

Coping-Skills Training for the Management of Anxiety: A Critical Review

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This paper evaluates the research on coping-skills training for the management of anxiety. The training techniques reviewed include anxiety management training, applied relaxation, cue-controlled relaxation, self-control desensitization, and self-statement modification. While many of the studies on these techniques were flawed, the treatments were reported to be successful in reducing situation-specific anxiety reactions. Mixed results were obtained for responses other than those directly treated (generalized effects). Recommendations for future research emphasize the use of sensitive-dependent measures, employment of clinically anxious subjects, and examination of the preventive effects of coping-skills training.

Behavior therapists have become increasingly interested in coping-skills training, i.e., techniques which teach clients an active skill such as relaxation that can be utilized in coping with a variety of anxiety eliciting life situations (Goldfried & Merbaum, 1973; Mahoney, 1974; Mahoney & Thoresen, 1974).¹ Coping-skills training differs from traditional interventions which adhere to a mastery model, in that it involves active instruction of clients in the identification of indexes of anxiety and the execution of behavior which will reduce or eliminate tension. Mastery-based treatments do not provide clients with such instruction or practice in strategies for managing anxiety when it is experienced. Interventions founded upon

The authors wish to thank Donald P. Hartmann, Donna M. Gelfand, and Steven M. Ross for their comments and suggestions. Reprints may be obtained from Billy A. Barrios, Department of Psychology, University of Utah, Salt Lake City, UT 84112.

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a mastery model do not anticipate treated clients experiencing levels of anxiety which will impair performance. This expectation appears to be unjustified.

If, as many contend, the ultimate goal of therapy is to provide clients with resources to cope independently with their life stresses, then research on such coping techniques assumes some importance. A number of coping procedures have been developed for the treatment of anxiety. Among these are anxiety management training (Sinn & Richardson, 1971), applied relaxation (Deffenbacher, 1976), cue-controlled relaxation (Russell & Sipich, 1973), self-control desensitization (Goldfried, 1971), and self-statement modification (Goldfried, Decenteo, & Weinberg, 1974; Meichenbaum and Cameron, Note 1). Interest in coping skills stems from several diverse trends in psychotherapy, including concerns with self-control and cognitive processes, dissatisfaction with traditional behavior therapy approaches, and renewed interest in prevention.

Behavioral self-control is one of the most extensively investigated areas in behavioral theory today. According to Bandura (1977), people possess self-reactive capacities that enable them to exercise control over their own feelings, thoughts, and actions. The application of self-control procedures demonstrates that people can direct their behavior toward valued goals by arranging the environmental conditions most likely to elicit the desired behavior and by creating cognitive aids and self-reinforcing consequences to sustain the behavior (Bandura, 1977). Coping-skills training programs are consistent with this emphasis on self-control in that they are aimed at instructing the individual in generalizable methods for reducing anxiety.

Related to the focus on self-control is the recognition of the usefulness of considering cognitive processes in behavior-change programs. All behavior cannot be entirely accounted for in terms of antecedent and consequent events in the external environment. External influences affect behavior through intermediary cognitive processes (Bandura, 1977). One of the most significant revisions in learning-theory approaches has been the acceptance of covert phenomena as legitimate investigative targets and clinically relevant variables.

Another primary reason for the emergence of coping-skills training has been the dissatisfaction with the limitations of traditional behavior therapy. An examination of the typical treatments of choice for anxiety, systematic desensitization, and *in vivo* modeling illustrates the point. Systematic desensitization is of limited use for clients who are unable to achieve or maintain vivid imagery and for clients suffering from multiple anxiety reactions. *In vivo* modeling techniques avoid the difficulties associated with imagery, but they do require considerable therapist time and may be inappropriate or unfeasible for certain anxieties, such as test or pervasive anxiety. When resources and environmental constraints render *in vivo* modeling inapplicable, covert modeling techniques may be used (Kazdin, 1974). However, as with desensitization, imagery related difficulties may detract from their effectiveness. Perhaps the major

shortcoming with both desensitization and modeling procedures is that treatment effects do not appreciably generalize to nontarget behaviors or nontarget situations (Liberian & Smith, 1972). Thus, it would seem that traditional procedures that emphasize discrete, situation-specific responses could well profit from the development of procedures that train coping skills which can be applied across situations and problems.

