THE ROLE IN SYSTEMATIC DESENSITIZATION OF THE REATTRIBUTION OF CAUSALITY THROUGH SELF-OBSERVATION

by

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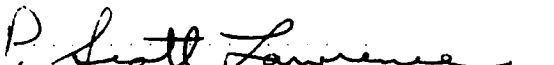
A Dissertation Submitted to
the Faculty of the Graduate School at
The University of North Carolina at Greensboro
in Partial Fulfillment
of the Requirements for the Degree
Doctor of Philosophy

Greensboro, North Carolina
1975

Approved by



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LUREY, EDWARD. The Role in Systematic Desensitization of the Reattribution of Causality Through Self-Observation. (1975) Directed by: Dr. P. Scott Lawrence. Pp. 129.

It was hypothesized that one of the active and clinically effective elements which was operational within a systematic desensitization paradigm involved an attributional reorganization. This reorganization would occur as a function of the subject observing himself on video tape behave in a non-fearful manner (as indicated by false heart rate feedback) toward a feared stimulus. The subject would then positively attribute to himself a series of dispositional traits involving adaptive coping skills. These skills would be demonstrated in each of the five dependent measures (Behavioral Avoidance Test, Fear Thermometer, Heart Rate, Physiological Perception Questionnaire, and S-R Inventory of Anxiousness) which were collected in pre and posttreatment assessments. The experimental design consisted of three different video conditions by two audio feedback conditions and a no-treatment control group. There were four sessions for each treatment group. After the first session (i.e., the second session through the posttest), subjects either saw themselves and the snake, a model and the snake, or the snake only on videotape. In addition, while reviewing videotaped sessions, subjects either heard no audio feedback or what was purported to be their heart rate (false feedback) decreasing over sessions.

The results of statistical multivariate and univariate analyses of variance indicated that the six experimental treatment groups and the no-treatment group demonstrated equal improvement on most dependent measures. Post hoc analyses indicated differential treatment effects only on the Behavioral Avoidance Test dependent measure.

In an effort to explain why overall differential treatment effects were not found, major differences in the parameters between recent experimentation in cognitive therapies and this experiment were discussed. In addition, the results were discussed and interpreted as tentative support for an extinction hypothesis.

ACKNOWLEDGMENTS

The writer wishes to thank Dr. P. Scott Lawrence for serving as dissertation adviser and Drs. Louis Karmel, Rosemery Nelson, Kendon Smith, and Michael Weiner for serving as committee members.

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CHAPTER I

INTRODUCTION

Researchers in behavior therapy are currently interested in delineating the active elements influencing fear reduction in systematic desensitization (SD). In general, reviews of the literature in the area on human process studies (Bandura, 1969; Davison & Wilson, 1973; Lang, 1969) and animal analogue research (Wilson & Davison, 1971) have provided evidence supporting an extinction hypothesis. In addition, Evans (1973), examining the logical structures of proposed alternate explanations of SD, concluded that the extinction hypothesis was the most logically viable of all considered alternatives. Although the weight of the evidence has supported an extinction hypothesis in SD, exploration of adjunct factors has continued. One procedure used to investigate these other hypothesized active elements has been the utilization of false physiological feedback.

Investigators of false physiological feedback within SD have sought experimental evidence for the utility of this approach in modifying a subject's response to a fearful stimulus. The theory underlying the experimental paradigm common to these studies was derived from the social psychological framework of attribution theory (Davison & Wilson, 1973). As the present study is also investigating the use

of false feedback and attribution within SD, the results of past experimentation in this area will be reviewed.

Attribution

The clinical analogue studies in which attribution was used as an explanatory concept were based upon theoretical concepts proposed by Schachter. Experiments by Schachter and his collegues (Nisbett & Schachter, 1966; Schachter & Singer, 1962; Schachter & Wheeler, 1962) provided evidence to the effect that specific emotions reported by a person not only depend upon his internal state of physiological arousal but also on the way he cognitively interprets and labels this subjective state. A clinical extension from this theory was initiated by Valins and Ray (1967).

Valins and Ray (1967) conducted two studies which utilized snake-fearful subjects. In both studies, Valins and Ray led experimental subjects to believe that they were listening to their own heart rates not reacting to snake stimuli (slides or in-vivo presentations of the snake). Concomitantly, the experimental subjects were supposed to believe that they were demonstrating a noticeable heart-rate reaction to the presentation of slides signaling a mild electric shock. The control subjects in both studies were to assume that the sounds heard throughout the experiment were extraneous, non related laboratory noises. Valins and Ray reported that on post-test measures, experimental subjects demonstrated significantly greater approach behaviors toward

the snake than did control subjects. The experimenters hypothesized that a cognitive reappraisal had occurred in that subjects attributed their lack of physiological responses to the cognition that they were really not frightened by snakes. Davison and Wilson (1973) indicated that experimental design problems in addition to questionable statistical manipulations dispute the veridicality of the explanation offered by Valins and Ray. Even more damaging than the internal problems associated with the Valins and Ray study was the lack of experimental verification by other researchers. Kent, Wilson, and Nelson (1972) attempted to replicate the Valins and Ray study using the same stimuli and procedure as the original study. However, Kent et al. (1972) used more stringent and objective pre- and posttest measures. The results from the Kent et al. study indicated no significant changes in the experimental subjects' approach behaviors nor in their attitudes toward snakes. In conceptually similar studies, Sushinsky and Bootzin (1970), Rosen, Rosen, and Reid (1972), and Gaupp, Stern, and Galbraith (1972) all failed to produce evidence supporting the proposition that cognitive reattribution based upon false physiological feedback would result in significant covert (physiological and subjective feelings and thoughts) or overt (approach) changes in the subjects' fear responses. Wilson (1973) reported a modified replication of an experiment by Brown (1970), testing the hypothesis that progress up the hierarchy in SD

results in a reduction of avoidance behavior. Although the Wilson (1973) study was not specifically investigating cognitive reattribution, the experimental paradigm was sufficiently similar to cite his results as evidence in the appraisal of the utility of reattribution within SD. Wilson found that false feedback did produce a reduction in subjects' self-report of fear but failed to influence overt avoidance behavior. As other investigators (e.g., Gaupp et al., (1972); Kent et al., (1972); Sushinsky & Bootzin, (1970)) had not obtained similar results in modifying cognitive measures of fear, Wilson concluded there was little compelling experimental support for any strictly cognitive explanation of SD which, of course, includes reattribution. The preponderance of evidence reported by other investigators has placed the Valins and Ray (1967) attributional explanation in an empirically unsupported and theoretically tenuous position.

False Physiological Feedback

Fundamental to all of the studies cited thus far was the incorporation of false physiological feedback as the crucial independent experimental manipulation. Data have been reported indicating that in specific experimental circumstances, false feedback may be an important factor in maintaining a subject's fear response (Koenig & Del Castillo, 1969). A recent study by Koenig (1973) tested the maintenance or reduction of anxiety in test-anxious subjects

by manipulating the feedback indicating the magnitude of their autonomic activity. The results of this study supported the proposition that false feedback denoting low anxiety facilitated subject performance while feedback indicating high arousal led to decreased test performance. The obvious implication was that in certain circumstances a subject's overt performance can be affected by the cognitions that he is in a relaxed or aroused physiological state. Borkovec has also been most active in investigating the effects of physiological feedback on anxiety and fear reduction. In one study, Borkovec and Glasgow's (1973) objective was an effort to define the necessary conditions for replicating the Valins and Ray (1967) study. Their study was performed after three attempted replications (Gaupp et al., 1972; Kent et al., 1972; Sushinsky & Bootzin, 1970) had failed to demonstrate any significant changes in the subject's approach behaviors. Borkovec and Glasgow (1973) demonstrated that false feedback could modify avoidance behavior as originally reported by Valins and Ray. However, their study indicated that this result was dependent upon (1) not pre-exposing subjects to the feared stimulus prior to false feedback and (2) a high demand posttest. As only those subjects who were not exposed to the feared stimulus demonstrated increased approach behaviors, Borkovec and Glasgow (1973) concluded that pre-exposure mitigated any influence false feedback might have on subsequent behavior.

In further pursuing this line of investigation, Borkovec (1973a) empirically demonstrated that suggestions for improvement and physiological cues had differential effects upon subjects who differed on the dimensions of strong versus weak physiological activity (pulse rate), and strong versus weak perception of physiological cues during the actual exposure to the feared stimulus. The results failed to indicate a significant effect of feedback on fearful behavior. However, the study did find that individual subject characteristics relating to the magnitude of arousal and the subjects' perception of arousal were significantly related to improvement and differentially affected by the bogus feedback. Borkovec (1973a) further stated that the "absence of internal cues, as defined by low pulse rate reaction to pre-test instructions was related to greater approach change . . ." (Borkovec, 1973a, p. 190). The most recent study published by Borkovec was designed to assess the effects of false feedback during actual exposure and also during subsequent exposures to a fear stimulus. For this study Borkovec, Wall, and Stone (1974) utilized speech-anxious subjects. It was predicted that

> . . . there would be no differential feedback effects during the second (feedback) speech but that the decrease conditions and no-change conditions would result in significantly less

> fear on the third speech than the increase condition (Borkovec et al., 1974, p. 165).

The results confirmed the findings for Borkovec's (1973a) study, as data were reported indicating that false feedback had no effect during its presentation. However, subjects who had received bogus heart-rate decreases or no-change information demonstrated significantly less fear on the third speech than subjects who believed their heart rates increased. The data from Borkovec's studies are congruent with two corollary hypotheses offered in Borkovec's (1973b) review of the literature on physiological feedback in fear research. In his review, Borkovec proposed that:

> (a) external demand cue manipulation will affect fear behavior to the extent that actual, internal physiological cues are absent. Subjects for whom the physiological component is very strong will be little affected by demand cues suggesting improvement; physiological cues will maintain fear behavior until such cues and/or their functional relationships with subsequent behaviors are changed. (b) Actual physiological cue manipulation will reduce (or maintain) fear behavior in the presence of external demand cues discriminative for non-fear (or fear) behavior (Borkovec, 1973b, p. 499).

In summarizing the evidence presented thus far, it is apparent that the overwhelming weight of accumulated experimental evidence is contrary to the Valins and Ray (1967) attribution hypothesis. On the other hand, results of studies investigating false physiological feedback have yielded data supporting this approach in modifying certain fears and anxieties. Although the data from false feedback studies cannot be accepted as direct support for a cognitive reattribution hypothesis, the data do sustain the logical inference that some restructuring may be occurring within the subject for bogus feedback to result in increased approach behavior.

In an effort to explain the possible intervening cognitive process which occurs between perception of feedback and subsequent changes in approach (motor) behavior, an attributional explanation will be hypothesized. However, prior to the eludication of the specific hypothesis under experimental investigation, there are two areas of investigation of interest to behavior modifiers which are germane to the theoretical rationale of this study. These two procedures are Meichenbaum's (1973, 1974) cognitive training technique and Kazdin's (1974a, 1974b, 1974c) covert modeling procedure.

Cognitive Coping Treatment

A skills-oriented treatment procedure has been developed by Meichenbaum (1973) which he terms "stress

inoculation training." His treatment approach was based upon earlier empirical studies (Meichenbaum, Gilmore & Fedoravicius, 1971; Meichenbaum & Goodman, 1971) which demonstrated the efficacy of self-statements as potential modifiers of behavior. (As Meichenbaum's technique is considered a variation of the standard systematic desensitization paradigm Davison and Wilson [1973] address themselves to this approach in their critical review on cognitively oriented SD alterations. It seems most significant to reiterate Davison and Wilson's conclusion that, in their opinion, only Meichenbaum's cognitively oriented approach demonstrated sufficient evidence to warrant further experimentation and consideration.) In essence, Meichenbaum's technique was designed to accomplish the following goals.

> It attempts (1) to modify the client's appraisal of the fearful situation and of his ability to cope; (2) to teach the client specific skills, and (3) to provide him with an opportunity for application of training. The skills-training treatment approach was designed to translate the client's sense of "learned helplessness" into a feeling of "learned resourcefulness" so that he could cope with any stress-inducing situation (Meichenbaum, 1974, p. 16).

In general, Meichenbaum specified a process which was designed to endow the client with the belief that he (the client) had the requisite skills to interact with the feared stimulus or situation in an adaptive manner. Meichenbaum's process differed from the traditional SD approach in "how" the client visualized himself interacting with the feared stimulus. In traditionally practiced SD, the client was requested to visualize himself interacting with the stimulus at low levels of subjective anxiety thereby demonstrating "mastery" of the task. In Meichenbaum's technique, the client was led into the hierarchy item with feelings of fear and was subsequently led through a series of statements in which he effectively "copes" with the perceived subjective anxiety. (E.g., "This anxiety is what the doctor said you would feel. It's a reminder to use your coping exercises" [Meichenbaum, 1974].) Meichenbaum has concluded that:

> Comparisons between skills-training procedures and standard behavior therapies have indicated that greater therapeutic benefit, broader application of behavior change, and longer persistence of behavior improvement result from skills-training treatment programs (Meichenbaum, 1974, p. 16).

