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THE THERAPEUTIC EFFECTS OF FIVE TYPES OF  
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THE THERAPEUTIC EFFECTS OF FIVE TYPES OF  
MODELING ON SNAKE-PHOBIC WOMEN

by

Jon Roy Standahl

A dissertation Submitted to  
the Faculty of the Graduate School at  
The University of North Carolina at Greensboro  
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APPROVAL PAGE

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## ABSTRACT

STANDAHL, JON ROY. The Therapeutic Effects of Five Types of Modeling on Snake Phobic Women. (1972)  
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The main purpose of this experiment was to determine whether a condition in which snake phobic Ss observed models behaving initially fearfully and terminally fearlessly towards a snake would produce greater fear reduction in observers than a condition in which the models' behavior toward this snake was both initially and terminally fearless. Five groups of 21 snake-phobic female college students watched one of five "therapeutic" three-minute movies. Before and after watching the movie, each S was requested by way of audio tape to see how close she could get to a harmless live snake and to rate her fear level when she was as close to the snake as she felt she could get. In one movie three separate female models approached and handled the snake in a fearless manner; in a second movie the three models behaved fearfully toward the snake and never handled it; in a third movie the three models approached and handled the snake in a fearful manner but became fearless; in a fourth movie the three models were initially fearless but became fearful after touching the snake; in the fifth movie (the control condition) the three models engaged in non-snake-related activity. After a three-week interval, Ss who had not watched a movie in which the models were terminally fearless of the snake were shown one of the

two such movies and again requested to approach the snake. The extent to which the models accurately portrayed the intended conditions was determined both by the phobic Ss and by independent movie raters.

Prior to watching the movies, none of the groups significantly differed from the others on any measures. Immediately after watching the movies, Ss in all conditions except those that watched the films in which models were fearful throughout significantly increased their approach to the snake. Although the Ss in the experimental condition tended to increase their reported fear level at this approach point, the reported fear level decreased on follow-up even though the approach tended to increase. The group that had seen the models becoming less fearful was the only significantly superior group on approach. The two groups that had previously seen the models acting terminally fearfully generally performed the worst on most measures of fear reduction. However, these groups significantly increased their approach to the snake after watching either movie where the models were terminally fearless; while Ss who had previously seen the control condition did not improve. Lack of improvement in the control group after exposure to the second movie was interpreted as reflecting the high level of prior performance. The improvement in the

other groups was interpreted as reflecting the beneficial effect of seeing models undergoing extinction. These findings support the hypothesis that one reason gradual presentation of phobic objects in vicarious extinction is desirable is that Ss interpret the models' behavior as undergoing extinction.



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## INTRODUCTION

There are four main characteristics often found in people who suffer from phobias or "irrational" fears. The first is the presence of physiological correlates of arousal. The second is the person's labeling these correlates as unpleasant or designating himself as being anxious. The third is the person's avoidance of the feared object or situation. The fourth is the disorganized and ineffective behavior which occurs when the person cannot avoid the object or situation.

Various causes of phobias have been identified. The physiological correlates of arousal and the disorganized and ineffective behavior may be classically conditioned to the stimulus through the direct temporal conjunction with an aversive experience (Watson & Rayner, 1920). A person can also develop a phobia by witnessing others either responding fearfully toward, or being hurt by, certain phobic objects (Bandura, Blanchard, & Ritter, 1968; Kanfer, 1965; Bandura & Menlove, 1968; Bandura & Rosenthal, 1966; Bandura, 1965; Berger, 1962). In both cases avoidance and disorganized behavior may also be reinforced by the acceptance and sympathy of others. Also, a person may behave in a disorganized and ineffective manner in the presence of some situation and appear phobic, not because of any actual or

vicarious experiences with the object, but because he has not learned the necessary skills to behave appropriately. Similarly, some people have learned to avoid situations for which they do not have the requisite skills and therefore appear afraid of the situation or object (Ullmann & Krasner, 1969). Finally, as Schachter (1964) has demonstrated, fears depend partially on how a subject has been induced to label a physiologically activated state.

There are three main behavioral treatments for phobias. The first approach has been most commonly called desensitization. It involves the gradual substitution of a more desired response to a stimulus that is incompatible with the phobic response to the stimulus. The first systematic application of this method was reported by Jones (1924) in the treatment of a boy who exhibited severe phobic reactions to furry animals. The treatment consisted of feeding the boy in the presence of a caged rabbit which was brought nearer the boy with each meal. Presumably, the pleasant feelings elicited by the food were incompatible with the fear elicited by the rabbit, and the gradual presentation of the rabbit assured that the food experiences were always stronger and therefore conditioned to the rabbit. During the final stages of the treatment, the rabbit was placed on the table and even in the boy's lap. Today such treatment, using real objects, is called "in vivo desensitization" (Freeman & Kendrick, 1960).

During the last decade Wolpe's (1952) version of desensitization has stimulated a great deal of research (Krasner, 1971). His variation is based on Jacobson's (1938) hypothesis that a state of muscle relaxation is incompatible with anxiety. Wolpe teaches his subjects to relax their muscles and, while calm, to visualize situations beginning with the least aversive or anxiety-arousing and gradually progressing towards the most aversive or anxiety-arousing. When the subject becomes the least bit tense, he immediately signals the therapist, stops the image, and returns to relaxing. Paul (1966) developed a relaxation procedure that can be taught in half an hour. Rachman (1966) demonstrated that generalization to the extratherapy situation parallels progress on the visualized hierarchy.

Desensitization has been called "counter-conditioning" because of the emphasis on replacing the anxiety response with another response and not allowing the phobic response to occur. Thus, although other explanations of desensitization have attributed the change to habituation (Lader & Mathews, 1968), to operant conditioning (Leitenberg, et al, 1969), and altered attribution (Valins & Ray, 1967), the emphasis is usually on substituting a new response and not extinguishing the old one.



In a critical review of all available controlled studies of desensitization, Paul (1969) concluded that "the findings were overwhelmingly positive, and for the first time in the history of psychological treatments, a specific therapeutic package reliably produced measurable benefits for clients across a broad range of distressing problems in which anxiety was of fundamental importance." Two obvious limitations are that the success of desensitization logically depends on the subject's ability to produce "good mental images" of the scenes presented to him (Wolpe & Lazarus, 1966) and his ability to learn to relax. Another limitation might be that visualization is not always sufficient to teach the requisite skills a person may need to behave appropriately.

A second approach is called implosion therapy (Stampfl & Levis, 1967, 1968) and is based on simple extinction. With this technique only the most frightening scenes are presented, and it is assumed that with repetition the anxiety response will extinguish. For example, Hogan and Kirchmer (1967) had rat-phobic coeds imagine themselves having a rat nibble at their fingers, biting them viciously in the neck, devouring their eyes, etc. Although with implosion there is a progression from "low" to "high" anxiety provoking cues, as with desensitization, the "lows" in implosion therapy would actually constitute the "highs" in a Wolpe-type anxiety hierarchy. Recently D'Zurilla (1969) has

modified the technique and utilizes a more systematic and gradual progression from very low to high anxiety cues. Both techniques, however, require the subjects to continue to imagine the anxiety-producing scenes until their anxiety becomes extinguished. Thus, in contrast to desensitization, where subjects are instructed to stop the image when they become the least bit tense, implosion therapy instructs the subject to feel the anxiety as fully and as realistically as possible.

The research in implosive therapy has been impressive and is growing rapidly (Kotilia, 1969; Frazio, 1970; Dee, 1970; Jacobson, 1970; Prochaska, 1971). As with Wolpe's method, implosion is dependent on the subject's ability to visualize scenes (D'Zurilla, 1969). This limitation is compounded by the fact that due to the aversive characteristics of the scenes, even subjects who are capable of visualizing vividly may not do so. Another limitation is that implosion is even less likely than desensitization to teach the subject any necessary skills to behave appropriately. One possible advantage of implosion over desensitization, however, is the fact that subjects do not have to be taught to relax.

A third method has been called vicarious extinction (Bandura, 1969) and entails the reduction of fear in an observer after observing a fearless model performing what is for the observer a fear-provoking behavior. The method is

called "vicarious extinction" because the observer is repeatedly shown that an anticipated aversive consequence does not occur following a performance he regards as hazardous. Jones (1924) was also the first to apply this method systematically, by having phobic children observe their peers behave in a nonanxious manner in the presence of the avoided object. Masserman (1943) demonstrated the method with cats which had been made to avoid food. Bandura, Grusec, and Menlove (1967) produced highly stable and generalized vicarious extinction in dog-phobic children by having them observe a fearless peer model exhibit what were for the observers progressively more fear-provoking interactions. Bandura and Menlove (1968) found that "symbolic models" (movies of models) were also effective in removing dog phobias in children, but not as effective as live models. This study also found that multiple models (several different girls and boys of varying ages interacting positively with several dogs) were superior to a single model and that "symbolic" multiple models were as effective as single live models in terms of continued improvement in approach behavior and terminal performances. Bandura, Blanchard, and Ritter (1968) found that vicarious extinction was superior to systematic desensitization in reducing snake phobia when live models were used but not significantly superior when "symbolic" models were used.

Modeling research has demonstrated that learning can occur vicariously through observation of other persons' behavior (Bandura, 1965; Bandura & Walters, 1963). Thus, operationally, "standard" vicarious extinction is the same as vicarious learning in that both teach terminal behaviors through modeling. It follows that one similarity between vicarious extinction and desensitization is that both teach an incompatible response, relaxation instead of anxiety in the case of desensitization and an approaching and picking up a snake (for example) instead of avoiding the snake in the case of vicarious extinction. A second similarity is that both methods use stimulus graduation, i.e., those situations which are of low arousal value are presented first, and the most threatening last. In desensitization, however, the reason for this graduation is to prevent the subject from experiencing anxiety, whereas in vicarious extinction the reason is to prevent the subject from making an avoidance response such as closing his eyes or looking away, which would impede observation. However, vicarious extinction does have an advantage over desensitization in that the scenes are presented more vividly and realistically through modeling rather than imagery.

In the preceding paragraph it was noted that "standard" vicarious extinction is operationally the same as vicarious learning. Consider, for example, a case in which

a person reports that he has no fear with respect to snakes but refuses to pick up a snake because he does not know how to do so without frightening the snake. In such a case vicarious learning procedure could be used to teach the person how to pick up the snake. Such a procedure would consist of having him observe a model pick up the snake. It should be apparent that this vicarious learning procedure is the same as standard vicarious extinction procedure given a snake phobic subject. It is proposed, therefore, that a procedure in which the phobic subject observes a model becoming less fearful towards the phobic object, i.e. watches the model go through extinction, comes closer to what should be meant by vicarious extinction and is called here "true" vicarious extinction. In other words if subjects in a vicarious learning situation observe a model performing behaviors to be learned by the observers, then subjects in true vicarious extinction should observe a model extinguishing behavior to be extinguished by the observers.

