Processes of Fear-Reduction in Systematic Desensitization: Cognitive and Social Reinforcement Factors in Humans

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Systematic desensitization (SD) is a technique which usually takes place in a social context and involves the use of imagery and possibly other symbolic/cognitive processes as well. Research and theory bearing on these two sets of uniquely human variables are critically reviewed. The main conclusions are as follows: (a) a conceptualization of SD as a procedure which is effective via the induction of counterphobic cognitions has failed to find replicable support and is, furthermore, questionable on a priori grounds because of the doubtful relevance of attribution theory to the alteration of severe, long-standing phobias; (b) expectation of gain can produce increments in beneficial effects arising from SD but does not appear to account for all improvement; (c) deliberately induced self-instructions may increase the efficacy of SD and may, furthermore, be operating in uncontrolled but important ways in the procedure as currently practiced; (d) the word “cognitive” is used in both a descriptive and an explanatory sense in the literature, threatening even more obfuscation than already exists; (e) experiments designed to determine the role of the desensitizer as a social reinforcer for increased (imaginal) approach behavior are either inappropriate in conception, confounded in design, or productive of inconclusive results; and (f) stimulus–response formulations are proposed not to be ipso facto incapable of usefully conceptualizing and manipulating covert processes, including imagery.

Although a substantial amount of both clinical and experimental evidence currently attests to the efficacy of systematic desensitization (SD)
in reducing neurotic anxiety (Bandura, 1969; Marks, 1969), debate as to the effective process mechanisms continues. The delineation of the critical variables operating in successful SD would contribute greatly to our understanding of behavior change processes in general and would allow for the development of more refined, efficient therapeutic methods for reducing neurotic fears. Previous reviews of the literature have dealt with human process studies in SD in general (Bandura, 1969; Lang, 1969), while Wilson & Davison (1971) have recently discussed the relevant animal analogue research. In the main, all these reviews have tended to concentrate on various conditioning formulations which have been proposed to explain SD. In this paper we shall focus specifically on more recent, peculiarly human avenues of theory and research in SD, viz., the role of social and cognitive factors.

COGNITIVE FACTORS IN DESENSITIZATION

The general proposition that systematic desensitization might usefully be construed in terms of cognitive processes was originally enunciated by London (1964). He proposed that SD derived its effectiveness through the modification of a person’s thinking and expectancies about the feared situation/object. Experimental research along cognitive lines actually began with the investigations of Valins (1966; Valins & Ray, 1967) within the social psychological framework of attribution theory. False Feedback of Responsiveness

Valins’ interpretation of SD derived from Schachter’s (1964) theory of emotional behavior, which holds that emotion is the conjoint product of both physiological arousal and cognitive/perceptual factors. According to this formulation, physiological arousal provides a nonspecific basis of emotion; the quality of emotion the individual experiences is said to be a function of how he explains to himself the reasons for the arousal (cf., Schachter & Singer, 1962). Valins extended this position by suggesting that actual autonomic arousal might be unnecessary in order emotional reactions to be influenced provided that the individual only believe he is aroused or not even if this is not the case. Accordingly, Valins reasoned that Ss might be induced to believe that they were reacting nonfearfully in the presence of the phobic stimulus and thereby relabel that stimulus as nonthreatening and subsequently behave less fearfully.

Valins and Ray (1967) investigated this possibility in two closely related studies. Unselected Ss (study I) and Ss who had earlier indicated fear of snakes on a questionnaire (study II) were recruited for a study investigating physiological reactions to frightening stimuli. Ten slides of snakes (study I) in order of previously ranked increasing were presented interspersed with slides of the word SHOCK (which were followed by an uncomfortable though not painful shock); in study II the snake stimuli entailed exposure to a live snake in a cage behind a one-way screen. Experimental Ss heard what they were erroneously led to believe was their heart reacting noticeably to the shock slides but not to the snake presentations. Control Ss heard the same sounds but were told they were extraneous noise. In both studies experimental Ss showed a greater amount of posttreatment approach behavior towards the snake than did the control Ss, a finding which Valins and Ray construed as confirmation of their hypothesis. They suggested that this false feedback acted in a manner analogous to the role of relaxation in SD, which, they proposed, might derive its effectiveness by inducing the cognition that the previously fear-eliciting stimulus no longer retained its aversive properties.

