phobic stimulus itself. From a Schachterian point of view it might be said that a person's evaluation of a stimulus event is based largely upon an assessment of his own internal physiological reactions in the face of the event. It would seem that the evaluation a person makes about the phobic stimulus would be a potent mediating factor in determining his subsequent approach/avoidant behaviour toward that object. Thus it would be predicted that changes in the evaluation of the phobic object should be correlated with changes in beliefs about how one is reacting in the face of the stimulus

object. Furthermore, given positive changes in evaluations of the phobic object and in one's reactions to the phobic object, this would increase the likelihood of approach behaviour toward the phobic object. It would be predicted that under conditions of short exposure, where there is little opportunity to experience a decrement in physiological arousal, that evaluations of the phobic stimulus, as well as beliefs about one's own reactions to the phobic stimulus, would be less positive than the evaluations and beliefs of the Ss who have experienced longer exposure and greater physiological decrement. If the cognitions of individuals receiving short exposure coincide with their actual physiological state, they would be less likely to approach the phobic object than individuals who had been given an opportunity to experience a decrement in physiological arousal from which they could make inferences about how they felt during the exposure period, how they felt about the phobic object, and subsequently, the degree to which they would approach the phobic object.

Furthermore, given the fact that cognitive changes toward the phobic object may take place, it would be important to determine (a) the nature of the changes which must take place, and (b) the conditions under which such changes must take place in order to modify approach/avoidant behaviour toward the phobic object. Thus, for example,

simply modifying one's beliefs or cognitions about a phobic event, in the absence of perceived physiological decrements, may not be a sufficient condition in promoting behaviour change. Changing a person's cognitions and beliefs about a phobic event through persuasion, education, or reading about the phobic object may be a necessary but not a sufficient condition to promote behaviour change toward that object.

In order to examine the interaction effects between physiological and cognitive states, it was decided to expose Ss to a phobic stimulus and to evaluate, at discrete intervals throughout the flooding procedure, the physiological and cognitive changes that took place.

It was hypothesized that both cognitive and physiological indices of fear would be related to behavioural avoidance of a phobic object following a flooding procedure to the extent that Ss receiving continuous exposure would exhibit less behavioural avoidance than Ss

- (a) receiving interrupted exposure,
- (b) receiving bibliotherapy, or
- (c) in a control group of Ss who were not exposed to the phobic stimulus.

Furthermore, it was hypothesized that less behavioural avoidance for Ss receiving continuous exposure would be related to changes that take place in the cognitive and physiological indices during the course of the flooding

procedure itself. And, finally, it was hypothesized that cognitive, physiological and behavioural indices of fear of a phobic object would be reduced from pre- to post-treatment assessment for Ss receiving continuous exposure and not for Ss

- (a) receiving interrupted exposure,
- (b) receiving bibliotherapy, or
- (c) in the control group.

A review of the literature would be incomplete if no mention were made of the recent and very thorough critique by Morganstern (1973). The design of the present study has been improved by complying with his request for (a) the use of true control groups, (b) employing efforts to reduce experimenter bias, (c) equating the treatment time for all groups, and (d) using many criteria to measure change. Furthermore, his insistence in the importance of duration of continuous exposure and the possible interaction of physiological and cognitive factors has influenced the present investigation to the point where these variables are of prime concern.

CHAPTER II

METHOD

Subjects

The Ss were drawn from the University of Ottawa summer student population. Three hundred and seventy-one students completed a "fear" questionnaire (Appendix 1) and of these 96 were male and 275 female. For purposes of this study, the questionnaires of females only were considered. Forty-nine female Ss who responded at the extreme of "Very much" to item 1, "How afraid of snakes are you in general?" and item 3, "Would you be afraid to simply touch a garter snake?" were then contacted by telephone and asked if they would volunteer to participate in a study to do with fear of a live but harmless snake. Seven Ss at pretesting on a behavioural measure (see below) did not exhibit the degree of fear they had previously reported and were excluded from the remainder of the experiment; one S was excluded because of a history of heart murmur; and one S was so disturbed by the experimental procedure that she refused to complete the study. The final sample comprised 40 female Ss who qualified on the criterion measures of exhibiting sufficient fear to be included and who remained until completion of the study.

The age range of these 40 Ss was 20 to 49 and their average age was 28. No payment was made to Ss for their participation.

Criterion Measures of Fear

(1) Behavioural Avoidance Test (BAT) (Appendix 2)

This instrument served as the major tool for determining if a S was to be included in the study. It is an 18-step behavioural test adapted from one devised originally by Lang and Lazovik (1963) and used in modified form in nearly all of the analogue studies to date as a pre- post-change evaluation instrument. The BAT involved asking the S to approach the phobic object as closely as she could. The measure of behavioural avoidance was ascertained by counting the number of "steps" between actually holding the phobic object close and the start of the S's point of advance.

(2) Cognitive Measure

Self-perception Questionnaire (SPQ) (Appendix 3). Since it was one of the purposes of this study to investigate cognition during a fear-aroused state it was necessary to devise a questionnaire which would satisfy the questions being addressed. Consequently, the SPQ was created containing 10 items which were to be rated by each S at various points in time by checking how she felt on each item on the 21-point

continuum ranging from "none at all" to "very much." The advantage of using a 21-point scale is that it allowed the S ample range of opportunity to evaluate how she felt while at the same time not making it too easy for her to remember exactly which point she checked on the previous administration. Similar scales have been used successfully by Girodo (1974) and Girodo and Strickland (1974). The SPQ contains reference to basically two types of items: (a) cognitive-- self-evaluation of nervousness, worry, difficulty concentrating and wishing to avoid the situation; and (b) somatic-- self-report of feelings of increased heart rate, difficulty breathing, perspiration, faintness, and nausea. An item analysis revealed correlation coefficients ranging from .44 to .83, with total score, all statistically significant. However, it was decided to omit item 5, "Did you enjoy the challenge?", because it did not seem to bear face validity with the remainder of the items, thus leaving the range of coefficients .66 to .83. The split-half reliability coefficient, corrected for shortening with the Spearman-Brown formula, was .82.

(3) Attitude Measure

Snake-evaluation Questionnaire (SEQ) (Appendix 4). It was also the purpose of the study to determine if attitude toward a phobic object in any way altered following an

experience of decreased physiological arousal and/or changed cognitions toward the phobic object and/or behavioural change. Therefore, a semantic differential type questionnaire was devised similar to that used by Osgood, Suci and Tannenbaum (1957). The SEQ contains 10 bipolar items arranged on a 21-point continuum. The choice of items was based upon evaluative, activity, and potency factors used by Osgood et al. Item analysis revealed all items contributed significantly to the total score. The correlation coefficients ranged .54 to .87.

Personality Measure

Eysenck Personality Inventory (EPI) (Appendix 5). Although it was not a major variable in the present study, it was felt that some measure of personality should be taken to rule out serious personality abnormalities. The EPI is a much-used instrument for such purposes and was thought appropriate and useful in this study, not only because of the extensive research behind it, but also because of the expediency with which it could be administered.

Phobic Object

The object used in this study to stimulate fear was a 2-1/2 foot, non-poisonous garter snake which is indigenous to this area of Ontario. It was housed in a glass

aquarium 10-1/2" wide X 20" long X 12" high and fitted with a glass top which could be slid to one side for easy access.

Testing Room

This room was adjacent to the office used by the experimenter (E) and in it the snake was confined in the glass aquarium on a waist-high table. The floor had been marked at 1-foot intervals so that the Ss' degree of avoidance of the phobic object could be easily ascertained. The door of the room conveniently had a crack just wide enough for the E to observe the Ss' approach tendencies without himself being observed during the BAT tests.

Procedure

Ss were scheduled at 2-hour intervals and randomly assigned to one of four experimental conditions. Upon arrival at the laboratory the S was greeted by the E and ushered to the office. In order to standardize the procedure for all Ss, the instructions (Appendix 6) were read aloud by the E. The S then entered the testing room and approached the snake as closely as she could. No one other than the S was in the testing room during the test. Following this attempt, she returned to the office where the E asked her to check off her point of approach on the BAT and to complete the SPQ, SEQ, and EPI. Upon completion of the questionnaires

the S was ushered to the experimental, air-conditioned room where the E read the instructions (Appendix 7) for the next stage in the procedure.¹

Lafayette chromium-plated finger electrodes were applied to the first and third digits of the left hand to record GSR. Silver-plated electrodes were applied to both wrists and one ankle to measure HR. Beckman electrode paste was applied liberally to act as the interface between each electrode and the S's skin. The leads passed through the wall to an adjacent sound-proofed room which housed the Nihon Kohden polygraph recorder. Four channels were used to yield data on the following:

¹ It has long been recognized that concomitant with emotional change there occurs also physiological change. More particularly, it is known that autonomic nervous system functioning is very much altered at moments of emotional arousal. In much of recent psychological experimentation it is customary to record, whenever possible, the autonomic changes that occur in response to a stimulus. The major problem, however, is, as Lacey (1956) has discovered, that there are individual differences in the response pattern and individual differences in the magnitude of a response to a given stimulus. One, albeit not completely satisfactory, method of control for the problem of individual differences in the magnitude of responses is to record baseline data for each S and then, in effect, each S acts as his or her own control. The other problem of individual differences in response pattern poses difficulties that are somewhat, but not completely, resolved by the method of obtaining a physiological measure of more than one response modality. One effective method of recording physiological change in a number of response modalities simultaneously is to employ a polygraph recorder. The polygraph recorder used in the present investigation was a Nihon Kohden Model RN 85. It was decided to measure physiological change in the same response modalities as was done by Marks and his co-workers, namely, heart rate (HR) and galvanic skin resistance (GSR).

- (a) beat-by-beat heart rate;
- (b) beats per minute heart rate;
- (c) GSR - DC variable baseline requiring bridge box balancing;
- (d) GSR - AC non-variable baseline to record number of spontaneous fluctuations.

The S was asked to sit quietly while the E balanced the recording devices. Five minutes of baseline data were gathered after which time the E entered the experimental room and read the instructions for the next stage in the procedure.

