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EFFICACY OF PARTICIPANT MODELING AS A FUNCTION OF RESPONSE INDUCTION AIDS [1]

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The present experiment tested the efficacy of participant modeling as a function of the amount of response induction aids employed. Adult phobics received participant modeling with either a low, a moderate, or a high number of aids. Marked changes in behavior and attitudes were rapidly induced when a wide array of performance aids was available, whereas progress was retarded and attainments were substantially lower given limited auxiliary options. Therapeutic efficacy, however, was not monotonically related to number of performance facilitators. Modeling with moderate induction aids generally yielded comparable results to the more highly aided treatment and, on some measures, produced greater generalization effects. Supplementary findings indicated that generalized changes are best achieved by using aided participant modeling to restore inhibited behavior followed by self-directed practice to extinguish residual fears and to reinforce personal mastery.

In modifying avoidance behavior, therapists tend to direct their attention to emotional arousal. The widely applied desensitization approach is conducted on the principle of minimization of anxiety arousal (Wolpe, 1969). Treatment strategies are therefore keyed to this factor. Aversive stimuli are presented in graduated doses and promptly withdrawn whenever clients experience anxiety. Should perturbing emotional reactions be evoked, there are essentially two things the therapist can do: relax the client or reduce the threat value of the aversive scenes.

More recently, avoidance behavior has been treated by flooding and implosion procedures, which rely upon maximization of anxiety arousal (Gath, 1973; Stampfl & Levis, 1967; Watson & Marks, 1971). In this approach, intense anxiety is elicited by prolonged exposure to the most threatening situations. The therapist's main efforts are aimed at inducing and sustaining anxiety at high levels without relief until the emotional reactions are extinguished.

Coupled with the anxiety focus is a heavy reliance upon symbolic renditions of aversive events. In both desensitization and flooding treatments, emotional responses are typically extinguished to imaginal representations of anxiety-provoking situations. Although elimination of anxiety to imaginal threats produces improvement in behavioral functioning, there is a notable transfer loss of therapeutic effects from symbolic to real-life threats (Agras, 1967; Barlow, Leitenberg, Agras, & Wincze, 1969). Such transfer decrements are understandable, considering that complete response generalization rarely occurs when treated events differ significantly from the natural ones.

The participant modeling approach favors successful performance as the primary vehicle of psychological change. Persons exhibiting intractable inhibitions, of course, are not about to do what they dread. The therapist, therefore, arranges the environment in such a way that despite himself, an incapacitated person can perform successfully. This is achieved by enlisting a variety of supportive aids and protective controls. To begin with, the threatening activities are repeatedly modeled to show the client how they can be effectively performed and that the consequences he fears do not in fact occur. Joint performance with the therapist, who offers physical assistance when needed, enables apprehensive clients to engage in threatening activities that they would not consider doing on their own.

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Highly demanding or intimidating performances are reduced to graduated subtasks of increasing difficulty so that at any given step participants are asked only to do what is clearly within their immediate capabilities. Treatment is conducted in this stepwise fashion until eventually the most trying activities are performed skillfully and fearlessly.

Another aid for overcoming response inhibition is to have clients perform the avoided behavior over graduated temporal intervals. Initially, participants may be willing to perform aversive activities for manageable short periods, but they resist doing so if required from the outset to endure distress over a long time. The time interval is extended until activities that earlier would have produced intolerable distress can be performed with equanimity.

Arrangement of protective conditions that reduce the likelihood of feared consequences is a further effective means of weakening dysfunctional restraints that retard the process of change. Thus, for example, snake phobics are willing to touch snakes, which ordinarily they would not do, provided the model holds the snake securely by the head and tail (Bandura, Blanchard, & Ritter, 1969); and acrophobics will climb scarey heights given the security of the therapist's physical support (Ritter, 1969).

Most of the preceding operations reduce the aversive potential of a situation while retaining the source of threat at a high level. Animal phobics, for example, are presented with fearsome animals, but performance supports and safeguards are temporarily introduced into the environment so as to enable clients to perform successfully. If such environmental arrangements prove insufficient to induce change, approach behavior can be established by reducing the aversive source. Weaker threats are presented.

During early phases of treatment, therapists use supplementary performance aids that are well suited to initiate behavioral changes. As treatment progresses, however, the supports are gradually removed so that clients come to function effectively without assistance. Although the provisional supports undoubtedly attenuate emotional arousal, performance is not deferred in order that anxiety reactions be extinguished. Rather, the positive experience of successful action is considered to be one of the best eradicators of anxiety.