This novel interpretation of SD has attracted considerable attention as an alternative to more conventional conditioning accounts. In an unwarranted overgeneralization, Murray and Jacobson (1971) state that this study strongly demonstrates that the critical factor in desensitization therapy is a change in belief about the self—similar to that occurring in traditional therapy—rather than the mechanics of relaxation, hierarchies, images, and so on” (p. 739). Valins and Ray more properly point out that “it is not possible to conclude that successful desensitization therapy is based upon the induction of these cognitions, but they do conclude that "cognitions about internal reactions are important modifiers of behaviors," and suggest that the kind of cognitions produced by the false feedback might be responsible for successful desensitization. In view of the significance attributed to the Valins and Ray report, it is unfortunate that several factors preclude an unequivocal interpretation of the findings. In study I, Valins and Ray had to perform an internal analysis on the data, discarding subjects who reported previously touching a snake, in order to demonstrate a significant experimental effect. This confounds the cognitive manipulation with selection factors. In study II significant treatment effects were observed, but on the basis of the amount of money required to induce subjects to touch the snake rather than the conventional behavioral avoidance test utilized in other studies of SD and rejected by Valins and Ray because it might have been too frightening. The Valins and Ray dependent measure represents a relatively weak behavioral requirement (Bandura, 1969), which makes it difficult to compare these data to other studies on fear reduction methods.

Furthermore, several experiments have attempted in vain to confirma
these results. Kent, Wilson, and Nelson (1972) followed precisely the same false feedback procedure as Valins and Ray, with the substitution of a standard behavioral snake-avoidance test to assess experimental effects more stringently. Contrary to the original data they found no behavioral or attitudinal effect of the false heartrate feedback. Sushinsky and Bootzin (1970) reported a “conceptual replication” of the Valins and Ray study in which they likewise failed to demonstrate an attribution effect on avoidance behavior. Those investigators eliminated the use of shock which was employed as a contrast stimulus by Valins and Ray, and instead provided subjects with feedback that their heartrate was increasing when slides of rats were projected, but not when slides of snakes were shown. A number of procedural differences between this study and the Valins and Ray experiments, such as the use of a pretest, could have accounted for the differences in results. Sushinsky and Bootzin selected Ss on the basis of a pretreatment behavioral avoidance test which eliminated about 40% of those Ss who had reported fear on the screening questionnaire (a typical finding in fear assessment; cf., Bernstein & Paul, 1971). Since the Valins and Ray Ss were either unselected or else chosen on the basis of their self-report of fear, they were no doubt less fearful than Sushinsky and Bootzin’s Ss. This issue is important since it does not seem likely that the extremely fearful S, especially the kind of client typically seen in therapy, can be deceived into believing that he is not acting fearfully on exposure to an aversive object or situation with which he has had considerable experience, a caveat issued by attribution theorists themselves, viz., "Since we would not expect that an individual undergoing extreme pain, fear, or rage could easily be persuaded to attribute the accompanying physiological arousal to an artificial source, there should be limits placed on the generality of these notions." (Nisbett & Schachter, 1966, p. 228).

Rosen et al. (1972) selected snake-fearful Ss on the basis of a behavioral avoidance test, and additionally determined that these Ss associated an increase in their heart rate with exposure to snakes, a neglected consideration in the aforementioned studies. In addition to the two groups used by Valins and Ray, Rosen included two extra control groups. In order to control for attentional effects one group heard their heartrate increase to the shocks but not to the snake slides, while the other constituted a no-treatment control. Veridical heartrate measures were monitored throughout the study in order to ascertain whether false heartrate feedback brought about an actual decrease in physiological arousal. Consistent with previous findings, the results revealed no significant differences between any of the groups on either behavioral or questionnaire measures of fear. Nor did the false feedback serve to re-

duce actual heartrate measures. Had Rosen replicated the Valins–Ray false feedback effect while at the same time finding that such false feedback led to an actual reduction in heartrate, the original Valins–Ray findings would have been open to a compelling alternative explanation along conditioning lines, with the false feedback becoming a technically expeditious though conceptually uninteresting procedure for inducing a state (response) of nonanxiety which could, along counterconditioning lines, neutralize anxiety to the snake stimuli.

Posttreatment interviews revealed that a critical assumption of the Valins model had not been met, viz., Ss did not reevaluate their fear of snakes despite the fact that they had accepted the feedback as their own veridical arousal. Rather, they adopted an alternative explanation of their heartrate reactions which allowed them to maintain their fear of snakes: they decided that it was slides of snakes they were unafraid of, not actual snakes. Consequently Rosen concluded that the methodology employed by Valins and Ray is inappropriate to testing their assumption that a cognitively induced reevaluation of fear will mediate changes in avoidance behavior. On the other hand, it will be recalled that Kent et al. (1972) found that Ss did report reevaluating their fear, though, as already stated, without any subsequent effect on avoidance behavior.