Group I Ss received 30 minutes of continuous exposure (CE) to the phobic object. That is, after the baseline period, the S was instructed to the effect that she would next have an opportunity to be exposed to the snake. The snake, contained in the glass aquarium, was brought into the experimental room by the E and placed on a table directly in front of the S. The table was high enough to permit the S's legs and the arms of her chair to pass underneath, thereby placing the snake in extremely close proximity to the S. The E then asked the S to attend closely to the snake and he promptly left the room. In the adjacent room the E was able to monitor the S's HR and GSR as well as observe her behaviour from behind a one-way mirror. The procedure for group II Ss--interrupted exposure (IE)--was similar to that of group I (CE) except that after each

10-minute period of exposure the snake was removed from the experimental room while the S rested for five minutes. Group III Ss--bibliotherapy (Bib)--received no exposure but instead were asked to simply read about snakes. Group IV Ss--reading control (RC)--also did not receive exposure in the experimental condition but instead read or scanned irrelevant magazines. The magazines used were Time, Saturday Evening Post, Paris Match, and Jours de France. All groups were similar in that at 10-minute intervals the E entered the room and asked each S to complete the SPQ and SEQ. Completion of these scales was done in the presence of the snake. Instructions given to all groups are reproduced in Appendix 8. It is noteworthy that the instructions for CE and IE Ss differ slightly from those of the two control groups. There are two specific reasons why this is so and they are:

- (1) It seemed important to maximize the chances of obtaining positive behavioural outcomes in order to account for any possible changes observed in cognitive assessment.
- (2) It was reasoned that the type of instructions given to CE and IE Ss would dissuade them from using individualized coping strategies which would add to uncontrolled variance.

Despite these differences in instructions, if a statistically significant difference arose between CE and IE Ss with respect to either of the control groups, then it would seem safe to conclude this difference was due, not to the instructions, but to the independent variable under study, namely, duration of exposure to the phobic object.

Post Experimental Criterion Measure

Upon completion of the experimental procedure, the E entered the room, removed the electrodes from the S and then informed her about the last stage of the experiment which involved a second BAT (Appendix 9). The S was ushered from the experimental room to the same testing room where the initial behavioural avoidance measure was obtained. Once again the S's avoidance tendencies were observed by the E through the crack in the door. Upon completion of this post-experimental criterion test, the S returned to the office where once again measures were obtained on BAT, SPQ, and SEQ. The experimental procedure now completed, the S was permitted a few minutes to discuss her impressions and opinions and, before she departed, the E requested a promise that the S would not discuss the experiment with other students.

CHAPTER III

RESULTS

In order to assess the effects of flooding procedures a one-way analysis of variance was performed on each of the dependent measures. As a check on the homogeneity of variance assumption underlying the analysis of variance F-max tests were computed and found non-significant. One-way analysis of variance on pre-treatment scores indicated there were no significant differences between any of the four groups as was expected from the random assignment of Ss to experimental groups. The most common method of assessing the effects of a treatment procedure is to obtain change scores by subtracting post-treatment from pre-treatment scores and computing an analysis of variance on these data. Table 1 summarizes the results of this analysis. Significant differences were found on two of the measures, the Behavioural Avoidance Test ($F = 4.67; 3,36 \text{ df}; p < .01$) and the Self-perception Questionnaire ($F = 4.13; 3,36 \text{ df}; p < .05$). These results are illustrated in Figures 1 and 2, respectively.

In order to determine where the differences lay, post hoc analyses were conducted on these pre- and post-change scores. Duncan's Multiple Range Test (Duncan, 1955) on BAT change scores indicated that CE Ss ($\bar{X} = 4.2$) exhibited more ($p < .05$) behavioural approach towards the phobic object

Table 1
One-way Analysis of Variance on Change Scores for Each
of the Dependent Measures

Dependent Variable	Source	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
BAT	Between	84.08	3	28.03	4.67	.01
	Within	215.90	36	6.00		
	Total	299.98				
SPQ	Between	18,336.68	3	6112.23	4.13	.05
	Within	53,243.30	36	1478.98		
	Total	71,579.98	39			
SEQ	Between	8,585.00	3	2861.67	2.19	n.s.
	Within	47,016.60	36	1306.02		
	Total	55,601.60	39			

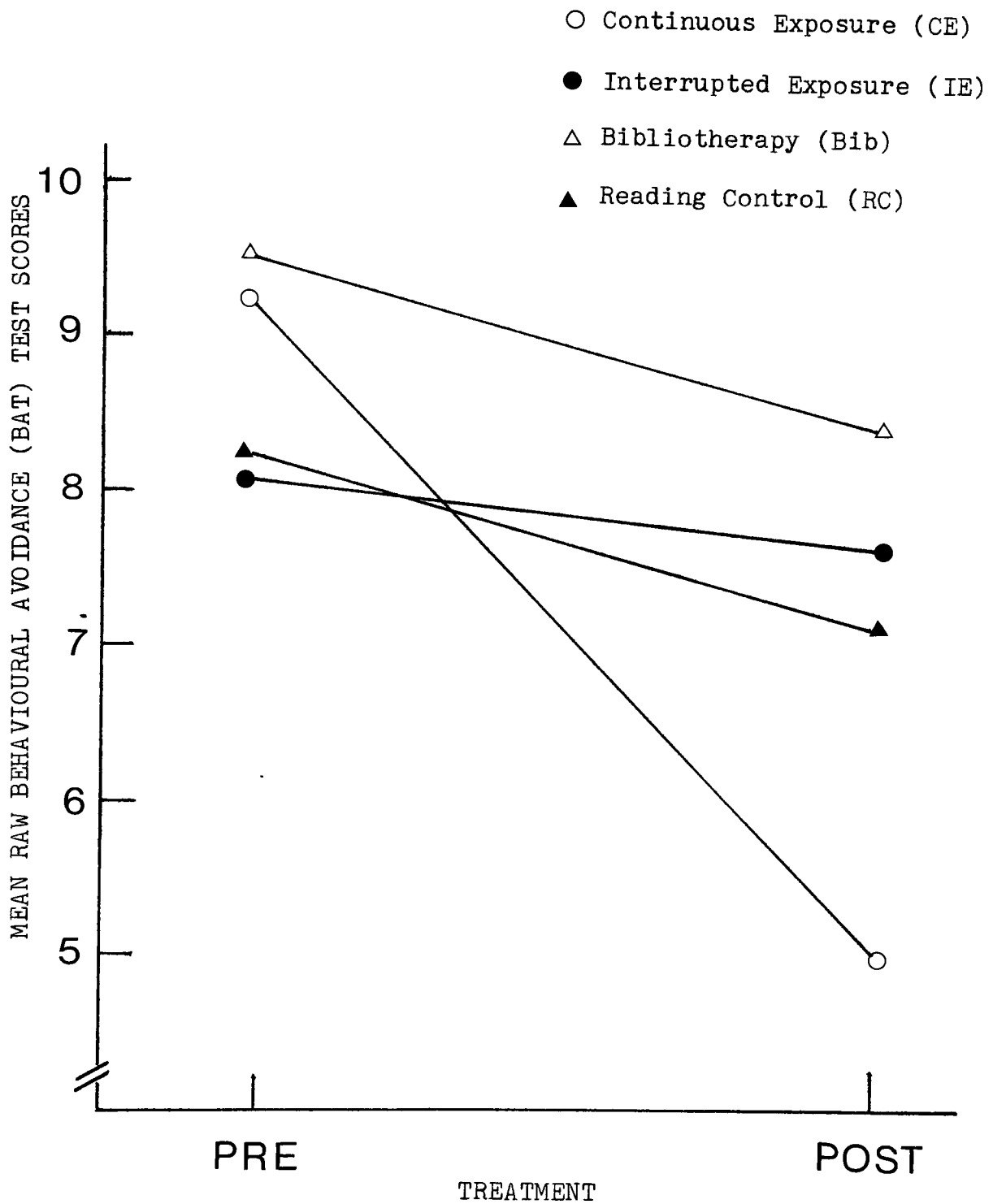


Figure 1. Mean Pretest and Posttest Behavioural Avoidance Scores (BAT) for Four Groups of Subjects.