True vicarious extinction has several of the advantages of standard vicarious extinction. First, both employ real versus imagined stimulus presentations. Secondly, both teach the terminal behavior. Finally, in both treatments the observer is repeatedly shown that the frightening terminal event does not have fearful consequences. In addition, there are several reasons why true vicarious extinction should be superior to standard vicarious extinction.

First, people can recognize their behavioral deficits from watching video feed-back of their behavior and subsequently improve on their behavior (Bernal, 1969). To the extent that the model's behavior is similar to the observers', this might also occur in the model observers. Geer and Turteltaub (1967) support this view and provide some additional evidence that true vicarious extinction might be superior to standard vicarious extinction. They reported that two observers who were shown a fearful model showed much less fear on a second behavioral test. When questioned, these two subjects reported that the models had made them realize how "silly" their fears were. A third reason to hypothesize that true vicarious extinction should be superior to standard vicarious extinction is that observers more readily imitate characteristics which they believe are similar to their own. (Burnstein, Stolland, & Zander, 1961; Stolland & Dunn, 1963.) It might be supposed that a model who will be judged by the observers as most similar to himself is the one who, like the observer, is initially afraid of the phobic object. In this connection, it may be that the gradual presentation of the approach response is more effective, not because the observer is less likely to make an avoidance response such as looking away, but rather because the observer is more likely to judge the model as initially fearful and thus more like himself.

A final reason for supposing that true vicarious extinction is superior to standard vicarious extinction is that true vicarious extinction uses, vicariously, some of the techniques of implosion. In true vicarious extinction, for example, the subject is allowed to feel the fears just as in implosion. With true vicarious extinction the extinction of these fears, however, may be speeded up through modeling.

The superiority of true vicarious extinction over regular vicarious extinction is by no means certain. After reviewing the literature on psychotherapy based upon modeling, Bandura (1971) concludes: "It remains an open question whether observation of fearful models undergoing change is more or less effective than an equivalent amount of exposure to bold behavior by dauntless models." Bandura argues that the degree of model similarity has been assigned too prominent a role. He notes that although subjects with high similarity to a model are significantly more affected by the model's performance than subjects with low similarity, these subjects do not significantly differ from control subjects in which no attempt is made to induce similarity to the model. In addition, Bandura thinks that in view of the demonstrations that negative affective expressions by others elicit fear and avoidance behavior in observers, fearful modes of presentation may retard the rate of vicarious extinction by arousing high levels of fear.

### Statement of the Problem

When the initially and terminally modeled behavior can show either low fear (low) or high fear (high), then a high-fear/low-fear (high-low) condition (the model shows initially high fear and terminally low fear) represents true vicarious extinction, and a low-fear/low-fear (low-low) condition represents standard vicarious extinction. The two remaining possibilities are high-fear/high-fear (high-high), a condition investigated by Geer and Turteltaub (1967), and low-fear/high-fear (low-high), a condition which has been shown to produce fear in observers (Bandura, Blanchard & Ritter, 1968; Bandura & Menlove, 1968). In the present study these four conditions, along with a control modeling condition, were compared as to their effect on snake-phobic college students. Snake phobia has often been used in phobic experimentation (Lang, Lazovik & Reynolds, 1965; Davison, 1968; Geer & Turteltaub, 1967; Bandura, Blanchard & Ritter, 1968) because a large number of snake-fearing people can be found in a college population. In addition, there is some ethical justification for placing some snake-phobic subjects in a control (no treatment) group since it is unlikely that this fear would interfere with a person's normal functioning (Ullman & Krasner, 1969). Multiple models were used in order to maximize the effect of the various conditions (Bandura & Menlove, 1968). The models were



filmed in order to control the reliability of the models' performances.

The predictions for this study were that the high-low condition and the low-low condition would be the two most effective conditions, followed by the control, the high-high, and the low-high condition in that order. Geer and Turteltaub (1967) did not find the high-high condition to be inferior to their control condition. Their experiment, however, may have been influenced by the fact that the experimenter touched the snake "to demonstrate that the snake was alive and not dangerous" prior to the modeling condition. Although several reasons were given by Bandura for not expecting high-low to be superior to the low-low, most of the arguments support the opposite conclusion and, therefore, the primary intent of this study was to show that high-low is superior to low-low.

An important difference in the present study from most previous studies was in the control condition. In most previous studies, the control condition consisted of exposure of subjects to the phobic object for the same length of time as the experimental subjects. Under such conditions control subjects improved slightly but not significantly. However, in view of recent research demonstrating the large extent to which the wording of instructions can alter subjects behaviors, the present experiment attempted to equate for

expectancies by giving the control subjects identical instructions and suggesting that they, too, were watching a therapeutic movie. It was therefore expected that the control subjects would also show some improvement after watching their "therapeutic movie."

## METHOD

### Subjects

The experimental Ss were 105 female college students who indicated that they felt "much afraid", "very much afraid", or "terror" with respect to snakes. Their fear level was determined by a Modified Fear Survey which was distributed to the introductory psychology classes. The Fear Survey Schedule (Walk, 1956) is composed of a seven-point rating scale for 50 common fears. One item on this schedule (#38) deals specifically with the fear of snakes. On the Modified Fear Survey Schedule, #38 and five other items dealing with fears of small animals were retained (see Appendix A-1). The reason for the shorter form was to require less classroom time. The names of the Ss who showed sufficient fear to qualify for the experiment were posted on an experimental sign-up sheet. Volunteers were aware only of the facts that the experiment involved behavior modification, and called for a 30-minute initial session and a 10-minute follow-up after the Christmas holidays.

There were also 50 "movie raters." Twenty-three of these raters were female students in introductory psychology whose fear level was too low to qualify them for the snake-phobia experiment. The 27 additional raters were 7 female and 20 male students solicited from a dormitory. In general,

then, the fear level of the raters was lower with respect to snakes than that of Ss in the snake-phobia experiment itself.

### Beginning Instructions

The initial experiment was performed during the two weeks prior to the Christmas holidays and took each S about 25 minutes. The experimenter greeted each S at the door outside the experimental room; showed her to her chair (see Figure 1); and said, "Now, in order not to bias the experiment, I will give all your instructions by way of a tape recorder. However, I will still be able to watch you from behind the curtain." Then E went to the observation room from which all remaining instructions were given.

### Pretreatment Assessment of Avoidance Behavior

The first phase of the experiment utilized a Behavior Avoidance Test. The Behavior Avoidance Test (see Appendix 2) consisted of a series of 21 ascending graded approach steps ranging from Step 0, "Will not leave the chair," to Step 14, "Have put gloved hand into the cage but have not touched the snake," to Step 20, "Have held snake close to chest with bare hands for 15 seconds." In most previous studies (Lang & Lazovik, 1963; Lang, Lazovik, & Reynolds, 1965), the E assisted the Ss in a behavior avoidance test by demonstrating the steps. Since this

procedure would be influenced by modeling effects, a modified procedure introduced by Mealiea and Nawas (1970) was utilized. In the modified procedure the instructions are pre-recorded on audio tape and presented to the Ss in a room next to the avoidance-test room. Briefly, the tape recording (see Appendix B-1) stated that a harmless snake (a five-foot black snake, Elophe Obsoleta) was located in a latched cage in the next room and that S was to take a list of the 21 Behavior Avoidance Test steps into the testing room and check her closest approach point. In order to help each S determine how close she came to the snake, masking tape was placed at two-foot intervals, marking the distance from the entrance of the room to the cage.

At the bottom of the same sheet which contained the Behavior Avoidance Test items was a Fear Thermometer. The Fear Thermometer was a ten-point self-rating scale of anxiety on which each S was instructed to rate the degree of fear she felt when she had reached her closest approach to the snake. E observed the Ss through one-way, see-through curtains as an independent check of the Ss' testimony on the Behavior Avoidance Test. The curtains were unbleached muslin which could be seen through only from E's side because the snake side of the curtain was more brightly lit. Four Ss who were able to reach

Step 15 ("Have touched the snake with gloved hand") were excluded from this study for displaying insufficient fear.

#### Treatment Conditions

Ss volunteered for a time convenient for them. They were assigned randomly to treatment groups with the stipulation that each group had to contain an equal number of "much," "very much" and "terror" responses on the Modified Fear Survey Schedule.

Each group saw three female actress models (two White and one Black) perform for about 70 sec. each. The models' performances were filmed on regular 8mm color movie film. The movie was filmed at another location from ten feet behind and ten feet to the right of the snake cage, however, the same cage and curtains were used in the film as in the experiment. The first two models were senior drama majors, and the third model had acted in high school. Each film except the control showed the snake and snake cage for about four sec. and then focused on the models, who were initially at the entrance of the room. Each model's performance was separated from that of the next by ten sec. of unexposed film.

The cage was made of clear plexiglass and was 42" x 18" x 18". The top was made of pegboard. In the experiment there was a brick on each front lid of the cage that was absent in the film.

The low-low group saw the three models fearlessly performing the Behavior Avoidance Test and constituted the standard vicarious extinction condition. Models walked smilingly and unhesitantly up to the cage, unlatched the cage, picked up the snake, allowed it to crawl around their shoulders and held it near their face and chest.

The high-low group saw the same three models approach fearfully and fearfully pick up the snake and then interact more and more fearlessly with the snake. In this segment, the models were more hesitant and jerky in their approach, showed a more fearful expression, and initially used gloves to touch the snake. The approach time (about 20 sec.) and the terminal behaviors modeled were virtually identical to the low-low condition. The high-low group thus constituted the true vicarious extinction condition.

The high-high group saw the three models fearfully performing the Behavior Avoidance Test items, stopping before Item #8, where they remained during that time interval when they were approaching and handling the snake in the low-low and high-low conditions. This was a partial replication of the conditions of Geer and Turteltaub's (1967) study.

The low-high group saw the three models approach the snake as in the low-low condition, but after having touched the snake, the models jumped back as if having

been bitten and retreated in a fearful manner during the time interval they were handling the snake in the low-low and low-high condition. The control group saw the three models reading a book, a paper and a magazine.