Empirical verification of Meichenbaum's coping skills technique has not been limited to those studies which retain

his name as author. Kazdin (1974a, 1974b, 1974c), utilizing covert desensitization procedures, has reported greater treatment effectiveness in support of a coping approach versus a mastery approach.

Covert Coping Treatment

Kazdin's research was based upon Cautela's (1971) proposal that observational learning (modeling) could be effectively executed by requesting that the client imagine the model (covertly) rather than utilize a live or filmed model. Recently, Cautela, Flannery, and Hanley (1974) have demonstrated that covert and overt modeling are equivalent in reducing avoidance behavior. Additional evidence supporting the efficacy of covert modeling has been presented by Kazdin. Kazdin's studies have indicated that covert modeling was effective in developing assertiveness (Kazdin, 1974b) and also in reducing avoidance behavior (Kazdin, 1973, 1974a, 1974c). In one study, Kazdin (1974a) manipulated two variables: the similarity of the imagined model to the subject (similar versus dissimilar) and the method by which the subject imagined himself interacting with the feared stimulus (coping versus mastery). The results indicated that subjects who were instructed to imagine a model similar in age and sex performed significantly better than those subjects who imagined a model interacting with the feared stimulus who was older and oppositely sexed. Although the results did not indicate statistical significance

in support of the coping manipulation, the general results indicated greater improvement for coping subjects than mastery subjects. By far, the most improved group examined across all dependent measures was the similar-coping group. This result is consonant with the experimental literature, which has supported the proposition that the greater the similarity between the model and observer, the greater the modeling effect (Rachman, 1972). Kazdin's (1974c) next experiment manipulated subjects covertly imagining themselves (self) or someone else similar in age and sex (other) in a series of scenes with a feared stimulus. In this study, Kazdin also instructed subjects to visualize the assigned model demonstrating behaviors indicative of mastery or of coping with the feared stimulus. The results indicated that a coping technique was significantly more effective in improving approach behaviors than the mastery technique. However, there was no statistical difference between those subjects who imagined themselves coping (self-coping) and the group who imagined someone of similar age and sex coping (other-coping). The rationale for this particular study (Kazdin, 1974c) was based upon his observation that

> Covert modeling bears conspicuous resemblance to imaginal systematic desensitization. Indeed, desensitization may be construed as self- modeling where the client imagines himself performing behaviors he would normally avoid. (An argument

> could also be made for a self-modeling interpretation of in vivo desensitization where a subject observes his own performance and draws inferences on the basis of consequences which follow his behavior (C.F. Bem, 1967) (Kazdin, 1974c, p. 625).

The different inferences which a subject makes based upon his behavioral observations of self versus others was considered important by two other theoreticians, Jones and Nisbett (1971).

Divergence of Perception

> There is a pervasive tendency for actors to attribute their actions to situational requirements, whereas observers tend to attribute the same actions to stable personal dispositions (Jones & Nisbett, 1971, p. 2).

Data from experimental studies yield confirming evidence to the hypothesis of divergent attributions among actors and observers. Jones, Rock, Shaver, Goethals, and Ward (1968) demonstrated this effect, utilizing a rigged I.Q.-testing situation. Each subject, paired with an accomplice, answered 30 questions. The questions were of sufficient difficulty so that correctness of the answers was not discernible. The feedback to the subjects in all conditions was manipulated so that they believed they had correctly solved ten of the 30 questions. The subject's

correct responses were evenly scattered throughout the test. The experimental manipulation assigned 15 correct answers to the accomplice, randomly, at the beginning, or at the end of the test. In the first condition, the accomplice solved 15 items uniformly scattered among the 30 items. In the second condition, the accomplice solved most of the problems in the first half, and in the last condition, the majority of correct answers were given toward the end of the test. The results from a post-experimental questionnaire indicated that the manipulation had a strong effect upon the subject's judgement of the accomplice's ability on another I.Q. test. Accomplices who solved a larger proportion of the questions at the beginning of the test (descending condition), were perceived by the subjects to be the most intelligent, perceived their overall performance in a more favorable manner, and predicted an even better result on future tests. The subject's perception of accomplices in the ascending condition (most problems solved late in the series) was least favorable. They were perceived as not having the magnitude of positive abilities or dispositional characteristics which would warrant expectations of success on future tests. The uniformly scattered condition fell midway between the descending and ascending manipulations.

The results of the first part of the study were unequivocally reversed when the accomplices randomly solved ten problems and the subjects solved fifteen in either

ascending, descending or random order. Subjects who correctly answered more problems at the end of the series (ascending condition) were quite willing to attribute their success to a situational determinant, the fact that test items were easier toward the end. Those subjects in the descending condition viewed the test items as becoming increasingly more difficult, despite the experimenter's statement that all questions were of equal difficulty. The descending subjects firmly held the belief that there was a change in the level of item difficulty. The experimental manipulation also affected subjects' predictions of achievement on future series. Subjects who performed better at the end (ascending) predicted greater success for themselves than those in the descending condition. This was a direct reversal of what subjects had predicted in the observation of a successful accomplice. Although subjects were most willing to judge the mental abilities of the accomplices, judgements about their own intellectual capacities were unaffected by the experimental manipulations. In summary:

> The pattern of attributions is therefore quite different for actor and observer. In identical situations, the actor attributes performance to variations in task difficulty, the observer to variations in ability (Jones & Nisbett, 1971, p. 3).

There are studies indicating observers will maintain a dispositional attitude toward another person even under

circumstances in which the person's behavior is being directed by obvious situational determinants. Jones and Harris (1967) performed three experiments which were variations upon a common theme. In each of the studies, subjects listened to or read essays purported to be another student's work. In different conditions, subjects were informed that the communication was based upon a mandatory requirement or performed as a personal expression of attitude. The results indicated that the situational constraints had no effect on the observer's estimates of the true opinions of the communicator. For example, subjects who listened to a speech supporting Castro's Cuba inferred that the communicator held a positive personal attitude toward Castro even when they were informed that the position communicated was fulfilling a course requirement. The inference of attitude in the anti-Castro message also indicated an attribution of what was believed to be the subject's true feeling. The observer's inference of attitudes in the free-choice condition was essentially in the same direction as the mandatory condition but of much greater magnitude. The importance of these results is not in the strength of the effect, but in the fact that the same attribution of personal attitude occurred in both choice and no-choice situations. The results seem to indicate that observers tend to disregard, to a large extent, the situational demands involved and most readily ascribe dispositional attitudes on the part of the communicator. In

a similar study, these results were replicated using the legalization of marijuana as the issue (Jones, Worchel, Goethals, & Grumet, 1971).

Nisbett, Caputo, Legant, and Marecek (1973) report a series of three experiments on a differing perceptual phenomenon. In the first study two sets of subjects were utilized. One set of subjects, designated as actors, were led to believe that they would be participating in a study on decision making. The other set (observers) were told that they were to observe the subjects (actors) and would be responsible for making judgements about the actors' reasons for making a particular decision. As part of the experiment, the experimenter stated that prior to beginning the study, he had a request for volunteers to perform as campus guides on the weekend. The experimenter first asked a confederate, taking part in the study, if he would volunteer. The confederate always complied with the request. The subject was then asked if he would agree to volunteer. The independent experimental manipulation consisted of offering $.50 per hour or $1.50 per hour in the request-for-volunteers' speech. The results revealed that 20% of the low pay subjects volunteered, and 66% of the high-pay subjects complied with the request. At that point, the actor and observer were led to separate rooms and were both questioned about the actor's motives for volunteering. The data indicated that observers of volunteering subjects, in both high and low pay

conditions, believed that those subjects would be predisposed to volunteer for another cause in the future. Most of the observers tended to believe that the observation of a volunteering subject indicated personal traits which would result in high probabilities of similar behaviors. The volunteering actors, themselves, did not agree. The majority of the compliant actors did not believe that they were any more likely to help another cause than those actors who had not volunteered. The actors were appraising their current as well as future behavior in terms of the situational demands rather than attributing their volunteering to personality predispositions. This study adds evidence to the premise that observers are inclined to infer stable personality traits while actors are not.

Attribution of personality traits by observers has also been demonstrated using paper and pencil questionnaires. McArthur (1972) manipulated various levels of consensus, distinctiveness, and consistency information in a series of statements read by her subjects. After reading a series of response statements, subjects were requested to attribute those statements to characteristics of the person (actor), the stimulus, the circumstance, or to some combination of the three factors. McArthur asks:

> . . . why are mundane events such as "Sue is afraid of the dog," "George translates the sentence incorrectly," "Ralph trips over Joan's

> feet while dancing," and "Steve puts a bumper sticker advocating improved auto safety on his car" overwhelmingly attributed to characteristics of Sue, George, Ralph, and Steve (a total of 35 person attributions) rather than to the ferocity of the dog, the difficulty of the sentence, the clumsiness of Joan, or the attractiveness of the bumper sticker (a total of three stimulus attributions)? One is hard pressed to come up with any logical explanation of this proclivity for person attribution. Certainly the real-world incidence of fearful people, dumb people, clumsy Ralphs, and bumper sticker buffs does not exceed the incidence of ferocious dogs, difficult sentences, clumsy Joans, and beautiful bumper stickers (McArthur, p. 177)!

Although the main purpose of the experiment was to delineate the different effects information and verb category have on causal attribution, McArthur did report data relevant to the divergence of perception hypothesis. McArthur (1972) found that subjects assigned only 4% of the total statements to pure stimulus attributions or to mixed stimulus-circumstance attributions. By far the largest proportion of attributed causes, 44%, were indicated as pure person attributions. Thus, she states:

> One can only conclude that there exists a bias in favor of attributing behavior to characteristics of the person rather than to the stimulus properties of his environment (McArthur, 1972, p. 177).

Along the same lines as McArthur's (1972) study, Cohen (1969) presented his subjects with a list of 64 statements representing responses made by other persons. The subject's task was to divide up a total of 10 causal points between three possible loci, the person, the stimulus, or the circumstance. The results of his study also indicated that person attributions were given significantly greater weightings than stimulus properties.

Using a different experimental tactic, Nisbett et al. (1973) asked subjects to write brief paragraphs stating why they had chosen their major field of academic concentration and why they liked the girl they most frequently dated. The subjects were then requested to write similar paragraphs explaining why their best friend had chosen his major and why the friend dated a particular girl. The sentences used by the subjects were coded into either stimulus attributions (e.g., "Psychology is a high-paying field," "She is a very warm person"), or person attributions ("I want to make a lot of money," "I like warm girls"). Data analysis revealed that subjects listed approximately the same number of stimulus and person reasons for choosing their major and twice as

many stimulus as person reasons for choosing their girl friend. However, when answering for his best friend, the subject listed approximately three times as many person versus stimulus reasons for choosing his major and roughly the same number of stimulus as person reasons for the choice in girl friends. In essence, subjects displayed a relative propensity for using dispositional language in describing their best friend's behavior and not for themselves.

The final study summarized tested directly the divergence of perception hypothesis. Storms' (1973) experimentally tested actor versus observer attributions utilizing videotapes of a brief, unstructured conversation between two subjects. The experimental design included two subjects, designated as actors, who engaged in a getting-acquainted conversation and two additional subjects (observers) who were instructed to watch the conversation but not to participate in it. The actors and observers were placed across the table from each other so that each actor faced the other actor and each observer was oriented toward one of the actors. The independent experimental manipulation occurred in the replay of the conversation between the actors. The video cameras were placed so that in the video playback each actor would either see himself in the conversation (actor - new orientation) or the other actor (actor - same orientation). The observers also saw replays of either the same actor they

had been assigned to observe (observer - same orientation) or the other actor (observer - new orientation). In addition to these conditions, another set of actors and observers did not see a video replay. The dependent measure was a post-experimental questionnaire designed to determine to what extent actors and observers attributed situational or dispositional behavioral causes to the actors. It was hypothesized that those actors and observers who saw the videotape duplicating their original visual perspective would not change their causal attributions. On the other hand, those subjects who saw replays from the opposite orientation would change. The results indicated that actors and observers in the no-tape and same-orientation cells indicated no significant shifts in attributions. In these two conditions, actors remained situational in attributions while observers maintained a dispositional position. As it was anticipated that actors who saw videotapes of themselves would become more dispositional in causal attributions and that observers viewing videotapes of the other participant would become more situational, a role X videotape orientation interaction subjected to the appropriate statistical test. This interaction was highly significant indicating a complete reversal of causality for both actor and observer in the new-orientation condition. Storms (1973), in discussing the results, states:

> The present study demonstrates that visual orientation has a powerful influence on the inferences made by actors and observers about the causes of the actor's behavior. When videotape was not presented and subjects were left to assume their own orientations, or when videotape reproduced subjects' original orientations, actors attributed their behavior relatively more to situational causes than did observers. . . . but under conditions of reorientation, when subjects saw a new point of view on videotape the attributional differences between actors and observers were exactly reversed. Reoriented, self-viewing actors attributed their behaviors relatively less to situational causes than did observers (Storms, 1973, p. 171).