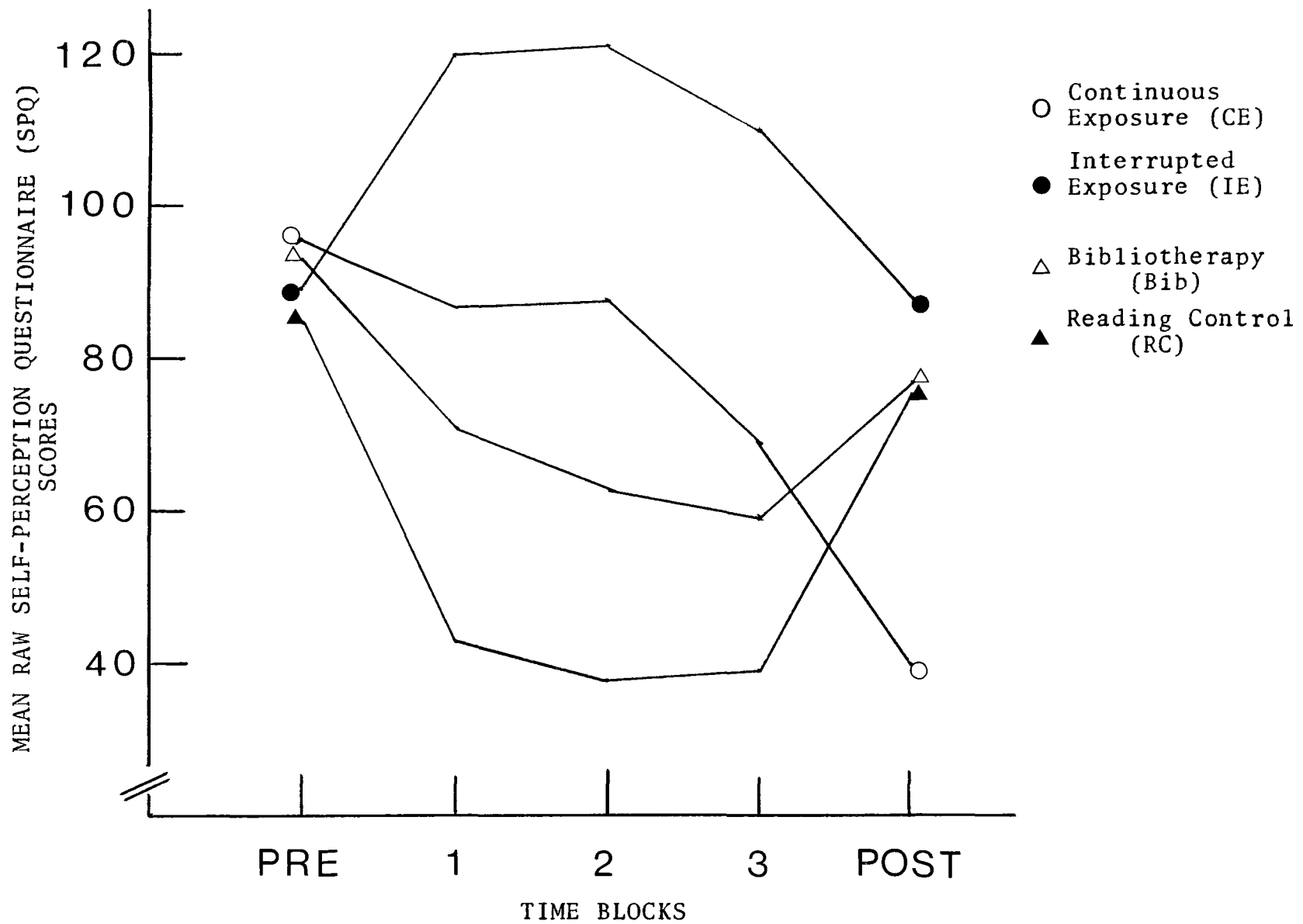


Figure 2. Mean Self-perception Questionnaire Scores for Pretest and Posttest and at Three Time Intervals between Pretest and Posttest for Four Groups of Subjects.

following treatment than did IE Ss ($\bar{X} = .5$), Bib Ss ($\bar{X} = 1.1$) or RC Ss ($\bar{X} = 1.1$). Similarly, the SPQ change scores indicated that CE Ss ($\bar{X} = 56.2$) perceived themselves as less aroused ($p < .05$) following treatment than IE Ss ($\bar{X} = .7$), Bib Ss ($\bar{X} = 17.2$) or RC Ss ($\bar{X} = 8.0$). CE Ss showed less avoidance tendencies toward the phobic object than any of the Ss in the other three groups at posttesting. Furthermore, these same CE Ss, who received continuous exposure to the phobic object, reported less worry and nervousness and feelings of less faintness, less nausea, and less heart rate than IE, Bib, or RC Ss.

However, these observations are based upon change scores from the pre- to post-treatment session. In order to determine if these perceptions of bodily state were the result of the treatment procedure as a whole or if they developed throughout the course of the flooding procedure, assessments were gathered at 10-minute intervals during the entire procedure. These SPQ scores were subjected to one-way analysis of variance followed by Duncan's Multiple Range Test to determine the exact location of the differences. The F test results are summarized in Table 2 and means for each time period for the four groups are illustrated in Figure 2. Significant differences were found between the groups at each of the three time epochs. Post hoc analysis of these significant F tests indicated that at Time 1 (i.e., the end

Table 2
 One-way Analysis of Variance on Self-perception Questionnaire
 at Three 10-minute Intervals throughout the Flooding
 Procedure

	Source	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Time 1	Between	30,074.88	3	10,024.96	6.47	.01
	Within	55,768.50	36	1,549.13		
	Total	85,843.38	39			
Time 2	Between	37,910.28	3	12,636.76	5.16	.01
	Within	88,078.70	36	2,446.63		
	Total	125,988.98	39			
Time 3	Between	26,808.08	3	8,936.03	3.56	.05
	Within	90,491.30	36	2,513.65		
	Total	117,299.38	39			

of the first 10 minutes of exposure) CE Ss ($\bar{X} = 87.3$) perceived themselves as more aroused ($p < .05$) than RC Ss ($\bar{X} = 43.6$), and I.E. Ss ($\bar{X} = 119.4$) more aroused ($p < .05$) than both Bib Ss ($\bar{X} = 71.2$) and RC Ss ($\bar{X} = 43.6$). CE Ss and IE Ss were being exposed to the phobic object and, as expected, reported more arousal at Time 1 than Ss in either of the control groups. At Time 2, the results were similar to Time 1 with both groups CE and IE reporting they were feeling more aroused than the control groups. CE Ss ($\bar{X} = 88.3$) perceived themselves more aroused ($p < .05$) than RC Ss ($\bar{X} = 38.0$). IE Ss ($\bar{X} = 121.3$) reported more arousal ($p < .05$) than Bib Ss ($\bar{X} = 63.5$) and RC Ss ($\bar{X} = 38.0$). However, at Time 3, only the IE Ss ($\bar{X} = 110.1$), those who were subjected to non-continuous exposure, still reported greater arousal ($p < .05$) than Ss in either control group Bib ($\bar{X} = 59.4$) or RC ($\bar{X} = 39.0$). There was no statistically significant difference between CE and IE Ss at Time 1, Time 2, or Time 3.

It would seem reasonable to expect that if Ss had experienced some cognitive change in their level of distress or discomfort, and, if they had been able to show improved behavioural approach tendencies toward the phobic object, then perhaps they would have altered their attitudes toward the phobic object as well in the direction of more favourable evaluations of the snake. The SEQ was designed to reflect any possible changes in these attitudes. Reference to Table 1

indicates that the pre- and post-treatment SEQ change scores showed no significant differences between the groups ($F = 2.19; 3,36$ df; ns).

During the course of the flooding procedure assessments were gathered at 10-minute intervals to determine if the experimental procedure had an effect upon the attitudes Ss formed toward the phobic object. These SEQ scores were subjected to one-way analyses of variance and the results are summarized in Table 3. None of the analyses approached significance.

The analysis of the data to this point has been concerned solely with the comparison of the various groups. Another way to analyze the data is to compute t test differences for means of correlated samples for each group from pre- to post-treatment on each of the dependent measures. The results of these several t tests are presented in Table 4. The results indicate that on the BAT and SPQ only CE Ss showed significant changes in scores ($\underline{t} = 3.74; 9$ df; $p < .01$, and $\underline{t} = 3.78; 9$ df; $p < .01$, respectively). That is, only those Ss who received continuous exposure to the phobic object formed cognitions of lowered physiological arousal, and concomitantly, showed less behavioural avoidance of the phobic object. Ss who received interrupted exposure did not improve on any of the dependent measures, nor did those Ss in the bibliotherapy or reading control groups. Although the

Table 3
 One-way Analysis of Variance on Snake Evaluation
 Questionnaire at Three 10-minute Intervals
 throughout the Flooding Procedure

	Source	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Time 1	Between	2,731.28	3	910.43	.46	n.s.
	Within	71,030.50	36	1,973.07		
	Total	73,761.78	39			
Time 2	Between	3,496.00	3	1,165.50	.53	n.s.
	Within	79,030.60	36	2,195.29		
	Total	82,527.10	39			
Time 3	Between	3,181.88	3	1,060.63	.45	n.s.
	Within	84,178.90	36	2,338.30		
	Total	87,360.78	39			

Table 4

t Tests of Means of Correlated Samples on
Pre- to Post-treatment Change Scores

	BAT		<u>t</u>	p	SPQ		<u>t</u>	p	SEQ		<u>t</u>	p
	Pre \bar{X}	Post \bar{X}			Pre \bar{X}	Post \bar{X}			Pre \bar{X}	Post \bar{X}		
CE	9.2	5.0	3.74	.01	96.2	40.0	3.78	.01	127.3	114.0	.91	ns
IE	8.1	7.6	.76	ns	89.2	88.5	.05	ns	114.5	135.9	-1.93	ns
Bib	9.5	8.4	1.67	ns	94.2	77.0	1.34	ns	137.4	124.2	1.06	ns
RC	8.2	7.1	2.09	ns	85.2	77.2	1.60	ns	127.6	117.1	1.84	ns

df = 9
All tests: two-tailed

SEQ failed generally to indicate shifts in attitudes toward the phobic object, the negative results for IE Ss ($t = 1.93$; 9 df; $p .10$) approached significance. This finding indicates that following interrupted exposure to the phobic object there was a tendency for IE Ss to form even more negative attitudes toward the snake.

The analysis of the data to this point has concentrated upon the behavioural, cognitive and attitudinal dependent variables in the pre- to post-treatment testing situations as well as analysis of cognitive and attitudinal scales during the course of the flooding procedure. Another important parameter of this investigation concerns the physiological recordings of Ss during the procedure. Heart rate (HR) and galvanic skin resistance (GSR)² were recorded continuously throughout the course of the experimental procedure on all Ss in all groups. Table 5 summarizes the analysis of variance for HR. The data that were used consisted of change scores from the last minute of baseline, after the method of Boulougouris, Marks and Maset (1971) and Watson and Marks (1971). The number of HR beats per minute were subtracted from the last minute of the baseline beats per minute recording. These change scores were then submitted to a two-way

2 The GSR data were discarded due to possible contaminating and extraneous factors which modified skin resistance and rendered the data uninterpretable. The problem is discussed in Chapter IV.

Table 5

Two-way Analysis of Variance
Repeated Measures on HR
Change Scores

Source	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Between subjects	2778.28	39			
B (Groups)	82.25	3	27.42	.37	n.s.
Subj. within groups	2696.03	36	74.89		
Within subjects	791.42	80			
A (Blocks)	151.99	2	76.00	9.68	.0001
AB	74.19	6	12.37	1.58	n.s.
A X Subj. within groups	565.24	72	7.85		
Total	3569.70	119			

analysis of variance with repeated measures. Significance was found on Blocks (A) factor only ($F = 9.68$; $2,72$ df; $p < .0001$). This result is illustrated in Figure 3. Post hoc analysis using the Tukey test revealed that there was no statistical difference between the means of time blocks 1 and 2 ($q = -3.11$; $3,72$ df; n.s.) nor between blocks 2 and 3 ($q = -3.16$; $3,72$ df; n.s.). However, there was a significant difference between the means for time blocks 1 and 3 ($q = -6.27$; $3,72$ df; $p < .01$). This finding indicates that as the experimental procedure continued over time all groups experienced a diminution in HR. No significant overall group effect was obtained.