Another major reason for the interest in coping-skills training is the attention being directed toward prevention (Gelfand & Hartmann, 1977; Kessler & Albee, 1975; Poser, 1970, 1976). A number of individuals (Cautela, 1969; Goldfried & Merbaum, 1973; Meichenbaum, 1973; Stuart, 1977) have suggested that behavior therapists should teach clients active skills which are generalizable and which may be utilized for remedial or preventive purposes. Nonclinical populations can be taught to cope with stress by such diverse cognitive techniques as information seeking, anticipatory problem solving, imagery rehearsal, task organization, altered attributions, self-labels, and relaxation (Meichenbaum, 1973). People currently learn to cope with stress in a haphazard fashion; it would appear more sensible to devise empirically based programs which explicitly teach skills and provide practice in applying them to various stressors. Cautela (1969) has argued that in addition to removing clients' maladaptive behaviors, the behavior therapist should attempt to make the client less susceptible to the development of future maladaptive behaviors and provide a means for the individual to eliminate such behaviors without the aid of the therapist. Thus as a result of this movement toward preparing the client to deal with future difficulties and the recent focus on prevention, the area of coping-skills training has developed among behavior therapists.

The epidemiological data on anxiety reactions and phobic disorders provide additional justification for coping-skills training programs. Large segments of the general population suffer from performance-debilitating anxiety reactions. For example, 20% of school children (Eysenck & Rachman, 1965) and 25% of college students (Suinn, 1969) are test anxious. A significant portion of the adolescent and young adult population report intense heterosocial anxiety (Borkovec, Stone, O'Brien, & Kaloupek, 1974; Fishman & Nawas, 1973; Martinson & Zerface, 1970). Also anxiety related to public speaking (Paul, 1966), assertion (Gambrell & Richey, 1975), and mathematics (Richardson & Suinn, 1971) is pervasive among the nonclinical public. Agras, Sylvester, and Oliveau (1969) listed snakes, heights, storms, flying, dentists, injury, illness, death, enclosures, journeys alone, and being alone as common objects of fear. Macfarlane, Allen, and Honzik (1954) found that 90% of children between 2 and 14 years of age had at least one specific fear. Lapouse and Monk (1959) found that 43% of 6- to 12-year olds had at least 7 of 30 listed fears. Thus, it is apparent that a sizeable portion of the general population experience anxiety in a variety of situations. Thus, treatment procedures may teach the individual an active skill for coping with anxiety to maximize preventive effects, reduce multiple anxiety reactions, and minimize treatment

duration. Coping-skills training programs would seem to offer promise in achieving these goals (Barrios, 1978a; Deffenbacher, 1976).

The vast majority of the problems associated with imagery and hierarchy construction are not usually encountered in coping-skills training. Thus, the techniques are procedurally more feasible than systematic desensitization and *in vivo* modeling. The sources of interest in coping-skills training may not be congruent with their theoretical underpinnings and reasons for development. The various coping-skills training programs do differ with respect to the theoretical tenets from which they were developed and the interpretations of the active mechanism(s) responsible for the effects produced. For example, cue-controlled relaxation was generated from a classical conditioning paradigm (Paul, 1966), whereas self-control desensitization originates from a cognitive mediational model (Goldfried, 1971). Despite theoretical and interpretive differences, proponents of each of the coping-skills training programs agree that the techniques to be superior to mastery-based procedures with respect to generalized effects and preventive potential. Although coping-skills training programs are relatively recent developments, they have already generated a substantial research literature. The present paper reviews the data on the efficacy of five coping-skills training procedures: anxiety management training, applied relaxation, cue-controlled relaxation, self-control desensitization, and self-statement modification, which includes stress inoculation and rational restructuring.