It is the opinion of the present writer that sufficient experimental evidence exists to warrant a belief in the divergent perception hypothesis. However, for a comprehensive understnading of the attributional process, it is necessary to consider <u>why</u> this empirically demonstrated phenomenon occurs.

Jones and Nisbett (1971) have examined the data and have proposed a few viable alternatives to explain the divergent perception phenomena. They propose that the divergence occurs within three distinct areas for actors and

observers. The first is cause-and-effect data; the second, historical data available to actors and observers; and the third (and most controversial area) involves hypothetical conceptualizations utilized in the processing of the available data.

With respect to the effect data, both the actor and the observer can possess equivalent data concerning the (1) nature of the act (specifically what behavior was carried out) and the (2) environmental outcome (positive or negative consequences of the behavior). The actor and observer possibly diverge on the third effect, (3) the experimental (emotional) accompaniments of the behavior. The observer must infer from subtle or perhaps not so subtle cues on the actor's part what emotion the latter is experiencing; or perhaps the observer relies upon self-knowledge of how he would have felt under similar circumstances. The data resulting from inner effects is, of course, most subject to incorrect inferences.

Considering causal data, both actor and observer supposedly have equal knowledge concerning (1) the proximal environmental stimuli operating upon the actor. Theoretically, this knowledge is equivalent. However, from a practical, realistic standpoint, the actor and observer may only approach this equality. For example, should an actor be subjected to a series of degrading remarks from an experimenter at one time (T_1) and again receive a series of milder

insults at another time (T_2), an observer at T_2 may erroneously misattribute the cause of the actor's outburst toward the experimenter at T_2. Furthermore, causal data relating to the (2) actor's intentions, may be quite divergent from what the observer infers to be the actor's true motivation. Just as the effect a situation may have on the actor's experiential state can never be directly known, the intentional cause can only be approximated by vicarious introspection.

It seems apparent that much of the discrepancy and error in actor-observer attributions is due to ideographic differences which are based upon an individual's past history. The observers of others' behavior possess three different kinds of information: (1) consensus information - do other actors behave in the same way to a given stimulus? (2) distinctiveness information - does the actor and do other actors behave in the same way to other stimuli? and (3) consistency information - does the actor and do other actors behave in the same way to the given stimulus across time and situational contexts? According to Kelly (1973), when the observer fills in the corresponding three-dimensional cube he will always lack some of the distinctiveness and consistency information that the actor possesses by virtue of the actor's knowing his own history. Thus the observer is frequently diverted into dispositional generalities for explaining others' behavior in specific situations.

Conversely, what may be considered by an observer to be a typical sample of the actor's behavior may in fact be extremely atypical from the actor's view and specifically linked to situational determinants. In essence, the observer is forced into utilizing a small sample of behavior as complete data to make characteristically ideographic judgements. On the other hand, the actor, knowing himself as no one else possibly can, has more precise and complete information to which he may attribute his behavior.

The last conceptualization which may be used to explain divergence of perception is one involving differential information processing by actors and observers. Jones and Nisbett (1971) state:

> We believe that important information-processing differences do exist for the basic reason that different aspects of the available information are salient for actors and observers and this differential salience affects the course and outcome of the attribution process (Jones & Nisbett, 1971, p. 7).

The stress upon differential information processing is based upon a strong Gestalt orientation. It may be assumed that all actions or behaviors occur within a situational or environmental context. From an observer's point of view, the action occurring is dynamic and in a constant state of change from one moment to the next, while the contextual

setting (once set) remains static. Thus, while the observer focuses upon the nuances of figural activity (the actor), the actor is most likely to direct his attention outward toward the subtle cues and discriminative stimuli to which he is responding (the situation). Parenthetically, it may also be pointed out that the actor's visual receptors are poorly located for recording the nuances of his own behavior. Therefore, the differential foci of attention as between actors and observers could result in differences of causal perception. The actor may regard his behavior to be primarily contingent upon environmental cues to which he must respond. On the other hand, the observer's primary stimulus is the actor's behavior as seen against a situational ground. The observer, in focusing on the actor's responses, would likely account for his observations in terms of attributed dispositions.

In addition to different causal attributions based upon Gestalt organizations, there is another effect of perception upon the attribution process. This other perceptual difference is based upon a distinction between the primary versus secondary or evaluative qualities intrinsic to a stumulus. Jones and Nisbett (1971) accurately point out that even as adults we maintain beliefs in stimulus properties based upon their assumed primary qualities rather than a subjective evaluation of them. For example, most children as well as many adults believe that

clowns are funny in the same way that balls are round; funniness is experienced as a property of the clown. The fact that we rarely separate the belief that the beauty of a rose is a secondary evaluation and not a primary quality of the stimulus is a common error made in many of the evaluations people perform everyday. This failure to perceive the true dichotomy between intrinsic and evaluative qualities most certainly effects an actor's and observer's attributions in similar yet distinctly different ways. This lack of evaluation seems to allow the actor to experience attractions, repulsions, and restraints from what the actor believes to be the primary qualities of the stimulus to which he is responding. However, the identical stimuli impinging upon the actor are probably not salient to the observer. The observer, focusing upon the actor's behavior, may easily assume those behaviors to be the primary quality and the subsequent actions to be a reflection of dispositions or inherent qualities of the actor. To the extent that most people believe in and are imbued with this bias of perceptual observation, the actor will over-attribute his behavior to environmental stimuli (the situation) while observers will over-attribute the observed behavior to qualities of the actor (his trait dispositions).

> In summary, the observer and the actor are likely to take different perspectives toward the same information. For the observer, the actor's behavior

> is the figural stimulus against the ground of the situation. The actor's attention is focused outward on his own behavior, and moreover, those situational cues are endowed with intrinsic properties that are seen to cause the actor's behavior toward them. Thus, for the observer the proximal cause of action is the actor; for the actor the proximal cause lies in the compelling qualities of the environment. Finally, the tendency for the observer to attribute action to the actor is probably increased to the extent that the observer is also an actor and to the extent that both the observing and the observed actor are tied together in a mutually contingent interaction (Jones & Nisbett, 1971, p. 10).

Recapitulation

At this juncture the following hypotheses have been shown to receive a degree of empirical support through experimentation:

1. False physiological feedback may under certain experimental circumstances lead to modification of fear, as evidenced by increased approach toward the feared stimulus.

2. Comparisons between a coping versus a mastery approach have indicated the greater efficacy of teaching coping skills.

3. Subjects can utilize coping skills covertly, and the covertly imagined model that is similar to the subject produces the most positive results.

4. There appears to be a general, pervasive tendency for observers to ascribe trait qualities and dispositions to observed models (actors). The results summarized in the above four points led to the following propositions.

Hypothesis Investigated

It was proposed that one of the active and effective elements which may be operational within a systematic desensitization paradigm involves an attributional reorganization. This reorganization would occur as a function of the person observing himself (through imagery) behaving in an adaptive or nonfearful manner toward a feared stimulus. The resulting positive attributions to the observed model (actually himself) would be coded and assimilated as a series of dispositional traits involving adaptive coping skills. The subject believing that he possesses the necessary trait skills to interact adaptively with the feared stimulus would demonstrate decreased avoidance. In an effort to empirically substantiate that a reattribution of adaptive traits occurs within desensitization paradigm, the following hypothesis was tested.

It was hypothesized that those subjects who observed themselves on videotaping reacting nonfearfully (as indicated

by false physiological feedback) in the presence of a feared stimulus would regard themselves as possessing the positive skills observed in the video-model (themselves). The resulting reattributions of coping traits would be demonstrated in decreased fear responses in all dependent measures.

CHAPTER II

METHOD

Subjects

A preliminary screening questionnaire (see Appendix A) was administered to approximately 1,000 undergraduate students enrolled in introductory psychology at the University of North Carolina-Greensboro. The fear-survey questionnaire was one of many psychological tests issued in a mass testing program at the beginning of the semester. Students who rated a four or a five (one = not at all afraid, five = very much afraid) to the question asking to what degree they feared snakes were selected for further testing. Two hundred and thirty-seven female students rated their fear at four or five. Each of these students was contacted by phone or by personal visit and was requested to undergo a pretreatment assessment. Two hundred and twelve students were evaluated in the pretreatment for which 47 demonstrated sufficient fear to be utilized as subjects. From the forty-seven, forty-two subjects were randomly chosen to participate in the study (6 subjects per cell).

Pretreatment Assessment

Prior to administration of the behavioral avoidance test (BAT), subjects were requested to read a short

paragraph stating basic factual information on the characteristics of reptiles (see Appendix B). Subjects were also given verbal instructions in how to properly handle reptiles. Bernstein and Paul (1971) have reported that subjects who are given this information demonstrate higher probabilities in handling snakes than subjects who have not received this type of communication. Therefore, this information was presented in an effort to exclude moderate and low fearful subjects who might have demonstrated avoidance on the BAT primarily due to misinformation and unfamilarity with the feared stimulus.

Subjects were escorted individually into the experimental testing room and seated at the end of a 9 foot pulley track. Three physiological monitoring devices (electrodes) were attached, one clip to each ear and the third to the subject's left wrist. While these electrodes were being attached, the experimenter explained that the purpose of the electrodes was to accurately record the heart rate (HR). The leads were connected to a polygraph (Grass Instrument Model #7) which was used to measure the subject's heart rate. The subjects were advised to sit quietly for a two-minute period to allow themselves to adapt to the novel situation.

The high demand for approach BAT (see Appendix C), was initiated by the experimenter who read prepared instructions (see Appendix D). The subjects were also advised

that they would not be forced to perform any behavior to which they strongly objected. The necessity and extreme importance of their full cooperation was stressed in order to determine how closely they could follow instructions in allowing a nonpoisonous 4 foot boa constrictor approach them. As specified on the BAT, the first ten items designated the distance between the seated subject and the boa housed in a plexiglass cage. The snake was located at the maximum distance (9 feet) from the subject at the end of the pulley track. The electronically activated pulley track was a modified Levis phobic test apparatus (1969) which advanced the snake toward the subject in one-foot increments. Prior to activating the switch which decreased the linear distance between the subjects and the snake, the subjects were requested to specify how much fear they subjectively felt at the time. They were informed that the range of this scale (fear thermometer) was from "zero = no fear" to "ten = terrified." If the subject failed to perform the BAT item upon the first request, a five second latency was allowed to occur. At that time the experimenter advised the subject that it was "extremely important for you to proceed and please cooperate by . . . (the BAT item was repeated)." High demand upon the subject to perform the requested behavior was believed to eliminate those subjects who were not terrified of reptiles (Bernstein & Paul, 1971).

The subjects who failed to complete item 15 (touching the snake with bare hand on top of head) or any lesser item were believed to be sufficiently fearful to remain as experimental subjects. These subjects were escorted to an adjoining room and given two additional paper-and-pencil questionnaires; the S-R Inventory of Anxiousness (SRIA) (Endler, Hunt & Rosenstein, 1962; see Appendix E) and a modified form of Mandler, Mandler, and Uviller's (1958) autonomic perception questionnaire as altered and utilized by Borkovec (1973; see Appendix F).

Dependent Measures

The data from previous research imply that human behavior involves a set of separate but interacting response systems. Typically there are low correlations between those systems composing the triple response modes, verbal, motor, and physiological (Lang, 1968). Therefore, multiple dependent measures were indicated for pre-post test comparisons. In addition, the recent research by Borkovec (1973a, 1973b) demonstrated that subject characteristics of perceived and actual arousal were related to improvement. In an effort to test Borkovec's hypotheses, a physiological perception questionnaire was included. The following dependent measures were given as pre-post test assessments:

1. Behavioral avoidance test (BAT) - Motor Behavioral mode
2. Fear Thermometer (FT) - Verbal-cognitive Behavioral mode
3. Heart Rate (HR) - Physiological Behavioral mode

4. S-R Inventory of Anxiousness (SRIA) - Verbal-cognitive Behavioral mode
5. Borkovec's Physiological Perception Questionnaire (PPQ) - Verbal-cognitive/physiological Behavioral mode

Design Overview

Pre-tested subjects who failed item 15 or less on the BAT were matched into groups with respect to the behavioral avoidance measure (BAT), heart rate measure (HR), and the subjective fear measure (FT), such that all group means and standard deviations were homogeneous.