In order to determine if any of the groups experienced a diminution in HR over the course of the entire exposure period a number of t tests for correlated samples were computed. The average HR change score at time block 1 was compared with the average HR change score at time block 3 for each group separately. The results of this analysis are summarized in Table 6. CE Ss and Bib Ss were the only two groups to experience a statistically significant reduction in HR during the experimental procedure (t = 2.68; 9 df; $p < .05$, and t = 2.53; 9 df; $p < .05$, respectively).

Correlational analysis of the data revealed a number of significant relationships. These correlation coefficients are presented in Table 7. It is interesting to note that,

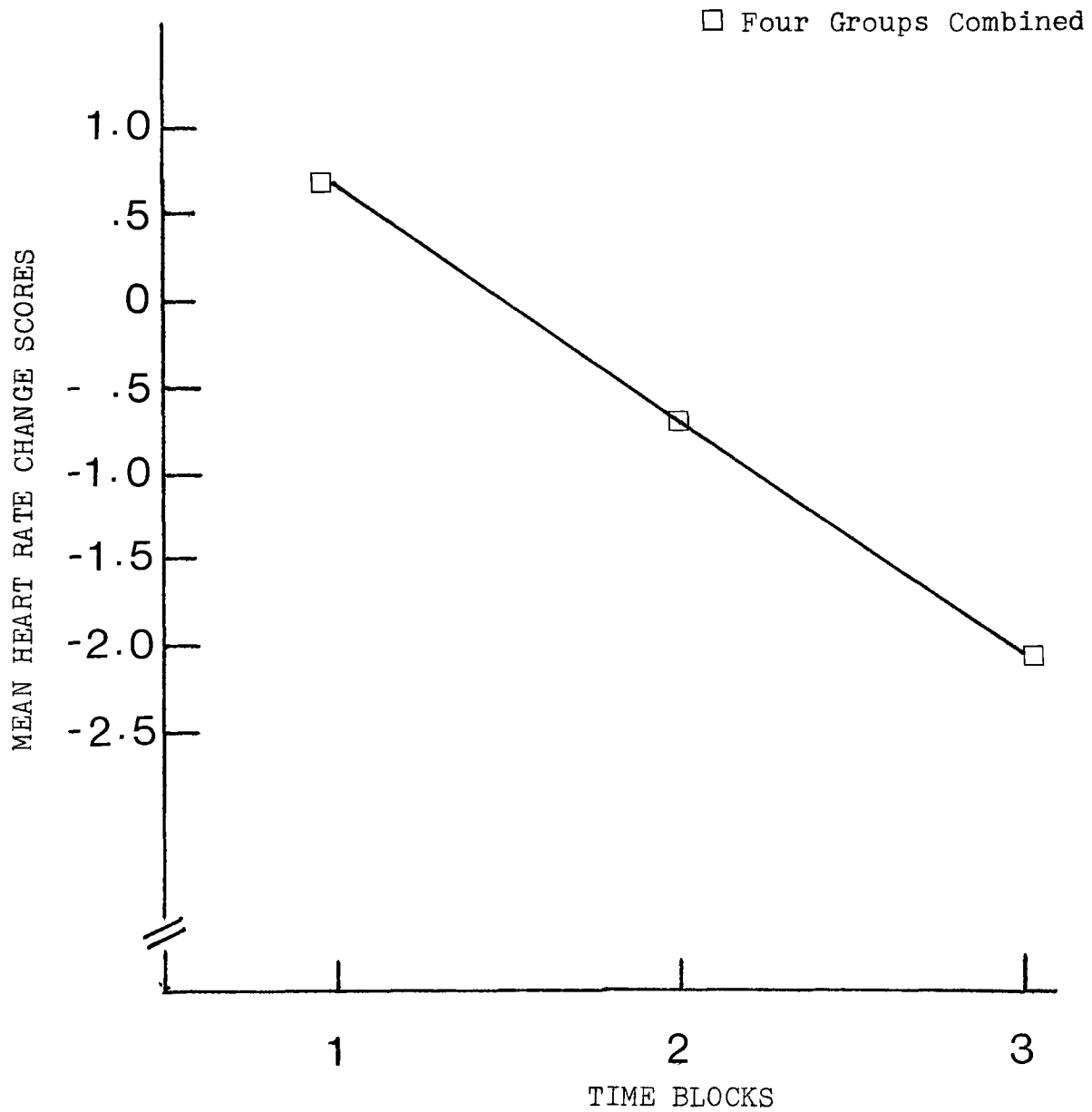


Figure 3. Mean Heart Rate Change Scores at Three 10-minute Intervals for Four Groups of Subjects Combined.

Table 6

t Tests of Means of Correlated Samples on HR Change Scores
Time Block 1 to Time Block 3

Group	Block 1 \bar{X}	Block 3 \bar{X}	<u>t</u>	<u>p</u>
CE	3.72	-1.10	2.68	.05
IE	.55	-2.79	1.63	n.s.
Bib	-.69	-2.76	2.53	.05
RC	-.92	-1.70	1.08	n.s.

df = 9

All tests: two-tailed

Table 7
 Pearson Product Moment Correlation Coefficients on
 Dependent Variables at Various Assessment
 Periods

Correlations				<u>r</u>	<u>p</u>
SPQ	Block 1 to Block 3 Change	SEQ	Block 1 to Block 3 Change	.50	.01
SPQ	"	HR	"	.37	.02
SPQ	"	SPQ	Pre- to Post-Change	.44	.01
SPQ	"	BAT	"	.18	ns
SPQ	"	SEQ	"	.23	ns
SEQ	"	HR	Block 1 to Block 3 Change	.22	ns
SEQ	"	SPQ	Pre- to Post-Change	.25	ns
SEQ	"	BAT	"	.17	ns
SEQ	"	SEQ	"	.48	.01
HR	"	SPQ	"	.41	.01
HR	"	BAT	"	.41	.01
HR	"	SEQ	"	.12	ns
SPQ	Pre- to Post-Change	BAT	"	.56	.01
SPQ	"	SEQ	"	.59	.01
BAT	"	SEQ	"	.42	.01

df = 38

All tests: two-tailed

although the analysis of variance on SEQ failed to yield significant group differences in attitude toward the phobic object during the flooding procedure, a highly significant relationship was found to exist between SEQ and SPQ ($r = .50$, 38 df, $p < .01$) on change scores from time block 1 to time block 3. This relationship is apparent also in the significant correlation which exists between SEQ and SPQ on the pre- to post-treatment change scores ($r = .59$, 38 df, $p < .01$). Consistency was found on both the SPQ and SEQ variables such that changes from time block 1 to time block 3 were correlated with their respective pre to post-treatment change scores (SPQ $r = .44$, 38 df, $p < .01$, and SEQ $r = .48$, 38 df, $p < .01$). The physiological decrement as recorded by HR change between time block 1 and time block 3 was found to be significantly correlated with the SPQ for time block 1 to time block 3 ($r = .37$, 38 df, $p < .02$). Furthermore, the HR change for time block 1 to time block 3 was found to be correlated significantly with the Ss' subsequent behavioural approach/avoidant tendencies as measured by the BAT pre- post-treatment change scores ($r = .41$, 38 df, $p < .01$) and with the cognitive self-report of Ss as measured by SPQ pre- post-treatment change scores ($r = .41$, 38 df, $p < .01$). The BAT pre- post-treatment change scores correlate significantly with the SPQ pre- post-treatment change scores ($r = .56$, 38 df, $p < .01$)

and with the SEQ pre- post-treatment change scores ($r = .42$, 38 df, $p < .01$).

Finally, a number of correlational analyses were conducted on the extraversion and neuroticism scales of the EPI. The results of these analyses are presented in Table 8. As is indicated, none of the correlation coefficients is statistically significant. This would seem to indicate that the results of the experiment were not related to the Ss' extraversion or neuroticism scores.

Table 8

Pearson Product Moment Correlation Coefficients on Eysenck
Personality Inventory and Several Dependent Variables

Correlations			<u>r</u>	<u>p</u>
EPI	Extraversion	BAT Pre- to Post-Change	.05	ns
	"	SPQ	-.06	ns
	Neuroticism	BAT	-.05	ns
	"	SPQ	-.01	ns
	Extraversion	SPQ Block 1 to Block 3 Change	-.20	ns
	Neuroticism	SPQ	-.08	ns

df = 38

All tests: two-tailed

CHAPTER IV

DISCUSSION

The purpose of the present investigation was to examine some of the anxiety components underlying fear during forced exposure to a phobic object. It was felt that a study of the physiological, cognitive, and attitudinal states that accompany fear and anxiety would reveal the role these factors could play in flooding procedures. The first question that must be asked is: was the flooding procedure in this study an effective aid for reducing fear and anxiety felt toward a phobic object? This study attempted to answer this question by collecting data on essentially three dimensions, behavioural, cognitive, and physiological, for two groups of Ss who were in some way exposed to slight but crucial variations in the procedure, and to compare them with two control groups. Behaviourally, the flooding procedure was effective in decreasing the avoidance behaviour (or increasing approach tendencies) toward the phobic object for those Ss who received continuous exposure to the phobic object during the flooding procedure. Ss in groups receiving non-continuous exposure, in bibliotherapy or in a reading control, did not improve in their approach tendencies toward the phobic object. For CE Ss, the cognitive scores yielded changes which paralleled the behavioural data. In fact, there was a significant correlation

between changes in SPQ and BAT. Where the flooding procedure was of a continuous variety there was evidence of altered cognitions to the extent that the Ss reported perceiving themselves as less anxious.