Prior to seeing the movies and before the lights were turned off, each S was told (see Appendix B-2) that she was going to be shown a short therapeutic movie during which she was to call out any letters that appeared on the screen. The movies for each group contained 10 letters, four during the first model's performance, and three each during the second and third models' performances. In all the films the first letter appeared seven sec. after the film began. Three remaining letters appeared near the beginning, near the middle and near the end of each model's performance (see Table 1). The letters were made of black electrical tape, filmed against a white background and superimposed over the "therapeutic" movies in corresponding positions for each group. Each letter was centered in the middle of the screen, covered about two thirds of the screen, and could be seen for .5 sec. The purpose of displaying the letters was to determine whether each S was watching the movie closely.

After watching the movie, each S was told (see Appendix B-3) to see again how close she could get to the snake and to rate her fear level at her closest approach



point. Then after returning to her chair, she was asked to rate each of the three models on a 10-point scale as to the fear level of the models' initial and terminal behaviors (see Appendix B-4). Each S was told not to discuss the experiment with anyone and to return for a follow-up.

#### Follow-up Assessment of Avoidance Behavior

The follow-up phase of the experiment was conducted during the first week after the Christmas holidays. For the most part, Ss returned on the same day of the week and at the same time of day as for their initial trials. The follow-up was two and a half to three weeks after the initial treatment. Each S was asked to fill out another Modified Fear Survey Schedule and then via tape recordings was told (see Appendix B-5) that the purpose of the follow-up was to determine the effect of time on the therapy they had received. Each was again requested to carry out the Behavior Avoidance Test and Fear Thermometer instructions.

#### Post Follow-up

Ss who were in control, high-high, and low-high groups and who had not reached Step 15 on the Behavior Avoidance Test were told (see Appendix B-6) that the therapeutic movie which they had seen was designed to have a weak or negative therapeutic effect and for ethical

reasons they would now be shown the film which was designed to have a large and beneficial effect. Then they were shown the film which was seen by either low-low or high-low groups and again asked to perform the approach and rate their fear at this approach point. The films were alternated first high-low, then low-low through each day's experimentation.

### Movie Ratings

The extent to which the movies reflected the conditions of the experiment was determined by five groups of 10 raters. Each group of raters observed one of the experimental film segments. The raters were told that the movies showed three subjects who were going to approach a live, harmless snake. The raters' first task was to check the fear level of the models on a seven-point scale (see Appendix A-3) every 12 sec. (when the film was interrupted). Next the film was reshown and the raters rated the fear of each model again, this time with a circle. On this second showing, however, the film was stopped to be rated each time a letter appeared. The film was then shown a third time during which the raters were told to write down any letters that appeared and to guess at the letters if they were not sure what they were.

## RESULTS

### Movie Ratings

Figure 2 shows the models' average fear ratings given by each group of movie raters at each 12 sec. interval. The fear level for the low-low condition begins at the level of the control and low-high condition (in the "none" to "very little" fear range), appears to rise as the model approaches the snake (at about 24 sec.), and then subsides. The curve of the high-low conditions is similar to an extinction curve, beginning at the level of the high-high condition ("a little" to "some" fear range) and terminating near the low-low condition ("very little" fear). The low-high curve jumps markedly (from "no fear" to "terror" range) but then declines considerably (to "some" fear) even though the models were trying to portray extreme terror. The high-high curve appears to show the models becoming progressively more fearful. The curve for the control condition has a slight rise but stays within the "very little" to "little" fear range. These findings held true for each individual's modeling performance as well (see Table 2).

A Kruskal-Wallis one-way analysis of variance (Siegel, 1956) reveals a significant treatment difference for phobic Ss' ratings of the models' initial fear level ( $H=74.39, p<.01, df=4$ ). Mann-Whitney U tests on these initial ratings (see Table 3) reveal no significant differences between the low-low, low-high, and control groups, whereas the high-low group rated these models significantly more fearful than these. The high-high group rated the models significantly more fearful than all other groups.

A Kruskal-Wallis one-way analysis of variance on phobic Ss' ratings of the models' terminal fear level also reveals a significant treatment difference ( $H=58.13, p<.01, df=4$ ). Mann-Whitney U tests on these terminal ratings (see Table 4) reveals that the low-low group's ratings were significantly less fearful than all other groups' and that the low-high group's ratings were significantly more fearful than all other groups. The high-low and control groups' ratings were not significantly different from each other, but both were significantly less fearful than those of the high-high group.

Wilcoxon matched-pairs signed-rank tests (Siegel, 1956) reveals that all groups except the control rated the models' terminal fear level significantly different from

the models' initial fear level (see Table 5). The low-low and high-low groups both rated the models significantly more fearful initially than terminally; while the reverse was true for both the high-high and low-high groups' ratings.

### Pretreatment Performances

The raw data for the high-low, low-low, control, high-high and low-high groups, together with the means, are given in Appendix C-1, C-2, C-3, C-4, and C-5 respectively. The Ss were matched for their initial Modified Fear Survey Schedule responses on the snake item. There were nine "terror" ratings, seven "very much" ratings, and five "much" ratings in each group. The mean ranks for the low-low, high-low, control, high-high, and low-high groups' Behavior Avoidance Tests were 49.7, 54.1, 57.0, 55.2 and 48.9 respectively. A Kruskal-Wallis one-way analysis of variance on these scores was not significant ( $H=.75, p>.05, df=4$ ). The mean ranks for the low-low, high-low, control, high-high and low-high groups' Fear Thermometer scores were 56.5, 50.5, 48.1, 53.7 and 53.7 respectively. A Kruskal-Wallis one-way analysis of variance on these scores was not significant ( $H=.61, p>.05, df=4$ ).

### Treatment Effects

Wilcoxon matched-pairs signed-rank tests (see Table 6) reveal that all groups except the high-high group significantly increased their Behavior Avoidance Test scores immediately after seeing their respective movie. A Kruskal-Wallis one-way analysis of variance on these increases reveals a significant treatment difference ( $H=14.30, p<.01, df=4$ ). Separate Mann-Whitney U tests (see Table 7) show that the high-low group's increased scores were greater than all other groups' and that all these differences were significant except for the low-low group. The low-low, high-high, control, and low-high groups, however, did not significantly differ from one another. The increase in Behavior Avoidance test scores, immediately after seeing the films, tended to produce increased Fear Thermometer scores in all but the control group. Separate Wilcoxon matched pairs signed-rank tests, however, reveal that none of these changes were significant (see Table 8).

On follow-up all groups further increased their Behavior Avoidance Test scores. Separate Wilcoxon matched-pairs signed-rank tests, however, revealed that none of these changes reached significance (see Table 10).

The number of Ss in each group who had touched the snake and had also improved at least two steps by the second and third Behavior Avoidance Test is given in Table

11. Twice as many Ss in the high-low group had touched the snake by the second or third approach than in any other group. For both the second and third approaches respectively, however, the only significant differences were between the high-low and the high-high groups ( $\chi^2=5.11, p<.05, df=1$ ,  $\chi^2=8.40, p<.01, df=1$ ).

On the second Modified Fear Survey Schedule all groups tended to decrease their fear ratings of snakes. The Wilcoxon matched-pairs signed-rank tests (see Table 12) shows that these decreases were significant only for the high-low and low-low groups. A Kruskal-Wallis one-way analysis of variance on these changes reveals that there was a significant difference among groups ( $H=17.12, p<.01, df=4$ ). Mann-Whitney U tests revealed that this difference resulted from the superiority of both the high-low and low-low groups to the low-high group ( $z=2.04, p<.02, df=20$ ;  $z=2.14, p<.01, df=20$ ).

Omitting the snake item on the Modified Fear Survey Schedule, changes in the number of fear steps can be interpreted as "symptom substitution" or generalization of therapy depending on the direction of the change. All groups tended to decrease their fear of non-snake-related items and, thus, to generalize their reduced fear of snakes. Separate Wilcoxon matched-pairs signed-rank tests (see Table 13) reveal that these decreases were significant

only for the high-low and control groups, although the low-low group approached significance at the .05 level ( $p < .06$ ). A Kruskal-Wallis one-way analysis of variance, however, reveals that the differences between groups was not significant, ( $H = 4.47, p > .05, df = 4$ ).

The significant Spearman rank correlation coefficients between: 1) the number of letters seen, 2) the difference between the terminal and initial movie ratings, 3) the second, and 4) third increase in Behavior Avoidance Test scores over the initial scores, 5) the increase in second and 6) third Fear Thermometer scores over initial scores, 7) the reduction in non-snake-related fear steps on the Modified Fear Survey Schedule, and 8) the reduction in snake fear on the Modified Fear Survey Schedule are shown in Table 14. These correlation coefficients must be interpreted cautiously in view of the fact that out of the 140 correlations performed, about seven will be significant by chance at the .05 level. It is, therefore, desirable to look for trends across treatments. Several trends which might have been expected were the significant correlations between the second and third Behavior Avoidance Tests, the second and third Fear Thermometer, and the Modified Fear Survey Schedule ratings of snake fear with the remaining items. One other interesting trend was the finding of a significant correlation in both the high-high and low-high condition between perceived increase in the models' fear



and these Ss' Modified Fear Survey Schedule. For both groups there was a positive correlation between the extent to which models were perceived as becoming more fearful and higher fear ratings on the snake item of the Modified Fear Survey Schedule.

Table 15 reveals that a significant difference exists between groups in the number of letters seen ( $F=20.49, p<.01, df=4, 100$ ). A Newman-Keuls Analysis (see Table 16) shows that all these groups differed significantly except the low-low and high-high groups. In order of increasing difficulty, letter detection went from control, low-high, low-low, high-high, to high-low group.

Table 17 shows the percentage of phobic subjects in each group who detected each letter. Guesses were counted as letter detections if it was judged that the guess was in response to a letter. For example, if A (the first letter) and N (the third letter) were detected correctly and there was a guess between, this guess was counted as detection of the second letter. The most common errors that were counted as letter detections were E for R; H, E, and T for O; F for P; A for K; and Y for J. Table 18 shows the fear level and detection percentage associated with each letter by each group of movie raters. Under the best conditions for detectability (relatively fearless observers who had seen

the movie three times), every group except those rating the high-low film detected nearly 100% of the letters. Also, there seems to be no relationship between the fear level of the model's behavior at the time of the appearance of the letter (Table 18) and the detectability of the letters by the phobic Ss (Table 17).

### Post Follow-up Effects

Wilcoxon matched-pairs signed-rank tests reveal that Ss in both the high-low and low-low conditions significantly increased their Behavior Avoidance Test score after the post follow-up ( $T=1, N=14, p<.01$ ;  $T=0, N=11, p<.01$ ). Five Ss in the high-low condition and four in the low-low condition touched the snake for the first time. A Kruskal-Wallis one-way analysis of variance reveals no significant differences between the low-low and high-low groups' improvement on the Behavior Avoidance Test ( $H=.01, p>.05, df=1$ ).

