THE RELATIVE EFFICACY OF POSITIVE EXPECTANCY
VERSUS NO EXPECTANCY IN THE USE OF
ANXIETY-RELIEF CONDITIONING

THESIS

Presented to the Graduate Council of the
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By

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An experiment was conducted to study the role of "positive expectancy" when utilizing anxiety-relief conditioning. Fourteen male and female undergraduate psychology students were selected as subjects (Ss), based on pre-test scores obtained on the "Snake Intimacy Test" (SIT). Ss were matched according to pre-SIT scores and randomly assigned to the "positive expectancy" or "no expectancy" groups. Anxiety-relief conditioning was administered without variation. Only the rationale given each group describing what was transpiring was different. The statistical results revealed significant improvement by both groups. Also, the "positive expectancy" group improved significantly over the "no expectancy" group. Therefore, "positive expectancy" is apparently a sufficient, but not necessary, variable of anxiety-relief conditioning.
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Introduction

Anxiety-relief conditioning is a therapeutic procedure described and developed by Wolpe (1958). It is a behavior therapy technique which has as its theoretical basis, the principle of reciprocal inhibition. The rationale of reciprocal inhibition is that an organism cannot emit two incompatible responses at the same time. Therefore, if a response which is incompatible with anxiety, such as relief or relaxation, can be elicited during the presence of anxiety-evoking stimuli, then anxiety is less likely to occur, and the relief response will be conditioned to those particular anxiety-evoking stimuli.

A review of the literature dealing with anxiety-relief conditioning indicates that there has been no definitive study investigating the relationship between "positive expectancy" and the efficacy of anxiety-relief conditioning. In a study by Gaupp, Stern, and Galbraith (1972), subjects in the Non-Veridical informed group (N-VIG) received false heartrate feedback through phonographic speakers. They were told that this was due to a faulty piece of equipment which would allow them to hear their own heartbeat during
the anxiety-relief conditioning sessions, but they were instructed to ignore the sounds. The sounds did not increase during the presence of a snake slide but always increased markedly during the shock period. Between-group statistical analysis revealed that the N-VIG group significantly improved over a control group. This improvement is pertinent since the two remaining groups in the study received the same type of treatment as the N-VIG, but they did not improve. One was the Non-Veridical extraneous group (N-VEG), who heard the same false sounds as the N-VIG group, but the subjects were told that the sounds were meaningless and that the experimenter was studying the effects that these sounds would have on the subjects' physiological reactions to various stimuli. The other group received the same information as the N-VIG group but actually heard their own heart beat and were not told to ignore their heart beat as was the N-VIG group. This research was not designed for the purpose of investigating the potential significance of "positive expectancy," but the statistical results suggest that this variable may be important in expediting the effectiveness of anxiety-relief conditioning.

The results of two recent studies, Turnage and Wenrich (1973) and Wenrich and Le Tendre (1973), also suggest that "positive expectancy" is an important variable affecting the outcome of therapy when utilizing anxiety-relief conditioning.
Whereas the Turnage and Wenrich (1973) study solicited subjects with an intense fear of snakes, the Wenrich and Le Tendre (1973) study solicited subjects under the pretense that they would be involved in a physiological research project, and no indication was given that snake presentations would be part of the experiment. These studies both employed the same treatment paradigms and the same apparatus. The difference between the studies was that Turnage and Wenrich (1973) were purportedly treating "snake phobics," while Wenrich and Le Tendre (1973) were treating "normals" to see if a relief stimulus could be conditioned for prophylactic purposes. The results of the treatment indicated statistical significance in the Turnage and Wenrich (1973) study, but no significant change was noted in the Wenrich and Le Tendre (1973) study.