The analysis of variance on HR yielded significant results on the Blocks factor only but did not yield significant results for groups or, more importantly, on the groups by blocks interaction. This finding is similar to that reported by Stern and Marks (1973) who found that HR decreased overall during the flooding sessions. When t tests were computed for each group in the present study from block 1 to block 3 it was discovered that two of the groups (CE and Bib) experienced a statistically significant reduction in HR. Bib Ss were involved essentially in a condition of re-education most commonly referred to as bibliotherapy and they did not exhibit correspondingly improved behavioural approach tendencies toward the phobic object, nor did they report perceiving themselves as less anxious. Even though HR change (time block 1 to time block 3) was significantly correlated with SPQ change (time block 1 to time block 3) and with SPQ and BAT pre- post-treatment change scores, the finding that Bib Ss exhibited a diminution in HR points up the fact that the HR change is not necessarily a good index of the essential aspect of anxiety decrement that could predict a change in behavioural avoidance of the phobic object. It appears

somewhat more likely that it is the cognitions that Ss form about their own physiological state that could predict less phobic behaviour. Given that exposure is prolonged and continuous, Ss may form an opinion about their own physiological state as being less aroused or at least come to interpret their internal states differently. This then may be what Marks was referring to when he stated that during flooding procedures Ss "get used to" the phobic object.

On the basis of the foregoing, it would appear that the present investigation lends further support to most of the literature on flooding which has shown it to be a viable procedure for reducing the fear and anxiety associated with phobic behaviour. This is an important finding for it permits the analysis to proceed to the next question: what are the components of the flooding procedure and what are their relationship to fear and anxiety that leads to decreased avoidance following treatment?

In answer to these questions there appears to be a necessity that exposure to the phobic object be continuous if flooding is to be beneficial. Interrupted exposure serves as a further reinforcement for escape and may even further sensitize an already fearful person. This discovery supports the theoretical underpinnings of flooding as based upon Mowrer's (1951) two-factor theory of learning. In the present

study, continuous exposure to the phobic object for CE Ss gave them no opportunity to escape or avoid the object with the result that they seemed to perceive themselves as eventually being less anxious and, concomitantly, were able to demonstrate less phobic avoidance after flooding. IE Ss, on the other hand, by having the snake removed periodically, did not have the same opportunity as CE Ss to "test reality" and perhaps discover changes in their own internal reactions. Baum and Poser (1971) have referred to this blocked avoidance procedure as "forced reality testing" and this seems a useful way to view what happens during flooding. Phobic behaviour may be conceived as behaviour which is learned and maintained via the Mowrerian two-factor theory which appears in behavioural form as persons acting irrationally and unwilling to test reality. The individual conditioned to such fears permits himself escape or avoidance and fails to use his cognitive resources in assessing the reality of the situation. It appears that only by "forcing" the individual or encouraging him to tolerate the presence of the phobic object, will he be able to break the perpetual avoidance tendency and, in this way, test reality and thereby allow the opportunity for cognitive and, possibly, physiological changes to take place.

An alternative explanation of the results is to view continuous versus interrupted exposure as very much analogous

to massed versus distributed practice in learning theory. In this sense, then, just as massed practice is best for learning simple tasks, so also, continuous exposure apparently is best for overcoming fear of a phobic object.

It will be recalled that Stampfl and Levis (1967) had prescribed anxiety-arousal as crucial to implosive therapy. Boulougouris, Marks and Marset (1971), on the other hand, questioned if anxiety-arousal was even necessary. On the basis of results emanating from the present investigation it seems that the role of anxiety in flooding procedures is quite complex. Groups of Ss (i.e. Bib and RC) who received bibliotherapy or simply reading irrelevant magazines did not show improvement in their behavioural approach tendencies toward a phobic object, nor did they perceive themselves as being less anxious. A group of Ss (i.e. IE) who received interrupted exposure to the phobic object reported feeling more anxious than control Ss and they subsequently also did not show improvement in their behavioural approach tendencies toward a phobic object; they did not record decrements in physiological arousal, and they did not perceive themselves as being less anxious. One group of Ss (i.e. CE), who received continuous exposure to the phobic object, improved in their behavioural approach tendencies, reported perceptions of their own physiological state as being less aroused and, in fact, so far as the data permits, actually experienced

a decrement in physiological arousal. Thus, it appears that the cognitive component of anxiety may be an important component of the flooding procedure and, in order for there to be behavioural improvements, cognitive changes could be a necessary condition. Ss may experience a physiological decrement in arousal but the most important element would appear to be that they come to perceive themselves as less anxious, a state which appears to be at least partially independent of actual physiological arousal. This finding is congruent with that of Watson, Gaid and Marks (1972) who reported "phobic patients do not regard themselves as better until they feel better subjectively [p. 277]."

Theoretically then, it appears the present investigation is in accord with Schachter's cognitive theory of emotions. Schachter (in Spielberger, 1966) has stated that the key assumption underlying his theory is that:

given a state of physiological arousal for which an individual has no immediate explanation, he will label this state and describe his feelings in terms of the cognitions available to him [p. 220].

A logical corollary of this assumption would be that:

given a state of decreased physiological arousal for which an individual has an immediate explanation, he will label this state and describe his feelings in terms of the cognitions available to him.

On the basis of evidence garnered from the present study Ss may indeed alter their cognitions as a result of

perceived changes in their physiology. But the fact that a group of Ss receiving bibliotherapy also experienced a physiological decrement without the corresponding cognitive change indicates that decrement in physiological arousal, per se, may be an unreliable indicator of subsequent cognitive and behavioural change. It would appear that in order for persons to show less behavioural avoidance of a phobic object it is important that they modify their cognitions about themselves which will be based upon the perception of themselves as less anxious. And it would appear that in the behaviouristic approach to the treatment of anxiety states, such as is found in phobias, continuous exposure to the phobic object, for a prolonged period of time, with all escape and avoidance routes blocked, will enhance the likelihood that cognitive, and possibly physiological, states will modify. In a sense then, what Marks (1973) has suggested as the individual "getting used to" the phobic stimulus seems conceptually correct, even if unscientifically phrased. In essence, Marks seems to have suggested that the individual forms a cognition in the course of flooding that may lead to less behavioural avoidance tendencies. In modified Schachterian terms the same process may be viewed as the individual forming a cognition or interpretation of his physiological state which leads to less behavioural avoidance

of the phobic object. It may then be said the individual has "gotten used to" the phobic object.

Meichenbaum (1973) has described in a series of experiments how important cognitions are in therapy. He has shown that if Ss can have their thoughts modified they can then practice these thoughts to themselves as they experience that which is feared. Meichenbaum has modified cognitions on the kinds of things that Ss say to themselves. As he puts it, Ss are given a "stress inoculation" because they are taught to self-instruct themselves with such aids as "relax, I am in control, I can handle the situation." It has been shown clearly that ". . . cognitive processes are amenable to modification and that such modification enhances the efficacy of behaviour therapy [p. 429]." The present study appears to endorse Meichenbaum's assertion as to the utility in attending to the cognitive self-report of Ss. And, in another sense, the Meichenbaum studies, as well as the present one, partly answer the criticisms of Breger and McGaugh (1965) who complained that behaviour therapy had not paid enough attention to the role of cognitions.

A somewhat surprising finding in the present study was that the attitude of Ss toward the snake (SEQ), even though significantly correlated with SPQ, did not significantly alter for any of the groups during the course of the experimental procedure. This is a most interesting discovery

because it suggests that even though one's behaviour may have been altered in the direction of less fearful avoidance, and one's cognitions altered such that less physiological arousal is felt, the attitude toward the phobic object does not alter appreciably. Although there was a slight tendency for Ss receiving non-continuous exposure to report even more negative attitudes toward the phobic object, generally speaking, attitudes toward the snake remained unchanged. It seems that one may "get used to" a phobic object, that is, be able to tolerate it, without ever getting to "like" it. Perhaps this serves as a reminder then that should the phobia be one of a fear of water, the client may, through behaviour therapy, come to tolerate it without achieving the state of liking it or having a passion for swimming. While a person may have a phobia for heights, successful behaviour therapy creates no obligation for him to come to like heights.

Personality characteristics of Ss was not a variable of major importance in the present investigation. Nonetheless, it is interesting to note that one aspect of personality, namely, the Eysenckian extraversion/neuroticism concept, apparently had no relationship to any of the results obtained. In a future study it might be possible to take several measures of personality, using a variety of psychometric tests, and to examine if behavioural, cognitive, and physiological components of anxiety are related to personality characteristics.

It may well be found that existing psychometric tests are inadequate in detecting some aspects of personality such as the actual level of physiologically or cognitively felt anxiety in individuals.

In at least one respect the present investigation has been a refinement over previous studies on flooding procedures and, at the same time, it has several shortcomings. First of all, an improvement over previous studies was the use of in vivo presentation of the phobic object. The advantage in using this procedure over using in imagino scenes is that it eliminates the need to investigate if successful imagination of phobic scenes has generalized to the real phobic object. Another refinement over previous studies was the development of scales to measure cognitive and attitudinal states. Whereas previous studies have employed the Fear Survey Schedule (FSS) (Lang & Lazovik, 1963), which has only one item that measures self-report of snake fear, the SPQ developed for the present study has ten.

From a less positive point of view, even though the intent of the experimental design was to reduce as much as possible the opportunity for experimenter bias, demand characteristics and modelling effects that might act as mediating factors on dependent variable outcomes, it cannot be stated with certainty that such was the case. It cannot be known with certainty that Ss were not "forced" or

"coerced" to alter their cognitions by the very construction of the SPQ. Such is the subtle manner in which questionnaires may have demand characteristics about them that elicit Ss' co-operation to report self-perceptions in a manner slightly distorted from what they would report were they allowed to "free associate." Similarly, it may very well be that since the E knew which Ss were to receive a specific procedure, even though the procedure was standardized, he may have unwittingly transmitted cues as to his expectations for how they were to perform. One way to circumvent this possibility, partially, would have been to have had the entire experimental instructions administered to the Ss by use of a tape-recorder. This procedure would have reduced the E and S contact but would not have eliminated it. Because it was necessary to have an E attach the electrodes for the physiological measures, the E/S interaction could not have been eliminated entirely.