In another extension of the Valins and Ray (1967) paradigm utilizing concurrent physiological recording Gaupp, Stern, and Galbraith (1972) found no differential treatment effects on either behavioral avoidance or self-report of fear across groups modeled after the two Valins and Ray conditions and one in which subjects were given veridical physiological feedback. Unlike Rosen et al. (1972) study, all three experimental groups showed reduced physiological responding to the snake stimuli and showed significantly greater improvement than a no-treatment control group. Gaupp et al. (1972) interpret these data as challenging the Valins and Ray cognitive hypothesis and supporting a conditioning explanation of SD. Stern, Botto, and Herrick (1972) adduce further evidence against the Valins (1966) attribution hypothesis by showing that the behavior change Valins ascribed to the mere belief that physiological arousal was occurring may have been due to real physiological changes.

Expectancy of Gain

Marcia, Rubin, and Efcran (1969) have argued that expectancy change, rather than any conditioning process, is the effective element in SD. Snake-fearful Ss were administered a procedure in which Ss received periodic mild shocks while watching what they were informed were subliminal tachistoscopic presentations of snake slides. The high ex-
pectancy subjects were told they were receiving an effective treatment and were also shown bogus polygraph records indicating that their fear reactions to the snake stimuli had decreased. Low expectancy Ss were told that they were receiving an ineffective treatment and were given no information about their physiological reactions. These two groups were compared to a no-treatment control group and what the authors referred to as a SD condition. Marcia et al. interpreted their data as showing that the high-expectancy treatment produced the greatest reduction in behavioral avoidance, and they concluded that change of expectancy is the operative factor in SD.

However, this study has been strongly criticized by Bandura (1969), Howlett and Nawas (1971), and Rimm (1970), among others, who point out, for example, that various treatments were conducted in different years; that there was a differential rate of S-attrition across groups which confounds any comparisons made between the groups; that the assignment of Ss to groups was questionable; that the “desensitization” group in the study was quite different from SD; and that a full analysis of the data, which shows that high- and low-expectancy Ss did not in fact differ from each other on behavioral avoidance, contradicts the authors’ conclusions!

Several studies suggest that processes other than general expectancy of therapeutic gain are operative in effective SD (e.g., Davison, 1968; Lang, Lazovik, & Reynolds, 1965; Paul, 1966). Fishman (1970) found that SD with powerful suggestions of the therapeutic efficacy of SD combined with exposure to false physiological feedback via oscilloscopic display supposedly indicating decreased reactivity did not enhance the effect of SD administered without such suggestions. Similarly, Lomont and Brock (1971), McGlynn and Williams (1970), McGlynn and Mapp (1970), and McGlynn (1971) have shown that specific pretreatment instructions designed to inculcate either positive or negative expectations about therapeutic outcome have exerted no influence on the outcome of treatment. Fishman’s study is noteworthy also for highlighting an important methodological point in that he ascertained that his expectancy manipulation was successful in creating differential expectations across groups during SD treatment even though it failed to influence outcome. Independent assessment of the expectancy or placebo value generated by different treatments should be standard practice in therapy outcome studies. For example, merely labeling a procedure a placebo treatment because it does not seem, on rational grounds, to include any “active ingredients” does not ensure that its capacity to mobilize Ss’ expectations of benefit will be equal to that of the other treatments employed in the study.

In contrast to the above results, other studies have indicated that therapeutically oriented instructions can significantly influence the efficacy of SD (Borkovec, 1972; Leitenberg, Agras, Barlow, & Oliveau, 1969; McGlynn, Reynolds, & Linder, 1971; Oliveau, Agras, Leitenberg, Moore, & Wright, 1969). Indeed, it was only with these instructions that SD was found to significantly decrease avoidance behavior relative to control groups. However, it should be noted that neither Borkovec (1972) nor McGlynn et al. (1971) found a significant difference between SD with and without therapeutic instructions, and while both Leitenberg et al. (1969) and Oliveau et al. (1969) did show this difference, they also found that within-subject analyses of the SD group without instructions “support the hypothesis that the procedure of SD alone produces some therapeutic effect” (Oliveau et al., 1969, p. 32). McGlynn et al. (1971) suggest that experimenter bias might explain the latter findings since the experimenter in those studies administered both the instructions and the respective treatments. Woy & Efran (1972) compared SD groups with and without positive expectations of successful therapeutic outcome in a study on public speaking anxiety, modeled after Paul (1966), in which the therapists were “blind” as to the expectancy manipulation employed. Results showed that the high expectancy SD group differed from the neutral expectancy group only on one out of six dependent measures, a “self perception of improvement” rating on a seven point scale, but not on any of the measures used by Paul (1966). Furthermore, both SD groups improved significantly more than the no treatment control group on several measures. This well-executed study strongly supports the contention that the SD procedure is effective independent of any expectancy factors (Davison & Wilson, 1972).