The difference in the findings of the investigations described previously could be a result of the operational definition of "snake phobic" used by Turnage and Wenrich (1973). They described a "snake phobic" as a S with "the inability to proceed past point seven" (p. 9) on the "Snake Intimacy Test" (SIT) developed by Gaupp, Stern, and Galbraith (1972) (Appendix A). According to data presented by Wenrich and Le Tendre (1973), the mean score on the SIT by a random sample of college males was 8.4 with a standard deviation of 2.1 (Figure 1). For females the mean was 6.4, and the standard deviation was 2.4 (Figure 2). If one
assumes that people are "normal" who score between plus or minus one standard deviation of the mean, then it could be argued that the Turnage and Wenrich (1973) study used Ss in their research who might not be accurately classified as "snake phobics." Another possible reason for the difference in the results of these studies may be that the subjects in the Turnage and Wenrich (1973) experiment were thinking of themselves as "snake phobics" and, therefore, improved more because they were expecting to be helped. This latter interpretation of the Turnage and Wenrich study is the one most pertinent to the present experiment.

The purpose of the present study was to test the hypothesis that a "positive expectancy" group would evidence more improvement than a "no expectancy" group in the anxiety-relief conditioning treatment of a snake phobia. "Positive expectancy" was operationally defined as the verbal explanations, instructions, and rationale given the subjects to define the nature of their participation in the experiment prior to their treatment. The specific operational definition of "positive expectancy" is given verbatim in the "positive expectancy" section of Appendix B.

Method

Subjects

Fourteen subjects (Ss) were obtained from the subject pool of the Department of Psychology of North Texas State
University. Undergraduate students enrolled in certain psychology classes were required to participate in the subject pool. Notices giving a brief description of the research project, or what the researcher wished the subject to believe about the project, were posted where the prospective subjects could read and compare them.

The notices for this experiment stated that it was to be an investigation of physiological responsivity to various stimuli. No mention of snakes, or fear of snakes, was contained on the notices, in order to satisfy the requirements of the "no expectancy" group.

**Apparatus**

In order to make the research appear to be a physiological investigation, bogus GSR electrodes and a false GSR printout were used during the pre-treatment SIT, the post-treatment SIT, and treatment sessions. The "Behavior Modifier Mark II," shock apparatus manufactured by Farrall Instruments, was used to administer shock by way of two silver electrodes, each one-half inch in diameter, attached to the ventral surface of the subject's non-dominant forearm.

The snake stimuli consisted of fifteen color slides of different kinds of snakes depicted in various situations. These situations included slides of snakes in their natural habitat, in a cage, and while eating. Fifteen slides had been selected from a group of fifty-four pictures taken at
the herpetarium of the Marsalis Zoo in Dallas, Texas. These slides were selected on the basis of degree-of-aversivity ratings assigned to them by an independent sample of forty-two undergraduate and graduate psychology students. Three of the fifteen slides used were rated as "very mildly aversive," three as moderately aversive," and nine as "very aversive." The slides were arranged and presented to the subjects in a hierarchy from least to most aversive. The slides were projected by a Kodak Carousel projector onto a white wall, which produced an image that was approximately four feet by six feet in size.

The snake used in the administration of the pre-SIT and the post-SIT was a king snake, measuring twenty-nine and one-half inches in length, two inches in circumference, and four and on-tenth ounces in weight.

Hypothesis

It was hypothesized that a "positive expectancy" group would evidence more improvement than a "no expectancy" group in the anxiety-relief conditioning treatment of a snake phobia.

Procedure

Ss reported to the office of the Center for Psychological Services of North Texas State University. The experimenter met the Ss in the office and took them individually to a room in which they listened to a recorded set of instructions (Appendix B), which informed them that the study was concerned with their physiological reactions to various stimuli. They
were told that they would be asked to perform various behavioral tasks involving a caged non-poisonous snake. It was indicated that the tasks were not to be performed if they felt the least bit anxious. Subjects were then taken to another room, which had been arranged for the administration of the SIT. Bogus GSR electrodes were placed on the Ss' left index finger and left ring finger in order to maintain the physiological ruse. The instructions for the SIT were pre-recorded in order to reduce the effect of experimenter bias.