Use may have been made of a screen which, when lowered, would have prevented the IE Ss from being exposed to the snake. This slight modification to the experimental design would have eliminated the necessity for E to remove the phobic object from the test room and thereby would have reduced the risk of the E modelling approach behaviour toward the phobic object.

Another disappointing aspect of the study was the weak physiological results. In the absence of more convincing HR data and, in light of the failure of the GSR data, caution must be exercised in interpreting the behavioural change as due essentially to a modification of cognitions. With particular reference to the GSR data, all groups appeared to decrease in electrical resistance and increase in conductance over time. This seemed to be an improbable finding and it conflicted with the HR data. Especially, it seemed the phenomenon was such a consistent one that it possibly reflected the effect of some extraneous factor in the procedure. Post-experimental examination led to an hypothesis that the problem laid in the use of Beckman paste as the interface between the electrode and the S's skin. Edelberg (1967) has suggested that a paste solution of too high salt concentration can distort the surface reading and that, in fact, the S's perspiration may even be re-absorbed into the cells of the skin. These results have been known to occur particularly when the GSR is being recorded over extended periods of time as was the case in the present investigation. The problem cannot be resolved in the present study but this finding serves as an appropriate caution that future studies using GSR recordings should consider carefully the paste used. Edelberg suggests that the sodium chloride concentration of such solutions should approximate as closely as possible that of human perspiration.

With a partial resolve of some of the difficulties surrounding the recording of physiological data, future studies might consider also the use of telemetric methods for measuring HR and GSR during the pre- and post-treatment testing. This would then make possible the comparison of physiological with cognitive and behavioural data during one of the most crucial phases of the study, namely, when measuring improvement following some treatment procedure.

An increase in the number of Ss used in each experimental and control condition might have been useful in this study. It may well have been that, with an increased number of Ss, statistically significant results may have been obtained on some of the variables such as SEQ, and may have improved the findings on HR.

One of the major problems of analogue studies is inferring the results would apply to the opposite sex and, more importantly, to a clinical situation. Analogue studies are basically attempts to apply to the human situation discoveries from animal experimentation. The animal experimentation, in turn, tests hypotheses derived from theory. In essence then, every successful result in analogue research serves as an indirect support for the theory underlying the methodology. With accumulation of such evidence, and by the gradual refinement of procedures, it becomes feasible to attempt the therapeutic technique on patients who are suffering from

neuroses which inhibit normal, healthy functioning. Inference from analogue studies must be made cautiously but, nonetheless, must be made eventually, and have been made, to satisfy the demands of clinicians who are constantly searching for new and more effective techniques to alleviate the discomfort of persons with problems in the real world. Just as Hodgson, Rachman and Marks (1972) have attempted to show by their study on obsessive-compulsive patients, future studies should try to show the same components of flooding apply even if the procedure is to be addressed to other types of neuroses, to other anxiety states. Future studies should consider more carefully measures of anxiety with the better ones being cognitive and possibly physiological. It seems it is important to know what Ss state is happening to them and to measure what is actually happening to them.

One final point remains to be made, but it is by no means the least important. One S had to be excused from the present study because she found it too strenuous to continue. At least three other Ss wept openly but managed to continue until the termination of the experiment. This reinforces the objection made by some experimenters that flooding is a severe method which evokes great amounts of anxiety in some Ss. And even though it appears that a cognition of anxiety-reduction is important for the riddance of phobias it still makes one wonder if the anguish caused by the "cure" is not

worse than the "ailment" itself. Each experimenter and therapist has to answer this to his or her own satisfaction but there is some reason for concern as to how much anxiety-arousal can be morally justified by a therapist/experimenter.

In summary, it may be stated that flooding and flooding-type procedures, such as implosion, are effective behaviour therapy techniques for modifying the behavioural and cognitive elements of an anxiety state such as a phobia. Furthermore, it appears that with prolonged and continuous exposure to a phobic object, behavioural avoidance tendencies can be reduced, possibly because the individual has experienced a decrement in physiological arousal, and possibly because he has formed a cognition or belief that he is less aroused and that he can tolerate or withstand the presence of a phobic stimulus. And, finally, even with altered behavioural, cognitive, and possibly physiological, functioning the individual will not likely alter his attitude about the object which was responsible for arousing that anxiety state.

REFERENCES

- Alexander, F. The dynamics of psychotherapy in the light of learning theory. American Journal of Psychiatry, 1963, 12, 440-448.
- Bandura, A. Principles of behavior modification. New York: Holt, Rinehart & Winston, 1969.
- Barrett, C. L. Systematic desensitization versus implosive therapy. Journal of Abnormal Psychology, 1969, 74(5), 587-592.
- Baum, M. Extinction of an avoidance response motivated by intense fear: Social facilitation of the action of response prevention (flooding) in rats. Behaviour Research & Therapy, 1969, 7, 57-62.
- Baum, M. Extinction of avoidance responding through response prevention (flooding). Psychological Bulletin, 1970, 74(4), 276-284.
- Baum, M., & Gordon, A. Effect of a loud buzzer applied during response prevention (flooding) in rats. Behaviour Research & Therapy, 1970, 8, 287-292.
- Baum, M., & Poser, E. G. Comparison of flooding procedures in animals and man. Behaviour Research & Therapy, 1971, 9, 249-254.
- Benline, T. A., & Simmel, E. C. Effects of blocking of the avoidance response on the elimination of the conditioned fear response. Psychonomic Science, 1967, 8(9), 357-358.
- Berman, J. S., & Katzev, R. D. Factors involved in the rapid elimination of avoidance behavior. Behaviour Research & Therapy, 1972, 10, 247-256.
- Bernstein, D. A., & Paul, G. L. Some comments on therapy analogue research with small animal "phobias." Journal of Behaviour Therapy & Experimental Psychiatry, 1971, 2, 225-237.
- Black, A. H. The extinction of avoidance responses under curare. Journal of Comparative & Physiological Psychology, 1958, 51, 519-524.

- Borkovec, T. D. Effects of expectancy on the outcome of systematic desensitization and implosive treatments for analogue anxiety. Behavior Therapy, 1972, 3, 29-40.
- Boudewyns, P. A., & Wilson, A. E. Implosive therapy and desensitization therapy using free association in the treatment of inpatients. Journal of Abnormal Psychology, 1972, 79, 259-268.
- Boulougouris, J. C., Marks, I. M., & Marset, P. Superiority of flooding (implosion) to desensitization for reducing pathological fear. Behaviour Research & Therapy, 1971, 9, 7-16.
- Breger, L., & McGaugh, J. L. Critique and reformulation of "learning theory" approaches to psychotherapy and neurosis. Psychological Bulletin, 1965, 63(5), 338-358.
- Brock, L. D. The efficacy of various extinction procedures on a conditioned avoidance response in humans: An experimental analogue. Unpublished doctoral dissertation, Southern Illinois University, 1967.
- Buss, A. H. Psychopathology. New York: Wiley & Sons, 1966.
- Calef, R. A., & MacLean, G. D. A comparison of reciprocal inhibition and reactive inhibition therapies in the treatment of speech anxiety. Behavior Therapy, 1970, 1, 51-58.
- Carek, R. G. A comparison of two behavioural therapy techniques in the treatment of rat "phobias." Unpublished doctoral dissertation, University of Iowa, 1969.
- Carlson, N. J., & Black, A. H. Traumatic avoidance learning: Note on the effect of response prevention during extinction. Psychological Reports, 1959, 5, 409-412.
- Cooper, A., Furst, J. B., & Bridger, W. H. A brief commentary on the usefulness of studying fears of snakes. Journal of Abnormal Psychology, 1969, 74(4), 413-414.
- Coulter, X., Riccio, D. C., & Page, H. A. Effects of blocking on instrumental avoidance response: Facilitated extinction but persistence of "fear." Journal of Comparative & Physiological Psychology, 1969, 68(3), 377-381.

- Crowe, M. J., Marks, I. M., Agras, W. S., & Leitenberg, H. Time-limited desensitization, implosion and shaping for phobic patients: A crossover study. Behaviour Research & Therapy, 1972, 10, 319-328.
- Dee, C. K. Instructions and the extinction of a learned fear in the context of taped implosive therapy. Unpublished doctoral dissertation, University of Iowa, 1970.
- DeMoor, W. Systematic desensitization versus prolonged high intensity stimulation (flooding). Journal of Behaviour Therapy & Experimental Psychiatry, 1970, 1, 45-52.
- Dollard, J., & Miller, N. E. Personality and psychotherapy. New York: McGraw-Hill, 1950.
- Duncan, D. B. Multiple range and multiple F tests. Biometrics, 1955, 11, 1-42.
- Edelberg, Robert. Electrical properties of the skin. In Clinton C. Brown (Ed.), Methods in psychophysiology. Baltimore: Williams & Wilkins, 1967.
- Everaerd, W. T. A. M., Rijken, H. M., & Emmelkamp, P. M. G. A comparison of 'flooding' and 'successive approximation' in the treatment of agoraphobia. Behaviour Research & Therapy, 1973, 11, 105-117.
- Eysenck, H. J., & Eysenck, S. B. G. Eysenck Personality Inventory. San Diego, Calif.: Educational & Industrial Testing Service, 1968.
- Fazio, A. F. Treatment components in implosive therapy. Journal of Abnormal Psychology, 1970, 76(2), 211-219.
- Frankl, V. E. Paradoxical intention: A logotherapeutic technique. American Journal of Psychotherapy, 1960, 14, 520-534.
- French, T. M. Interrelations between psychoanalysis and the experimental work of Pavlov. American Journal of Psychiatry, 1933, 12, 1165-1203.
- Girodo, M. Yoga meditation and flooding-desensitization therapy in the treatment of anxiety neurosis. Journal of Behaviour Therapy & Experimental Psychiatry, 1974, 5, 157-160.

