DOCUMENT RESUME

ED 106 703 CG 009 767

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TITLE Reactive and Reciprocal Inhibition Therapies in the Group Treatment of Test Anxiety.
PUB DATE [Apr 74]
NOTE 24p.; Presented at the Annual Convention of the Western Psychological Association (54th, San Francisco, California, April 25-28, 1974)

EDRS PRICE MF-$0.76 HC-$1.58 PLUS POSTAGE
DESCRIPTORS *Anxiety; Behavior Change; College Students; *Group Therapy; Higher Education; *Inhibition; *Reactive Behavior; Research Projects; *Testing Problems
IDENTIFIERS *Test Anxiety Scale

ABSTRACT

This experiment compares the effects of group reactive inhibition therapy and group reciprocal inhibition therapy with no treatment on the anxiety level of test-anxious college students. Twenty undergraduate students volunteered for the study and were assigned to either the reactive inhibition group, the reciprocal inhibition group, or the non-treatment control group. Sarason's Test Anxiety Scale (TAS), the IPAT Anxiety Scale and the Galvanic Skin Response (GSR) were administered to all subjects both before and after treatment in order to assess anxiety level. The reactive inhibition group met for five twenty-minute sessions. Treatment consisted of having subjects concentrate on scenes from a standardized hierarchy of anxiety-arousing test situations, while at the same time trying to increase any feelings of tension and bodily sensations they were experiencing. The reciprocal inhibition group met for five forty-minute sessions consisting of training in deep muscle relaxation, and imagining scenes from the standardized hierarchy while in this relaxed state. Results were inconclusive, with trends suggesting that the appropriate treatment is dependent upon the objective desired. (Author/CJ)

Reactive and Reciprocal Inhibition Therapies in the Group Treatment of Test Anxiety

Maureen Kearney, Ph.D.

ABSTRACT

The present experiment was designed to compare the effects of group reactive inhibition therapy and group reciprocal inhibition therapy with no treatment on the anxiety level of test-anxious college students. Twenty undergraduate students volunteered for the study and were assigned to either the reactive inhibition group, the reciprocal inhibition group. or the non-treatment control group. Sarason's Test Anxiety Scale (TAS), the IPAT Anxiety Scale and the Galvanic Skin Response (GSR) were administered to all subjects both before and after treatment in order to assess anxiety level.

The reactive inhibition group met for five sessions and each meeting lasted for approximately twenty minutes. This group was given a treatment which consisted of having the subjects concentrate on scenes from a standardized hierarchy of anxiety-arousing test situations, while at the same time trying to increase any feelings of tension they were experiencing. Subjects were further instructed to focus on and augment any bodily sensations associated with their anxiety (e.g., rapid heartbeat, upset stomach, sweaty palms, etc.).

The reciprocal inhibition group also met for five sessions and the duration of each session was forty minutes. This treatment consisted of training the subjects in deep muscle relaxation and having them imagine scenes from the standardized hierarchy while in this relaxed state.

The findings of the study showed significant differences at the .10 level on the TAS measure when the reciprocal inhibition group was compared with the control group. There were no significant differences between reactive inhibition and reciprocal inhibition therapies on any

measure, and no significant differences were found between the reactive inhibition group and the control group. Analyses to determine significant improvements for each group indicated that there was a significant difference at the .05 level in pre- to post-treatment TAS scores for the reciprocal inhibition group. There was also a strong trend for reactive inhibition therapy to result in a considerable decrease in test anxiety as measured by both subjective and objective scores. This group's pre- to post-treatment TAS scores approached significance at the .10 level ($p = .109$), and a considerable improvement on the GSR measure was also noted. The above evidence indicates that subjects in both treatment groups showed an improvement in test anxiety as measured by the TAS.

Because no significant improvements were noted on either the IPAT or GSR measures, definitive conclusions cannot be drawn from this study concerning the efficacy of either treatment. There are trends, however, to suggest that selection of the appropriate therapy method might be done on a goal-oriented basis. When the main objective of treatment is to alter the patient's subjective perception of his anxiety, reciprocal inhibition is recommended as the preferred therapy; when control of autonomic responses to anxiety-provoking situations is the desired goal, reactive inhibition is indicated.