**Feedback of Progress**

Wilkins (1971) has stated that the efficacy of SD is attributable partly to cognitive factors such as expectancy of success, as discussed above, and what he terms “information feedback of success.” Extrapolating from Ben’s (1967) theory, Wilkins suggests that S’s perception of his own behavior during SD is a source of relevant feedback. Thus, as he observes himself not signalling anxiety, the subject makes the inference that he is not afraid. However, whether or not S signals would seem to be under the control of the therapist’s instructions to introspect on whether or not he is anxious. Under these circumstances, where the signalling is a function of instructions and the presumed detection of internal states, it is difficult to see how S could be utilizing his signalling behavior as the basis of an inference of whether he is anxious or not.
Progress up the hierarchy in SD is proposed by Wilkins as another information feedback parameter causing S to cognitively reevaluate his fear. In support of this argument he cites studies by Davison (1968), Cooke (1968), and Lang et al. (1965), which found that the greater the number of hierarchy items S had been desensitized to, the greater was the posttreatment improvement. However, this finding is predicted by the conditioning formulation (Wilson, in press, b) and was interpreted accordingly by the original investigators.

Two studies have tested this hypothesis by using bogus feedback of progress up the hierarchy, analogous to the manner in which Valins and Ray attempted to pit their cognitive interpretation of SD against a conditioning one. Brown (1970) selected spider-fearful subjects who were trained in muscle relaxation and then shown either slides of spiders which they had carefully ranked in terms of aversiveness on a previous occasion, or blank slides on which they were led to believe that spiders were presented tachistoscopically at speeds too fast for conscious perception. Ss in the SD group (real slides, relaxation) were encouraged to recognize that their progress up the hierarchy meant that they were reducing their fear. Three other groups were yoked to this (SD) group accordingly by the original investigators.

It is noteworthy that Brown (1970), like Marcia et al. (1969) and Valins and Ray (1967), reported a reduction in avoidance behavior following cognitive treatments, but observed no differences in self-report measures of fear. (Leitenberg et al. and Oliveau et al. report only behavioral data.) This finding is surprising in the present context, because if behavior change is said to be mediated by a cognitive reappraisal of the fear-eliciting stimulus, e.g., "Snakes no longer affect me as I thought they would," then one should logically expect self-report to reflect these very salient cognitions. This seeming inconsistency has not been accounted for by the protagonists of cognitive conceptualizations.

Bandura (1969) and Lang (1968) have noted that the stimulus determinants of fear are not necessarily confined to internal visceral or external cues, but might well include covert, self-generated stimuli which probably interact with the former in controlling the complex response labeled as emotional arousal. Indeed, the basic premise of Ellis' (1962) cognitive-rational-emotive therapy is that much, if not all, emotional suffering is due to the irrational ways people construe their world, and to assumptions they make which lead to self-defeating "internal sentences" or self-statements which exert an adverse effect on behavior. Recent research by Meichenbaum (1972) indicates that considerations of self-statements as potential modifiers of behavior might fruitfully be incorporated) into the standard SD procedure and might even be operating in the current technique in a hitherto overlooked fashion (e.g., Lazarus, 1968).

In an initial experiment he compared a cognitive modification procedure with SD and a no-treatment control group in reducing test anxiety. The cognitive group was first made aware of their worrisome self-verbalizations with respect to test situations. They were then trained to relax and to self-verbalize task-relevant and encouraging statements during imagery of coping with the various aversive hierarchy scenes. This procedure is in contrast to the traditional SD method, which does not deliberately include constructive self-statements and which entails "mastery" rather than "coping" imagery, i.e., the client imagines himself enacting the feared behavior calmly and with success. The cognitive modification group produced a significantly greater reduction in test
anxiety in a posttreatment analogue test situation and on self-report measures than the SD group, which was superior to no treatment. An additional finding was that the cognitive group alone reported a posttreatment increase in facilitative anxiety (cf., Alpert & Haber, 1960), indicating that these Ss came to interpret arousal as facilitative, as a cue for task-relevant, constructive action, like relaxing and self-verbalizing in a nondefeating manner. Meichenbaum's theorizing, as well as his data, appear to be consistent with the views of Goldfried (1971), who recommends that, during SD, clients be instructed not to terminate an aversive scene when fear is elicited, but rather to attempt to relax away any tension so as to acquire the general skill of coping with anxiety. Further research will be required to tease apart the different components of Meichenbaum's cognitive modification of SD, viz., "mastery" versus "coping" imagery, verbalizing constructively rather than defeatingly or not at all, etc. The approach, however, illustrates well how research into cognitive factors in SD might yield an improved, more truly multifaceted therapeutic method for treating the various specific dimensions of fear.