The experimental groups were designated as follows (see Table 1):

I. View self - out of focus video feedback - false audio HR feedback
II. View self - out of focus video feedback - no audio feedback
III. View model - out of focus video feedback - false audio HR feedback
IV. View model - out of focus video feedback - no audio feedback
V. View video feedback of snake only - false audio HR feedback
VI. View video feedback of snake only - no audio feedback
VII. No treatment control

After the pre-test, each of the experimental groups, with the exception of group VII, the no treatment controls,

TABLE 1

TREATMENT GROUPS AS DESIGNATED BY INDEPENDENT EXPERIMENTAL MANIPULATIONS

	Subject and snake	Model and snake	Snake only	No treatment control
False audio feedback	Group I	Group III	Group V	Group VII
No audio feedback	Group II	Group IV	Group VI	

proceeded through the following sequence of sessions. (See Table 2.)

The subject, T.V. camera and snake were located in the linear set up as shown in Figure 1.

Treatment Groups and Procedures

Experimental Group I (video-self, audio-false HR)

Following the pre-test, each subject arranged a convenient time to report for his treatment sessions. Upon arrival for the first treatment session, the subject was read the following instructions:

> The treatment design in which you are participating has been demonstrated to be an effective method of reducing a person's fear of snakes. As other volunteer subjects will not be receiving the same type of treatment as you are, I would appreciate your not discussing your particular treatment with any one else in the experiment.
>
> This session is the first of four treatment sessions. During each session, you will be connected to a physiological monitoring device and a recorder which will measure your heart rate to presentations of the snake. In addition, video pictures will be taken of you during the minute and a half that you will be interacting with the snake. After this first session, i.e., at the beginning of the second,

TABLE 2

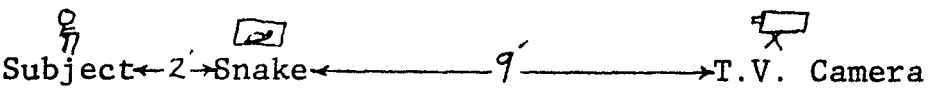
OVERVIEW OF TREATMENT SESSIONS INDICATING FEEDBACK AND SPECIFIED SUBJECT BEHAVIORS

	Video Tape Review	Specified Subject Behaviors	False HR Accompanying Video Tape for Appropriate Groups
Pre-test	No review	----	----
Treatment session (TS)#1	No review	*(1)	118 decreasing to 100
(TS)#2	TS-#1	(2)	105 decreasing to 90
(TS)#3	TS-#1, #2	(3)	90 decreasing to 80
(TS)#4	TS-#1, #2 #3	(4)	75 decreasing to 68
Post-test	TS-#1, #2 #3, #4	----	----

*(1) Subject seated directly in front of snake with box closed
(2) Subject required to lift cage lid half-way open and maintain the position during taping
(3) Subject required to open cage lid completely and leave in open position
(4) Subject required to place fingers and one-half of the palm on the top inside of cage during taping

FIGURE 1

PHYSICAL LAY-OUT OF THE EQUIPMENT



> third and fourth, I will ask that you observe yourself on a video monitor. At that time you will see yourself during the one and one half minute exposure to the snake and will also hear your heart rate. After reviewing the audio-video tape of the previous sessions, you will be connected to the heart rate recorders and video taped for the next scheduled session.

The subject was seated, physiological monitors were connected, and the subject was requested to look at the snake directly before her. At subsequent sessions, subjects were advised of the task as specified in Table 2. After video taping the subject interacting with the snake for 90 seconds, the subject was thanked and another appointment time arranged.

When the subject arrived for the second session, she was advised prior to reviewing the first taped session that the video equipment was not functioning correctly. Therefore, the picture would be slightly out of focus. Although the video was not as it should have been, the audio recording of heart rate was perfect.

The purpose for video taping the subject slightly out of focus was to reduce the possibility of the subject being able to perceive any nuances of facial expression which might give her cues indicating fear of the snake. Thus the subjects would only perceive that the picture on the monitor

was indeed themselves, and that their heart rates were decreasing over sessions.

Experimental Group II (video-self, audio-no feedback)

The procedure which this group followed was very similar to that followed by experimental Group I. These subjects were also connected to what was explained to be a physiological monitoring device for measuring their heart rate. As these subjects did not receive false audio feedback, the instructions read to them were modified, eliminating any mention of hearing their heart rates. (See Appendix I.) All other treatment procedures remained the same as for Group I.

Experimental Group III (video-model, audio-false HR)

In an effort to determine to what extent modeling was occurring, this group was advised that they would be seeing and hearing on video tape another person who was matched to them on many relevant variables. (See Appendix J.) Thus, subjects were exposed to the snake for 90 seconds "in vivo" while their heart rates were proportedly measured and reviewed other subjects most like themselves on tape. The taped subjects reviewed on sessions two through post-test were subjects from Group I matched only for skin color (black-white).

Experimental Group IV (video-model, audio-no feedback)

The procedure which this group followed was similar to that of Group III. The only difference was the exclusion of

any mention of hearing audio feedback during the tape review sessions. (See Appendix K.) The taped subjects reviewed on sessions two through post-test were subjects from Group II matched only for skin color (black-white).

Experimental Group V (video-snake, audio-false HR)

The subjects in this group were exposed for 90 seconds to the snake while performing the behaviors specified for each treatment session. Heart rate monitors were attached for each of the "in vivo" exposure sessions. However, the tape review session was designed to present a video picture of the snake only (no subject or model present). The accompanying audio feedback was purported to be the subject's heart rate recorded from the previous session. (See Appendix L.)

Experimental Group VI (video-snake, audio-no feedback)

The specific purpose for including this group was to determine how much improvement would result via extinction through repeated visual exposures to the snake. Therefore, these subjects were exposed for 90 seconds "in vivo" performing the behaviors as specified in Table 2 and reexposed to video recordings of the snake only. (See Appendix M.)

Experimental Group VII (no treatment control)

These subjects did not receive any treatment but participated in the pre- and posttreatment assessments as did the subjects in the other groups. Following the pretest assessment these subjects were informed that they would

be contacted at a later date with further instructions. During the time in which posttreatment assessments were performed, these subjects were contacted and advised that an additional test of their snake fear was required, and an appointment time was arranged for posttesting.

Posttreatment Assessment

Posttreatment testing followed within two days of the fourth treatment session for all subjects with the exception of the no-treatment group. The two posttest examiners were the same sex as the pre-test and session experimenter. One of the examiners was a male graduate student who had run a similar study and was well acquainted with the posttest procedure. The other examiner was a male undergraduate student who received approximately one hour of instruction on the posttest procedure. The two posttest examiners were unaware of the conditions to which each subject had been assigned.

The BAT, FT, and HR measures were acquired concurrently with the readministration of the BAT. Immediately following the BAT, subjects were escorted to an adjoining room and were readministered the SRIA and PPQ. All subjects were also given a questionnaire checking their belief in the independent experimental manipulations (see Appendix N). The subjects were explained the hypotheses under investigation and why it was considered necessary to utilize false heart rate feedback.

CHAPTER III

RESULTS

Pretreatment Matching of Groups. Prior to the experimental treatments, all groups were matched with respect to the Behavioral Avoidance Test (BAT), Fear Thermometer (FT), and the heart rate measure (HR), such that the groups were considered equivalent. To verify equivalence among the seven experimental groups, one multivariate and three separate univariate analyses of variance were computed. There were no significant differences between the groups (see Tables 3 and 4). Therefore any reduction in fear would be reflected by pre-post changes in a positive direction on the BAT measure and changes in a negative direction on all other dependent measures.

Subject Attrition. All subjects designated for treatment kept their appointments for the first session. Four subjects failed to return for the second and subsequent sessions. Three claimed illness was preventing their return, while the fourth simply refused to participate. Each of the four subjects had been assigned to a different experimental group. Therefore, upon the completion of the experiment, one subject was selected, using random numbers, from Groups I, III, and VII and eliminated for the purpose

TABLE 3

MULTIVARIATE ANALYSIS OF VARIANCE ON THE PRETREATMENT SCORES FOR BEHAVIORAL AVOIDANCE TEST (BAT), FEAR THERMOMETER (FT), AND HEART RATE (HR)

Source	Log (Generalized variance)	U-statistic	df	Approximate F	df
Between Groups	17.501	0.697	3, 6, 35	0.708	18, 93.82
Within Groups	17.140				

TABLE 4

ANALYSIS OF VARIANCE ON PRETREATMENT SCORES FOR BEHAVIORAL AVOIDANCE TEST (BAT), FEAR THERMOMETER (FT), AND HEART RATE (HR)

Source	df	MS	F
BAT Pretreatment Scores			
Between Groups	6	0.873	1.066
Within Groups	35	0.819	
FT Pretreatment Scores			
Between Groups	6	3.024	0.6895
Within Groups	35	4.386	
HR Pretreatment Scores			
Between Groups	6	111.865	0.578
Within Groups	35	193.584	

of equal N analysis. (The analyses were computed on N = 5 per cell.)

A Note of Caution in the Interpretation of the Statistical Results. It must be clearly stated that the reported results on all univariate analyses (ANOVAS) and subsequent post hoc tests should be considered with extreme caution. Many statisticians have questioned the appropriateness of performing univariate analyses following nonsignificant multivariate analyses (MANOVAS). In order to explain and understand the data from this experiment, the results from all significant ANOVAS will be fully analyzed, regardless of the MANOVA results. However, the extreme tentativeness of all conclusions drawn from ANOVAS which follow nonsignificant MANOVAS must be stressed.

Analyses of Dependent Variable Scores Treated as Repeated Measures. A multivariate analysis of variance was computed for the six experimental groups utilizing the dependent variable pretest and posttest scores as repeated measures. The result of the MANOVA indicated significance on the repeated measure factor F (5, 20) = 51.55, $p < .01$ (see Table 5). All other factors and interactions were not significant.

Following the multivariate analysis, each of the five dependent measures was separately analyzed with univariate analyses of variance. The significant results summarized in Table 6 indicated significance on the repeated measure

TABLE 5

SUMMARY TABLE ON THE MULTIVARIATE ANALYSIS OF VARIANCE FOR THE FIVE DEPENDENT MEASURES ACROSS SIX EXPERIMENTAL GROUPS TREATING THE PRE- AND POSTTEST SCORES AS REPEATED MEASURES

Source	Log (Generalized Variance)	U-statistic	df	Approximate F	df
Repeated Measure Scores		.072	5, 1, 24	51.55**	5, 20

**$p < .01$

TABLE 6

SUMMARY TABLE ON THE UNIVARIATE ANALYSES OF VARIANCE FOR BAT, FT, HR, PPQ, AND SRIA SCORES FOR THE SIX EXPERIMENTAL GROUPS TREATING THE PRE AND POSTTEST SCORES AS REPEATED MEASURES

Dependent Measure	Source	df	MS	F
BAT	Repeated Measure	1	201.66	73.33**
	Error	24	2.75	
FT	Repeated Measure	1	248.06	75.39**
	Error	24	3.29	
HR	Repeated Measure	1	1689.63	30.76**
	Error	24	54.92	
PPQ	Repeated Measure	1	12936.01	25.69**
	Error	24	503.35	
SRIA	Repeated Measure	1	3588.26	11.73**
	Error	24	305.86	

** $p < .01$

factor for each of the dependent measures, BAT, F (1, 24) = 73.33, $p < .01$, FT, F (1, 24) = 75.39, $p < .01$, HR, F (1, 24) = 30.76, $p < .01$, PPQ, F (1, 24) = 25.69, $p < .01$, SRIA, F (1, 24) = 11.73, $p < .01$. There were no additional significant main effects or interactions. The significance on only the repeated measure factor indicated equivalent improvement from pretest to posttest measurement for all experimental groups on all five dependent measures.

Computation of Difference Scores. Data analysis was performed on the difference scores, pretreatment to post-treatment, for the five dependent measures (BAT, FT, HR, PPQ, SRIA) (see Table 7). The score for the BAT was calculated by subtracting the last completed BAT item on the posttest from the last completed BAT pretest item. The FT difference score was calculated by comparing the fear rating given for the last completed BAT item on the pretest with the rating given to that same item on the posttest. The heart rate score was computed by comparing the beats per minute (BPM) on the last item completed on the pretest to the BPM for that same item on the posttest. The difference scores for the PPQ and SRIA were calculated by pre-post comparisons.