Reactive and Reciprocal Inhibition Therapies in The Group Treatment of Test Anxiety

Maureen Kearney, Ph.D.

A major concern of today's college student is the successful completion of academic requirements leading to his degree. Factors which impede the student's progress toward this goal represent a source of frustration to him and may ultimately lead to his withdrawal from the university. In recent years it has been established that excessive anxiety in test situations is one such factor which seriously hampers a number of students in their academic achievement (Alpert and Haber, 1960; Paul and Ericksen, 1964; Sarason, 1961).

Researchers have used a variety of techniques ranging from group psychotherapy to the development of study skills in an attempt to treat individuals suffering from this debilitating anxiety.

In recent years, treatment by behavior modification techniques was often found to be more effective and more efficient than treatment by traditional methods (Paul, 1966, 1967; Lazarus, 1961). The most widely used of these behavioral procedures for reducing test anxiety is reciprocal inhibition therapy which was developed by Wolpe (1958). This treatment consists of training the patient in progressive relaxation of the gross muscles of the body, constructing a hierarchy of anxiety-producing scenes around a common theme, and then pairing the learned relaxation technique with the imagined scenes from the hierarchy. Many studies to date have manipulated the various components of this therapy to determine which factors are responsible for its effectiveness, and a number of authors have called into question whether the relaxation phase of treatment is actually an essential element.

In studing the separate effects of relaxation and desensitization, Rachman (1965) found that the combination of the two was markedly superior to their separate effects. Davison (1968) and Lomont and Edwards (1967) compared systematic desensitization (in which relaxation is paired with aversive stimuli) with a method which used exposure to the anxiety-provoking scenes without inducing a relaxed state. Both of these studies found desensitization plus relaxation to be significantly superior to the extinction procedure. A similar comparison between these two procedures by Cooke (1968) showed no significant differences between the method employing relaxation and that which did not. These findings contradict those of the three studies mentioned above. Wolpin and Raines (1966) also report a study in which treatment was completed successfully without the use of relaxation. Subjects in this experiment either went through the hierarchy with no training or instructions in relaxation, went through the hierarchy with their muscles deliberately tensed, or were merely exposed to the most intensely anxiety-producing scenes in the hierarchy. The conclusion reached by this study was that repeated presentation of aversive stimuli without negative reinforcement results in change in a positive direction, indicating that the relaxation response advocated by Wolpe is unnecessary.

In 1959, Malleson described a therapeutic procedure for anxiety reduction which was based on the reactive inhibition theory of Hull, and which instructed the patient to imagine anxiety-evoking scenes while exaggerating any feelings of fear or tension he experienced as a result of these imaginings.

The use of imagined scenes from a heirarchy is common to both methods of treatment mentioned above; however, reciprocal inhibition therapy depends on relaxation responses to effect improvement, while reactive inhibition

therapy asks the patient to increase any feelings of tension. Clearly, the treatments use opposite procedures to achieve the same goal, reciprocal inhibition therapy being based on a counterconditioning model and reactive inhibition therapy on an extinction model.

Both types of therapy have been used in a group setting in order to treat patients suffering from the same phobia. Paul and Shannon (1966), Lazarus (1961), and Suinn (1968) have reported highly effective results when reciprocal inhibition therapy was administered in groups, and studies by Calef and MacLean (1970) and Graff et al. (1971) have supported the efficacy of treatment by reactive inhibition in groups.

The purpose of the present study was to compare the effects of group reactive inhibition therapy and group reciprocal inhibition therapy with no treatment on the anxiety level of test-anxious college students.

METHOD

Subject

Subjects were 20 volunteer students (7 males and 13 females) who were recruited from sociology, education, psychology and computer science classes.

Pre-Treatment Procedures

Before treatment began, all subjects were administered the Test Anxiety Scale (TAS) and the IPAT Anxiety Scale to determine their self-reported level of anxiety.