After the administration of the pre-SIT, the subjects' scores were judged as being indicative of snake phobic behavior, or not, by interpreting them according to data collected on males and females by Wenrich and Le Tendre (1973).

Figure 1 shows the distribution of snake-approach behavior in male introductory psychology students.

\[
\begin{align*}
\overline{X} &= 8.4 \\
\sigma &= 2.1 \\
N &= 58
\end{align*}
\]

\[0 = \text{refusing to enter room}; \quad 10 = \text{picking snake up and holding it}\] Distribution of snake-approach behavior in male introductory psychology students (Wenrich and Le Tendre, 1973).

Figure 1--Pre-SIT Scores (Males)
The distribution was markedly skewed in a negative direction. Over half of the population scored the highest possible score (indicating no overt display of fear of snakes) on the SIT.

Figure 2 shows the results of a distribution obtained in the same fashion as Figure 1, but with a female population. This distribution much closer approximates a "normal" curve than did the male distribution in Figure 1. The mean score for the females was two points lower than the males, but the standard deviations were very close.

\[ \bar{X} = 6.4 \]
\[ \sigma = 2.4 \]
\[ N = 95 \]

\(0 = \text{refusing to enter room}; 10 = \text{picking snake up and holding it}\) Distribution of snake-approach behavior in female introductory psychology students (Wenrich and Le Tendre, 1973).

Figure 2--Pre-SIT Scores (Females)

For the purposes of this study, subjects scoring one standard deviation below the mean of the distribution for their sex were operationally defined as "snake phobics." The subjects were put in matched pairs according to their sex and scores on the pre-SIT. A coin was tossed to decide in a random manner which subject of each matched pair
would receive "positive expectancy" or "no expectancy" treatment. In two pairs, the scores on the SIT differed by one point. In each case, the subject with the lower score on the SIT (indicating a more intense fear of snakes) was placed in the "positive expectancy" group in order to avoid a positive bias.

Upon completion of the pairing, the Ss were scheduled to return on four consecutive days. Three days consisted of approximately fifteen minutes of anxiety-relief conditioning. The fourth day consisted of the post-SIT being used for an evaluation of the change, or lack of change, in the Ss' snake-approach behavior. Ss were given the same recorded instructions on the post-SIT as on the pre-SIT. Administration of the SIT test was performed in the same room, with the same equipment, at approximately the same time of day for both the pre- and post-measures of each S.

**Treatment.** All Ss were given exactly the same therapy treatment. The difference between the two treatment groups of "positive expectancy" and "no expectancy" was in the before-treatment explanations of what was about to transpire. The Ss of the "positive expectancy" group (Appendix B) were told that they were chosen because they had been ascertained as having a more intense fear of snakes than the average individual of their sex. They were given a detailed explanation of the theoretical principle of anxiety-relief conditioning and how it should help them to overcome their
fear of snakes. The "no expectancy" group (Appendix B) was led to believe that they were participating in a physiological study and that the snake, snake slides, and shock were all various stimuli being employed for the examination of their physiological reactions. No mention was ever made regarding snake phobias, and no rationale concerning therapy or treatment was provided.

The Ss received treatment in the Anxiety-Relief Conditioning laboratory of the Center for Psychological Services at North Texas State University. Once in the laboratory, the Ss were seated in a straight-back wooden chair. Bogus GSR electrodes were attached to the index finger and the ring finger of the dominant hand. Shock electrodes were attached to the ventral surface of the S's non-dominant forearm. The midpoint between the sensation threshold and the pain threshold for each S was used as the shock intensity level for that S. In an effort to reduce habituation to the shock, the shock level was re-established before each treatment session for every S.