Analysis of Six Experimental Groups (Excluding the No-treatment Group). A two-way (feedback x treatment) multivariate analysis of variance was computed on the difference scores for the six experimental groups. The statistical

TABLE 7

PRE, POST AND DIFFERENCE SCORE MEANS FOR EACH EXPERIMENTAL GROUP ACROSS ALL DEPENDENT MEASURES

Group	BAT (+)			FT (-)			HR (-)		
	Pre	Post	Diff	Pre	Post	Diff	Pre	Post	Diff
I Self - F.F.	12.20	16.40	4.20	8.40	4.40	4.00	105.38	93.16	12.22
II Self - N.F.F.	12.20	16.20	4.00	9.60	6.00	3.60	98.46	92.14	6.34
III Model - F.F.	12.80	15.00	2.20	9.60	6.60	3.00	110.92	98.20	12.72
IV Model - N.F.F.	12.60	16.80	4.20	8.80	5.00	3.80	103.16	92.98	10.18
V Snake - F.F.	12.40	18.20	5.80	7.60	2.00	5.60	110.46	97.54	12.92
VI Snake - N.F.F.	12.20	13.80	1.60	8.40	4.00	4.40	105.02	95.72	9.30
VII No Treatment	11.80	12.40	.60	9.80	5.80	4.00	102.88	94.32	8.56

(Table 7 continued, next page.)

TABLE 7 (Continued)

Group	PPQ		(-)	SRIA		(-)
	Pre	Post	Diff	Pre	Post	Diff
I Self - F.F.	78.20	40.60	37.60	166.40	147.20	19.20
II Self - N.F.F.	111.80	63.40	48.40	187.60	161.80	25.80
III Model - F.F.	109.60	92.20	17.40	170.20	169.40	0.80
IV Model - N.F.F.	87.80	69.40	18.40	162.60	153.00	9.60
V Snake - F.F.	76.60	39.00	37.60	149.20	127.20	22.00
VI Snake - N.F.F.	81.60	64.80	16.80	169.80	152.80	17.00
VII No Treatment	62.60	43.40	19.20	165.20	150.40	14.80

result was not significant for the video F (10, 38) = .835, $p < .59$, audio F (5, 28) = .808, $p < .55$, or video X audio interaction F (10, 38) = 1.52, $p < .16$ (see Table 8). Separate univariate analyses, computed on each of the five dependent variables, were also not significant (see Table 9).

Analysis of Six Experimental Groups and No-Treatment Group. A multivariate analysis of variance was also computed on the difference scores for the six experimental groups and the no-treatment controls across all dependent measures. A summary of the analysis is presented in Table 10. The statistical result only approached significance, F (30, 112) = 1.451, $p < .08$, indicating no differential treatment effects among the conditions across all five dependent measures.

Following the multivariate analysis, each of the five dependent measures was separately analyzed with a univariate analysis of variance. The summary of these results is presented in Table 11. The results indicated only the BAT measure reached significance, F (6, 28) = 5.392, $p < .01$. The strength of association, W^2, between treatment conditions and the BAT change scores indicated that the treatments accounted for 15% of the total variability.

A Newman-Keuls post hoc comparison of the BAT treatment means was performed to determine the significant difference among the seven conditions. The results of the

TABLE 8

MULTIVARIATE ANALYSES OF VARIANCE ON THE DIFFERENCE SCORES FOR THE FIVE DEPENDENT MEASURES ACROSS SIX EXPERIMENTAL TREATMENT GROUPS

Statistical Test Methods	Source	df	F	Prob >F
Hotelling-Lawleys Trace	Video	10, 38	0.835	0.598
	Audio	5, 20	0.808	0.558
	Video X Audio	10, 38	1.521	0.169

TABLE 9

SUMMARY OF UNIVARIATE ANALYSES OF VARIANCE FOR THE FIVE DEPENDENT VARIABLE DIFFERENCE SCORES FOR THE SIX EXPERIMENTAL TREATMENT GROUPS

Dependent Measure	Source	df	F Value	P > F
BAT	Video	2	0.368	0.700
	Audio	1	0.870	0.360
	Video X Audio	2	0.503	0.537
FT	Video	2	1.050	0.366
	Audio	1	0.080	0.778
	Video X Audio	2	0.383	0.690
HR	Video	2	0.124	0.883
	Audio	1	1.099	0.304
	Video X Audio	2	0.066	0.935
PPQ	Video	2	1.599	0.221
	Audio	1	0.067	0.797
	Video X Audio	2	0.649	0.505
SRIA	Video	2	1.538	0.234
	Audio	1	0.196	0.661
	Video X Audio	2	0.263	0.774

TABLE 10

MULTIVARIATE ANALYSIS OF VARIANCE ON THE DIFFERENCE SCORES FOR THE BAT, FT, HR, PPQ, AND SRIA ACROSS ALL GROUPS

Statistical Test Method	df	F	Prob > F
Hotelling-Lawley's Trace	30, 112	1.451	0.084

TABLE 11

SUMMARY OF UNIVARIATE ANALYSES OF VARIANCE FOR BAT, FT, HR, PPQ AND SRIA DIFFERENCE SCORES FOR ALL EXPERIMENTAL GROUPS AND THE NO-TREATMENT GROUP

Dependent Measure	df	F Value	Prob > F
BAT	6, 28	3.392	0.012*
FT	6, 28	0.449	0.839
HR	6, 28	0.264	0.947
PPQ	6, 28	0.950	0.523
SRIA	6, 28	0.691	0.660

*$p < .05$

comparison are presented in Table 12. The test indicated that Group V (view the snake and receive false audio feedback) differed significantly from Group VII (no-treatment) ($p < .01$) and Group VI ($p < .05$) in performing more items on the BAT.

In order to facilitate understanding and explaining the lack of differential experimental effects, an additional table of results is presented. The overall difference score means and standard deviations computed for all subjects are shown in Table 13.

Analyses Relating to Borkovec's Hypotheses

Analyses based upon pretest physiological heart rate activity. Borkovec (1973a) hypothesized that subjects with low pulse rates (as measured on pretests) demonstrate greater approach change as a function of false physiological feedback than those subjects with initially high pulse rates. In keeping with Borkovec's hypothesis, differential results would be expected in this experiment based upon the subjects' initial level of physiological reactivity (defined as the HR measure). Subjects who received an experimental treatment were blocked into groups on the following dimensions: 1. Those subjects who were exposed to false audio feedback and those who were not (regardless of the video conditions). 2. Within these two groups, the subject's pretest heart rate scores were rank-ordered into three groups of five. Those subjects with the highest pretest HR

TABLE 12

NEWMAN-KEULS COMPARISON OF TREATMENT MEANS FOR BAT DIFFERENCE SCORES

	VII	VI	III	II	I	IV	V	r	C.V. for =.05	C.V. for =.01
Group VII		1.00	1.60	3.40	3.60	3.60	5.20**	7	4.32	5.18
VI			.60	2.40	2.60	2.60	4.20*	6	4.16	5.03
III				1.80	2.00	2.00	3.60	5	3.98	4.85
II					0.20	0.20	1.80	4	3.73	4.62
I						0.00	1.60	3	3.38	4.30
IV							1.60	2	2.81	3.76
V								1		

*$p < .05$
**$p < .01$

TABLE 13

DIFFERENCE SCORE MEANS AND STANDARD DEVIATIONS
FOR ALL EXPERIMENTAL SUBJECTS

Dependent Variable	Mean Difference	SD of Differences
BAT	3.22	2.62
FT	-4.06	2.55
HR	-10.32	9.94
PPQ	-27.91	29.59
SRIA	-15.37	23.02

scores were labeled as the high group, the next highest group of five as medium, and the remaining five as low in reactivity. The mean pretest HR scores for each group are presented in Table 14. Because the subjects were blocked on this pretest measure, as expected there was significance in the ANOVA of their pretest scores for both the feedback variable F (1, 24) = 7.20, p .05 and the levels of reactivity F (2, 24) = 32.20, p .01 (see Table 15).

A multivariate analysis of variance was computed on the difference scores across all five dependent measures for the six groups. The results of the test were not significant (see Table 16). Separate univariate analyses were also computed for each of the dependent measures. The summary of these results is presented in Table 17. The results indicated only the HR measure reached significance F (2, 24) = 8.96, p .001. The strength of association, W^2, between levels of reactivity and the HR change scores indicated that reactivity accounted for 38% of the total variability.

A Newman-Keuls post hoc comparison of the HR treatment mean difference scores was performed to determine the significant differences between the low, medium, and high subject groups. The results of the comparison are presented in Table 18. The test indicated that the high and medium

TABLE 14

MEAN PRETEST HEART-RATE SCORES FOR PHYSIOLOGICAL REACTIVITY ANOVA

	Subjects Receiving False Audio Feedback	Subjects Not Receiving False Audio Feedback
High Physio. Activity	125.6	114.12
Medium Physio. Activity	108.02	102.76
Low Physio. Activity	95.58	89.8

TABLE 15

ANALYSIS OF VARIANCE ON PRETEST HEART RATE SCORES FOR SUBJECTS DESIGNATED AS HIGH, MEDIUM AND LOW IN PHYSIOLOGICAL REACTIVITY

Source	df	MS	F
Feedback	1	406.29	7.20*
Reactivity	2	1817.77	32.2**
Feedback & Reactivity	2	25.56	0.45
Error (within)	24	56.42	

**$p < .01$
*$p < .05$

TABLE 16

MULTIVARIATE ANALYSES OF VARIANCE ON THE DIFFERENCE SCORES FOR ALL DEPENDENT MEASURES ACROSS SUBJECTS GROUPED INTO THREE LEVELS OF PRETEST PULSE-RATE ACTIVITY

Statistical Test Method	Source	df	F	Prob > F
Hotelling-Lawley's Trace	Audio Feedback	5, 20	.797	.565
	HR Reactivity	10, 38	1.71	.111
	Feedback X Reactivity	10, 38	.699	.720

TABLE 17

SUMMARY OF UNIVARIATE ANALYSES OF VARIANCE FOR BAT, FT, HR, PPQ AND SRIA DIFFERENCE SCORES FOR SUBJECTS GROUPED INTO THREE LEVELS OF PRETEST PULSE-RATE ACTIVITY

Dependent Measure	Source	df	F Value	Prob.> F
BAT	Feedback	1	0.680	0.417
	Reactivity	2	0.487	0.625
	Feed. X React.	2	0.695	0.513
FT	Feedback	1	0.077	0.783
	Reactivity	2	0.729	0.503
	Feed. X React.	2	0.120	0.886
HR	Feedback	1	1.901	0.180
	Reactivity	2	8.960	0.001**
	Feed. X React.	2	0.116	0.889
PPQ	Feedback	1	0.060	0.807
	Reactivity	2	0.205	0.817
	Feed. X React.	2	0.632	0.544
SRIA	Feedback	1	0.211	0.650
	Reactivity	2	0.502	0.616
	Feed. X React.	2	2.348	0.115

**$p < .01$

TABLE 18

NEWMAN-KEULS COMPARISON OF TREATMENT MEANS FOR HR DIFFERENCE SCORES

	Low Reactive	Medium Reactive	High Reactive	r	C.V. for =.05	C.V. for =.01
Low Reactive		9.31*	14.94**	3	8.79	11.21
Medium Reactive			5.63	2	7.28	9.80
High Reactive				1		

**$p < .01$
*$p < .05$

groups were significantly different from the group defined as low reactivity ($p < .01$, $p < .05$ respectively), but did not differ from each other.

Analyses Based upon Pretest Perception of Heart Rate Activity. Borkovec (1973a) hypothesized that subjects' perception of physiological activity and actual physiological reactions were separate dimensions. Borkovec (1973b) reported that subjects who were accurate perceivers demonstrated greater mean approach and pulse rate reduction than inaccurate perceivers. Therefore, data from this experiment was blocked on the following dimensions: 1. Those subjects who were exposed to audio feedback versus those who were not (regardless of the video condition). 2. Within these two groups, the PPQ (see Appendix F) pretest scores from item numbers 9, 10, and 11, were summed. The summed scores from the three items, which were specifically related to the subject's perception of heart rate activity, were rank-ordered into groups of five subjects each. The five subjects with the highest summed scores were labeled as the high perception group. The next highest group of five as medium and the remaining five as low in heart rate activity perception. The mean summed pretest perception scores for each group are presented in Table 19.

Multivariate analyses of variance were computed on the difference scores across all five dependent measures for the feedback and heart rate perception variables. The results

TABLE 19

MEAN PRETEST SCORES FOR THE SUMMATION OF PPQ HEART RATE ITEM NUMBERS 9, 10, AND 11

	Subjects Receiving False Audio Feedback	Subjects not Receiving False Audio Feedback
High in Heart Rate Perception	23.4	22.4
Medium in Heart Rate Perception	19.4	15.8
Low in Heart Rate Perception	9.8	7.8

presented in Table 20 indicated no significant effect for the audio feedback or perception of heart rate variables. Separate univariate analyses were computed for each of the dependent measures. The summary of these results is presented in Table 21. The results indicated significant main effect on the PPQ measure, F (2, 24) = 5.625, $p < .009$ and the SRIA measure, F (2, 24) = 4.214, $p < .026$. The statistically significant result for both the PPQ and SRIA was congruent considering the high correlation (r = .736) between the two dependent measures.