Wilcoxon matched-pairs signed-rank tests revealed that Ss who had been in the high-high or low-high condition significantly increased their respective Behavior Avoidance Test scores ( $T=0, N=13, p<.01$ ;  $T=0, N=7, p<.02$ ), whereas those who had been in the control condition did not ( $T=2.5, N=6, p>.05$ ). Whereas five Ss in the high-high group and four in the low-high group touched the snake during post follow-

up, no one who had been in the control group touched the snake. A Kruskal-Wallis one-way analysis of variance on the effect of previous treatment on the post follow-up Behavior Avoidance Test scores, approaches but does not quite reach significance at the .05 level ( $H=5.74, p<.06, df=2$ ). In any case, the mean improvement was in the direction from the control group being the worst to high-high, to low-high.

## DISCUSSION

### Movie Ratings

With only a few exceptions the phobic Ss saw the films as they were intended to be seen. The low-low, low-high and control groups did not differ in how they rated the fear level of the models' initial performances and the high-low and high-high groups rated the models significantly more fearful. Although the phobic Ss in the high-high group did rate the initial modeling performances significantly more fearful than those in the high-low condition, the results of the movie raters (see Figure 2) suggest that the first 12 sec. of the performances in both groups were equal. It seems the phobic Ss interpreted rating the "beginning" performance as rating a portion of the film extending for longer than the first 12 sec. of the film. It is possible, nevertheless, that the phobic Ss actually did see the initial performance of the high-high models as more fearful than the high-low models. This study did not try to determine this possibility, and the logic of the experimentation does not depend on it.

The phobic Ss rated the terminal high-low performances of the models as equal to the terminal performances observed by the control group. Surprisingly enough, the

low-low models' terminal performances were rated significantly less fearful than the performances observed by all other groups. The phobic Ss rated the models in the high-high and low-high films as significantly more fearful than the models in all the other films with the low-high models slightly but significantly more fearful than the high-high models. The movie raters, however, rated the terminal performances for the low-high models as less fearful than the high-high models. Again the discrepancies between the ratings of the movie raters and the phobic Ss might be explained by a liberal interpretation of "beginning" and "end" of the movie by the phobic Ss. It seems likely that the movie raters' ratings would also be replicated by more fearful Ss under the movie raters' condition.

In summary, the models in the low-low condition appear to be slightly more fearful to the movie raters as they approach the snake, but then become less fearful toward the end of the movie. This result corresponds to the phobic Ss' ratings of the low-low models as significantly less fearful terminally than initially. The Ss in the high-low condition start judging the models to be as fearful as the models observed by Ss in the high-high condition but then judge the models' fear level gradually to approach the fear level of the models observed by the control

group. The high-high models are seen as continually increasing their fear responses, whereas the low-high models' fear starts out at the level of the low-low group, abruptly increases, and then undergoes considerable extinction. Thus, both the movie raters and the phobic Ss rated the models' initial and terminal fear level (high or low) as these were intended to be seen.

Letter detection by the movie raters provides some evidence that the letters in the high-low film may have been less detectable than in the other films. These ratings, however, provide no evidence that letter detection differed among the other films. In the control film and the high-high film, there was very little model movement. Although this may account for the high numbers of letter detections of the phobic Ss in the control group, it does not explain the relatively low number of detections by the high-high group. The model movement and background for the high-low and low-low films, moreover, were virtually identical although there was a considerable difference in the number of letters detected by those groups. The fact that the group which saw the fewest letters performed the best on the modified Behavior Avoidance Test seems to indicate that avoidance behaviors, i.e., not watching the movie, was not a probable explanation for the low number of letter detections. Additional support is found in the

fact that the models' fear level at the appearance of the letters was also not a factor. Thus, although it is possible that the letters differed absolutely on a detectability scale, it is more likely that there were some other factors, such as attention or interest, which accounted for the differences in the number of letters detected.

### Behavioral Measures

Behavioral measures (approach responses) are usually the major concern in experiments on vicarious extinction. Although the behaviors of control Ss are often reported to improve from the pre-test to post-test to follow-up, these improvements have almost always been non-significant. In the present study, all groups increased their approach scores on post-tests. This increase can partially be explained by the expectancies of the Ss and the demand characteristics of the experiment. The Ss were all told that they were receiving a therapeutic treatment and told to see how close they could get to the snake. In addition, many Ss reported that they thought the letters in the experiment had something to do with the "supposed" therapeutic effect. All this probably served to increase the Ss' approach to the

snake. Hence, since Ss in all the groups experienced these expectancies and all experimental conditions had roughly the same demand characteristics, the effects of these factors have been eliminated from the therapeutic effects. Thus, all conditions were compared under the assumption that expectancy factors were equal. Although the control condition in this experiment may not be the best procedure for purely theoretical research, for clinical research it may be best to try to equate for expectancies.

The high-low group was superior to all other groups with respect to increased approach to the snake. This superiority was significant for all groups except the low-low group. None of the other groups differed significantly although the low-low group approached significance at the .05 level over the high-high group. The results on the number of Ss who actually touched the snake demonstrates also the superiority of the high-low condition and inferiority of the high-high condition in generating approaches to the snake. Over twice as many Ss touched the snake in the high-low condition as in any other condition and four times as many Ss touched the snake in the other conditions as in the high-high condition.

One very surprising finding was that the third best group with respect to snake approach was the low-high



group, a group predicted to be the worst. Several factors may have caused this finding. First, this condition provided models for approach behavior not seen by the control and high-high groups--walking up to the snake and opening the cage. Bandura and Walters (1963) have shown that straight modeling is sufficient for learning to occur and that the consequence of the modeled behavior (in this case being bitten by the snake), serves only to facilitate or inhibit similar subsequent behavior by the observer. If the experimental Ss realized that the snake was harmless or could not hurt them as long as they did not touch it, the inhibitory aspect of the film would be reduced and one might expect an increased snake approach. In this connection it was informally noticed by the E that several Ss in the low-high condition imitated the models almost exactly. One S touched the snake, jumped back, and slammed the lid of the cage just as the models had done. Other Ss in this group including the previous S yelled, cried, and verbalized their fear and behaved as though they were being forced to open the cage. These kinds of behaviors were not present in any other condition. It seems likely, therefore, that one of the reasons for the low-high group's increased snake approach was that they tended to imitate the models.

Another reason why the low-high group increased their snake approach may be that the condition is, vicariously, very similar to implosion. In implosion, for example, the S is asked to imagine the most fear-provoking images such as being bitten by a snake. In the low-high condition, on the other hand, these images are presented to the S. In addition to being similar to implosion, however, the low-high condition might also incorporate another advantage of true vicarious extinction--the modeled extinction of fear. Figure 2 and Table 1, for example, both show that the models' initial increase in fear subsided considerably over time.

It should not be concluded from the above result that people do not acquire fears vicariously. One S in the control group dropped seven points on her follow-up approach and refused to leave her chair. When the experiment was completed she explained her increased fear as having resulted from seeing a commercial movie in which a man was bitten repeatedly by a rattlesnake. Furthermore, the low-high group had the most Ss (three) to actually decrease their snake approach immediately after seeing the treatment phase. The high-high condition produced the second largest number of Ss (two),

to decrease their approach score, and this condition also showed models more fearful terminally than initially. The control condition and the low-low condition both produced one S who decreased in approach, while the high-low condition produced none. It seems, therefore, that seeing a model become more fearful can produce or increase phobic behavior, especially in a non-therapeutic situation.

The relatively poor approach performance shown by the high-high group can be explained in a manner consistent with what has been said about the low-high condition. First of all the models in the high-high condition performed no approach behavior that had not, for the most part, already been achieved by the high-high Ss on their initial approach. Secondly, the models in the high-high condition were perceived as continuing to increase their fear level. Thus, the high-high group, in contrast to the low-high group, did not receive this aspect of true vicarious extinction.

Although the high-high group was the only one which did not significantly increase their snake approach, eight Ss did. When asked why they had gotten closer to the snake many of them said they realized how silly they looked or said that they felt they could do better than the model. As mentioned in the introduction, these were

also the explanations given to Geer and Turteltaub (1967) by their high-high Ss. An interesting question is: if eight Ss in the high-high group improved because they felt challenged by the models or were given beneficial feedback, why didn't the Ss do better than the control group which got neither? One possible explanation is that the beneficial effects produced by the models in the high-high group was more than offset by a decrease in expectancy for most of the Ss. This interpretation raises the possibility that none of the groups were equated for expectancy. For example the Ss in the low-high condition may have been led to think that the E expected them to imitate the model up to but not including touching the snake. Ss in the high-high condition may have been led to think that they had already performed as well as the E expected. It is quite likely that in the true vicarious extinction condition most Ss thought they knew what the E expected and would be quite certain about their belief. This suggests one method for further researchers to approximately determine the Ss' expectations after the modeling and prior to approaching the snake. This method would have the Ss guess the extent to which E expects them to improve and to rate their confidence in the

guess. It is doubtful, however, if expectancy factors could ever be satisfactorily separated from therapeutic effects. Nevertheless, these factors can be quite powerful, as witnessed in the present control group, and should not be neglected.

### Subjective Measures

Ss did not change their Fear Thermometer ratings from the first to the second approach to the snake, although there was a tendency for the Fear Thermometer to be higher for all but the control group. On the follow-up, however, the Fear Thermometer scores tended to be lower than on the second approach for all but the control group even though Ss tended to increase further their approach responses. Thus, it appears that there is a slight tendency to increase fear levels initially with increased approach responses but that this increase in Ss' fear dissipates with time, whereas the behavioral approach does not. These results replicate the findings of many investigators that behavioral changes typically precede corresponding modifications in Ss' attitude (Brehm & Cohen, 1962; Cohen, 1964; Festinger, 1967).