After establishing the appropriate shock intensity, the treatment session began by presenting the appropriate recorded tape (Appendix B), either "positive expectancy" or "no expectancy," depending upon which group the S was placed in previously. If further understanding of the situation was felt necessary by the subject, then the subject was allowed to ask questions. All questions asked by the "positive
expectancy" group were answered as accurately as possible by the experimenter. The answers to the questions posed by the "no expectancy" group were carefully constructed and even falsified, if necessary, to avoid any possible change of the subject's "no expectancy" attitude. Next, the fifteen snake slides were presented individually and interspersed with shock and blank spaces between them. The order and duration of the slide and the shock presentation consisted of an initial blank space lasting 13.5 seconds, a faradic shock lasting 1.5 seconds, and a snake slide lasting 15 seconds. After each snake slide, there was a blank space left on the slide carriage, which lasted 13.5 seconds and started the process over again until the fifteen snake slides had been presented.

All Ss saw the same slides during each of the three treatment sessions and received the same schedule of shock. In order to reduce the effects of any systematic experimenter bias, the presentation and the duration of the snake slides, the blank spaces, and the faradic shocks were fully automated by an electro-mechanical programmer.

**Criterion measure.** Scores on the post-SIT were used as indices for post-treatment changes in the Ss. The post-SIT was administered exactly as the pre-SIT. It was administered on the day following each S's last treatment session.
Results

The pre- and post-treatment SIT raw scores and means for both groups are presented in Table I. The higher post-SIT scores are indicative of the improvement of the subject after treatment. Both groups' means increased, with the "positive expectancy" group's mean increasing the most.

Table I
Pre- and Post-Treatment SIT Raw Scores and Means for "Positive" and "No" Expectancy Groups

<table>
<thead>
<tr>
<th>Positive Expectancy</th>
<th>No Expectancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-SIT</td>
<td>Post-SIT</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>4</td>
<td>8</td>
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<td>8</td>
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<tr>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>4</td>
<td>9</td>
</tr>
</tbody>
</table>

Σ = 26 Σ = 54 Σ = 28 Σ = 40
Mean 3.714 Mean 7.714 Mean 4.000 Mean 5.714

\[ t = 5.79 \]
\[ p < .001 \]

\[ t = 4.76 \]
\[ p < .0025 \]

A one-tailed t test for repeated measures was used to test for significance of the within group means. The "positive
expectancy" group improved significantly ($t = 5.79$, 
$df = 6$, $p < .001$), as did the "no expectancy" group
($t = 4.76$, $df = 6$, $p < .0025$).

Analysis of covariance was employed to test the sig-
nificance of the difference between the post-treatment means.
The pre-SIT scores were used as the covariate. Table II
presents the residuals of the analysis of covariance and the
$F$ value for the comparison between the means.

Table II

<table>
<thead>
<tr>
<th>Source</th>
<th>Degrees of Freedom</th>
<th>Sum of Squares</th>
<th>Mean Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>12</td>
<td>43.1771</td>
<td></td>
</tr>
<tr>
<td>Within</td>
<td>11</td>
<td>23.5669</td>
<td>2.1424</td>
</tr>
<tr>
<td>Difference</td>
<td>1</td>
<td>19,6102</td>
<td>19.6102</td>
</tr>
</tbody>
</table>

$F = 9.1532$
$p < .05$

Adjusted Means
"Positive Expectancy" = 7.9103
"No Expectancy" = 5.5182

Results of the analysis of covariance indicate that the
"positive expectancy" group improved significantly more than
the "no expectancy" group [$F (1,11) = 9.1532$, $p < .05$].
Discussion

Data collected in this experiment indicate that the proposed hypothesis should be accepted. Apparently "positive expectancy" is a moderator variable (Anastasi, 1968) of anxiety-relief conditioning. Statistical results indicate that the "no expectancy" group improved significantly from the pre-SIT to the post-SIT, but that the "positive expectancy" group improved significantly more than the "no expectancy" group. This implies that although "positive expectancy" is not necessary for anxiety-relief conditioning to be successful, it is a salient variable that increases the efficacy of anxiety-relief conditioning.