- Girodo, M., & Strickland, L. H. A conflict-theory interpretation of attitude change in forced compliance situations. Canadian Journal of Behavioural Science, 1974, 6(4), 385-397.
- Heath, G. H. A comparison of reciprocal inhibition and flooding in decreasing the strength of a conditioned avoidance response. Unpublished doctoral dissertation, Temple University, 1968.
- Hodgson, R. J., & Rachman, S. An experimental investigation of the implosion technique. Behaviour Research & Therapy, 1970, 8, 21-27.
- Hodgson, R. J., Rachman, S., & Marks, I. The treatment of chronic obsessive-compulsive neurosis: Follow-up and further findings. Behaviour Research & Therapy, 1972, 10(2), 181-189.
- Hogan, R. A. Implosive therapy in the short term treatment of psychotics. Psychotherapy: Theory, Research & Practice, 1966, 3, 25-32.
- Hogan, R. A. The implosive technique. Behaviour Research & Therapy, 1968, 6, 423-431.
- Hogan, R. A., & Kirchner, J. H. Preliminary report of the extinction of learned fears via short-term implosive therapy. Journal of Abnormal Psychology, 1967, 72(2), 106-109.
- Hogan, R. A., & Kirchner, J. H. Implosive, eclectic verbal and bibliotherapy in the treatment of fears of snakes. Behaviour Research & Therapy, 1968, 6, 167-171.
- Hughes, H. H. An investigation of the assumptions of implosive therapy and systematic desensitization using an animal analogue. Unpublished doctoral dissertation, University of Georgia, 1970.
- Jacobson, H. A. Reciprocal inhibition and implosive therapy: A comparative study of a fear of snakes. Unpublished doctoral dissertation, Memphis State University, 1970.
- Kimble, G. A., & Kendall Jr., J. W. A comparison of two methods of producing experimental extinction. Journal of Experimental Psychology, 1953, 45(2), 87-90.
- Kirchner, J. H., & Hogan, R. A. The therapist variable in the implosion of phobias. Psychotherapy: Theory, Research & Practice, 1966, 3, 102-104.

- Kirts, S. M. L. An experimental analogue comparing two models of psychotherapy: Reciprocal inhibition and implosive therapy. Unpublished doctoral dissertation, University of Southern California, 1968.
- Kotila, R. R. The effects of education and four varieties of implosive therapy on fear of snakes. Unpublished doctoral dissertation, Washington State University, 1969.
- Lacey, J. I. The evaluation of autonomic responses: Toward a general solution. Annals of New York Academy of Sciences, 1956, 67, 123-164.
- Lamontagne, Y., & Marks, I. M. Psychogenic urinary retention: Treatment by prolonged exposure. Behavior Therapy, 1973, 4(4), 581-585.
- Lang, P. J., & Lazovik, A. D. Experimental desensitization of a phobia. Journal of Abnormal & Social Psychology, 1963, 66, 519-525.
- Lang, P. J., Lazovik, A. D., & Reynolds, D. J. Desensitization, suggestibility, and pseudotherapy. Journal of Abnormal Psychology, 1965, 70, 395-402.
- Layne, C. C. The effects of suggestion in implosive therapy for fear of rats. Unpublished doctoral dissertation, Southern Illinois University, 1970.
- Lederhendler, I., & Baum, M. Mechanical facilitation of the action of response prevention (flooding) in rats. Behaviour Research & Therapy, 1970, 8, 43-48.
- Levis, D. J., & Carrera, R. Effects of ten hours of implosive therapy in the treatment of outpatients. Journal of Abnormal Psychology, 1967, 72(6), 504-508.
- Malleson, N. Panic and phobia: A possible method of treatment. Lancet, 1959, 1, 225-227.
- Marks, I. Perspective on flooding. Seminars in Psychiatry, 1972, 4(2), 129-138.
- Marks, I. The reduction of fear: Towards a unifying theory. Canadian Psychiatric Association Journal, 1973, 18(1), 9-12.

- McGlynn, F. D. Systematic desensitization, implosive therapy and the aversiveness of imaginal hierarchy items. Unpublished doctoral dissertation, University of Missouri, 1968.
- Mealiea Jr., W. L., & Nawas, M. M. The comparative effectiveness of systematic desensitization and implosive therapy in the treatment of snake phobia. Journal of Behaviour Therapy & Experimental Psychiatry, 1971, 2, 85-94.
- Meichenbaum, D. Cognitive factors in behavior modification: Modifying what clients say to themselves. In C. M. Franks & G. T. Wilson (Eds.), Annual Review of Behavior Therapy, Theory & Practice. New York: Brunner/Mazel, 1973.
- Miller, B. V., & Levis, D. J. The effects of varying short visual exposure times to a phobic test stimulus on subsequent avoidance behavior. Behaviour Research & Therapy, 1971, 9, 17-21.
- Morganstern, Kenneth P. Implosive therapy and flooding procedures: A critical review. Psychological Bulletin, 1973, 79(5), 318-334.
- Mowrer, O. H. Two-factor learning theory: Summary and comment. Psychological Review, 1951, 58, 350-354.
- Mylar, J. L., & Clement, P. W. Prediction and comparison of outcome in systematic desensitization and implosion. Behaviour Research & Therapy, 1972, 10, 235-246.
- Osgood, C. E., Suci, G. J., & Tannenbaum, P. H. The measurement of meaning. Urbana: University of Illinois, 1957.
- Page, H. A. The facilitation of experimental extinction by response prevention as a function of the acquisition of a new response. Journal of Comparative & Physiological Psychology, 1955, 48, 14-16.
- Page, H. A., & Hall, J. F. Experimental extinction as a function of the prevention of a response. Journal of Comparative & Physiological Psychology, 1953, 46, 33-34.
- Polin, A. T. The effects of flooding and physical suppression as extinction techniques on an anxiety motivated avoidance locomotor response. The Journal of Psychology, 1959, 47, 235-245.

- Rachman, S. Studies in desensitization--II: Flooding. Behaviour Research & Therapy, 1966, 4, 1-6.
- Rachman, S. Treatment by prolonged exposure to high intensity stimulation. Behaviour Research & Therapy, 1969, 7, 295-302.
- Rachman, S., Hodgson, R., & Marks, I. M. The treatment of chronic obsessive compulsive neurosis. Behaviour Research & Therapy, 1971, 9, 237-247.
- Schachter, S. The interaction of cognitive and physiological determinants of emotional state. In C. Spielberger (Ed.), Anxiety and behavior. New York: Academic Press, 1966.
- Schachter, S., & Singer, J. E. Cognitive, social, and physiological determinants of emotional state. Psychological Review, 1962, 69, 379-399.
- Shearman, R. W. Response-contingent CS termination in the extinction of avoidance learning. Behaviour Research & Therapy, 1970, 8, 227-239.
- Siegelman, M. B., & Baum, M. Extinction of well-established avoidance responses through response prevention (flooding). Behaviour Research & Therapy, 1971, 9, 103-108.
- Sippelle, C. N. Induced anxiety. Psychotherapy: Theory, Research & Practice, 1967, 4, 36-40.
- Smith, R. E., & Sharp, T. M. Treatment of a school phobia with implosive therapy. Journal of Consulting & Clinical Psychology, 1970, 35, 239-243.
- Stadter, M. In vivo facilitation as a variable in the effectiveness of taped flooding. Behaviour Research & Therapy, 1973, 11, 239-241.
- Stampfl, T. G., & Levis, D. J. Essentials of implosive therapy: A learning-theory-based psychodynamic behavioral therapy. Journal of Abnormal Psychology, 1967, 72(6), 496-503.
- Stampfl, T. G., & Levis, D. J. Implosive therapy--A behavioral therapy? Behaviour Research & Therapy, 1968, 6, 31-36.

- Stern, R., & Marks, I. Brief and prolonged flooding. Archives of General Psychiatry, 1973, 28, 270-276.
- Strahley, R. F. Systematic desensitization and counter-phobic treatment of an irrational fear of snakes. Unpublished doctoral dissertation, University of Tennessee, 1965.
- Ullmann, L. P., & Krasner, L. Case studies in behavior modification. New York: Holt, Rinehart & Winston, 1965.
- Uno, T., Greer, S. E., & Goates, L. Observational facilitation of response prevention. Behaviour Research & Therapy, 1973, 11, 207-212.
- Watson, J. P., Gaid, R., & Marks, I. M. Physiological habituation to continuous phobic stimulation. Behaviour Research & Therapy, 1972, 10, 269-278.
- Watson, J. P., & Marks, I. M. Relevant and irrelevant fear in flooding - A crossover study of phobic patients. Behavior Therapy, 1971, 2, 275-293.
- Weinberger, N. M. Effect of detainment on extinction of avoidance responses. Journal of Comparative & Physiological Psychology, 1965, 60(1), 135-138.
- Williams, S. B., & Williams, E. Barrier frustration and extinction in instrumental learning. American Journal of Psychology, 1943, 56, 247-261.
- Willis, R. W., & Edwards, J. A. A study of the comparative effectiveness of systematic desensitization and implosive therapy. Behaviour Research & Therapy, 1969, 7, 387-395.
- Wolpe, J. Psychotherapy by reciprocal inhibition. Stanford: Stanford University Press, 1958.
- Wolpin, M., & Raines, J. Visual imagery, expected roles and extinction as possible factors in reducing fear and avoidance behaviour. Behaviour Research & Therapy, 1966, 4, 25.
- Yates, A. J. Behavior therapy. New York: Wiley & Sons, 1970.

Please mark an "X" over one of the dots which best represents how you feel for each of the following items:

	Not at all	Very Much
1. How afraid of snakes are you in general?
2. Do you mind handling worms?
3. Would you be afraid to simply touch a garter snake?
4. Do you get nervous watching someone else handling a snake?