Social learning theory distinguishes among three basic change processes, namely, the induction, generalization, and maintenance of behavior (Bandura, 1969). Since the determinants governing each of these processes differ in some respects, they require separate analysis. The present experiment was designed to assess the relative efficacy of participant modeling in achieving terminal performances as a function of the number of response induction aids employed. Adult phobics were matched in triads on severity of avoidance behavior and administered participant modeling with either a low, a moderate, or a high number of performance aids until one of the members completed all the required tasks in treatment. Subjects were then tested for amount of behavioral, attitudinal, and affective changes.

It was predicted that subjects who had the benefit of moderate and high performance aids would be more likely to attain terminal performances in treatment and greater overall changes than those who received participant modeling with minimal aids. When disinhibition is facilitated by extensive supports, subjects may attribute their performances to external aids rather than to restored capacity. The change process can be further complicated by development of discriminations that the probable consequences for approach behavior differ under circumstances varying in safeguards. As a result, subjects may behave boldly under secure conditions but remain fearful in unprotected situations. In the participant modeling approach, however, after behavior is induced by facilitative supports, they are withdrawn so that subjects experience success unaided. Since the likelihood of limiting attributions or discriminations would be abated by the altered arrangements, provisional use of high performance aids was expected to augment the process of change as compared to the moderately aided condition.

METHOD

Subjects

Subjects who were distressed by their snake phobia were recruited through advertisements placed

in community newspapers. This source was used because earlier pilot studies revealed that the avoidance behavior of hampered snake phobics was more refractory to change than that of college volunteers. Of the 36 subjects included in the study, 4 were males and the remainder were females. They varied in age from 17 to 47 years, with a mean age of 32 years.

Virtually all of the subjects in the sample had abandoned recreational activities such as hiking, camping, swimming in lakes, or fishing because of their dread of snakes. Some could not pursue their vocation satisfactorily, as in the case of a geologist who abhorred field work. Others were incapacitated in more unusual ways. One individual, for example, was unable to use her bathroom for several weeks upon learning that a snake had escaped into the municipal sewer system of a distant city. Because the threat is mobile, it was more incapacitating than fixed sources of distress that do not affect everyday functioning as long as they are avoided.

New information about snakes usually produced additional constriction of activities as illustrated by a woman who gave up swimming in open waters ("I read an interesting article about sea snakes in *Science Digest* that ruined me for life."). The more pervasive consequences of the snake phobia were thought-produced distresses ("During spring and summer they are constantly on my mind when I'm outdoors. . . . Once I've seen one or a picture of one it is hard for me to get them out of my head. . . . Now that I know they are on some land we purchased I feel tense about living there."). Many suffered recurrent nightmares in which snakes pursued and attacked them.

Pretreatment Measures

The assessment procedures were similar to those described at length in a previous study (Bandura et al., 1969) and are therefore only summarized here.

Attitudinal measurement. Subjects were first administered six attitude scales describing different types of encounters with snakes. They rated each item on a 7-point scale designating strong enjoyment at one end, strong dislike at the other, and indifference at the midpoint. The mean of the six ratings constituted the attitude score.

Behavioral avoidance task. The test of avoidance behavior consisted of a series of 29 performance tasks involving increasingly more threatening interactions with a three-foot boa constrictor. The tasks required subjects to approach the snake in a glass cage, to look down at it, to touch and hold the snake with gloved and then bare hands, to let it loose in the room and return it to the cage, to hold it within five inches of their faces, and finally to tolerate the snake crawling in their laps while they held their hands passively at their sides.

Prior to the test of avoidance behavior, subjects were given factual information about the characteristics and habits of snakes to eliminate moderately fearful subjects who might achieve some fear reduction on the basis of incidental information alone that could be gained from testing and treatment experiences. Moreover, by introducing information influences in the pretest stage their effects, if any, were included in the baseline measurement rather than allowed to operate differentially depending upon treatment efficacy. A weak method that produces minimal contact responses will generate much less informative feedback than one that restores a high level of interactive behavior.

Subjects' avoidance behavior was measured by a female tester. Those who were unable to enter the room containing the snake received a score of zero; subjects who would go in were asked to perform the various tasks in the graded series. To control for any possible influence of expressive cues from the tester, she stood behind the subject and read aloud the approach responses to be performed.