In conclusion, this study has shown that "positive expectancy" is an important, but not necessary, variable in the success of anxiety-relief conditioning for the treatment of "snake phobics." It is further hypothesized that "positive expectancy" will be a relevant variable whenever anxiety-relief conditioning is applied to other problem areas. From the results of this study, it is reasonable to assert that preceding studies (Gaupp, Stern, and Galbraith, 1972; and Turnage and Wenrich, 1973) did not control for the role of expectancy, as their selection procedures may have introduced adventitious "positive expectancies."

"Positive expectancy" is only one of the many variables important to the efficacy of anxiety-relief conditioning.
Many aspects and parameters of anxiety-relief conditioning still need to be thoroughly researched. Areas in which new research should be generated include (a) shock intensity—is the mid-point the most effective level of shock? (b) shock duration—what is the most effective length of time for the shock? (c) relief-phase duration—how long should the stimuli be presented? (d) blank slide duration—how much time is needed to assure that the aversive qualities of the shock do not become associated with the snake slides? (e) would behavioral modeling combined with anxiety-relief conditioning be more effective? (f) how many treatment sessions are necessary? (g) how many slides should be presented per session? and (h) should treatment sessions be on consecutive days, have days in between, or possibly on the same day with some time between sessions.
Appendix A

Snake Intimacy Test

Step 1--enter the room and look over at the snake.

Step 2--go over to the table on which the caged snake is sitting.

Step 3--sit down in the chair next to the table.

Step 4--put hand on the outside portion of the cage next to the snake.

Step 5--stand up, take the lid off the cage, and look down at the snake.

Step 6--put hand over and level with the top of the cage.

Step 7--put hand into the cage.

Step 8--touch the snake.

Step 9--pick the snake up a few inches within the cage.

Step 10--pick the snake up and out of the cage and hold it.

Appendix B

These are the rationales and "Snake Intimacy Test" instructions played to the subjects on tapes before each appropriate treatment session or "Snake Intimacy Test."

No Expectancy

This portion of the experiment will involve further physiological measurements with different stimuli being employed. The experimenter will show you where to sit. Please focus your attention on the wall in front of you. Some of the stimuli will appear as slides; some will be mild shocks. Since baseline measurements are important, it is necessary that you remain attentive, with as few unnecessary movements as possible.

Positive Expectancy

According to previous testing, it has been determined that you have a somewhat more intense fear of snakes than the average female. The next portion of this experiment will consist of a treatment technique which has been proven to be a very effective method for reducing the intensity of snake fears in people.

The treatment will consist of giving you a mildly aversive shock. Immediately at the end of the shock, a
slide of a snake will appear on the wall. The theoretical basis for this treatment states that after the shock is over, you should experience a period of relief and general pleasantness. During this period of pleasant relief, you will be shown a snake slide which will become associated with these good feelings. After a series of treatment sessions, you should start associating pictures of snakes, and snakes themselves, with relief, and not with anxiety. You will never be shocked during the presence of a snake slide, only during a blank slide. By associating relief, rather than anxiety, with the presence of a snake, you should eventually be able to be in the presence of a snake without experiencing feelings of discomfort. In general, upon completion of the treatment sessions, you should experience a considerable reduction, or a complete elimination, of your fear of snakes. The experimenter will show you where to sit. Please focus your attention on the wall in front of you where the slides will appear.

Snake Intimacy Test Instructions

Our purpose here is to study physiological reactions in various situations. In a moment we will go to a room with a caged non-poisonous snake, and I will ask you to perform various behavioral tasks, beginning with entering the room and looking at the snake. If at any time you feel any anxiety or discomfort--Stop--and say "That is all."
However, if you do not experience any anxiety or discomfort--continue. Remember! This is not a test of your bravery; we are trying to measure your reactions, so the first time you feel even a twinge of anxiety--either when I ask you to perform the task or while you are performing it--just stop and say "That's all." Whatever you do, don't force yourself; stop at the first twinge of anxiety.
References