The low-low and the high-low groups were the only groups to significantly decrease their fear of

snakes as measured by the Modified Fear Survey Schedule. These two groups, however, differed significantly only from the low-high group. Thus, in addition to being the condition in which the largest number of Ss decreased their approach the low-high condition also produced the smallest decrease in fear of snakes. Again looking at the Modified Fear Survey Schedule but excluding the snake item, the high-low group and the control group significantly lowered their fear ratings. The low-low group was almost significantly lower, but not the high-high group or the low-high group. In this connection it is interesting to note that the direction of change in the Modified Fear Survey Schedule scores minus the snake item can be viewed as "symptom substitution" or generalization, depending on the direction. With implosion research, it has been reported (Kotilia, 1969) that increased behavioral approach is often accompanied by increased temporary fear to neutral stimuli. In the present experiment, the high-high and low-high conditions are similar to implosion at a vicarious level. It is possible that if the Modified Fear Survey Schedule had been given immediately after treatment a similar increased fear response to neutral stimuli would have been found. It is also

interesting to note that for the low-high and high-high groups, there was a significant correlation between perceived increase in modeled fear and higher subjective fear ratings by the Ss on the Modified Fear Survey Schedule. It should be noted here that, although the high-low condition also shares some properties with implosion, the models' fear levels were continually decreasing in their film.

#### Post Follow-up

A failure to differentiate between the high-low and low-low conditions after the follow-up may be partially the result of the high level of responding already achieved by the Ss that had been in the other three groups. Another reason might be that Ss who had previously seen the high-high or low-high conditions and then saw the low-low condition were receiving a treatment combination very similar to high-low; so that the two conditions did not differ functionally for Ss who had been in these two previous conditions. Support for this interpretation arises from the fact that the high-high and low-high groups were the only ones that touched the snake and significantly increased their Behavior Avoidance Test scores during the post follow-up. These results support the hypothesis that true vicarious extinction is superior to regular vicarious extinction.

## CONCLUSIONS

The present study has demonstrated the strong influence of expectancies and demand characteristics in therapeutic situations. Control Ss significantly increased their approach to the snake and also significantly reduced their fear of non-snake-related Modified Fear Survey Schedule items. Even Ss administered a phobia-producing treatment (low-high) increased their approach to the snake when it was suggested that the treatment would have a therapeutic effect. In both conditions about 20% of the Ss actually touched the snake.

In general, all groups increased their approach to the snake and also tended to increase their fear levels at their closest approach point after watching their respective movies. On follow-up, however, their approaches tended to continue to increase while their fear level at this approach-point tended to decrease. These findings support the notion that covert fear reduction follows rather than precedes behavioral changes.

Showing Ss terminally fearful models tended to attenuate all measures of fear reduction. In addition, these Ss' mean fear reduction on their Modified Fear



Survey Schedule was significantly correlated with the Ss' perception of modeled increasing fear levels. Any negative effect attributed to terminally fearful models was removed, however, when these same models were later (on follow-up) shown to be fearless. In this connection, the present study reported many findings that supported the hypothesis that having phobic Ss watch models becoming less fearful toward the phobic object has a powerful therapeutic effect. Having phobic Ss watch 1) a fearful condition, 2) a fearful-fearful condition, or 3) a fearless-fearful condition seemed to facilitate the effectiveness of a later fearless condition on reducing fear. In addition Ss in the standard vicarious extinction (the second best therapeutic condition) also reported that they perceived the models' significantly reducing their fear level. These results support the hypothesis that the reason gradual presentation of the phobic situation is desirable for standard vicarious extinction is that the Ss tend to interpret this gradual approach as fear reduction on the part of the model. The letter detection findings did not, on the other hand, support the hypothesis that gradual presentation is desirable in order to inhibit avoidance responses.

## TABLES

TABLE 1

Letter Placement Times for Each Model's Movies

Models					
First		Second		Third	
Letters	Sec.	Letters	Sec.	Letters	Sec.
A	7	P	13	Z	6
R	26	X	41	H	37
N	57	K	61	V	68
O	65				

TABLE 2

Mean Fear Ratings for Each Model's Movie Over  
Six Consecutive 12-Second Intervals

Models	Treatments				
	High-Low	Low-Low	Low-High	High-High	Control
First	3.0	1.0	1.0	2.0	1.3
	1.8	1.4	1.5	4.8	1.8
	2.8	1.0	5.8	4.8	2.4
	2.5	1.6	5.4	5.3	2.3
	2.5	1.2	5.4	4.5	2.5
	1.5	1.0	4.4	5.0	2.3
Second	3.5	1.2	1.1	3.8	2.3
	4.8	2.6	1.5	4.3	2.9
	5.3	2.0	6.5	5.0	2.4
	5.0	1.6	6.6	5.5	3.3
	4.3	1.4	4.6	5.8	3.0
	3.3	1.2	4.5	5.8	2.5
Third	3.0	2.2	1.1	2.0	1.3
	2.5	3.0	1.5	4.0	1.8
	5.0	3.4	5.4	4.5	1.9
	4.5	2.7	4.4	5.3	2.6
	2.3	2.6	4.5	5.5	2.9
	1.8	2.6	4.4	5.5	3.3

TABLE 3

Z Scores for Mann-Whitney U Tests on  
Differences Between Groups<sup>1</sup>  
Initial Movie Ratings

Conditions . . . . .		Control	Low-Low	Low-High	High-Low	High-High
Ordered means . . . . .		1.93	1.95	1.98	3.68	5.67
		Control	Low-Low	Low-High	High-Low	High-High
Z scores on differences between rank means	Control		.66	.66	4.76**	5.84**
	Low-Low			.34	4.76**	5.72**
	Low-High				3.76**	5.61**
	High-Low					4.99**

\*\* $p < .01$

TABLE 4

Z Scores for Mann-Whitney U Tests on  
Differences Between Groups'  
Terminal Movie Ratings

Conditions . . . . .		Low-Low	High-Low	Control	High-High	Low-High
Ordered means . . . . .		1.32	1.75	1.92	7.10	7.75
		Low-Low	High-Low	Control	High-High	Low-High
Z scores on differences between rank means	Low-Low		1.96*	1.96*	6.03**	6.03**
	High-Low			.31	5.99**	5.99**
	Control				5.99**	5.99**
	High-High					2.41**

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

TABLE 5

Wilcoxon Matched-Pairs Signed-Rank Tests on Differences  
Between Initial and Terminal Fear Ratings  
of Models by Phobic Subjects

Conditions	<u>N</u>	<u>T</u>	<u>P</u>
High-Low	21	1	.01
Low-Low	19	10.5	.01
Control	11	36.5	NS <sup>a</sup>
High-High	21	17	.01
Low-High	21	0	.01

<sup>a</sup>Not significant at  $p < .05$ .

TABLE 6

Wilcoxon Matched-Pairs Signed-Rank Tests on  
Difference Between First and Second  
Behavior Avoidance Test Scores

Conditions	<u>N</u>	<u>T</u>	<u>P</u>
High-Low	18	0	.01
Low-Low	15	15	.01
Control	10	4	.05
High-High	10	11	NS <sup>a</sup>
Low-High	15	20	.05

<sup>a</sup>Not significant at  $p < .05$ .



TABLE 7

Z Scores for Mann-Whitney U Tests for Differences  
Between Groups' Increases on the Second  
Behavior Avoidance Test

Conditions . . . . .		High-Low	Low-Low	Low-High	Control	High-High
Ordered means . . . . .		2.38	1.33	1.19	.76	.57
		High-Low	Low-Low	Low-High	Control	High-High
Z scores on difference between rank means	High-Low		1.21	2.09*	3.64**	3.22**
	Low-Low			.90	1.60	1.91
	Low-High				1.23	1.54
	Control					.37

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

TABLE 8

Wilcoxon Matched-Pairs Signed-Rank Tests  
on Differences Between First and  
Second Fear Thermometer Scores

Conditions	<u>N</u>	<u>T</u>	<u>P</u>
High-Low	15	47.5	N.S. <sup>a</sup>
Low-Low	16	57	N.S.
Control	14	33.5	N.S.
High-High	17	78.5	N.S.
Low-High	14	39.5	N.S.

<sup>a</sup>Not significant at  $p < .05$ .

TABLE 9

Wilcoxon Matched-Pairs Signed Rank Tests on  
Differences Between Second and Third  
Behavior Avoidance Test Scores

Conditions	<u>N</u>	<u>T</u>	<u>P</u>
High-Low	11	30	N.S. <sup>a</sup>
Low-Low	9	22	N.S.
Control	11	23	N.S.
High-High	14	42	N.S.
Low-High	15	30	N.S.

<sup>a</sup>Not significant at  $p < .05$ .

TABLE 10

Wilcoxon Matched-Pairs Signed-Rank Tests  
on Differences Between Second and  
Third Fear Thermometer Scores

Conditions	<u>N</u>	<u>T</u>	<u>P</u>
High-Low	20	84	N.S. <sup>a</sup>
Low-Low	16	32	N.S.
Control	17	51	N.S.
High-High	11	18.5	N.S.
Low-High	18	62.5	N.S.

<sup>a</sup>Not significant at  $p < .05$ .

TABLE 11

Number of Subjects Who Touched Snake by Improving  
at Least Two Behavior Avoidance Test  
Steps on Second and Third Test

Conditions	Test	
	Second	Third
High-Low	8	9
Low-Low	4	4
Control	2	4
High-High	1	1
Low-High	2	4

TABLE 12

Wilcoxon Matched-Pairs Signed-Rank Tests on Differences  
Between First and Second Modified Fear Survey  
Schedule Ratings of Snake Fear

Conditions	<u>N</u>	<u>T</u>	<u>P</u>
High-Low	9	4.5	.05
Low-Low	13	16.5	.05
Control	8	7	N.S. <sup>a</sup>
High-High	7	9	N.S.
Low-High	6	6	N.S.

<sup>a</sup>Not significant at  $p < .05$ .

TABLE 13

Wilcoxon Matched-Pairs Signed-Rank Tests on Differences  
Between First and Second Modified Fear Survey  
Schedule Ratings of Non Snake Items

Conditions	<u>N</u>	<u>T</u>	<u>P</u>
High-Low	20	35	.01
Low-Low	20	53.5	.06
Control	16	20	.01
High-High	15	41	N.S. <sup>a</sup>
Low-High	21	71	N.S.

<sup>a</sup>Not significant at  $p < .05$ .