A Newman-Keuls post hoc comparison of the mean difference scores was performed to determine the significant differences between the low, medium, and high perception subject groups for both the PPQ and the SRIA. The result of the comparison for the PPQ is presented in Table 22 and for the SRIA in Table 23. Both the PPQ and SRIA tests indicated that the medium perception group differed only from the group classified as low in heart rate perception ($p < .01$ and $p < .05$ respectively).

Summary of Treatment Effects. The percent improvement (difference score divided by pretest score) for each group over the five dependent measures was calculated (see Table 24). Figure 2 plots the three groups which received false audio feedback and the no-treatment group. Figure 3 shows the three groups which did not receive false feedback and, for comparison, the no-treatment group.

TABLE 20

MULTIVARIATE ANALYSES OF VARIANCE ON THE DIFFERENCE SCORES FOR ALL DEPENDENT MEASURES ACROSS SUBJECTS GROUPED INTO THREE LEVELS OF PRETEST HEART RATE PERCEPTION

Statistical Test Method	Source	df	F	Prob>F
Hotelling-Lawley's Trace	Audio Feedback	5, 20	.716	.620
	HR Perception	10, 38	1.769	.100
	Feedback X Perception	10, 38	2.34	.028

TABLE 21

SUMMARY OF UNIVARIATE ANALYSES OF VARIANCE FOR BAT, FT, HR, PPQ AND SRIA DIFFERENCE SCORES FOR SUBJECTS GROUPED INTO THREE LEVELS OF PRETEST HEART-RATE PERCEPTION

Dependent Measure	Source	df	F Value	Prob > F
BAT	Feedback	1	1.024	.321
	Perception	2	.775	.525
	Feed X Percep	2	1.26	.287
FT	Feedback	1	.105	.747
	Perception	2	1.298	.291
	Feed X Percep	2	1.571	.243
HR	Feedback	1	1.313	.263
	Perception	2	1.438	.256
	Feed X Percep	2	1.126	.341
PPQ	Feedback	1	.084	.774
	Perception	2	5.625	.009**
	Feed X Percep	2	.246	.785
SRIA	Feedback	1	.235	.631
	Perception	2	4.214	.026*
	Feed X Percep	2	.351	.712

**$p < .01$
*$p < .05$

TABLE 22

NEWMAN-KEULS COMPARISON OF TREATMENT MEANS FOR PPQ DIFFERENCE SCORES

	Low Perception	High Perception	Medium Perception	r	C.V. for =.05	C.V. for =.01
Low Perception		17.6	42.3**	3	31.24	39.82
High Perception			24.7	2	25.86	34.82
Medium Perception				1		

**$p < .01$

TABLE 23

NEWMAN-KEULS COMPARISON OF TREATMENT MEANS FOR SRIA DIFFERENCE SCORES

	Low Perception	High Perception	Medium Perception	r	C.V. for =.05	C.V. for =.01
Low Perception		12.4	29.2*	3	24.88	31.72
High Perception			16.8	2	20.61	27.73
Medium Perception				1		

*$p < .05$

TABLE 24

PERCENT IMPROVEMENT FOR EACH GROUP OVER THE FIVE DEPENDENT MEASURES

	I	II	III	IV	V	VI	VII
BAT	34	33	17	33	47	13	05
FT	48	38	31	48	.74	52	59
HR	12	.06	11	10	12	09	08
PPQ	48	43	16	21	49	21	31
SRIA	12	14	00	06	16	10	09

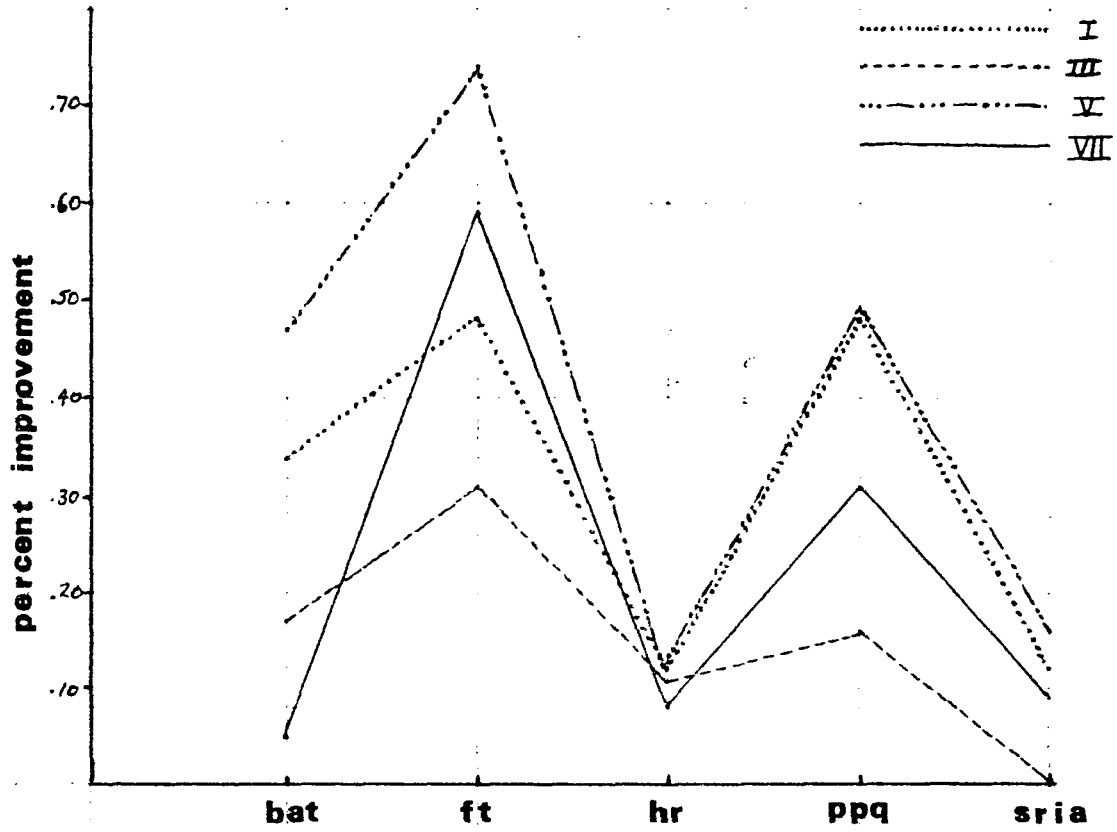


Figure 2. Percent improvement demonstrated by Groups I, III, V (all receiving false heart rate feedback) and no treatment Group (VII) on the five dependent measures.

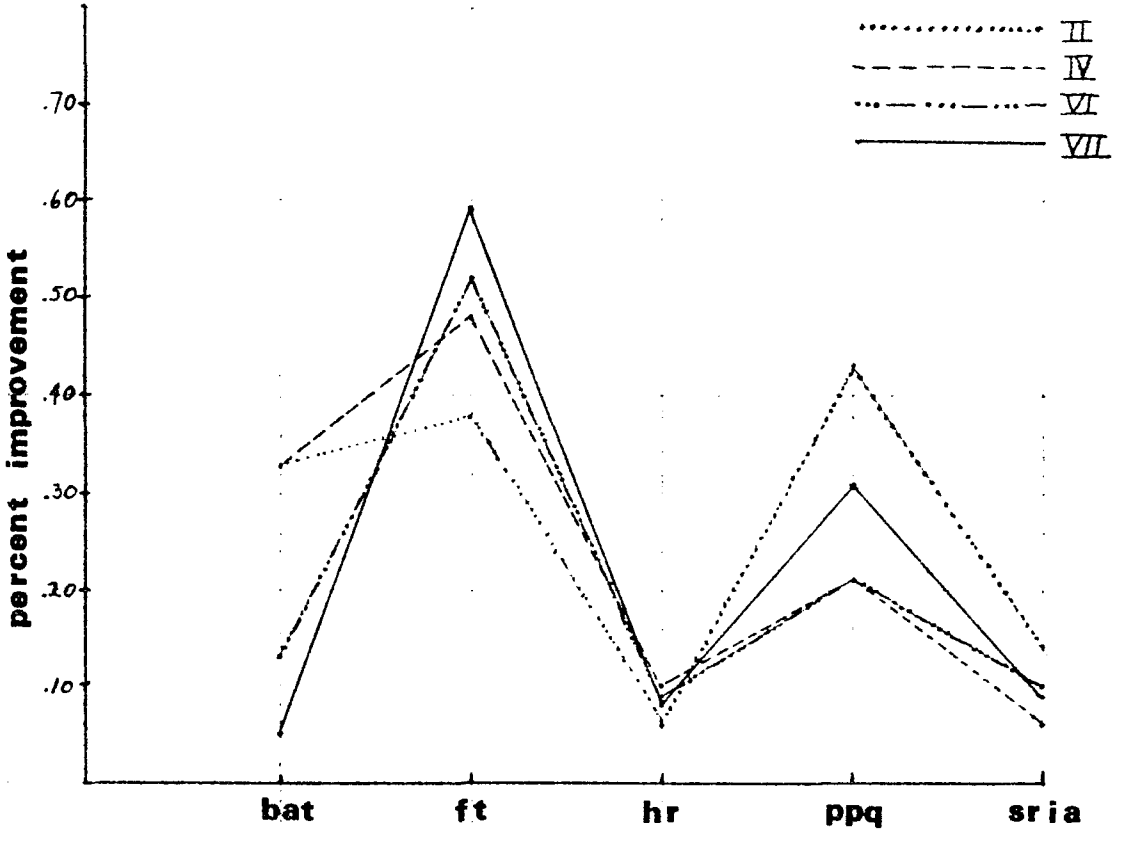


Figure 3. Percent improvement demonstrated by Groups II, IV, VI (not receiving false heart rate feedback) and no treatment Group (VII) on the five dependent measures.

Only Group V (view the snake with false feedback) demonstrated consistently higher improvement percentages across all dependent measures (see Figure 2). This group was also the only one to exceed the no-treatment group across all of the dependent measures.

Postexperimental check on the Independent Manipulations. The postexperimental questionnaire (see Appendix L) indicated that subjects believed their feedback (video and/or audio) to be veridical. In addition, all statements made by subjects during their review of previously taped sessions in no way indicated awareness of non-verdicality.

CHAPTER IV

DISCUSSION

Discussion of Primary Results

The results from this experiment indicated that all experimental treatment groups (Groups I-VI) improved on all five dependent measures. This was indicated by the highly significant pre-post repeated measure factor (Table 5 and Table 6). In addition, the MANOVA (Table 8) calculated across all dependent measures for the six experimental treatment groups and the ANOVAS (Table 9) comparing the treatment groups on each of the five dependent measures were not significant. Thus, it may be concluded that all of the experimental treatments were equally effective in producing change across the response measures.

In subsequent analyses, the six experimental groups were compared with each other and the no-treatment control group. The result of this MANOVA (Table 10) achieved marginal significance, which would again indicate equivalent improvement across all dependent measures for the experimental groups and the no-treatment group. With the exception of the significant BAT measure, all other ANOVAS (Table 11) were nonsignificant, reaffirming that all seven groups improved equally. The post hoc examination of BAT mean difference scores (Table 12) indicated that Group V (snake

only and false audio feedback) demonstrated significantly greater improvement than Group VI (snake only and no audio feedback) and Group VII (no-treatment). Prior to discussing the BAT post hoc analysis, possible explanations will be proposed to explain the equivalent improvements demonstrated by the no-treatment and experimental groups, on all measures except the BAT.

Discussion of the Overall Pre-Post Improvements

As stated previously, the results of the MANOVA and ANOVAS for the six experimental groups were nonsignificant. A logical approach may be used to determine why all experimental treatments demonstrated essentially equivalent improvement. The purpose of such an approach would be to define a common factor which occurred in all treatments. There was one factor which appeared in all treatment conditions (and to a certain extent in the no-treatment group). The common factor was the multiple "in vivo" exposures to the fear stimulus. Therefore, it may be proposed that the equivalent improvements for all the experimental groups may have been the result of extinction. The fact that the multiple exposures occurred in a gradual manner, becoming more intimate with each session, may also be considered a form of "in vivo" desensitization. This concurs with Davison and Wilson (1973) who have proposed that extinction, operating within a systematic desensitization paradigm, is the most

viable of all current hypotheses explaining the process of fear reduction.

A less supportable, but possible explanation for the equivalent improvements may be conceptualized as motivational or demand characteristics operating on the subjects. As all subjects were young females, there may have been subtle self-imposed demands to please the oppositely sexed experimenter and posttest examiners. It is interesting to speculate that the current results might have changed considerably had the subjects been older and the same sex as the experimenter and examiners.