The Test Anxiety Scale used in this study was a sixteen-item, true/false questionnaire developed by Sarason (1962) to ascertain the degree of anxiety a person experiences in test situations. (See Appendix A for a copy of this scale).

Sarason's definition of a high test anxiety score as being nine or above was used as the criterion in the present study.

The IPAT anxiety scale is an eighty-item questionnaire developed by Cattell and Scheier (1963) to measure the general anxiety of adults and young adults. A raw score of forty on this standardized questionnaire indicates an individual whose anxiety, to quote the IPAT literature, "could be getting serious." (Cattell and Scheier, 1963, p. 10). Therefore, a score of forty was used as a cutoff point for the inclusion of subjects in this study.

In addition to the two subjective measures mentioned above, each student's Galvanic Skin Response (GSR) was recorded to determine his state of arousal while in an actual test-taking situation. During this procedure, an initial baseline reading was obtained for a ten-minute period. The subject was then told that the test he was about to take (the Otis Self-Administering Test of Mental Ability) had been proven to be highly reliable in evaluating a person's potential level of intellectual operation. This was done to induce an anxiety response in the subject which would show up as a decrease in skin resistance.

Students accepted for the study either:

1. had to obtain the following scores on any two of the three measures: a score of 9 on the TAS; a score of 40 on the IPAT; a GSR reading which showed a 10% decrease in skin resistance; or
2. had to obtain an extremely high score on any one of the measures (i.e., a score of 13 on the TAS; a score of 50 on the IPAT; a GSR reading which showed a 30% decrease in skin resistance).

Subjects were assigned to either the reactive inhibition group, the

reciprocal inhibition group, or the non-treatment control group, and the Mann-Whitney U Test was used to determine whether there were any significant differences among the groups. No significant differences ($p < .05$) were found on any of the measures.

Treatment

Reactive Inhibition. The reactive inhibition group contained 7 subjects; therapy consisted of 5 twenty-minute sessions.

In the initial session subjects were given an explanation of how anxiety in test situations develops and how this high level of anxiety was currently being sustained. Subjects were told that, in highly anxiety-provoking situations, one tends to do things to avoid that particular circumstance. This avoidance response leads to a temporary decrease in anxiety, but when faced with a similar situation at some later time, one is likely to experience as much anxiety as on the previous occasion. It was further explained that this occurs because the individual does not allow himself to experience his anxiety feelings as fully as possible without avoidance. In order to break the cycle of the feared situation leading to an anxiety response leading to an avoidance response, subjects were told that their treatment would consist of imagining scenes of test situations as vividly as possible while trying not to avoid the anxiety feelings accompanying the scenes. Instead, they would be asked to concentrate on their anxiety responses (such as rapid heartbeat, perspiration, upset stomach, etc.) and try to augment them. As a result of this effort, inhibition would build up and the anxiety responses would decrease and eventually cease in real-life test situations (Malleson, 1959). As a practice example, the subjects were asked to imagine a scene

in which they were in a dentist's office, and were told to concentrate on and increase any feeling of anxiety they were experiencing.

After this demonstration of the reactive inhibition technique, subjects were given copies of MacLean and Graff's Home Remedy for Fears (MacLean and Graff, 1970) for a more detailed explanation of the process and were told to practice the technique whenever possible. (See Appendix B for a copy of the handout.) Subjects were also given copies of the hierarchy items which would be used during the treatment sessions. This handout contained 12 scenes describing test situations which were arranged from the least anxiety-producing to the most anxiety-producing situation (Appendix C). This standardized hierarchy was a modification of the one used in a study by Garlington and Cotler (1968).

During the second session the first 3 items in the hierarchy were presented for approximately 3 minutes each, while the counselor emphasized the importance of focusing on and exaggerating any feelings of anxiety that were experienced. After each scene was presented, subjects were asked to signal any anxiety by raising the index finger of the right hand. When all subjects indicated that there was not anxiety present, the next scene was described.

During session three, the next 4 items in the hierarchy were covered and a change in the finger-raising technique was made. Subjects were instructed to indicate any anxiety experienced immediately after the scene was described by raising the index finger, and keeping it raised until the anxiety dissipated.