DESCRIPTION OF TECHNIQUES AND EVALUATION OF OUTCOME STUDIES

Before proceeding to the studies, brief descriptions of the techniques are presented. The general findings of the outcome studies relevant to each technique are then summarized. The review of the outcome literature extends to the end of 1978. Table 1 presents a summary of each of the reviewed studies to permit cross-study comparisons. These summaries indicate the success of the treatment and the methodological adequacy of the study. A number of categories included in Table 1 require brief amplification. Under the heading Conditions Compared, only experimental conditions which were of focal interest are listed. For example, a number of studies examined the relative effectiveness of various components of a technique or the effect of minor procedural variations on outcome. In cases such as these only the primary technique is listed. Under the heading of Outcome, the effectiveness of therapeutic condition(s) was determined by collapsing the results across all dependent measures for each response channel. The post-treatment and follow-up results for each of the specific channels assessed are reported. The heading Generalized reports the findings of investigations which examined treatment effects on nontarget behaviors or situations. It is apparent that a certain degree of subjectivity or bias may have entered into our determination of the outcomes. However, each of the authors independently evaluated the outcome data and obtained 100% agreement with respect to

the superior conditions. Because of the large number of dependent variables employed in some studies, it was deemed unfeasible to report the results for each outcome measure.² It should also be noted that the studies are not presented in alphabetical order but rather are grouped in blocks according to technique. This was done in order to permit the reader to more readily inspect the design characteristics and outcome data on each specific coping-skills training program.

Anxiety Management Training

Anxiety management training (AMT) consists of three basic phases: (a) an introduction to the principles of AMT and training in relaxation, (b) 1 hr of training in visualization of scenes associated with anxiety arousal, relaxation, and competency, and (c) 1 hr of experience in anxiety induction and control (Suinn & Richardson, 1971). In phase I, relaxation training involves the muscle tension and release exercises specified by Jacobsen (1938). In phase II, the client receives extensive instruction in the identification and vivid visualization of imagined situations which induce feelings of anxiety, relaxation, or competency. The client is taught to discriminate the sensations associated with each emotional state and to rapidly initiate a scene, quickly terminate it, and immediately visualize another scene or the state of relaxation. During this phase, the client is also introduced to the use of a deep-breath control cue for rapid reestablishment of relaxation and elimination of anxiety. Phase III involves repeated practice in anxiety induction with quick termination of the anxiety by means of the deep-breath control signal and a shift to relaxation or competency imagery.

Six studies investigated the efficacy of AMT. Five of these studies employed a group design with adequate no-treatment and nonanxious control conditions. Target behaviors were mathematics, public speaking, test, and general anxiety. All the studies reported substantial reductions in anxiety upon completion of AMT and demonstrated AMT to be superior to no-treatment. In those investigations in which a normal control condition was employed, posttreatment anxiety levels of subjects receiving AMT were equivalent to those of nonanxious individuals. In the five studies which examined generalized effects, some support for generalization was obtained. Unfortunately none of the studies employed an attention placebo condition, and only the Deffenbacher and Shelton (1978) investigation conducted a follow-up assessment. The Deffenbacher and Shelton (1978) study is noteworthy in that it found AMT to achieve superior generalized effects (though equivalent treatment effects). This superiority was found at the follow-up assessment only, which emphasizes the importance of follow-up in examining generalized effects. A critical limitation of all the studies was the heavy reliance on self-report measures. Only the studies by Suinn and Richardson (Richardson &

² A complete list of the dependent measures employed in each study reviewed is available from the authors.

TABLE 1. A SUMMARY OF THE OUTCOME STUDIES

Authors	Design	Target anxiety	Conditions compared	Assessment channel	OUTCOME			
					Post-treatment		Follow-up	
					Treated	Generalized	Treated	Generalized
Anxiety management training								
Deffenbacher & Shelton (1973)	Group N = 40	Test	AMT SD	Self-report	AMT = SD	AMT = SD	AMT > SD	AMT > SD
Ede (1972)	Group N = ?	General	AMT NC	Self-report	AMT = NC	AMT = NC	NA	NA
Nicoletti (1972)	Group N = ?	Public speaking	AMT NT NC	Self-report	AMT = NC > NT	NA	NA	NA
Nicoletti (1972)	Group N = ?	General	AMT NT NC	Self-report	AMT = NC > NT	AMT = NC > NT	NA	NA
Richardson & Suinn (1973)	Group N = 52	Math	AMT SD AMD NT	Self-report	AMT = SD = AMD > NT	NA	NA	NA
Suinn & Richardson (1971)	Group N = 143	Math	AMT AMD NC	Behavioral	AMT = SD = AMD = NT	NA	NA	NA
				Self-report	AMT = AMD = NC	AMT = AMD = NC	NA	NA
				Behavioral	AMT = AMD = NC	NA	NA	NA
Applied relaxation								
Chang-Liang & Denney (1976)	Group N = 81	Test	AR SD Relaxation NT	Self-report	AR = SD = Re- laxation > NT	AR = SD = Re- laxation > NT	NA	NA
				Behavioral	AR > SD = Re- laxation = NT	NA	NA	NA