The subject's score on the behavioral test was the number of snake-interaction tasks performed successfully. Those who could lift the snake inside the cage with a gloved hand were considered insufficiently fearful for inclusion in the experiment. Based on this criterion, 35% of the respondents who considered themselves snake phobic proved, much to their surprise and relief, relatively bold in the behavioral pretest. It is likely that in other areas of functioning involving persistent avoidance and limited opportunity for reality testing, many people suffer from erroneous self-definition. To extend the generality of the findings, subjects were excluded only on the basis of approach performance without regard to any other psychological characteristics.

Fear arousal accompanying approach responses. In addition to measuring attitudes and performance capabilities, the amount of fear aroused by each approach response was also assessed. During the behavioral test subjects rated orally, in terms of a 10-interval scale, the intensity of fear they experienced when each snake approach response was described to them, and again while they were performing the corresponding behavior. The fear scores, averaged across the responses that each subject could perform, indicated degree of anticipatory fear arousal and performance related fears. Since the measures of anticipatory and performance fear correlated highly ($r = .88$), these two sets of ratings were averaged for statistical analysis.

Appraisal of fear proneness. As the final pretreatment assessment, subjects completed a comprehensive fear inventory containing 20 items in each of the following five classes of fears: animals; social situations and interpersonal behavior; physical afflictions and injuries; classical phobias; and a collection of miscellaneous fears. They rated their emotional responses to each object or situation in terms of a 5-point scale describing increasing degrees of fearfulness. The number and mean intensity of fears were scored separately for each of the five categories and summed across all the items to provide an overall index of vulnerability to fear arousal.

Immediately after the behavioral avoidance test was completed, subjects were readministered the attitude scales to obtain a new attitudinal baseline reflecting any changes resulting from factual information and exposure to an actual snake.

Treatment Conditions

Subjects were individually matched in triads on the basis of their pretreatment avoidance behavior and then randomly assigned to one of three conditions. The first treatment session was scheduled within a week after the pretest. A female experimenter conducted the treatment sessions with the boa constrictor.

For all subjects the treatment activities comprised a prefixed sequence of tasks ranging from looking at, touching, and holding the snake; placing open hands in front of its head as it moved about; holding the snake's head in front of their faces, allowing the snake to crawl freely in their laps; and letting the snake loose in the room and retrieving it. In each case, the required behavior was first modeled and then subjects were instructed to perform it. If they were unable to do so, the experimenter sequentially introduced performance aids from the preestablished hierarchy designed for each condition until subjects accomplished the desired responses. After the behavior was so induced, the supportive aids and protective controls were withdrawn. Thus, both the sequence of treatment tasks and utilization of performance aids were standardized. Except for modeling and task gradation, which were common to all conditions, the treatments varied in terms of the number of additional supplementary aids employed.

When subjects receiving the high induction aids treatment were unable to execute behavioral tasks upon demonstration alone, the experimenter made use of joint performance, enactment for initially brief but increasing durations, or joint enactment for longer intervals of time. To facilitate the first contact responses, the experimenter held the snake securely by the head and tail, thus affording complete protection against any feared injury. Should subjects still resist touching the snake, they were asked to don either light or heavyweight gloves and to touch and hold the midsection. Similar performance aids, glove protectors, and assured control of the snake were used to foster more intimidating contact with the snake's head and entwining tail. For the severely incapacitated phobics who remained immobile even under these secure conditions, the dreaded responses were first performd with appropriate supports toward a baby king snake which had a much weaker threat value.

In the moderate induction aids treatment, the repertoire of response facilitators included modeling, task and temporal gradation, as well as joint performance. During the physical contact activities the experimenter maintained partial rather than full control of the snake. Neither physical protectors nor the less frightening snake were used when subjects were unable to perform the required behavior after the aids available to them were exhausted.

Subjects who were administered the low induction aids treatment had only the benefit of modeling and task and temporal gradation. Moreover, they were required to perform contact responses without the experimenter exercising any control over the snake.

Within each matched triad, treatment was administered until one of the members successfully completed the therapeutic tasks, whereupon they were all tested for the degree to which they benefited from their respective treatments of identical duration.

An untreated group was not included in the present design because several previous experiments (Bandura & Barab, 1973; Blanchard, 1970; Bandura et al., 1969), drawing samples from the same source and using identical measurement procedures, revealed no significant changes with repeated testing alone. This study was primarily concerned with the relation between levels of response induction aids and outcomes. For this purpose, a no-treatment baseline is of little interest.