Sessions four and five followed these same procedures, with session

four covering the next 3 items and sesion five completing the last 2 scenes.

Reciprocal Inhibition. The reciprocal inhibition group contained 6 subjects; therapy consisted of 5 forty-minute sessions. Procedures for the administration of treatment followed standard desensitization methods.

In the initial therapy session, subjects were given the explanation that they were presently suffering from a high degree of anxiety in test situations due to previously learned anxiety responses in similar situations. Subjects were told that, in order to reduce their test anxiety, a two-step therapy process would be used which included training in deep muscle relaxation and the pairing of this relaxed state with imagined scenes of test situations. This pairing of relaxation responses with thoughts of test situations would tend to countercondition anxiety responses, and eventually the bond between the feared situation and the anxiety response would be broken.

After the rationale of the reciprocal inhibition process was explained, a copy of the 12-item hierarchy was given to all subjects. This hierarchy was identical to that used in the reactive inhibition group.

Subjects then followed instructions to relax the muscles in the upper part of the body and were told to practice this technique between sessions.

In the next session the counselor assisted the subjects in relaxing the muscles they had previously been taught to relax, and further instruction was given on the relaxation of the muscles in the lower part of the body. After each subject indicated that he was no longer experiencing tension in any part of his body, the first item in the hierarchy was described. During this session the second item was presented also.

Reciprocal inhibition therapy followed the format described below:

All scenes were initially presented for 5 seconds, and if no one raised

his finger to indicate anxiety, the scene was re-presented for 10 seconds. If there was still no indication of anxiety, subjects were asked to imagine the same scene for 15 seconds. Finally, if no anxiety was acknowledged after this presentation, the item was presented for 20 seconds. Between scene presentations, subjects were instructed to concentrate on relaxing their muscles.

When a subject indicated tension after a specific presentation, the scene was re-presented for the same length of time. If the item still caused difficulty, the time was decreased.

Subsequent sessions followed the same procedures as those described above. Session three covered the next 4 scenes in the hierarchy, session four dealt with items 7,8, and 9, and the last session completed the remaining 3 items.

Control Group. The control group consisted of 7 subjects who received no treatment for test anxiety during the five weeks the experiment was being conducted.

Post-Treatment Procedures

The procedures for this session were the same as those employed in the pre-treatment assessment meeting, the only difference being that an alternate form of the Otis test was used while the GSR was being measured.

Results and Discussion

The Mann-Whitney U test was used to analyze the post-treatment data comparing the groups on the three behavioral measures. The results of these analyses are presented in Table 1. Statistical comparisons of the reactive inhibition group with the no-treatment control group on the three anxiety measures yielded no significant differences on any of the measures. The data comparing the

Table 1

Mann-Whitney U Test Comparing the Reactive Inhibition Group, the Reciprocal Inhibition Group, and the Control Group on the Post-Treatment Anxiety Measures

Measure	Groups Compared	U Statistic	p
TAS	reactive / reciprocal	17	.31
IPAT	reactive / reciprocal	12.5	.13
GSR	reactive / reciprocal	17.5	.34
TAS	reactive / control	15	.13
IPAT	reactive / control	22	.40
GSR	reactive / control	15.5	.15
TAS	reciprocal / control	11	.09 *
IPAT	reciprocal / control	18.5	.39
GSR	reciprocal / control	17.5	.34

Note. - n=7 for the reactive group, n=6 for the reciprocal group, and n=7 for the control group.

*$p < .10$

reciprocal inhibition group with the control group indicated that there was a significant difference at the .10 level on the post-treatment TAS measure. There were no significant differences between the two groups on the other two measures. No significances were found between the two treatment groups on any of the anxiety measures.

Pre-to post-treatment differences were analyzed on the three anxiety measures for each of the three groups using the Wilcoxon Matched-Pairs Signed Ranks test. The results of this analysis, shown in Table 2, indicate significant differences between the pre and post TAS scores at the .05 level for the reciprocal inhibition group. There was also a strong trend for reactive inhibition therapy to result in a considerable decrease in test anxiety as measured by the TAS. This group's pre- to post-treatment scores approached significance at the .10 level ($p = .109$).