Deffenbacher (1976)	Case N = 4	Test	AR	Self-report Behavioral	AR	NA	NA	NA
Deffenbacher & Payne (1977)	Group N = 38	Communication	AR SCD NT	Self-report	AR = SCD > NT	NA	NA	NA
Deffenbacher & Rivera (1976)	CASE N = 2	Test	AR	Self-report Behavioral	AR	NA	AR	NA
Deffenbacher & Snyder (1976)	Case N = 11	Test	AR	Self-report Behavioral	AR	NA	NA	NA
Goldfried & Trier (1974)	Group N = 27	Public speaking	AR Relaxation AT	Self-report Behavioral	AR = relaxation = AT AR = relaxation = AT	AR = relaxation = AT AR = relaxation = AT	AR = relaxation = AT AR = relaxation = AT	AR = relaxation = AT AR = relaxation = AT
Sherman & Plummer (1973)	Group N = 45	General	AR NT	Self-report	AR > NT	AR > NT	NA	NA
Snyder & Deffenbacher (1977)	Group N = 43	Test	AR SCD NT	Self-report Behavioral	AR = SCD > NT	NA	NA	NA
Zeisset (1968)	Group N = 48	Interview	AR SD AT NT	Self-report Behavioral	AR = SD > AT = NT AR = SD > AT = NT	AR = SD > AT = NT NA	NA	NA
Cue-controlled relaxation								
Barrios (1977)	Case N = 2	Nail biting	CC	Self-report Behavioral	CC	NA	CC	NA
Barrios (1978a)	Case N = 1	Multiple	CC	Self-report	CC	CC	CC	CC
Barrios (1978b)	Case N = 2	Nail biting	CC	Self-report Behavioral	CC	NA	CC	NA

TABLE 1 Continued

Authors	Design	Target anxiety	Conditions compared	Assessment channel	OUTCOME			
					Post-treatment		Follow-up	
					Treated	Generalized	Treated	Generalized
Barrios, Ginter, & McKnight (Note 2)	Group N = 18	Test	AR CC (cognitive) CC (conditioned)	Self-report Behavioral	AR = CC (cognitive) = CC (conditioned) AR = CC (cognitive) = CC (conditioned)	NA NA	NA NA	NA NA
Beck, Kaul, & Russell (1978)	Case N = 10	Dental	CC	Self-report Physiological	CC	not significant NA	CC NA	CC NA
Counis, Hollandsworth, & Alcorn (1978)	Group N = 40	Test	CC CC + EMG feedback AT NT	Self-report Behavioral	CC = CC + EMG feedback > AT = NT CC = CC + EMG feedback > AT = NT	CC = CC + EMG feedback = AT = NT NA	NA NA	NA NA
Gurman (1973)	Case N = 1	Public speaking	CC	Self-report	CC		CC	CC
Marchetti, McDynn, & Patterson (1977)	Group N = 33	Test	CC AT NT	Self-report Physiological	CC = AT = NT CC = AT = NT	CC = AT = NT NA	NA NA	NA NA
McDynn, Kinjo, & Doherty (1973)	Group N = 28	Test	CC AT NT	Self-report	CC = AT > NT CC = AT = NT	CC = AT = NT CC = AT > NT	CC = AT > NT CC = AT > NT	CC = AT > NT CC = AT > NT