TABLE 14  
Significant Spearman Rank Correlation  
Coefficients Within Groups of  
Phobic Subjects

Groups	Correlations	Coefficients
Low-Low	Letters and change in movie ratings	$r_s = -.48$
	Second and third Behavior Avoidance Test	$r_s = .75$
	Second and third Fear Thermometer Score	$r_s = .43$
High-Low	Change in movie ratings and Second Fear Thermometer Score	$r_s = -.42$
	Second and third Behavior Avoidance Test	$r_s = .74$
	Second Behavior Avoidance Test and symptom substitution	$r_s = -.51$
	Second and third Fear Thermometer Score	$r_s = .48$
	Third Fear Thermometer and symptom substitution	$r_s = .41$
Low-High	Change in movie ratings and Fear Survey Schedule	$r_s = .43$
	Second and third Behavior Avoidance Test	$r_s = .43$
	Fear Survey Schedule reduction and symptom substitution	$r_s = -.39$

(Table 14 continued)



Control	Letters and Fear Survey Schedule reduction	$r_s = .50$
	Letters and third Behavior Avoidance Test	$r_s = .46$
	Second and third Behavior Avoidance Test	$r_s = .41$
	Second Behavior Avoidance Test and Second Fear Thermometer	$r_s = .41$
	Second Fear Thermometer and Fear Survey Schedule reduction	$r_s = .43$
	Fear Survey Schedule reduction and symptom substitution	$r_s = -.56$
	Second and third Fear Thermometer	$r_s = .65$
High-High	Change in movie ratings and Fear Survey Schedule reduction	$r_s = .55$
	Second and third Behavior Avoidance Test	$r_s = .47$
	Fear Survey Schedule and Second Fear Thermometer	$r_s = .40$
	Second and third Fear Thermometer	$r_s = .53$
	Fear Survey Schedule reduction and symptom substitution	$r_s = -.61$

Note.--For  $N = 21$  correlation greater than .38 are significant  
at  $p < .05$  and correlation greater than .53 are significant  
at  $p < .01$ .

TABLE 15

Analysis of Variance on Number of Letters Seen  
by Each Group of Phobic Subjects

Source	<u>Ss</u>	<u>df</u>	<u>MS</u>	<u>F</u>
Treatments	286.44	4	71.61	20.49**
Error	349.52	100	3.50	
Total	635.96	104		

\*\* $p < .01$

TABLE 16

Newman-Keuls Analysis of Total Number  
of Letters Seen by Each Group  
of Phobic Subjects

Conditions . . . . .		Control	Low-High	High-High	Low-Low	High-Low
Ordered totals		202	168	151	149	93
		Control	Low-High	High-High	Low-Low	High-Low
Differences between pairs	Control		34**	51**	53**	109**
	Low-High			17*	19*	75**
	High-High				3	58**
	Low-High					56**
* $q_{.95} (r, 105) =$			14.31	16.71	18.00	18.44
** $q_{.99} (r, 105) =$			20.48	22.62	23.62	24.60

TABLE 17

The Percent of Phobic Subjects in Each  
Condition Who Detected Each Letter

Models	Letters	Conditions				
		Low-Low	High-Low	Control	High-High	Low-High
First	A	62	81	100	81	71
	R	43	5	100	62	90
	N	86	5	100	67	86
	O	71	10	100	43	38
Second	P	76	76	95	100	76
	X	67	52	100	100	62
	K	67	38	95	95	86
Third	Z	81	86	90	67	90
	H	86	76	95	29	95
	V	86	5	100	52	67

TABLE 18

The Fear Level and Percent Detectability Associated  
With Each Letter by Each Group of Movie Raters

Percentage Seen

Models	Letters	Conditions				
		Low-Low	High-Low	Control	High-High	Low-High
First	A	100	100	100	100	100
	R	90	30	100	100	100
	N	100	70	100	100	100
	O	90	70	90	90	90
Second	P	90	90	100	100	100
	X	100	90	100	100	100
	K	90	90	100	100	100
Third	Z	100	90	100	100	100
	H	90	80	100	100	100
	V	100	90	100	100	100

(Table 18 continued.)

Models	Fear Association					
	Letters	Conditions				
		Low-Low	High-Low	Control	High-High	Low-High
First	A	1.9	7.0	1.3	1.9	1.5
	R	1.3	2.8	3.0	4.0	2.0
	N	1.6	3.0	3.5	5.1	5.7
	O	1.0	2.2	2.1	4.4	4.7
Second	P	1.1	4.9	3.8	2.6	1.2
	X	2.5	5.2	3.9	4.7	5.3
	K	1.9	3.1	3.3	4.9	4.8
Third	Z	2.6	3.7	1.8	1.3	1.2
	H	3.8	4.7	2.3	4.9	5.0
	V	3.8	2.2	3.3	4.6	4.2

## FIGURES

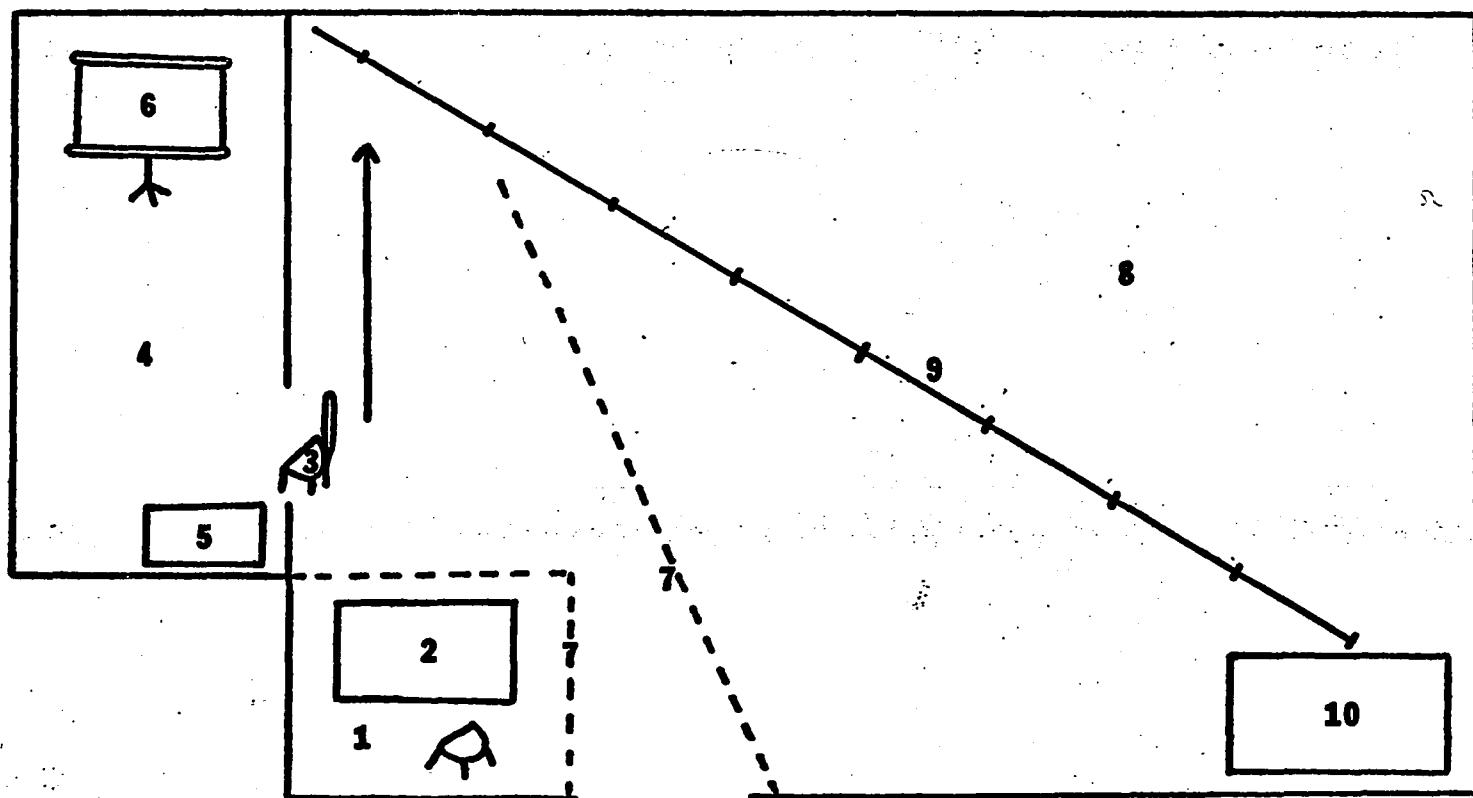


Fig. 1. Design of the experimental room. (Note one cm. represents approximately two feet.) (The numbers designate the following: (1) E's observation room, (2) E's desk with tape recorder and projector plug, (3) S's chair, (4) S's instruction room, (5) S's desk with projector and test form, (6) movie screen, (7) dotted line denotes curtains, (8) snake room, (9) line marking number of feet to snake, (10) desk with snake cage and snake.)