Terminological Note on the Word "Cognitive" in SD

"Cognitive" is a word widely used by different people with different meanings. Accordingly, there is some confusion and controversy as to its precise meaning in behavior modification (cf., Bergin, 1970; Nawas, 1970). Bandura (1969) and Mi schel (1968) both refer to "cognitive desensitization" and "cognitive counterconditioning." Theirs is a descriptive usage, denoting the involvement of human symbolic processes like imagery (covert self-stimulation) : their explanatory framework, however, is still conditioning. Similarly, Meichenbaum (in press) assumes that cognitive phenomena (covert behavior) obey the same laws as overt behavior and he thus maintains a conditioning conceptualization (cf., Ullmann, 1970). On the other hand, Valins and Ray's (1967) reference to "cognitive desensitization" postulates a specific explanation of SD in terms of cognitive processes they regard as having nothing to do with conditioning principles but drawn from attribution theory. This distinction is very evident in Marcia et al. (1969), who also differ from Valins and Ray's use of the term by equating a cognitive interpretation with general expectancy of gain or placebo factors in any treatment technique.

"Cognitive explanations" of SD are often put forward as alternatives to conditioning formulations when, in fact, the presumed difference might only be semantic. Thus, London (1964) first suggested that during SD the client learns to discriminate between realistic and unrealistic consequences of a particular action and thereby overcomes his irrational fear. As London noted, there is a marked similarity between this position and the explanation of the extinction of avoidance behavior in the animal laboratory in terms of discrimination learning, or the detection of changes in the controlling reinforcement contingencies (Wilson & Davison, 1971). The necessary operations for the elimination of the behavior would seem to be the same in both instances, i.e., arranging for non-reinforced exposure to the previously avoided stimuli, covertly or overtly (Davison & Wilson, 1972). This procedure may be described as decreasing expectancy of disastrous consequences (Beck, 1970a, p. 4), or increasing objectivity, i.e., discriminating between real and fantasied danger (Beck, 1970b, p. 196); but, whether any specific theoretical or therapeutic advantages are to be gained by such cognitive descriptions has still to be demonstrated. It is on the basis of these descriptions of events in cognitive terms and the fact that covert activities are involved that Beck labels SD as a "cognitive therapy" as opposed to a "behavior therapy," a step which Bergin (1970) heralds as "startling and persuasive," but which might simply reflect differences in labelling behavior.

SOCIAL REINFORCEMENT FACTORS IN SD

Another factor suggested as responsible for the success of SD is the role of the therapist as a social reinforcer of nonfearful responses. Wagner and Cauthen (1968) gave two Ss two sessions in relaxation training, followed by four sessions during which they were encouraged to relax while being rolled on a lounger toward a female assistant holding a snake. Their instructions were to signal when they became even slightly tense, at which time they were rolled back a few feet before proceeding once again. Three other Ss were given a shaping procedure, during which they were likewise rolled slowly toward the snake, without prior training in relaxation and having been instructed to signal tension in the same manner. Each time S indicated that she wanted to be moved closer, E praised her. The subjects improved markedly, results which the authors suggested favor an operant conditioning interpretation of desensitization.

Aside from the very small N, the lack of a psychotherapy control group (perhaps in this instance a group praised for signalling anxiety rather than for indicating closer approach) makes it impossible to attribute the improvement of the shaping group to the contingency of approach behavior with approval.