TABLE 1 Continued

Authors	Design	Target anxiety	Conditions compared	Assessment channel	OUTCOME			
					Post-treatment		Follow-up	
					Treated	Generalized	Treated	Generalized
Denney & Rupert (1977)	Group N = 86	Test	SCD SD AT NT	Self-report Behavioral	SCD > SD > AT = NT SCD > SD > AT = NT	SCD = SD = AT = NT NA	NA SCD > SD > AT = NT	NA NA
Goldfried (1973)	Case N = 1	Multiple	SCD	Self-report	SCD	SCD	SCD	SCD
Goldfried & Goldfried (1977)	Group N = 42	Public speaking	SCD PE	Self-report Behavioral Physiological	SCD = PE SCD = PE SCD = PE	SCD = PE NA NA	SCD = PE NA NA	SCD = PE NA NA
Lent & Russell (1978)	Group N = 57	Test	Skill acquisition SD + skill acquisition SCD + CC + skill acquisition NT	Self-report Behavioral	Skill acquisition = SD + skill acquisition SD + skill acquisition = SCD + CC + skill acquisition > SCD + CC + skill acquisition > NT	Skill acquisition = SD + skill acquisition question = SCD + CC + skill acquisition > SCD + CC + skill acquisition > NT	Skill acquisition = SD + skill acquisition question = SCD + CC + skill acquisition > SCD + CC + skill acquisition > NT	Skill acquisition = SD + skill acquisition question = SCD + CC + skill acquisition NA
Speigler, Cooley, Marshall, Prince, & Puckett (1976)	Group N = 47	Test	SCD SD NT	Self-report	SCD > SD = NT	SCD = SD = NT	NA	NA

TABLE 1 Continued

								OUTCOME			
								Post-treatment		Follow-up	
								Treated	Generalized	Treated	Generalized
Zemore (1975)	Group N = 40	Test and Public speaking	SCD SD NT	Self-report Behavioral				Information = SSM + information = AT > SSM	NA	SSM + informa- tion, SSM > in- formation, AT	NA
Self-statement modification											
Bruch (1978)	Group N = 60	Test	Problem solving SSM Modeling NC	Behavioral							
Emmelkamp, Kuipers & Eggenraat (1978)	Group N = 20	Agoraphobia	SSM PE	Self-report Behavioral				PE > SSM PE > SSM	NA NA	NA NA	NA NA
Finger & Galassi (1977)	Group N = 48	Test	SSM Relaxation SSM + relaxation NT	Self-report Behavioral				SSM = Relaxation = SSM + Relax- ation > NT SSM = relaxation = SSM + relax- ation = NT	NA NA	NA NA	NA NA
Frenouw & Har- man (1975)	Group N = 41	Speech	SSM + relaxation + response ac- quisition NT	Self-report Behavioral				SSM + relaxation + response ac- quisition > NT SSM + relaxation + response ac- quisition > NT	SSM + relaxation + response ac- quisition > NT NA	NA NA	NA NA
Frenouw & Zitter (1978)	Group N = 46	Speech	SSM + relaxation Response acquisition (RA) AT NT	Self-report Behavioral				Response acqui- sition > SSM + relaxation = AT = NT SSM + relaxation = response ac- quisition > AT = NT	SSM + relaxation = response ac- quisition > AT = NT NA	SSM + relaxation = response acqui- sition = AT = NT NA	
Self-statement modification											
Glass, Gottman, & Shimurak (1976)	Group N = 61	Dating	SSM Response acqui- sition SSM + RA NT	Self-report Behavioral				SSM = response acquisition = SSM + response acquisition > NT SSM > response acquisition = SSM + response acquisition > NT	NA NA	SSM = response acquisition = SSM + response acquisition = NT SSM = response acquisition = SSM + response acquisition > NT	NA NA
Glogower, Fre- emore, & McCloskey (1978)	Group N = 40	Communication	Extinction SSM (insight) SSM (coping re- hearsal) NT	Self-report Behavioral				Extinction = SSM (insight) = SSM (coping) = SSM (insight + cop- ing) > NT Extinction = SSM (insight) = SSM (coping) = SSM (insight + cop- ing) > NT	Extinction = SSM (insight) = SSM (coping) = SSM (insight + cop- ing) > NT NA	Extinction = SSM (insight) = SSM (coping) = SSM (insight + cop- ing) > NT NA	Extinction = SSM (insight) = SSM (coping) = SSM (insight + cop- ing) > NT NA
Goldfried, Live- han, & Smith (1978)	Group N = 36	Test	SSM PE NT	Self-report				SSM = PE > NT	SSM = PE = NT	SSM = PE	SSM = PE = NT