Posttreatment Measures

The assessment procedures used in the pretreatment phase of the study were readministered within a week after the termination of treatment. As in the pretest, the attitudes were measured prior to and following the behavioral avoidance test.

In order to determine the generality of treatment effects, half of the subjects in each of the conditions were tested initially with the familiar boa constrictor and then with a four-foot corn snake, while the remaining subjects were tested with the two snakes in the reverse order. In a separate study six snake phobics were tested with both snakes in a counterbalanced order to compare their threat value. The subjects displayed equivalent approach behavior and fear arousal toward the two snakes.

The same female tester who conducted the pretreatment assessment administered the posttreatment measures. To control for any possible bias, she had no information on the conditions to which subjects were assigned.

RESULTS

Attainments in Treatment

Terminal performances were achieved by one or more members of the various triads within a relatively short period. The mean treatment time was 81 minutes, with 75% of the terminals occurring on an average of 41 minutes.

As depicted in Figure 1, the ease with which subjects achieved terminal performances during treatment varied directly with amount of response induction aids. Results of the Cochran Q test (Siegel, 1956) show that the treatments differ significantly among themselves ($Q = 6.50$, $p < .05$). Compared

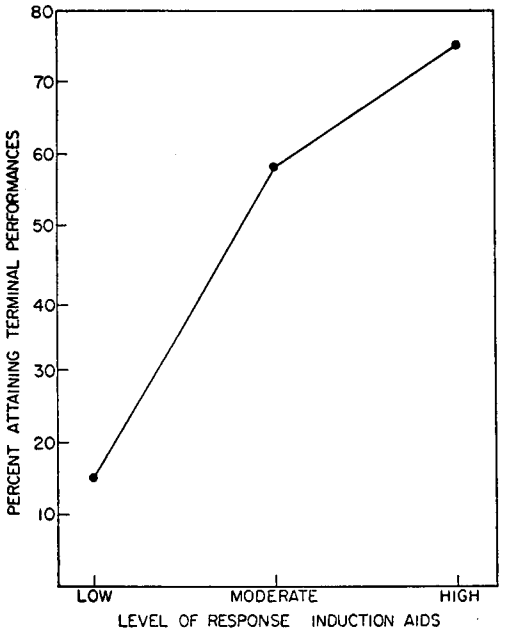

FIGURE 1. Percentage of subjects who achieved terminal performances as a function of amount of response induction aids.

to the minimal condition, participant modeling with high performance aids was clearly superior ($p < .01$), while the moderate aids treatment was of lesser effectiveness ($p = .09$). The difference between the latter two groups, however, fell short of conventional levels of significance.

Posttreatment Changes in Approach Behavior

Figure 2 summarizes the changes in approach responses as a function of induction aids. Within-group analyses reveal that all three forms of participant modeling produced significant increases in approach behavior toward both test snakes. The behavioral gains were all significant beyond the .001 level for subjects who had the benefit of high or moderate performance aids, and the .05 level for the minimally aided group.

Subjects were precisely matched in terms of approach behavior toward the boa but not on any of the other measures. Differences between treatment conditions on the multiple measures used in this study were therefore evaluated by analysis of covariance with pretreatment scores serving as the covariants. In the statistical evaluations the degrees of freedom are 2 and 32 for the covariance analyses, 1 and 32 for the intergroup comparisons, and 11 for the intragroup t tests. The main effect of induction aids is a significant source of variance in approach responses toward the boa ($F = 4.42$, $p < .025$), the corn snake ($F = 4.13$, $p < .05$), and the pooled scores, $F = 4.58$, $p < .025$). Neither snake order of