Leitenberg et al. (1969) compared two main experimental groups. One group received SD embellished with "therapeutic instructions" and
Oliveau et al. (1969) investigated the instruction and reinforcement variance with those expected from SD. Snake-fearful volunteer the same list of 19 items as constituted the what was termed a suggestions but instructions which would specify behavioral objectives at influence on Ss rather than “emphasis on defining and attaining specific behavioral objectives” in the context of a 2 X 2 factorial design. Results showed a superior of the former over the latter and over a no-treatment control group, the “pure” SD group faring little better than the no-treatment control (yet showing within-group improvement). As pointed out earlier, however, their therapeutic instructions were, in effect, a placebo manipulation emphasizing the efficacy of SD therapy. As a result, the similarity the authors draw between their procedure and a study by Ayllon and Azrin (1964) is inappropriate, since in this latter experiment instructions specified which behaviors would be reinforced. Positive reinforcement was said to have been provided the embellished group in the form of praise during each session following completions of imaginal items, as well as following a 15 min in vivo exposure to the snake. In contrast, the pure SD group was never praised for progress through the imaginal anxiety hierarchy, and, further, were told that the in vivo session was intended to refresh their memories of what the real snake looked so as to sharpen their images. Whether selective positive reinforcement was present is not possible to determine; stimuli presented contingent on a response should not be classified as positive reinforcement unless it can clearly be shown that they have worked to increase the behavior. In this study, we cannot know whether the contingency was of any importance at all. The experimenter was clearly more supportive and more friendly for this group than for the pure SD group, and noncontingent praise might have worked just as well.

Davison and Wilson (1972) have contested Wilkins’ (1971) conclusion that these studies document the importance of the therapist as a social reinforcer within SD. In addition to the above mentioned problems, they noted several studies in which contact with the therapist was intentionally minimized (e.g., Kahn & Baker, 1968; Lang, 1969) without nullifying the efficacy of SD. The conclusion drawn by Wilkins is that “These variables (expectancy of gain and social reinforcement from the therapist) in the therapeutic relationship appear to be quite powerful praise for progressing up the imaginal snake hierarchy, while the other SD group did not receive these additional comments. Results showed a superiority of the former over the latter and over a no-treatment control group, the “pure” SD group faring little better than the no-treatment control (yet showing within-group improvement). As pointed out earlier, however, their therapeutic instructions were, in effect, a placebo manipulation emphasizing the efficacy of SD therapy. As a result, the similarity the authors draw between their procedure and a study by Ayllon and Azrin (1964) is inappropriate, since in this latter experiment instructions specified which behaviors would be reinforced. Positive reinforcement was said to have been provided the embellished group in the form of praise during each session following completions of imaginal items, as well as following a 15 min in vivo exposure to the snake. In contrast, the pure SD group was never praised for progress through the imaginal anxiety hierarchy, and, further, were told that the in vivo session was intended to refresh their memories of what the real snake looked so as to sharpen their images. Whether selective positive reinforcement was present is not possible to determine; stimuli presented contingent on a response should not be classified as positive reinforcement unless it can clearly be shown that they have worked to increase the behavior. In this study, we cannot know whether the contingency was of any importance at all. The experimenter was clearly more supportive and more friendly for this group than for the pure SD group, and noncontingent praise might have worked just as well.

Oliveau et al. (1969) investigated the instruction and reinforcement parameters in the context of a 2 X 2 factorial design. Results showed a significant effect only for the therapeutic instructions factor (though all four groups revealed within-condition improvement).

Taken together these two related experiments fail to support an interpretation of the successful outcomes of desensitization in terms of the shaping of approach responses. The superiority of the instructions-plus-reinforcement SD group in the Leitenberg et al. (1969) study is, in view of the Oliveau et al. (1969) findings, likely due to the “therapeutically oriented instructions,” which may have provided suggestive influence on Ss rather than “emphasis on defining and attaining specific behavioral objectives” (Oliveau et al., 1969, p. 32). Perhaps one could shed light on this issue by creating an SD group which received placebo suggestions but instructions which would specify behavioral objectives at variance with those expected from SD.

Barlow, Agras, Leitenberg, and Wincze (1970) compared SD with what was termed a “shaping” procedure. Shaping entailed providing a snake-fearful volunteer the same list of 19 items as constituted the imaginal hierarchy for SD Ss, this list being virtually identical to the behaviors asked of Ss during the pre- and posttreatment assessments. S was told that repeated practice is useful in reducing fears, and that she should therefore enter the room alone where the snake was caged and practice approaching the snake along the lines of the 19-item list. S was to perform as many or as few steps as she could before returning to E in the neighboring room where any reported improvement was amply praised. Both groups showed significant improvement, with the shaping condition more effective.

The first interpretation made by the authors is that operant conditioning of overt approach behavior (ignoring any mediating anxiety) was shown to be superior to SD, which presumably counterconditions the mediating anxiety drive. However, they suggest also that both SD and shaping (as here employed) might operate in the same way by providing for exposure to aversive stimuli without reinforcement of the fear. This extinction formulation, similar to that proposed by Wilson and Davison (1971), was postulated to explain the efficacy of both procedures, with the differences found here possibly attributable to the use of real-life stimuli in the shaping procedure and imaginal stimuli in SD. Indeed, in an earlier study (Barlow, Leitenberg, Agras, & Wincze, 1969), it was shown that pairing relaxation with the real object leads to more effective behavior change than does the standard SD procedure, a finding consistent with Davison’s (1968) stimulus-sampling proposal for the failure of imaginal SD to effect complete transfer to the real life situation.