TABLE 1 Continued

Authors	Design	Target anxiety	Conditions compared	Assessment channel	Post treatment		Follow-up	
					Treated	Generalized	Treated	Generalized
Meichenbaum (1972)	Group N = 21	Test	SD SSM + SD (coping) NT	Self-report Behavioral	SSM + SD (coping) > SD > NT SSM + SD (coping) = SD > NT	NA NA	SSM + SD (coping) > SD > NT NA	
Meichenbaum & Cameron (Note 1)	Group N = 30	Snakes and rats	SSM SSM + rehearsal SD SD EAR NT	Self-report Behavioral	SSM + rehearsal EAR > SSM > SD, NT SSM + rehearsal, SD > EAR > SSM, NT	SSM + rehearsal > EAR > SD, NT SSM + rehearsal, SSM, EAR > SD, NT	SSM + rehearsal > SSM, EAR > SD, NT SSM + rehearsal, SSM, EAR > SD, NT	
Meichenbaum, Gilmore, & Federavicius (1971)	Group N = 53	Speech	SSM SD SSM + SD AT NT	Self-report Behavioral	SSM = SD > SSM + SD > AT = NT SSM, SD > SSM + SD, AT > NT	SSM = SD = SSM + SD > AT NA	SSM = SD = SSM + SD > NT > AT NA	

Norton, Mac- Lean, & Wachna (1978)	Case N = 1	Stage	SSM	Self-report	SSM	NA	NA	NA
Trexler & Karst (1972)	Group N = 33	Speech	SSM	Self-report	SSM > AT, NT	NA	SSM > AT, NT	SSM > AT, NT
			AT NT	Behavioral Physiological	SSM = AT = NT	NA	NA	NA
Weissberg (1977)	Group N = 73	Speech	SD	Self-report	SSM + SD (coping) = SD (coping)	SD = SD (coping)	SSM + SD (coping) = SD (coping)	SD = SD (coping)
			SSM + SD (coping) NT	Behavioral	SSM + SD (coping) = SD (coping)	NA	SSM + SD (coping) = SD (coping)	SSM + SD (coping) = SD (coping)

Note. AMT = Anxiety management training; AR = applied relaxation; CC = cue-controlled relaxation; EAR = expanded anxiety relief; PE = prolonged exposure; SCD = self-control desensitization; SD = Systematic desensitization; SSM = Self-statement modification; AMD = Accelerated massed desensitization; AT = attention placebo; NT = no-treatment; NC = normal controls.

Suinn, 1974; Suinn & Richardson, 1971) used behavioral indexes of anxiety, and none of the studies obtained physiological measures.

Applied Relaxation

Applied relaxation (AR) or relaxation as self-control is a broad category comprised of a number of relaxation-based techniques used as self-control procedures.³ Goldfried and Trier's (1974) applied relaxation training is procedurally the simplest. Training includes three stages: (a) a self-control or coping rationale, (b) progressive relaxation training, and (c) *in vivo* application. Chang-Liang and Denney's (1976) and Zeisset's (1978) programs differ from that of Goldfried and Trier (1974) in only minor ways. Chang-Liang and Denney (1976) include an anxiety hierarchy, whereas Zeisset (1968) incorporates differential relaxation (identification of tension during daily activities and subsequent relaxation of muscles which are unnecessarily tense) and its *in vivo* application. Applied relaxation procedures reported by Sherman and Plummer (1973) and Deffenbacher and Snyder (1976) are clearly the most complex and intensive. There are four stages involved in Sherman and Plummer's (1973) training. These are (a) progressive muscle relaxation, (b) direct relaxation without tensing, (c) deepening techniques, i.e., imagery, deep respiration, counting breaths, and (d) differential relaxation. Deffenbacher and Snyder's (1976) relaxation-as-self-control procedure consists of three steps: (a) discrimination training, in which the client is taught to become a careful observer of anxiety and associated response-produced cues, (b) progressive relaxation training, and (c) application training. There are seven components of application training: (a) amplified breathing, i.e., deep chest breathing, deep stomach breathing, stomach fatiguing, three breath technique, alternating focus, (b) differential relaxation, (c) cue-producing relaxation, (d) pleasant scene imagery, (3) tension-release from problem areas, (f) combined exercises, and (g) instructional set.