Mean pre-and post-treatment scores on the three measures of anxiety for the three groups indicated trends in the expected direction, with both treatment groups showing improvement on all mean scores and the control group showing an increase in anxiety on two of the three measures.

From Table 3 it can be seen that both treatment groups improved substantially on the TAS measure, while the control group showed only a minimal decrease in test anxiety. In addition, the reciprocal and reactive inhibition groups experienced a decrease in generalized anxiety as measured by the IPAT scale, whereas the anxiety level of the control group increased. Mean GSR scores for the reactive inhibition group decreased substantially from pre- to post-treatment as is evident from the table. While the reciprocal group improved slightly, the control group exhibited an increase in autonomic arousal to the Otis test over the five-week period that treatment was being conducted for the other two groups.

Table 2

Comparison of Pre- to Post-Treatment Scores

for Each Group on the Three Anxiety Measures

Measure	Group	t Statistic
TAS	reactive	5.5
TAS	reciprocal	2 **
TAS	control	6.0
IPAT	reactive	11
IPAT	reciprocal	6
IPAT	control	11
GSR	reactive	7
GSR	reciprocal	10
GSR	control	6.5

Note. — n = 7 for the reactive group, n = 6 for the reciprocal group, and n = 7 for the control group.

** $p < .05$

Table 3

Mean Pre- and Post-Treatment Scores for the Reciprocal Inhibition Group, the Reactive Inhibition Group, and the Control Group

Measure	Group	Pre $\overline{X}$	Post $\overline{X}$
TAS	reciprocal	9.5	7.7
IPAT	reciprocal	38.7	34.2
GSR	reciprocal	24.2	23.3
TAS	reactive	8.1	7.4
IPAT	reactive	42:9	41.0
GSR	reactive	26.0	- 2.57
TAS	control	9.6	9.3
IPAT	control	34.6	35.3
GSR	control	21.7	25.7

The overall results of the study indicate that neither of the two treatment groups improved significantly over the control group on the IPAT and GSR measures of anxiety. Comparison of TAS scores, however, showed that reciprocal inhibition therapy was significantly more effective than no treatment ($p < .10$).

Further analyses to determine significant improvements for each group indicated that there was a significant difference at the .05 level in pre- to post-treatment TAS scores for the reciprocal inhibition group. There was also a strong trend for reactive inhibition therapy to result in a considerable decrease in test anxiety as measured by both subjective and objective scores. This group's pre- to post-treatment TAS scores approached significance at the .10 level ($p = .109$). The above evidence indicates that subjects in both treatment groups showed an improvement in test anxiety as measured by the TAS.

Because no significant improvements were noted on either the IPAT or GSR measures, definitive conclusions cannot be drawn from this study concerning the efficacy of either treatment. There are trends, however, to suggest that selection of the appropriate therapy method might be done on a goal-oriented basis. When the main objective of treatment is to alter the patient's subjective perception of his anxiety, reciprocal inhibition is recommended as the preferred therapy; when control of autonomic responses to anxiety-provoking situations is the desired goal, reactive inhibition is indicated.

APPENDICES

APPENDIX A

The Test Anxiety Scale

Answer true or false for each of the following statements.

1. While taking an important examination, I perspire a great deal. _____
2. I get to feel very panicky when I have to take a surprise exam. _____
3. During tests, I find myself thinking of the consequences of failing. _____
4. After important tests I am frequently so tense that my stomach gets upset. _____
5. While taking an important exam I find myself thinking of how much brighter the other students are than I am. _____
6. I freeze up on things like intelligence tests and final exams. _____
7. If I were to take an intelligence test I would worry a great deal before taking it. _____
8. During course examinations, I frequently get so nervous that I forget facts I really know. _____
9. During a course examination, I find myself thinking of things unrelated to the actual course material. _____
10. If I knew I was going to take an intelligence test, I would feel confident and relaxed beforehand. _____
11. I usually get depressed after taking a test. _____
12. I have an uneasy, upset feeling before taking a final examination. _____
13. When taking a test, my emotional feelings do not interfere with my performance. _____