The results from this study also suggest that viewing a model on video, regardless of feedback, may not have the same impact or effect as when subjects are requested to covertly imagine a fear provoking scene. The lack of a modeling effect in the current study is not consonant with other modeling studies which showed treatment groups improved over no-treatment controls. Cautela et al. (1974) demonstrated that covert and overt modeling were equivalent in reducing avoidance behavior. Meichenbaum (1971) utilized filmed models in demonstrating the superiority of coping versus mastery models in overcoming anxiety. In addition, Kazdin's (1973, 1974a, 1974c) research on avoidance behavior primarily investigated covert desensitization, manipulating model similarity versus dissimilarity in coping versus mastery situations. Kazdin's results have consistently demonstrated

the superiority of the similar-coping model in reducing avoidance behavior. This finding was not confirmed by the results from this experiment. However, as Kazdin utilized primarily covert rather than overt techniques in his research, his results cannot be completely generalized to this experiment. The disparity in results questions why the most similar of all models (viewing oneself) coping with the anxiety producing stimulus was not different from any other treatment approach? One possible explanation may be hypothesized in the distinction between covertly imagining oneself performing some avoidance behavior and actually engaging in these same behaviors prior to an overt (viewing another model) or covert review. In other words, it is possible that covert behavioral rehearsal of the activity must occur as a necessary precondition for changing overt and other behavioral modes.

Discussion of Nonsignificant Results

The nonsignificant experimental results allow more definitive conclusions to be drawn in reference to the principle and corollary hypotheses under investigation. As the two groups who viewed themselves on video, with or without audio feedback, were not significantly different from each other, the modeling groups, or the no-treatment group, it may be concluded that the divergence of perception (Jones & Nisbett, 1971) and reattribution of positive qualities

from actor to observer hypothesis has no empirical support from this study.

A possible explanation for the lack of differential effects, with the exception of the BAT, has been proposed by Borkovec and Glasgow (1973). They reported results indicating no significant differences in approach scores between feedback and no-feedback groups when subjects had prior exposure to the fear stimulus on a pretest and when a high-demand posttest was utilized. As the present study utilized a high demand pre- and posttest, and possible conclusion is that the same mitigating parameters reported in Borkovec and Glasgow's (1973) study were operating in this study. This would possibly explain why the treatment groups did not differ among themselves.

Discussion of BAT Results

The BAT post hoc analysis is most difficult to explain. As stated previously, Newman-Keuls comparisons indicated that only Group V was significantly different from Groups VI and Group VII. It may be recalled that Group VI was exposed to the snake "in vivo," as were the other treatment groups, and reexposed to the snake only on videotape without audio feedback. It is possible that the subjects in this group were not convinced that their treatment procedure was an effective method of reducing fear. If the face validity of the treatment procedure was much lower than the other treatment groups, the subjects may have reacted as if they were

receiving no treatment at all. Hence, Group VI's reactions as measured on the BAT would closely approximate the actual no-treatment group. It is possible that Group V demonstrated a superior performance on the BAT measure by chance. That is, the subjects who were assigned to Group V were simply more cooperative or "better" subjects. However, it is important to note that when charting the percentage improvement (Figure 2), Group V demonstrated the most consistent and also the highest percentages across all dependent measures.

Thus it may be concluded with a minimal amount of empirical support that viewing the snake on video and receiving false heart-rate feedback results in reduced fear behaviors (particularly motor behavior).

Discussion of Physiological Reactivity Results

It was stated in the introduction that Borkovec (1973a, 1973b) had published studies supporting his hypothesis that false physiological feedback or "external demand cue manipulation" (Borkovec, 1973a) would be effective in changing behavior when actual physiological cues were absent. In addition, he hypothesized that subjects who were accurate perceivers would demonstrate greater mean approach and pulse rate reduction than inaccurate perceivers. The logical deduction from Borkovec's hypotheses to this experiment would assume that differential

results would be expected based upon the subjects' initial level of pretest heart rate activity, their perception of that activity, and whether or not they received false heart rate feedback.

The multivariate analysis (Table 16) on the three levels of heart rate activity did not indicate any significant change nor did the univariate analyses except on the HR measure (Table 17). Due to the nonsignificant multivariate analysis and the fact that the subjects who were classified as high in reactivity were most likely approaching the extreme end of a finite scale, the conclusions are most tentative. However, the post hoc analysis (Table 18) results indicated that the HR measure confirmed Borkovec's hypothesis as the two groups with the higher initial pulse rates were significantly different from the low pulse rate group.

The multivariate analysis based upon the subject's perception of heart rate activity was not significant (Table 20). The two significant univariate analyses (Table 21), PPQ and SRIA, were expected as the subjects' scores were blocked on their subjective perceptions of heart rate activity (which was a part of both questionnaires). The results from the Newman-Keuls post hoc comparisons (Tables 22 and 23) for both measures were similar in that both comparisons indicated that the group classified as medium

in perception of heart rate activity were significantly different from the group low in perception. These results would not have been predicted from Borkovec's hypotheses.

It should be noted that all conclusions relating to Borkovec's hypotheses from this study are most tenuous. The data used in examining his hypotheses were blocked on specified dimensions without regard to the experimental groups from which they were taken. The assignment of data from different treatment groups could possibly confound any definitive empirical support for his hypotheses. In addition, the groups classified as high in heart rate perception and heart rate reactivity had the greatest room for change. Therefore, a ceiling effect for the low HR group and statistical regression toward the mean could account for the results of this study.

Summary

In conclusion, the experimental results failed to substantiate the major hypothesis under investigation. There was no statistical evidence nor was there even a trend in the data to support a reattribution hypothesis occurring within the current experimental paradigm. As all experimental groups and the no-treatment group demonstrated almost equivalent improvement on all measures, with the exception of the BAT, the defense of any theoretical system operating within this experiment in reducing a subject's fear would be most tentative.

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APPENDIX A

Name _____ Instructor _____

GENERAL SCREENING QUESTIONNAIRE

Please answer these following questions as honestly as possible. Thank you.

1. To what degree are you afraid of snakes?
Place one X next to the level which is most applicable.

Not at all____ A fair amount____ Very
A little____ Much____ much____

2. To what degree do you experience test anxiety prior to a test?

Not at all____ A fair amount____ Very
A little____ Much____ much____

3. To what degree do you feel depressed?

Not at all____ A fair amount____ Very
A little____ Much____ much____

4. To what degree are you disturbed about speaking in public?

Not at all____ A fair amount____ Very
A little____ Much____ much____

5. To what degree do you have trouble with insomnia (i.e., taking more than two hours to fall asleep at night)?

Not at all____ A fair amount____ Very
A little____ Much____ much____

6. To what degree do you feel anxious in situations involving interactions with other people?

Not at all____ A fair amount____ Very
A little____ Much____ much____

7. To what degree are you afraid of small insects?

Not at all____ A fair amount____ Very
A little____ Much____ much____

8. To what degree are you afraid of rats?

Not at all____ A fair amount____ Very
A little____ Much____ much____

9. To what degree are you afraid of speaking up in class?

Not at all____ A fair amount____ Very
A little____ Much____ much____

10. To what degree are you afraid of speaking to a professor in his office?

Not at all____ A fair amount____ Very
A little____ Much____ much____

11. To what degree are you afraid of asserting yourself towards others?

Not at all____ A fair amount____ Very
A little____ Much____ much____

12. To what degree do you feel your study skills are deficient?

Not at all____ A fair amount____ Very
A little____ Much____ much____

13. To what degree do you suffer from headaches?

Not at all____ A fair amount____ Very
A little____ Much____ much____

14. To what degree do you consider yourself to be underweight?

Not at all____ A fair amount____ Very
A little____ Much____ much____

15. To what degree do you consider yourself to be overweight?

Not at all____ A fair amount____ Very
A little____ Much____ much____

16. To what degree do you feel you have difficulty in carrying on a conversation with another person?

Not at all____ A fair amount____ Very
A little____ Much____ much____

APPENDIX B

Participant Information Sheet

PLEASE READ

Dear Participant:

You are being asked to participate in a study of fear reduction. A first requirement of such a study is an accurate measure of a person's fear. The examiners will be attempting to get such a measure by actively encouraging you to perform fearful items in a prearranged test situation. Please cooperate with them.

The test involves a snake. His name is Balboa. He is a non-poisonous boa constrictor of approximately four feet in length. He has been used in many such experiments and is quite harmless. Like most snakes, you will see him flick his tongue out. This is not any indication of danger. Like most snakes Balboa has poor eyesight. He uses his tongue as a scent receptor to explore his enviornment. In touching Balboa, you will find that he is not wet or slimy, rather he is dry and cool. His coolness is a result of the fact that he is not warmblooded. Therefore his body temperature is room temperature and that is cooler than your body temperature. When you hold him, it is quite likely that he will coil around your arm. This is done purely for support. An animal of his length cannot be easily supported between two hands. Thank you for your cooperation.

Sincerely,

The Experimenter

APPENDIX C

Behavioral Avoidance Test

(BAT)

1) Sitting 8½ feet from a caged snake.
2) Sitting 7½ feet from a caged snake.
3) Sitting 6½ feet from a caged snake.
4) Sitting 5½ feet from a caged snake.
5) Sitting 4½ feet from a caged snake.
6) Sitting 3½ feet from a caged snake.
7) Sitting 2½ feet from a caged snake.
8) Sitting 1½ feet from a caged snake.
9) Sitting directly before a caged snake.
10) Touch the side of the cage with a bare hand.
11) Open the lid of the cage one-half way for two seconds.
12) Open the lid of the cage all the way and let it remain open.
13) Place the flat palm of bare hand on the inside bottom of the cage for two seconds.
14) Touching the snake on top of its head with gloved hand.
15) Touching the snake on top of its head with bare hand.
16) Picking up the snake with one gloved hand two inches off the bottom of the cage.
17) Picking up the snake with bare hand two inches off the bottom of the cage.
18) Picking up the snake with two gloved hands for two seconds.

19) Picking up the snake with two bare hands for two seconds.

20) Holding the snake near chest with two gloved hands for fifteen seconds.

21) Holding the snake near chest with two bare hands for fifteen seconds.

APPENDIX D

Instructions Read to Subjects
During Fear Assessments

I am going to give you certain specific instructions to follow, and you should do exactly as you are instructed to do. Please do not ask any questions at this time. Simply follow my directions. You will be requested to perform a series of steps of increasing approach to a non-poisonous snake. First I will describe the nature of the activities that you are to perform. Then you will state your fear on a scale from one to ten, one being no fear and ten being terrified. After you have estimated your fear from one to ten, you will be required to complete the step described to you.

To repeat, the procedure is as follows: first, you will be told the nature of the step that you are to perform. Second, you will estimate your fear on a scale from one to ten. Third, you will perform the step which has been described to you. Do you have any questions?

APPENDIX E

Personal Reactions Questionnaire

Your name _____

Phone no. _____

Alternative phone no. _____

Local address _____

This packet consists of various questionnaires designed to further assess your reactions to anxiety-provoking situations. This information will be kept confidential, so please be as honest as possible in describing your reactions.

Personal Reactions Questionnaire 1

Name _____

Please circle the appropriate number from one to five describing your reaction to the situation at the top of each section.

Here is an example:

You are about to go on a roller coaster.

Heart beats faster	1	2	3	4	5
	Not at all				Much faster

If your heart beats much faster in this situation, you would darken alternative 5; if your heart beats somewhat faster, you would darken either alternative 2, 3, or 4 depending on how much faster; if in this situation your heart does not beat faster at all, you would darken alternative 1.