Name: _____

Age: _____

Telephone: _____

Understand English: _____

BEHAVIOURAL AVOIDANCE TEST

Name: _____

Date: _____

I approached the snake within: [check (✓)]

- ___ Refused to approach whatsoever
- ___ 10 feet
- ___ 9 "
- ___ 8 "
- ___ 7 "
- ___ 6 "
- ___ 5 "
- ___ 4 "
- ___ 3 "
- ___ 2 "
- ___ 1 "
- ___ Lifted cover from cage
- ___ Put hand on open cage
- ___ Put hand in cage
- ___ Touched snake for an instant
- ___ Stroked snake
- ___ Picked up snake
- ___ Held snake close to chest

SELF-PERCEPTION QUESTIONNAIRE

Name: _____

Date: _____

Please reply to all questions by marking an "X" on one of the dots which best represents how you felt over the last 10 minutes.

Not at all

Very much

- o How anxious or nervous did you feel overall?
- o Did you feel apprehension or worry?
- o Did you want to avoid the situation?
- o Did you find it difficult to concentrate?
- o Did you enjoy the challenge?
- o Was your heart beating faster?
- o Did you have difficulty breathing?
- o Were you perspiring?
- o Did you feel weak or faint?
- o Did you experience stomach distress or nausea?

SNAKE EVALUATION QUESTIONNAIRE

Name: _____

Date: _____

Please indicate below, by marking an "X" on one of the dots, how you rate the snake on the following scales:

- 1. good bad
- 2. ugly cute
- 3. clean dirty
- 4. cruel kind
- 5. pleasant unpleasant
- 6. weak strong
- 7. large small
- 8. dangerous safe
- 9. avoidable approachable
- 10. rough gentle

APPENDIX 5

EYSENCK PERSONALITY INVENTORY

FORM A

**By H. J. Eysenck
and Sybil B. G. Eysenck**

Name _____ Age _____ Sex _____

Grade or Occupation _____ Date _____

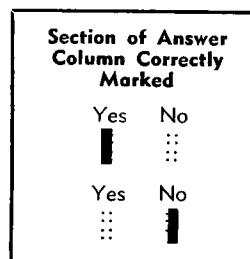
School or Firm _____ Marital Status _____

INSTRUCTIONS

Here are some questions regarding the way you behave, feel and act. After each question is a space for answering "Yes," or "No."

Try and decide whether "Yes," or "No" represents your usual way of acting or feeling. Then blacken in the space under the column headed "Yes" or "No."

Work quickly, and don't spend too much time over any question; we want your first reaction, not a long drawn-out thought process. The whole questionnaire shouldn't take more than a few minutes. Be sure not to omit any questions. Now turn the page over and go ahead. Work quickly, and remember to answer every question. There are no right or wrong answers, and this isn't a test of intelligence or ability, but simply a measure of the way you behave.



PUBLISHED BY EDUCATIONAL AND INDUSTRIAL TESTING SERVICE
BOX 7234, SAN DIEGO, CALIFORNIA 92107

COPYRIGHT © 1963 BY EDUCATIONAL AND INDUSTRIAL TESTING SERVICE
ALL RIGHTS RESERVED
REPRODUCTION OF THIS FORM BY ANY MEANS STRICTLY PROHIBITED
PRINTED IN U S A

			E	N	L
1. Do you often long for excitement?	Yes	No			
2. Do you often need understanding friends to cheer you up?	Yes	No			
3. Are you usually carefree?	Yes	No			
4. Do you find it very hard to take no for an answer?	Yes	No			
5. Do you stop and think things over before doing anything?	Yes	No			
6. If you say you will do something do you always keep your promise, no matter how inconvenient it might be to do so?	Yes	No			
7. Does your mood often go up and down?	Yes	No			
8. Do you generally do and say things quickly without stopping to think?	Yes	No			
9. Do you ever feel "just miserable" for no good reason?	Yes	No			
10. Would you do almost anything for a dare?	Yes	No			
11. Do you suddenly feel shy when you want to talk to an attractive stranger?	Yes	No			
12. Once in a while do you lose your temper and get angry?	Yes	No			
13. Do you often do things on the spur of the moment?	Yes	No			
14. Do you often worry about things you should not have done or said?	Yes	No			
15. Generally do you prefer reading to meeting people?	Yes	No			
16. Are your feelings rather easily hurt?	Yes	No			
17. Do you like going out a lot?	Yes	No			
18. Do you occasionally have thoughts and ideas that you would not like other people to know about?	Yes	No			
19. Are you sometimes bubbling over with energy and sometimes very sluggish?	Yes	No			
20. Do you prefer to have few but special friends?	Yes	No			
21. Do you daydream a lot?	Yes	No			
22. When people shout at you, do you shout back?	Yes	No			
23. Are you often troubled about feelings of guilt?	Yes	No			
24. Are all your habits good and desirable ones?	Yes	No			
25. Can you usually let yourself go and enjoy yourself a lot at a gay party?	Yes	No			
26. Would you call yourself tense or "highly-strung"?	Yes	No			
27. Do other people think of you as being very lively?	Yes	No			
28. After you have done something important, do you often come away feeling you could have done better?	Yes	No			
29. Are you mostly quiet when you are with other people?	Yes	No			
30. Do you sometimes gossip?	Yes	No			
			31. Do ideas run through your head so that you cannot sleep?	Yes	No
			32. If there is something you want to know about, would you rather look it up in a book than talk to someone about it?	Yes	No
			33. Do you get palpitations or thumping in your heart?	Yes	No
			34. Do you like the kind of work that you need to pay close attention to?	Yes	No
			35. Do you get attacks of shaking or trembling?	Yes	No
			36. Would you always declare everything at the customs, even if you knew that you could never be found out?	Yes	No
			37. Do you hate being with a crowd who play jokes on one another?	Yes	No
			38. Are you an irritable person?	Yes	No
			39. Do you like doing things in which you have to act quickly?	Yes	No
			40. Do you worry about awful things that might happen?	Yes	No
			41. Are you slow and unhurried in the way you move?	Yes	No
			42. Have you ever been late for an appointment or work?	Yes	No
			43. Do you have many nightmares?	Yes	No
			44. Do you like talking to people so much that you would never miss a chance of talking to a stranger?	Yes	No
			45. Are you troubled by aches and pains?	Yes	No
			46. Would you be very unhappy if you could not see lots of people most of the time?	Yes	No
			47. Would you call yourself a nervous person?	Yes	No
			48. Of all the people you know are there some whom you definitely do not like?	Yes	No
			49. Would you say you were fairly self-confident?	Yes	No
			50. Are you easily hurt when people find fault with you or your work?	Yes	No
			51. Do you find it hard to really enjoy yourself at a lively party?	Yes	No
			52. Are you troubled with feelings of inferiority?	Yes	No
			53. Can you easily get some life into a rather dull party?	Yes	No
			54. Do you sometimes talk about things you know nothing about?	Yes	No
			55. Do you worry about your health?	Yes	No
			56. Do you like playing pranks on others?	Yes	No
			57. Do you suffer from sleeplessness?	Yes	No

PLEASE CHECK TO SEE THAT YOU HAVE ANSWERED ALL THE QUESTIONS.

APPENDIX 6

INSTRUCTIONS

This is a study which has to do with fear of a live but harmless snake. In order for us to determine the degree to which you have a fear of snakes it is necessary for us to conduct a simple test. Listen carefully, please, to the following instructions.

In the room next to you there is, in an enclosed glass aquarium, a live, non-poisonous, and completely harmless, 2-1/2 foot garter snake. What we would like you to do is to enter the room and approach the snake as closely as you can. If you can, slide the lid to one side and reach in and stroke the snake; if you can, pick it up and hold it as close to you as possible. Remember, only do what you can. When you are finished trying, return to this room. All set; enter the room now.

APPENDIX 7

INSTRUCTIONS

Now, the next step in the study requires that some electrodes be attached to your fingers, wrists, and one ankle in order to record some physiological measures. It is important for you to understand that these electrodes are completely harmless and that no harm will come to you. After the electrodes are attached the experimenter will ask you to sit quietly for a few minutes so that he can calibrate his equipment properly.

APPENDIX 8

INSTRUCTIONS

CE and IE Groups

Now, the next step in the study requires that you have an opportunity to be exposed to the snake. Therefore, the experimenter will bring the snake into the room now. Please sit as quietly as possible because movement of arms and legs distorts the recording devices. It is important for you to try and feel as much anxiety as you possibly can as you watch the snake continuously. Remember to sit quietly, please.

Bib Group

Now, the next step in the study requires that you have an opportunity to read about snakes. The experimenter will hand you some literature which you should read very carefully in order to be able to answer some questions later on. Should you be able to read it all once, go back and begin to read it again. And please remember to sit as quietly as possible because movement of arms and legs distorts the recording devices.

RC Group

Now, it looks as though it is necessary for me to spend some time calibrating the physiological recording

devices. Therefore, I'm going to ask you to sit quietly while I make the necessary calibrations. Here are some magazines you may read in the meantime. I know you will have to use your hands and arms to turn the pages which is okay, but try to keep your movements to a minimum. Thank you.

APPENDIX 9

INSTRUCTIONS

Now, the final step in the study requires that we again obtain a measure of the degree to which you have a fear of snakes. In order to do this we are going to ask you to follow the same procedure as before.

In the room next to you, there is, in an enclosed glass aquarium, a live, non-poisonous and completely harmless, 2-1/2 foot garter snake. What we would like you to do is to enter the room and approach the snake as closely as you can. If you can, slide the lid to one side and reach in and stroke the snake; if you can, pick it up and hold it as close to you as possible. Remember, only do what you can. When you are finished trying, return to this room. All set; enter the room now.

ABSTRACT

Forty snake-phobic female Ss were assigned to one of four experimental conditions--continuous exposure (CE), interrupted exposure (IE), bibliotherapy (Bib), or reading control (RC). Behavioural, cognitive, and physiological indices were recorded pre- and post-treatment as well as during the flooding procedure. Results of the analyses of variance indicated that CE is essential to successful flooding. Behavioural and cognitive indices were highly correlated with Ss exhibiting improved approach tendencies toward a phobic object if they had an opportunity to experience cognitions of self-perceived lowered physiological arousal. These cognitions were not necessarily paralleled by actual physiological decrement in arousal level. Attitudes toward the phobic object did not alter.