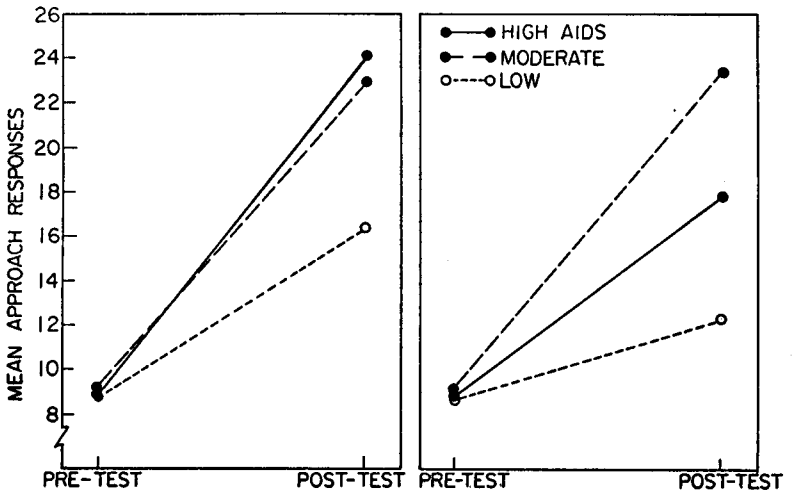

FIGURE 2. Mean number of approach responses performed by subjects toward the boa constrictor (left figure) and the corn snake (right figure) in the low, moderate, and high aid treatments.

testing nor the Order × Treatment interaction was significant for approach scores, or for any of the other measures used in this study.

Comparisons between pairs of conditions disclosed that for all three sets of approach scores, treatments employing moderate or high induction aids surpassed the minimal condition. The F values corresponding to the comparisons for total, boa, and corn snake approach responses, respectively, were 5.45 ($p < .05$), 6.64 ($p < .025$), and 3.29 ($.10 > p > .05$) between the high and low aid conditions and 8.04 ($p < .01$), 5.72 ($p < .025$), and 8.68 ($p < .01$) between the moderate and low treatments. The high and moderate conditions did not differ significantly from each other on any of the approach measures.

The terminal performance rates for low, moderate, and high conditions were 17%, 58%, and 58%, respectively. Although the figures are comparable for the latter two treatments, in the matched statistical comparisons, subjects who received participant modeling with maximal aids surpassed the lows ($p = .03$), whereas the moderates differed from their matched counterparts in the minimal condition only at a borderline level of significance ($p = .09$).

Fear Arousal Accompanying Approach Responses

A covariance analysis was computed on the measures of fear arousal associated with approach responses that subjects were able to perform before treatment and the fear levels reported for the same subset of responses in the posttreatment assessment. Subjects in all conditions experienced substantially less fear when they performed the same behavior following treatment, and did not differ in this respect.

Decrements in the level of anticipatory fear evoked by the approach task that subjects were unable to perform in the pretest provides an index of fear extinction that is unaffected by having enacted the behavior. Although all three groups achieved significant fear reduction, aided participant modeling extinguished anticipatory fear more thoroughly. On this measure, subjects who received the high ($F = 4.34$, $p < .05$) and moderate ($F = 5.38$, $p < .05$) treatments experienced significantly weaker anticipatory fears than did those receiving minimal supports.

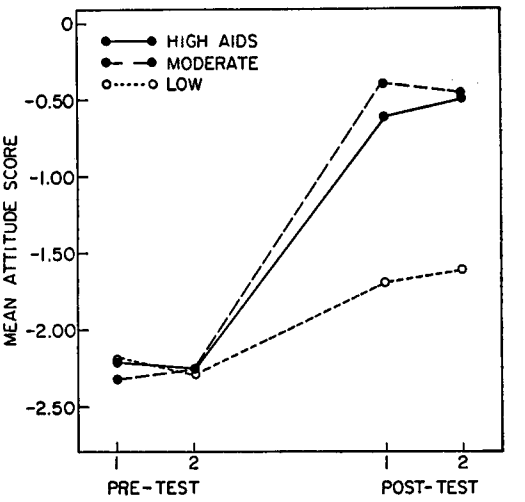

FIGURE 3. Attitudes displayed by subjects before and after receiving participant modeling with either low, moderate, or high performance aids.

Attitudinal Changes

The attitudinal modifications produced by the three treatments are shown graphically in Figure 3. Reassessment of attitudes with an intervening behavior test ($Pre_2 - Pre_1$) did not alter subjects' loathing of snakes. However, participant modeling experiences did. The significance of the intragroup changes ($Post_1 - Pre_2$) exceeded the .001 level for high and moderate aid groups and the .05 level for the minimal condition.

Covariance analysis of the attitudinal differences displayed by the groups in the posttreatment assessment ($Post_1 - Pre_2$) yielded a significant treatment effect ($F = 4.92$, $p < .025$). Both moderate ($F = 8.59$, $p < .01$) and high ($F = 5.94$, $p < .025$) response induction procedures created more favorable attitudes toward reptiles than did the minimal aid treatment, but they did not differ from each other.