It is difficult to accept the suggestion that the “shaping” procedure used in this study is necessarily true to its name. As in the Leitenberg et al. (1969) study, the authors did not demonstrate that the contingency between behavior and “reinforcer” was important. Further, a close examination of the “shaping” procedure reveals that what is actually “reinforced” (i.e., greeted with praise by E) is S’s verbal report of what he had just achieved; the increased approach behavior itself is not “reinforced,” nor is the extent of actual approach behavior ever objectively evaluated by E.

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in that they can have an immediate and long-term effect following very minimal contact with the therapist (p. 313). We fail to understand the logic of this reasoning, based, as it is, on data that show the effectiveness of SD under conditions of little if any direct social contact with another human being, at least during the SD procedure itself. Murray and Jacobson (1971) derive the same illogical conclusion from the same data as Wilkins, arguing that the success of Lang’s DAD (Lang, Melamed, & Hart, 1970), does not "necessarily reduce the importance of the social aspects" of treatment, since a machine is man made and exerts influence within the context of a helping relationship (p. 726). Clearly this type of reasoning is irrefutable and hence meaningless since it removes the issue from the possibility of critical experimental testing.

Though not dealing directly with SD, a study by Rimm and Mahoney (1969) raises some interesting questions regarding the possible role of shaping in reducing the kind of avoidance behavior which desensitizers deal with. They assigned snake-fearful volunteers to one of three groups: a shaping group, a noncontingent reinforcement group, and a no-treatment group. The shaping Ss were told that they would earn a number of tokens, later exchangeable for "a significant amount of money" for every task they could complete in the same graded series of approach behaviors that had been used in a pretreatment assessment. As in the pretreatment assessment, S was required to remain at a given stage for at least 15 sec, and the treatment was terminated if, after 1 min, S could make no further progress. The dispensing of tokens was quite salient during this shaping treatment. Noncontingent Ss were simply told that they would get money for participating in the experiment, but no mention was made of any relationship with their performance; in actuality, the number of tokens they received was matched to a shaping subject to whom each S was yoked, and bore no consistent temporal relationship to successful approach behavior. Results showed no differences among the three groups and no treatment effects of any kind. On the assumption that perhaps the tokens were not powerful enough incentive, Rimm and Mahoney attempted to shape four additional Ss by offering actual money during the treatment, up to $10. Again, no treatment effects were obtained.

In explaining their failure to obtain treatment effects Rimm and Mahoney suggest that a necessary requirement for successful employment of operant procedures in such a situation is that Ss during treatment exhibit a reasonable approximation to the desired terminal behavior. This consideration was also voiced by Lazarus, Davison, and Polefka (1965), i.e., that operant shaping of inhibited approach responses is of questionable utility if the mediating fear is so great as to preclude the emission of even small approximations of criterion approach behavior. On the other hand, a recent experiment by Leitenberg, Agras, Butz, and Winnic (1971) demonstrates that clinically phobic patients can reduce their avoidance behavior merely by being encouraged to expose themselves to the source of their fears, with no explicit attention being paid to the direct reduction in mediating anxiety. It may indeed be, therefore, that properly arranged conditions for graded exposure within an operant shaping paradigm can effectively eliminate even severe degrees of avoidance. As regards the role that the desensitizing therapist might play in reinforcing approach up the imaginal hierarchy via attention paid during the maintenance of relaxation, it should be pointed out that relaxation precedes every imaginal exposure, and when a S does signal anxiety, i.e., "avoids," he is at that time accorded the most attention by the therapist, who spends extra time before the next item presentation in helping the subject/client relax once again.

**IMAGERY, INTROSPECTION, AND BEHAVIORISM**

It is sometimes suggested that Wolpe’s real contribution lies not in the application of learning principles to the handling of clinical problems, but in drawing attention to the therapeutic properties of imagery and introspection. Perhaps the best-known exposition of this viewpoint is Weitzman’s (1967) article, which emphasizes the overriding importance of the flow of mental imagery during the presentation of scenes in SD. He reports transformations of imagery akin to observations made by psychodynamic therapists and cites the spontaneously made comment of one of his clients which is said to signify the fact that the client had gained therapeutic insight into his relationship with his mother. These observations derive from Weitzman’s own interviews of six clients undergoing SD therapy with him, and on the basis of these clinical data he rejects as simplistic the view that conditioning is operative in SD and asserts that the "dynamically rich" imagery of his clients "stretches the analogy to Wolpe’s procedure rather thin."