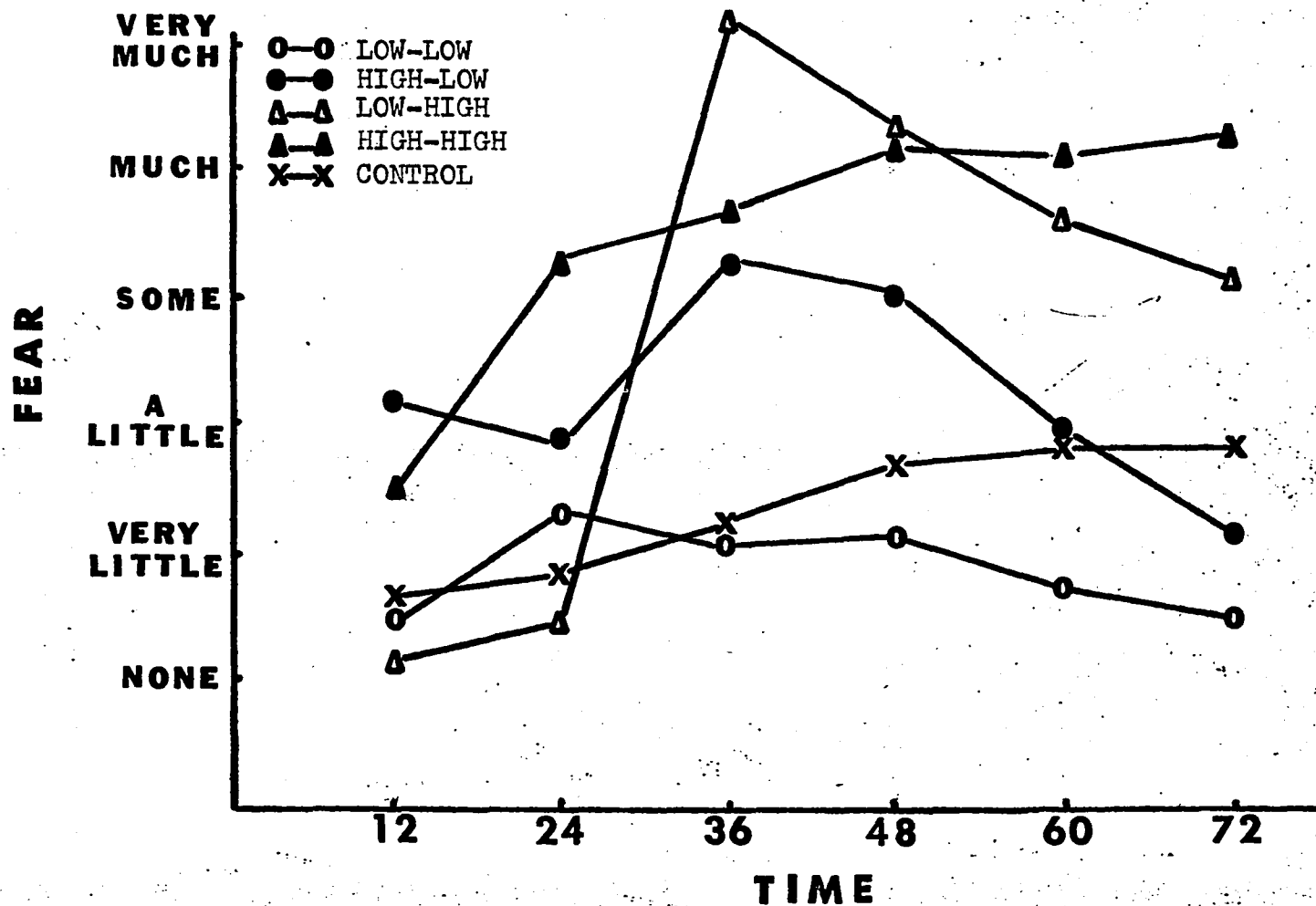


Fig. 2. Movie raters' average fear ratings of models' performances at 12 sec. intervals.

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APPENDIX A  
Test Forms

A-1

NAME \_\_\_\_\_

DATE \_\_\_\_\_

SCHOOL \_\_\_\_\_

COURSE \_\_\_\_\_

TIME \_\_\_\_\_

MODIFIED FEAR SURVEY SCHEDULE

For each item check the word or words that most nearly describes the amount of fear you feel towards the object noted in the item.

	None	Very Little	A Little	Some	Much	Very Much	Terror
1. Worms							
2. Rats and Mice							
3. Spiders							
4. Snakes							
5. Strange Dogs							
6. Stinging Insects							



A-2

NAME \_\_\_\_\_

CIRCLE THE NUMBER THAT CORRESPONDS TO YOUR CLOSEST APPROACH TO THE SNAKE.

0. Will not leave the chair.
1. Standing at the tip of the arrow, 20 feet away.
2. 18 feet away from the snake, but out-side the entrance.
3. 18 feet away from the snake, but inside the entrance.
4. 16 feet away from the snake.
5. 14 feet away from the snake.
6. 12 feet away from the snake.
7. 10 feet away from the snake.
8. 8 feet away from the snake.
9. 6 feet away from the snake.
10. 4 feet away from the snake.
11. 2 feet away from the snake.
12. Have touched the cage.
13. Have unlatched the cage and have the top all the way open.
14. Have put gloved hand into the cage but have not touched the snake.
15. Have touched the snake with gloved hand.
16. Have picked snake slightly off of cage floor with gloved hand.
17. Have touched snake with bare hands.
18. Have picked snake off of cage floor with bare hands.
19. Have held snake out of cage for at least ten seconds but not close.
20. Have held snake close to chest with bare hands for 15 seconds.

CIRCLE THE NUMBER WHICH CORRESPONDS TO THE DEGREE OF FEAR YOU FEEL AT YOUR CLOSEST APPROACH TO THE SNAKE.

- |                      |                     |
|----------------------|---------------------|
| 1. No fear.          | 6. Much fear.       |
| 2. Very little fear. | 7. Very much fear.  |
| 3. A little fear.    | 8. Extreme fear.    |
| 4. Mild fear.        | 9. Terror.          |
| 5. Moderate fear.    | 10. Extreme terror. |

RETURN TO YOUR CHAIR FOR FURTHER INSTRUCTIONS.

	B	E
G-1		
G-2		
G-3		

You will see three girls who are going to approach a live snake. Each time the projector stops, check the item that most nearly describes the amount of fear the girl was experiencing. Each girl will be rated about eight times.

A-3

GIRL-1	1	2	3	4	5	6	7	8
NONE								
VERY LITTLE								
A LITTLE								
SOME								
MUCH								
VERY MUCH								
TERROR								

APPENDIX B  
Instructions

## B-1

## Instructions for the Initial Approach to the Snake

You were chosen as a suitable subject for this experiment because you were one of the many people who indicated that you felt much fear, very much fear or terror with regard to snakes. The purpose of this experiment is to compare various therapeutic techniques for the alleviation of this fear. The experiment will consist of three parts. First we will get a behavioral assessment of your fear by seeing how close you can approach a latched cage containing a harmless live snake. Next you will return to your seat and watch a short therapeutic movie. Finally, we will determine the therapeutic effect of the movie by having you again determine how close you can get to the snake.

On the table beside you you will find a self-rating test form and two pens. Write your name on the form with the blue pen. The test form has three parts. For the first part you will circle the number which corresponds to your closest approach to the snake. If you don't want to leave your chair you get zero points. If you go to the top of the arrow behind your chair you get one point. If you go to the corner of the room from which you can see the snake 20 feet away you get two points. Nine points on the test form means that you get within six feet of the

snake. You get 15 points if you can touch the snake with a glove and 20 points if you can hold the snake with your bare hands for 15 seconds in front of your chest. Masking tape marks the number of feet you are away from the snake.

On the second part of the test form you are to circle the number which corresponds to the degree of fear you felt at your closest approach to the snake. The third part of the test form will not be used.

Now, take the blue pen; see how close you can get to the snake; mark the number of points you made and the degree of fear you felt when you were as close to the snake as you felt you could get. When you have finished return to your chair and say, "I have checked my closest approach and my fear level at this approach point." Then you will be given the instructions for the second part of the experiment.

B-2

## Instructions for Watching the Movie

Now you will be shown a short therapeutic movie. You will see three girls, one at a time. Occasionally while you are watching the movie a letter will appear on the screen. When this occurs, call out the letter. Make a quick guess if you are not sure what the letter was. The important thing is to watch the movie. Don't worry about the letters but call them out if you see them.

## B-3

## Post Treatment Instructions

Now we are going to determine the therapeutic effect of the film that you have just seen. This time take the green pencil and the same test form that you used last time and see how close you can get to the snake now. With the green pencil circle the number that corresponds to your closest approach point and circle the number that corresponds to the degree of fear you felt at this approach point. Then return to your chair for further instructions.

B-4

## Instructions for Movie Ratings

At the bottom of your test form you will see a diagram with the letters "B" and "E" written horizontally. "G1", "G2", and "G3" represent the first, second, and third girls respectively, that you saw in the movie. "B" and "E" stand for the beginning and end of each girls' spot on the movie. Using the ten point fear scale on the second part of your test form you are to determine the degree of fear each girl was experiencing at the beginning and the end of her spot on the movie and write the corresponding number in the appropriate blank. For example, if the first girl showed no fear at the beginning of the movie you write a "1" beside G1 and beneath B. If the girl was experiencing extreme terror at the end of the film you write a 10 beside G1 and under E. Rate all three girls and indicate when you are finished by saying, "I am finished."



## B-5

## Instructions for the Follow-up

The purpose of having you return is to determine the effect of time on the therapeutic movie you saw prior to the holidays. Therefore take the red pen and the self-rating test form you will find on the table beside you and see how close you can get to the snake. Mark how close you get and the degree of fear you felt when you were as close to the snake as you felt you could get. Then return to your chair for final instructions.

B-6

## Post Follow-Up Instructions

The therapeutic film which you saw was designed to have only a weak or negative effect on your fear of snakes. For ethical reasons you will now be shown the therapeutic film which was designed to have a large and beneficial therapeutic effect. Watch the film, don't worry about the letters and don't bother to call them out. When the film is over see how close you can get to the snake and mark your closest approach point and the degree of fear you felt at this approach point with the blue pen. Then, I will explain the entire experiment to you.

## APPENDIX C

Raw Data for Each Treatment Group

C-1

## RAW DATA FOR HIGH-LOW SUBJECTS

Subjects	Modified Fear Survey Schedule	Behavior Avoidance Test	Letters Seen	Fear Thermometer	Movie Ratings B	Movie Ratings E	Behavior Avoidance Test	Fear Thermometer
	1	1		1			2	2
1	6	12	6	3	7	8	13	5
2	7	3	3	7	18	9	10	8
3	7	10	6	6	13	7	11	6
4	7	10	3	6	14	3	10	6
5	7	10	3	7	9	3	12	4
6	7	11	5	5	16	10	16	3
7	7	12	4	2	11	7	15	8
8	6	7	5	7	8	4	8	6
9	6	12	8	5	8	11	14	7
10	6	12	4	6	7	4	15	4
11	5	10	5	4	9	4	15	4
12	5	10	7	4	11	4	12	4
13	5	12	4	6	13	3	16	7
14	5	13	2	6	10	3	15	9
15	6	11	0	6	14	6	12	5
16	6	12	3	1	12	4	12	3
17	7	11	6	7	7	3	15	5
18	7	12	6	3	10	4	12	2
19	7	10	4	5	8	6	12	5
20	6	11	3	1	14	3	11	1
21	5	12	6	1	13	4	15	4
Total	130	223	93	99	232	110	271	106
Mean	6.19	10.62	4.43	4.71	11.05	5.24	12.90	5.05

(Continued on next page)

Subjects	Modified Fear Survey Schedule 2	Symptom Substitution 3	Behavior Avoidance Test 3	Fear Thermometer 3	Condition 2	Behavior Avoidance Test 4	Fear Thermometer 4
1	5	- 4	15	3			
2	7	+ 6	10	6			
3	5	- 4	11	3			
4	7	+ 1	11	8			
5	6	- 3	13	5			
6	6	- 1	16	1			
7	7	- 4	15	7			
8	6	- 2	9	7			
9	6	+ 2	14	5			
10	6	- 3	14	5			
11	5	- 4	14	5			
12	4	- 6	12	3			
13	5	- 3	15	7			
14	6	- 1	13	5			
15	6	+ 3	12	6			
16	6	0	13	6			
17	6	- 6	18	7			
18	6	-12	12	3			
19	7	- 8	12	2			
20	5	- 5	11	4			
21	5	- 1	13	1			
Total	122	-55	273	99			
Mean	5.81	-2.62	13.00	4.71			