14. Getting a good grade on one test doesn't seem to increase my confidence on the second. _____

15. After taking a test I always feel I could have done better than I actually did. _____

16. I sometimes feel my heart beating very fast during important tests. _____

APPENDIX B

A SIMPLE HOME REMEDY FOR FEARS

"In many cases, when you have a specific kind of fear or anxiety, such as test anxiety or speech anxiety, a crucially important part of the fear is a wish to avoid or escape from the feared situation. As long as the wish persists, reciprocally the fear will persist. If you can persuade yourself to experience the fear without trying to avoid it, the vicious circle of fear leading to the escape urge leading to more fear can be unwound. (The footsteps that follow you past a cemetery in the dark become louder and more menacing the more you hurry. Only when you stop and permit them to approach do they disappear.)

"The home remedy for fear is simply to experience the fear, deliberately and as fully as possible. The technique is probably most efficient if you have a sympathetic friend present so you can verbalize and act out the fear. Think about the feared situation or object. Imagine that you are in the feared situation, or actually put yourself in the feared situation. In some cases it may be easiest to do this in progressive stages. As you do so, do not attend primarily to the feared situation or to the wish to escape the situation. Concentrate on the fear itself. Attend as actively as you can and experience as fully as you can the unpleasant emotions and all the concomitant bodily sensations that are aroused. If it's appropriate, go on to imagine all the undesirable consequences of being in the feared situation, the failure and loss of self-esteem that will result, and the ensuing scorn, ridicule, and rejection by friends, parents, and others.

"Take for example an agoraphobic person, say one who cannot walk from home to his place of work alone. He might begin by going to the foot of his front door steps, where he experiences all the fear possible there. When he has tried and tried to feel all the fear possible, and becomes so bored by it that he cannot feel more, then he advances, say, 25 yards or so down the sidewalk, or until the fear is rekindled. There again he is to stand still and experience his emotions, and so on.

"It is very important for you to understand that the aim of the exercises is to experience the fears and all the bodily sensations that always accompany them, and not simply to achieve such-and-such a

distance, or such-and-such a contact. One often meets people, particularly people with phobias of situations rather than objects (situations are less easily avoided) who say they can do so-and-so if they have to; but the mere doing of it does not at all reduce the phobic abhorrence the next time. Facing a feared situation by sheer will power is possible in many cases, but this does nothing to reduce the fear. For successful fear reduction, full attention to and experience of the internal unpleasantness is essential.

"In some cases where it is more convenient to imagine the feared situation, it may be necessary to repeat the treatment a number of times. Say you are suffering from test anxiety and you use this method to reduce the fear. You may do so at a time when you are not faced with a test. As the date of an actual examination approaches, you may begin to experience some fear. Do two things. First, every time you feel a little wave of spontaneous alarm, do not push it aside; do enhance it, augment it, try to experience it more profoundly and more vividly. Second, if you do not spontaneously feel fear, make a special, deliberate effort to do so two or three or six times a day, no matter how difficult or ludicrous this might seem.

"This technique works best with specific fears -- the more specific the fear, the more effective the technique. It works best if there is a sympathetic friend present, to whom you can describe your sensations as you experience your fear. Like most good home remedies, it sometimes doesn't work at all, but it can cause little harm, and sometimes it works amazingly well."

APPENDIX C

Test Anxiety Hierarchy

1. Studying in your room two weeks before a test.
2. Studying in your room and wondering how you will remember the information when the test comes.
3. Studying in your room two days before a test.
4. Studying in your room the night before a test.
5. Looking through your notes before leaving for the test.
6. Walking into the classroom to take the test.
7. Sitting at your seat, waiting for the test to be passed out.
8. Getting the test and looking it over.
9. Taking the test and thinking about how well you are doing compared to others.
10. Seeing a question on the test you are sure you do not know the answer to.
11. Seeing oth finish the test while you are still taking it.
12. Sitting in a class and the instructor tells you that you are going to have a pop quiz.

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