Basically Weitzman is reiterating the now classic antibehaviorist objection that an S-R conditioning formulation can never, ipso facto, conceptualize complex mental processes. The reply to this objection is equally unoriginal: presenting a tonal CS to a cat and asking a client to imagine being criticized by his mother are clearly topographically different events, but can be, and have been, shown to enter into similar functional relationships between antecedent and consequent events. Kimble (1967) points out that the term stimulus (or preferably, antecedent condition) "in addition to referring to specific physical objects," also includes "independently specifiable circumstances such as the number of trials.
in an experiment, the time since the last trial, instructions to Ss, and so on” (p. 79). The important issue, as Kimble continues, is whether or not we can specify the lawful effects of these variables on behavior. In this respect the controlled, voluntary induction of aversive imagery in humans has been empirically shown to have the same measurable effects as the application of a physically defined stimulus (cf., Craig, 1969; Grossberg & Wilson, 1968; Miller, 1935). Furthermore, in their impressive research program, Lang and his associates have shown that autonomic responses to imaginal stimuli bear a close resemblance to the parameters of conditioning (Lang et al., 1970). Such data suggest that conditioning formulations might indeed prove fruitful in conceptualizing covert processes and challenge Breger and McGaugh’s (1965) contention, supported by Weitzman, “that the use of the terms stimulus and response in SD are only remotely allegorical to the traditional use of these terms in psychology” (p. 340).

Aside from these logical considerations, Weitzman’s basis for these observations is highly suspect. It is hardly surprising that the uncontrolled, highly subjective analysis of six clients currently being seen in therapy by him generated a wealth of “dynamically rich” imagery, for it has become passe for students of therapy to note that every therapist can point to his clients experiencing and enunciating things in accord with the clinician’s theoretical orientation. The social influence process and examiner-bias effects are too well-known to allow substantial confidence to be placed in these highly suspect “data.” We ourselves have conducted an extensive series of interviews with clients we have desensitized and have seldom if ever found evidence for Weitzman’s observations. In those cases where transformations of the instructed image occurred (and were encouraged) no discernible improvement followed which could have indicated the critical effectiveness of that flow of imagery. (If the reader finds our own clinical observations less than convincing, then our point regarding Weitzman’s data has been made!)

SUMMARY AND IMPLICATIONS

In general, it appears that presently available research into cognitive and social variables has thus far produced little by way of convincing evidence for explaining the effective process mechanisms involved in SD. In view of this lack of supporting evidence the enthusiastic advocacy of “cognitive” as opposed to traditional conditioning explanations of SD is premature (e.g., Murray & Jacobson, 1971; Weitzman, 1967; Wilkins, 1971). Behavior therapy as a whole, and SD in particular, has not escaped the now classic “cognitive versus conditioning” controversy within psychology, and the issues involved have already been the subject of two spirited sets of exchanges of differing theoretical interpretation (Davison & Valins, 1968, 1970; and Wolpe, 1969, 1970; Wilkins, 1972; and Davison & Wilson, 1972). In this paper we have pointed out some methodological and conceptual inadequacies in nearly all of the research and theorizing clone to date.

Ss in most of the studies reviewed here were volunteer college students with a specific fear of snakes or spiders. Similar research needs to be clone with truly clinical populations of anxious clients, for whom the issues of expectation of therapeutic gain and cognitive relabeling are probably more complex and possibly different from those encountered in Ss employed in analogue studies. As Bandura (1969) observes, it might well be that the induction of auspicious cognitions can modify behavior in some cases of only mildly anxious individuals, but there must remain considerable doubt as to whether this strategy is effective with intense fears and well-established patterns of irrational avoidance behavior.

In a more practical sense, with the exception of Meichenbaum’s promising initial efforts, the failure of the studies reviewed here to isolate the “active ingredients” of SD does not compel any major procedural modification of the basic technique. However, further research on the question of “coping imagery” and the client imaging induced imagery might call for changes in the method as it is currently practiced. Finally, to conclude in a clinical vein, we wish to emphasize that practitioners should continue to use SD within the context of an appropriate therapist–client relationship, and to utilize client expectancies of improvement, not because these are necessarily critical factors within the boundary conditions of the specific SD paradigm (Evans, 1973), but for wider reasons related to sound clinical practice (Lazarus, 1971; Wilson. Hannon, & Evans, 1968).

REFERENCES


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