C-2

## RAW DATA FOR LOW-LOW SUBJECTS

Subjects	Modified Fear Survey Schedule 1	Behavior Avoidance Test 1	Letters Seen	Fear Thermometer 1	Movie Ratings B	Movie Ratings E	Behavior Avoidance Test 2	Fear Thermometer 2
1	7	13	6	5	9	5	14	5
2	6	12	5	3	4	3	12	3
3	5	12	10	5	5	7	12	4
4	6	12	8	5	8	5	12	4
5	5	10	6	5	4	3	11	5
6	7	9	6	5	5	3	9	6
7	6	9	8	6	5	3	10	5
8	6	12	10	5	14	6	17	6
9	7	14	8	6	7	4	15	7
10	7	12	9	4	5	3	12	6
11	7	9	1	5	5	3	12	5
12	5	14	9	5	7	3	15	6
13	7	12	10	7	6	4	14	8
14	6	10	8	3	3	3	12	2
15	5	13	8	3	4	3	15	4
16	6	12	0	3	5	3	17	7
17	5	8	7	6	7	7	12	3
18	7	8	5	7	5	4	0	7
19	7	1	10	4	4	3	1	5
20	7	9	7	5	5	4	12	4
21	7	12	10	3	6	4	17	2
Total	130	223	151	100	123	85	251	104
Mean	6.19	10.62	7.19	4.76	5.86	4.05	11.95	4.95

(Continued on next page)

Subjects	Modified Fear Survey Schedule	Symptom Substitution	Behavior Avoidance Test	Fear Thermometer	Condition	Behavior Avoidance Test	Fear Thermometer
	2		3	3	2	4	4
1	6	0	13	5			
2	6	- 2	11	5			
3	3	+ 1	13	5			
4	7	+ 7	12	2			
5	6	+ 3	11	5			
6	6	- 1	9	5			
7	5	- 4	11	3			
8	4	- 5	17	4			
9	7	- 1	15	6			
10	6	+ 2	12	5			
11	6	+ 1	12	3			
12	5	- 2	13	3			
13	7	+ 1	14	7			
14	5	- 5	12	2			
15	4	- 5	16	1			
16	6	- 2	17	7			
17	6	- 2	11	5			
18	7	- 3	0	8			
19	7	+ 1	12	4			
20	7	- 7	12	2			
21	3	- 5	18	2			
Total	119	-28	261	89			
Mean	5.67	-1.33	12.43	4.24			

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## RAW DATA FOR CONTROL SUBJECTS

Subjects	Modified Fear Survey Schedule	Behavior Avoidance Test	Letters Seen	Fear Thermometer	Movie Ratings B	Movie Ratings E	Behavior Avoidance Test	Fear Thermometer
	1	1		1			2	2
1	6	13	10	3	5	5	15	5
2	5	12	10	5	4	3	12	5
3	6	13	10	7	4	3	14	7
4	5	12	10	2	8	5	15	5
5	6	0	10	6	3	3	0	5
6	6	12	10	5	3	3	12	4
7	5	12	8	2	3	3	12	2
8	7	12	9	4	6	10	12	1
9	5	12	10	3	3	4	11	4
10	7	10	10	5	3	3	11	4
11	7	11	9	5	8	10	11	5
12	6	11	10	1	3	3	12	1
13	6	5	8	5	12	13	7	6
14	7	12	9	5	6	7	12	3
15	7	12	10	6	5	4	12	6
16	7	10	10	6	7	11	10	5
17	6	9	9	5	14	7	11	5
18	6	12	10	5	8	8	13	2
19	5	11	8	2	6	6	12	2
20	6	12	9	4	3	3	12	2
21	7	11	10	6	7	7	12	5
Total	130	222	199	92	121	121	238	84
Mean	6.19	10.57	9.48	4.34	5.76	5.76	11.33	4.00

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Subjects	Modified Fear Survey Schedule 2	Symptom Substitution 3	Behavior Avoidance Test 3	Fear Thermometer 3	Condition 2	Behavior Avoidance Test 4	Fear Thermometer 4
1	6	- 1	15	2			
2	6	0	15	5			
3	6	- 6	17	7			
4	5	+ 1	15	2			
5	6	+ 3	0	5	Low-Low	0	7
6	5	- 7	13	4	Low-Low	13	2
7	5	- 2	12	1	Low-Low	12	1
8	7	+ 1	12	2	Low-Low	12	1
9	6	0	12	5	Low-Low	13	4
10	7	+ 1	11	5	Low-Low	11	4
11	7	- 4	11	7	Low-Low	11	7
12	6	- 2	12	1	Low-Low	13	1
13	6	0	0	8	High-Low	0	7
14	7	- 2	13	5	High-Low	13	4
15	7	0	12	7	High-Low	12	6
16	6	- 2	11	6	High-Low	11	5
17	5	- 1	9	6	High-Low	10	4
18	6	0	12	2	High-Low	14	5
19	4	- 4	13	3	High-Low	13	3
20	5	- 3	13	3	High-Low	12	3
21	7	- 3	12	4	High-Low	13	5
Total	125	-31	240	90		183	69
Mean	5.95	-1.48	11.43	4.29		10.76	4.06

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## RAW DATA FOR HIGH-HIGH SUBJECTS

Subjects	Modified Fear Survey Schedule	Behavior Avoidance Test	Letters Seen	Fear Thermometer	Movie Ratings	Movie Ratings	Behavior Avoidance Test	Fear Thermometer
	1	1		1	B	E	2	2
1	5	11	7	5	16	21	11	4
2	6	13	10	5	26	29	13	5
3	6	12	5	2	13	17	14	5
4	7	0	7	9	10	16	4	7
5	6	12	7	7	21	19	12	6
6	6	11	7	5	19	23	11	4
7	6	11	7	6	20	23	11	7
8	6	11	5	5	8	21	12	4
9	6	12	6	5	17	20	12	5
10	7	10	8	4	23	24	8	3
11	7	10	6	5	22	23	11	2
12	7	8	4	5	22	16	10	6
13	7	3	10	6	9	16	2	7
14	7	12	10	5	17	23	12	5
15	5	12	10	2	10	20	15	6
16	6	12	5	4	24	27	12	5
17	5	12	7	3	16	21	12	5
18	5	12	7	2	13	21	13	3
19	5	13	4	6	12	24	13	5
20	7	12	10	7	18	21	13	6
21	7	11	4	3	21	22	11	3
Total	130	220	146	101	357	439	232	103
Mean	6.19	10.48	6.95	4.81	17	20.9	11.05	4.90

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Subjects	Modified Fear Survey Schedule	Symptom Substitution	Behavior Avoidance Test	Fear Thermometer	Condition	Behavior Avoidance Test	Fear Thermometer
	2		3	3	2	4	4
1	6	+ 1	10	6	Low-Low	11	4
2	6	- 1	14	4	Low-Low	15	4
3	6	+ 2	12	5	Low-Low	12	5
4	6	- 3	11	3	Low-Low	12	1
5	6	0	13	2	Low-Low	13	2
6	6	+ 2	12	3	Low-Low	13	5
7	6	0	12	3	Low-Low	12	3
8	6	+ 2	13	4	Low-Low	17	3
9	6	- 2	12	5	Low-Low	12	5
10	5	0	10	3	High-Low	12	6
11	5	- 9	11	2	High-Low	11	1
12	6	- 2	9	5	High-Low	11	6
13	7	0	6	6	High-Low	6	5
14	7	- 2	12	5	High-Low	12	5
15	5	- 1	14	5	High-Low	15	6
16	6	- 2	12	5	High-Low	13	5
17	6	+ 2	12	6	High-Low	13	8
18	5	0	14	3	High-Low	16	2
19	6	0	12	5	High-Low	14	6
20	7	+ 1	13	6	High-Low	15	9
21	7	- 2	11	5	High-Low	11	5
Total	126	-14	245	92		266	96
Mean	6.00	-.67	11.67	4.38		12.67	4.57

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## RAW DATA FOR LOW-HIGH SUBJECTS

Subjects	Modified Fear Survey Schedule	Behavior Avoidance Test	Letters Seen	Fear Thermometer	Movie Ratings	Movie Ratings	Behavior Avoidance Test	Fear Thermometer
	1	1		1	B	E	2	2
1	5	13	7	4	8	26	13	4
2	6	12	7	5	3	23	13	6
3	5	11	8	3	7	24	15	5
4	5	14	8	6	5	23	14	6
5	6	12	9	5	1	19	17	5
6	5	12	5	5	7	26	13	6
7	7	2	9	5	6	24	9	7
8	6	12	10	2	6	17	12	1
9	6	9	8	5	13	23	10	5
10	7	11	9	3	4	14	12	2
11	7	11	7	8	7	27	12	9
12	7	11	8	5	12	27	12	3
13	7	11	9	3	7	20	11	6
14	7	10	9	5	3	28	11	4
15	6	10	7	5	6	27	8	6
16	5	9	8	5	6	21	12	4
17	7	10	6	6	3	24	10	6
18	7	12	9	6	1	24	12	5
19	6	10	8	4	5	22	13	5
20	7	11	9	5	10	24	10	5
21	6	11	9	6	5	25	10	6
Total	130	224	169	101	125	488	249	106
Mean	6.19	10.67	8.05	4.81	5.95	23.24	11.86	5.05

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Subjects	Modified Fear Survey Schedule	Symptom Substitution	Behavior Avoidance Test	Fear Thermometer	Condition	Behavior Avoidance Test	Fear Thermometer
	2		3	3	2	4	4
1	4	+ 1	14	5			
2	6	- 2	15	4			
3	5	+ 1	16	4			
4	6	- 1	14	6			
5	6	- 2	18	4			
6	5	- 5	15	5			
7	7	- 1	2	3	Low-Low	11	3
8	6	- 3	12	2	Low-Low	14	3
9	5	- 2	9	4	Low-Low	9	3
10	6	- 5	12	3	Low-Low	12	2
11	7	- 6	13	9	Low-Low	15	10
12	7	- 2	11	6	Low-Low	12	4
13	7	+ 1	12	2	Low-Low	12	1
14	7	- 2	10	6	High-Low	11	6
15	5	- 1	12	4	High-Low	17	5
16	6	+ 9	12	4	High-Low	12	2
17	7	+ 5	12	7	High-Low	12	7
18	7	+ 1	12	7	High-Low	12	7
19	6	+ 1	13	2	High-Low	15	3
20	7	- 1	11	4	High-Low	11	4
21	6	+ 2	12	5	High-Low	12	2
Total	128	-12	257	96		187	62
Mean	6.10	-.57	12.24	4.57		12.47	4.13