A. Thinking about a snake

1. Heart beats faster	1	2	3	4	5
	Not at all				Much faster
2. Get an "uneasy feeling"	1	2	3	4	5
	None				Very strongly
3. Emotions disrupt action	1	2	3	4	5
	Not at all				Very disruptive
4. Feel exhilarated and thrilled	1	2	3	4	5
	Very much				Not at all
5. Want to avoid situation	1	2	3	4	5
	Not at all				Very much
6. Perspire	1	2	3	4	5
	Not at all				Perspire much

7.	Need to urinate frequently	1 Not at all	2	3	4	5 Very frequently
8.	Enjoy the challenge	1 Enjoy much	2	3	4	5 Not at all
9.	Mouth gets dry	1 Not at all	2	3	4	5 Very dry
10.	Become immobilized	1 Not at all	2	3	4	5 Completely
11.	Get full feeling in stomach	1 None	2	3	4	5 Very full
12.	Seek experiences like this	1 Very much	2	3	4	5 Not at all
13.	Have loose bowels	1 None	2	3	4	5 Very much
14.	Experience nausea	1 Not at all	2	3	4	5 Much nausea

B. Looking at a caged snake at a distance of 10 feet

1.	Heart beats faster	1 Not at all	2	3	4	5 Much faster
2.	Get an "uneasy feeling"	1 None	2	3	4	5 Very strongly
3.	Emotions disrupt action	1 Not at all	2	3	4	5 Very disruptive
4.	Feel exhilarated and thrilled	1 Very much	2	3	4	5 Not at all
5.	Want to avoid situation	1 Not at all	2	3	4	5 Very much
6.	Perspire	1 Not at all	2	3	4	5 Perspire much
7.	Need to urinate frequently	1 Not at all	2	3	4	5 Very frequently
8.	Enjoy the challenge	1 Enjoy much	2	3	4	5 Not at all
9.	Mouth gets dry	1 Not at all	2	3	4	5 Very dry
10.	Become immobilized	1 Not at all	2	3	4	5 Completely
11.	Get full feeling in stomach	1 None	2	3	4	5 Very full
12.	Seek experiences like this	1 Very much	2	3	4	5 Not at all
13.	Have loose bowels	1 None	2	3	4	5 Very much
14.	Experience nausea	1 Not at all	2	3	4	5 Much nausea

C. Sitting directly in front of a caged snake.

1.	Heart beats faster	1 Not at all	2	3	4	5 Much faster
2.	Get an "uneasy feeling"	1 None	2	3	4	5 Very Strongly
3.	Emotions disrupt action	1 Not at all	2	3	4	5 Very disruptive
4.	Feel exhilarated and thrilled	1 Very much	2	3	4	5 Not at all
5.	Want to avoid situation	1 Not at all	2	3	4	5 Very much
6.	Perspire	1 Not at all	2	3	4	5 Perspire much
7.	Need to urinate frequently	1 Not at all	2	3	4	5 Very frequently
8.	Enjoy the challenge	1 Enjoy much	2	3	4	5 Not at all
9.	Mouth gets dry	1 Not at all	2	3	4	5 Very dry
10.	Become immobilized	1 Not at all	2	3	4	5 Completely
11.	Get full feeling in stomach	1 None	2	3	4	5 Very full
12.	Seek experiences like this	1 Very much	2	3	4	5 Not at all
13.	Have loose bowels	1 None	2	3	4	5 Very much
14.	Experience nausea	1 Not at all	2	3	4	5 Much nausea

D. Holding a snake with bare hands

1.	Heart beats faster	1 Not at all	2	3	4	5 Much faster
2.	Get an "uneasy feeling"	1 None	2	3	4	5 Very strongly
3.	Emotions disrupt action	1 Not at all	2	3	4	5 Very disruptive
4.	Feel exhilarated and thrilled	1 Very much	2	3	4	5 Not at all
5.	Want to avoid situation	1 Not at all	2	3	4	5 Very much
6.	Perspire	1 Not at all	2	3	4	5 Perspire much
7.	Need to urinate frequently	1 Not at all	2	3	4	5 Very frequently
8.	Enjoy the challenge	1 Enjoy much	2	3	4	5 Not at all
9.	Mouth gets dry	1 Not at all	2	3	4	5 Very dry
10.	Become immobilized	1 Not at all	2	3	4	5 Completely
11.	Get full feeling in stomach	1 None	2	3	4	5 Very full
12.	Seek experiences like this	1 Very much	2	3	4	5 Not at all
13.	Have loose bowels	1 None	2	3	4	5 Very much
14.	Experience nausea	1 Not at all	2	3	4	5 Much nausea

APPENDIX F

QUESTIONNAIRE ON THE PERCEPTION OF FEELING

This questionnaire is designed to give you an opportunity to describe your subjective experience in relation to several dimensions of anxiety.

There are no catch questions in this questionnaire. Please read each question in each scale very carefully and consider your answer.

For each question there is a scale from 0 to 9. The end points are statements of extreme feelings or attitudes. Circle that number which you think best indicates the state of your feelings or attitude about the particular question.

For example, if a question asked, "How happy are you right now?", and you feel that you're somewhat happy but not very happy, you might answer the following scale by indicating the number 6 or the number 7 on the answer sheet.

0	1	2	3	4	5	6	7	8	9
extremely unhappy									extremely happy

Answer each of the following 21 items on the answer sheet on the next page. Be sure the number of the item on the answer sheet corresponds to the number of the item on the questionnaire.

THINK ABOUT EACH QUESTION CAREFULLY BEFORE YOU ANSWER.

CIRCLE ONLY ONE NUMBER ON EACH SCALE.

1. When you are with the snake, are you aware of many bodily reactions?

0 1 2 3 4 5 6 7 8 9

Aware of very few Aware of very many

2. When you are with the snake, how often are you aware of your bodily reactions?

0 1 2 3 4 5 6 7 8 9

Never Always

3. When you are with the snake, does your face become hot?

0 1 2 3 4 5 6 7 8 9

Does not change Becomes very hot

4. When you are with the snake, do your hands become cold?

0 1 2 3 4 5 6 7 8 9

No change Very cold

5. When you are with the snake, do you perspire?

0 1 2 3 4 5 6 7 8 9

Not at all A great deal

6. When you are with the snake, does your mouth become dry?

0 1 2 3 4 5 6 7 8 9

Never Always

7. When you are with the snake, are you aware of increased muscle tension?

0 1 2 3 4 5 6 7 8 9

No increased tension A great deal of tension

8. When you are with the snake, do you get a headache?

0 1 2 3 4 5 6 7 8 9

Never Always

9. When you are with the snake, how often are you aware of any change in your heart action?

0 1 2 3 4 5 6 7 8 9

Never Always

10. When you are with the snake, do you experience accelerated heart beat?

0 1 2 3 4 5 6 7 8 9

No change Great acceleration

11. When you are with the snake, does the intensity of your heart beat increase?

0 1 2 3 4 5 6 7 8 9

Does not change Increases to extreme pounding

12. When you are with the snake, how often are you aware of change in your breathing?

0 1 2 3 4 5 6 7 8 9

Never Always

13. When you are with the snake, does your breathing become more rapid?

0 1 2 3 4 5 6 7 8 9

No change Very rapid

14. When you are with the snake, do you breathe more deeply?

0 1 2 3 4 5 6 7 8 9

No change Much more deeply

15. When you are with the snake, do you breathe more shallowly?

0 1 2 3 4 5 6 7 8 9

No change Much more shallowly

16. When you are with the snake, do you feel as if blood rushes to your head?

0 1 2 3 4 5 6 7 8 9

Never Always

17. When you are with the snake, do you get a lump in your throat or a choked-up feeling?

0 1 2 3 4 5 6 7 8 9

Never Always

18. When you are with the snake, does your stomach get upset?

0 1 2 3 4 5 6 7 8 9

Not at all Very upset

19. When you are with the snake, do you get a sinking or heavy feeling in your stomach?

0 1 2 3 4 5 6 7 8 9

Never Always

20. When you are with the snake, do you have any difficulty talking?

0 1 2 3 4 5 6 7 8 9

Never Always

21. When you are with the snake, are you bothered by your bodily reactions?

0 1 2 3 4 5 6 7 8 9

Not bothered at all Bothered very much

APPENDIX G

INDIVIDUAL DATA SHEET

SUBJECT_____ GROUP_____

	BAT			FT			HR			Physio., Percep.		
	Pre	Po	Ch	Pre	Po	Ch	Pre	Po	Ch	Pre	Po	Ch
1.												
2.												
3.												
4.												
5.												
6.												
7.												
8.												
9.												
10.												
11.												
12.												
13.												
14.												
15.												
16.												
17.												
18.												
19.												
20.												
21.												

SRIA		
Pre	Po	Ch

S Expectation - before_____, after_____, change_____

APPENDIX H

Subject Expectation Form

Name _____

Please estimate the likelihood that your treatment program will (has) considerably lessen(ed) your fear of snakes.

1	2	3	4	5
very little				extremely likely

APPENDIX I

INSTRUCTIONS READ TO GROUP II

The treatment design in which you are participating has been demonstrated to be an effective method of reducing a person's fear of snakes. As other volunteer subjects will not be receiving the same type of treatment as you are, I would appreciate your not discussing your particular treatment with any one else in the experiment.

This session is the first of four treatment sessions. During each session, you will be connected to a physiological monitoring devise and a recorder which will measure your heart rate to presentations of the snake.

In addition, video pictures will be taken of you during the minute and a half that you will be interacting with the snake. After this first session, i.e., at the beginning of the second, third and fourth, I will ask that you observe yourself on a video monitor. At that time you will see yourself during the one and one half minute exposure to the snake. After reviewing the video tape of the previous sessions you will be connected to the heart rate recorders and video taped for the next scheduled session.

APPENDIX J

INSTRUCTIONS READ TO GROUP III

The treatment design in which you are participating has been demonstrated to be an effective method of reducing a person's fear of snakes. As other volunteer subjects will not be receiving the same type of treatment as you are, I would appreciate your not discussing your particular treatment with any one else in the experiment.

This session is the first of four treatment sessions. During each session, you will be connected to a physiological monitoring device and a recorder which will measure your heart rate to presentations of the snake.

After this first session, i.e., at the beginning of the second, third and fourth, I will ask that you observe another student on the video monitor. The student which you will observe was matched to you on the basis of almost identical responses on the pre-experimental tests, i.e., their reactions to the snake in what behavior they performed, the amount of fear reported, reactions on the questionnaire and the heart rate measure. You will observe this person most like yourself during the one and one half minute video exposure to the snake and will also hear their heart rate. After reviewing the audio-video tape of the previous sessions, you will be connected to the heart rate recorder and requested to view the snake once again.

APPENDIX K

INSTRUCTIONS READ TO GROUP IV

The treatment design in which you are participating has been demonstrated to be an effective method of reducing a person's fear of snakes. As other volunteer subjects will not be receiving the same type of treatment as you are, I would appreciate your not discussing your particular treatment with any one else in the experiment.

This session is the first of four treatment sessions. During each session, you will be connected to a physiological monitoring device and a recorder which will measure your heart rate to presentations of the snake.

After the first session, i.e., at the beginning of the second, third and fourth, I will ask that you observe another student on the video monitor. The student which you will observe was matched to you on the basis of almost identical responses on the pre-experimental tests, i.e., their reactions to the snake in what behaviors they performed, the amount of fear, reported, reactions on the questionnaire and the heart rate measure. You will observe this person most like yourself during the one and one half minute video exposure to the snake. After reviewing the video tape of previous sessions, you will be connected to the heart rate recorder and requested to view the snake once again.

APPENDIX L

INSTRUCTIONS READ TO GROUP V

The treatment design in which you are participating has been demonstrated to be an effective method of reducing a person's fear of snakes. As other volunteer subjects will not be receiving the same type of treatment as you are, I would appreciate your not discussing your particular treatment with any one else in the experiment.

This session is the first of four treatment sessions. During each session, you will be connected to a physiological monitoring device and a recorder which will measure your heart rate to presentations of the snake.

In addition the audio heart rate recording taken of you during the minute and a half that you will be interacting with the snake will be re-recorded on the video tape. After this first session, i.e., at the beginning of the second, third and fourth, I will ask that you observe the snake on the video monitor. At that time you will see the snake in the plexiglass cage for a one and one half minute exposure and will also hear your heart rate previously recorded. After reviewing the audio-video tape of the previous session, you will be connected to the heart rate recorder and taped for the next scheduled session.

APPENDIX M

INSTRUCTIONS READ TO GROUP VI

The treatment design in which you are participating has been demonstrated to be an effective method of reducing a person's fear of snakes. As other volunteer subjects will not be receiving the same type of treatment as you are, I would appreciate your not discussing your particular treatment with any one else in the experiment.

This session is the first of four treatment sessions. During each session, you will be connected to a physiological monitoring device and a recorder which will measure your heart rate to presentations of the snake.

After this first session, i.e., at the beginning of the second, third and fourth, I will ask that you observe the snake on the video monitor. At that time you will see the snake in the plexiglass cage for a one and one half minute exposure which has been previously recorded. After reviewing the video tape of the previous sessions, you will be connected to the heart rate recorder and taped for the next scheduled session.

APPENDIX N

POSTEXPERIMENTAL QUESTIONNAIRE CHECKING THE SUBJECT'S BELIEF IN THE EXPERIMENTAL MANIPULATIONS

Please circle your answer.

1. The person I saw on tape was

   A. myself
   B. my assigned model
   C. no one

2. The sounds I heard on the tape were

   A. none
   B. extraneous noise
   C. heart beat

3. The sounds I heard on tape were mady by

   A. mechanical device
   B. my model
   C. myself

4. The person I saw (and heard) on tape demonstrated

   A. more fear than I
   B. less fear than I
   C. same as I
   D. does not apply

5. I answered Question #4 based upon _____

   _____.