Six group and three case studies examined the effectiveness of applied relaxation in reducing test, public speaking, interview, communication, and free-floating anxiety. Successful anxiety reduction with applied relaxation was reported in each of the nine investigations. Group studies which contained a no-treatment control found applied relaxation to be more effective. Studies that included an attention placebo condition, however, yielded equivocal results. Zeisset (1968) found applied relaxation to be more effective than an attention placebo on both self-report and behavioral measures; whereas Chang-Liang and Denney (1976) employed relaxation training alone as an attention placebo and obtained superiority on only the behavioral measure. In the Goldfried and Trier (1974) study, applied relaxation, attention placebo, and relaxation alone produced effects which were not significantly different from each other. It should be noted that in these three studies, no credibility or expectancy assessments

³ Each program presents relaxation training and its induction processes as a therapeutic procedure which in and of itself enables the individual to cope with anxiety.

were conducted in order to determine whether the attention placebo conditions were equivalent to applied relaxation on these nonspecific treatment factors. Although substantial support for the efficacy of the technique was obtained, the absence of powerful experimental designs, follow-up assessment, and the assessments of multiple channels and generalized effects in a large percentage of the studies render most conclusions tentative.

Cue-Controlled Relaxation

Cue-controlled relaxation (CC) is aimed at enabling the individual to achieve a state of relaxation in response to a self-produced cue. The procedure consists of two phases: (a) training in deep muscle relaxation and (b) repeated association of the relaxed state with a self-produced cue word such as "calm" or "control" (Russell & Sipich, 1973). Following relaxation training and while the individual is totally relaxed, the individual subvocalizes the cue word with each exhalation. Initially the therapist repeats the word in synchrony with the individual's exhalations, then the individual continues alone for more pairings. A 60-sec period is allowed for the individual to focus on the sensations associated with relaxation. Then there are more pairings of the subvocalized cue word with exhalation. This entire procedure is generally repeated from four to six times. The individual is also encouraged to practice relaxation exercises and cue-word pairings outside the therapy setting.

Cue-controlled relaxation has been the most extensively investigated coping skills technique with a total of 18 (7 group and 11 case) studies. All except one (Marchetti, McGlynn, & Patterson, 1977) reported substantial reductions in anxiety among subjects receiving cue-controlled relaxation. In general, the technique was found to be superior to no-treatment and equivalent to traditional desensitization with respect to treatment effects. The evidence for generalized reduction, in nontarget anxiety and fear behaviors was equivocal. Although all of the case studies found some support for generalization, none of the group investigations obtained significant differences among groups on the generalization measures. One must view the findings of the review as somewhat tentative because of the large number of uncontrolled case reports. In addition, it should be noted that follow-up and generalization assessments were conducted in only about one-half of the studies.

Mixed results were obtained in the three experiments (Counts, Holdsworth, & Alcorn, 1978; Marchetti et al., 1977; McGlynn, Kinjo, & Doherty, 1978) which examined the relative efficacy of cue-controlled relaxation and a condition which controlled for nonspecific treatment factors. Counts et al. (1978) found cue-controlled relaxation to be superior, whereas the other investigations report the two groups to be essentially equivalent. Subjects, however, were not screened for skill deficits in either the Marchetti et al. (1977) or McGlynn et al. (1978) study. Therefore it is quite possible that a large number of individuals suffering from behavioral deficits were employed as subjects in these investiga-

tions. If such were the case, then one would expect potential differences between conditions to be attenuated. The coping-skills training programs reviewed in this paper are directed toward anxious individuals who do not possess skill deficits. Apparently, the techniques only teach a skill for coping with performance debilitating anxiety and not specific response components necessary for appropriate behavior. For example, a test-anxious student who displayed poor study habits requires training in appropriate study behavior. Thus, it is critical that individuals who suffer from behavioral-skill deficits be eliminated as potential subjects from research on the efficacy of coping-skills training programs.