Subjects showed no additional attitudinal changes as a result of their experiences in the posttreatment behavioral test ($Post_2 - Post_1$). In a finer analysis, however, subjects whose phobic behavior was completely eliminated changed their attitudes somewhat more

in the positive direction after the posttest than those who manifested residual inhibitions ($t = 1.71$, $df = 34$, $.10 > p > .05$).

Fear Inventory

The treatments did not differ from each other in the extent to which they affected fears in other areas of functioning, with one exception. Subjects who had undergone participant modeling with moderate aids reported a fewer number of miscellaneous fears following treatment than did their counterparts in either high ($F = 5.83$, $p < .025$) or low ($F = 5.84$, $p < .025$) conditions.

Subjects in all three conditions reported similar reductions in intensity of animal fears compared to their pretreatment levels ($t = 4.51$, $df = 35$, $p < .001$). Indeed, 94 percent of the participants recorded such decrements. These findings are in accord with those of previous studies (Bandura & Barab, 1973; Bandura et al., 1969), demonstrating that generalization of fear decrements following modeling treatments is most likely to occur toward threats within the same general class.

The other intragroup changes that were obtained suggest that partially aided modeling may facilitate generalization of fear reduction. Both the moderately ($t = 3.00$, $p < .02$) and the minimally ($t = 2.58$, $p < .05$) aided groups reported a general reduction in intensity of fears. In addition, the moderately assisted subjects registered a slightly weaker fear of physical injury ($t = 1.93$, $.10 > p > .05$).

Correlates of Behavior Change

Correlations were computed separately for data obtained from the three treatment conditions. When correlations from these sets of scores were in the same direction and did not differ significantly, as was usually the case, they were averaged by means of an r to z transformation. Since amount of approach behavior displayed toward the two snakes was highly correlated ($r = .79$, $p < .001$), the coefficients are reported for the mean performances.

Neither initial attitudes toward snakes, severity of phobic behavior, performance aroused fears, nor fear proneness correlated with degree of behavior change. Number of tasks completed in treatment, which is largely a therapist-controlled factor, was highly related ($r = .71$, $p < .001$) to later approach performances.

Although the level of fear initially aroused by approach behavior in the pretest assessment was a poor forecaster of therapeutic gains, measures of fear reduction taken after treatment were good predictors of subsequent behavior change. The greater the fear decrements on the initially failed task ($r = .61$, $p < .001$), and on all the responses originally performed in pretest ($r = .38$, $p < .02$), and the less fear aroused by the initially failed task ($r = -.60$, $p < .001$), the greater the behavioral improvement.

Consistent with previous findings (Blanchard, 1970; Bandura et al., 1969; Perloff, 1970), the attitudinal changes induced by participant modeling predicted amount of subsequent behavior change ($r = .42$, $p < .01$). In addition, for the highly aided subjects only, the greater the fear reduction they experienced on the tasks they were able to perform in pretest, the more they changed their attitudes in a favorable direction ($r = .75$, $p < .01$).

Correlates of Aid Use

Data from the high treatment condition, which permitted unlimited use of performance induction options, confirm the expectation that the more severe the debility, the greater the need for auxiliary aids to ensure therapeutic progress. Subjects who were the most phobic behaviorally ($r = -.40$, $p < .10$), who experienced the highest fear during their pretest performance ($r = .62$, $p < .02$), who had the most animal fears ($r = .41$, $p < .10$), and who loathed snakes ($r = -.43$, $p < .08$) required the highest number of induction procedures.

Supplementary Treatment

Ten of the subjects (6 lows, 2 moderates, 2 highs) who achieved only partial improvement were available at the conclusion of the experiment to receive maximally aided modeling. They represented the most refractory phobics in the total sample. Since the purpose of the formal experiment was to gauge the

level of response induction aids that restore approach behavior most rapidly, treatment was terminated for all members of a triad when one of them achieved terminal performance. The supplementary treatment, however, was administered in each case until all the therapeutic tasks were successfully completed, which was accomplished in an average of 101 minutes.

The supplementary treatment produced marked generalized changes in behavior. Of the ten subjects, 90% displayed terminal performances in the posttreatment assessment, with approximately equivalent approach responses toward the boa (28) and corn snake (25). These performance gains are highly significant ($t = 8.55$, $p < .001$). Positive attitudinal changes ($t = 3.19$, $p < .01$) and decrements in anticipatory fear ($t = 8.93$, $p < .001$) were equally substantial.

Highly aided modeling in the supplementary form effected more widespread fear decrements in other areas of functioning than did the original applications. Subjects reported a significant decrease in total number of fears ($t = 2.41$, $p < .05$) and fewer animal fears ($t = 2.58$, $p < .03$), which none of the treatments achieved originally. Subjects also showed an overall reduction in intensity of fears ($t = 2.09$, $p < .07$) and less apprehension about physical injury from other sources ($t = 2.23$, $p < .05$). Whether the additional benefits derive from increased amount of treatment or from independent practice remains to be demonstrated.

DISCUSSION

Results of the present experiment confirm the paramount role played by response induction aids in the success of participant modeling treatment. Subjects who had the benefit of high induction procedures surpassed their minimally aided counterparts on virtually all of the outcome measures. They displayed substantially higher behavioral attainments both in treatment and in subsequent assessments, greater attitudinal changes, and larger decrements in anticipatory fears. Moderately aided modeling similarly augmented behavioral and attitudinal changes and extinction of anticipatory fears, but it was not as clearly superior in terminal attainments.

Comparison of participant modeling with moderate and high aids indicates, however, that efficacy is not monotonically related to number of performance facilitators. On most measures the moderately aided performed about as well as the highs, and on some they showed a tendency toward greater generalization effects. These findings may be interpreted in several ways. One possible explanation is in terms of threshold properties. The number of inducements required to evoke an inhibited response varies for different behaviors and different individuals. Modeling combined with graduated joint performance under semiprotected circumstances may be sufficiently powerful to produce desired behavior in some cases so that additional aids become unnecessary or redundant. This could attenuate differences between high and moderately aided modeling.

Another possibility is that some of the potential benefits of aided performance may be partially negated by discrimination and attribution processes which link the behavior to the supports. Such effects are ordinarily minimized in applications of participant modeling by fading response aids and having subjects repeatedly engage in the activities unassisted. Any lingering doubts they may have either about their capabilities or about probable response consequences in unprotected situations can be easily dispelled in this manner. Because of precise time controls, induction aids were faded but treatment was terminated as soon as a subject performed the final therapeutic task, regardless of any acompanying anxiety, thus curtailing the amount of independent self-assuring practice.

Several lines of evidence question that attributing change to external support is a sufficient explanation. Amount of approach behavior displayed toward the generalization snake was unrelated to the number of aids received, except for those in the moderately aided treatment. The more they were aided, the bolder they behaved toward the generalization snake ($r = .42$, $p < .10$).

Results of the supplemental treatment of subjects who failed to achieve terminal performances suggest an alternative, though not necessarily mutually exclusive, explanation in terms of incomplete fear extinction. One

might expect subjects who achieved limited progress largely on their own, but rapid changes when fully aided, to attribute their behavior to external sources. Nevertheless, they displayed terminal attainments in treatment and virtually complete extinction of phobic behavior toward both snakes. In the supplemental treatment, subjects had greater opportunity to practice behaviors after they had been established. This would have the effect of both extinguishing any remaining fears and authenticating personal competency. Since these factors are reciprocally interrelated, their contribution to successful outcome is not easily separable. Experienced fear can instill a feeling of inadequacy; conversely, a sense of personal mastery can reduce vulnerability to fear arousal.

Aided participant modeling is a demonstrably powerful way of inducing behavioral, attitudinal, and affective change. But further work is needed to identify the conditions that maximize generalization of changes to a range of threat values. The overall evidence seems to indicate that widespread changes are best achieved by highly aided participant modeling supplemented with self-directed practice to extinguish residual fears and to reinforce a sense of efficacy. An experiment is planned to measure systematically the generality and durability of changes effected through participant modeling as a function of the amount and variety of self-directed performance.

The present analysis of participant modeling, which included a more formalized and wider range of response induction aids than in earlier applications, underscores the degree to which change processes are governed by the therapist's repertoire of effective options. Phobics with comparable incapacities progressed rapidly when the therapist had recourse to a wide array of performance induction aids, whereas their rate of improvement and attainments were disappointing if the therapist's auxiliary repertoire was limited. When facilitative options are available, client debility determines the number of performance supports that will be required, not the level of attainment. In developing powerful treatments, investigative attention might more profitably be directed at the scope of therapists' serviceable skills than at limiting client characteristics.

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