Self-control Desensitization

Goldfried's (1971) self-control desensitization (SCD) involves a number of modifications in both the rationale and the procedure of traditional systematic desensitization (Wolpe, 1969). In terms of rationale, clients are told that they are learning a relaxation skill which they can actively use in order to cope with anxiety. The procedural modifications associated with this self-control emphasis are the client's use of relaxation as an active coping skill, the maintenance of exposure to hierarchy items to provide practice in relaxing away tension, and the use of a hierarchy primarily to elicit anxiety cues toward which the coping skill might be directed. The client is informed that the treatment sessions are devoted to training in how to relax, to recognize tension as a signal to begin relaxing, and to practice relaxing of tensions engendered by a set of anxiety-provoking images. Clients are also instructed to actively apply their emerging relaxation skills outside the treatment setting to reduce tensions that occur in various life situations. According to this emphasis on self-control, the clients are being taught to cope with their proprioceptive anxiety responses and cues rather than with situations which elicit the tension. Therefore, a single hierarchy of varied situations eliciting increasing amounts of anxiety is constructed. During presentation of scenes in imagination, the clients are instructed to maintain their images even though they are experiencing anxiety and to relax away the tension.

Since the publication of Goldfried's (1971) self-control desensitization article, there have been only six reports which examined this technique. Despite the findings of successful reduction of test, speech, and multiple anxiety with the treatment, the existing literature is characterized by a number of limitations and mixed results. Two of the six studies were uncontrolled case reports, and two investigations did not include any type of follow-up evaluation. Mixed results were obtained with respect to self-control desensitization's superiority over traditional desensitization (Denney & Rupert, 1977; Spiegler, Cooley, Marshall, Prince, Puckett, & Skenzzy, 1976; Zemore, 1975) and the generalizability of treatment effects (Denney & Rupert, 1977; Goldfried & Goldfried, 1977; Zemore, 1975). The one investigation (Denney & Rupert, 1977) which contained both no-treatment and attention placebo conditions reported self-control desensitization to be more effective. Unfortunately, Denny and Rupert

(1977) did not conduct any assessment to determine whether the treatment and attention placebo conditions elicited comparable ratings of credibility and expectancy by subjects.

Self-statement Modification

Self-statement modification (SSM) techniques are based on the assumption that clients' anxieties depend on their interpretations of situations and thus the goal of therapy is to change the self-statements—what clients say and think to themselves. This category includes rational restructuring, cognitive restructuring, rational emotive therapy, and stress inoculation.

Meichenbaum and Cameron (1974) describe self-statement modification treatments as involving (1) presenting the rationale that self-statements or verbalizations mediate anxiety, (2) getting clients to become aware of their self-statements in anxiety-arousing situations, and (3) teaching clients to replace these statements with incompatible positive self-statements and behaviors through rehearsal with anxiety-arousing stimuli. Training in relaxation is often included.

Rational restructuring (Goldfried, 1977; Goldfried et al., 1974), incorporates Ellis' Rational Emotive Therapy into a social learning framework. The steps involve helping the client to (a) accept the assumption that self-statements mediate emotional arousal, (b) see the irrationality of certain beliefs, (c) understand that his or her own maladaptive emotions are mediated by irrational self-statements, and (d) modify these statements through prompted practice, role playing, modeling, and (e) apply the technique to situations in daily life. Unfortunately many of the studies using this procedure are unpublished or still in press (see Goldfried, 1977).

Meichenbaum and Cameron (Note 1) formalized self-statement modification into a coping skills package called stress inoculation, the goal of which is to provide clients with a set of skills to deal with future stress. The educational phase is aimed at providing clients with an explanatory schema of their response to stressful situations. Schachter and Singer's (1962) theory of emotion as a two-part reaction (heightened arousal plus anxiety-arousing thoughts, images, and self-statements) is presented, and the therapist notes that the clients' descriptions fit the theory that self-statements made during arousal are the prime causes of emotional behavior. In the second phase, rehearsal, clients are taught a variety of coping techniques, including ways to reduce arousal by direct action. These techniques include getting information about the feared object, physical relaxation, and changing cognitive sets through reappraisal and attribution. Special emphasis is directed to the control of breathing and to relaxation by tensing and relaxing muscle groups. Self-statements are changed by getting the clients to become aware of and to monitor their anxiety-arousing self-statements and to produce positive incompatible ones. Clients' maladaptive behavior, thoughts, and feelings are to be cues for using the coping techniques. In the last phase, application training, the clients practice the new skills by using them in stressful situations, such as shock or cold pressor tests, in the laboratory. The therapist and clients

discuss how they can apply the techniques to situations in the natural environment.

The review identified 22 studies that investigated self-statement modification techniques. A variety of target fears were examined—agoraphobia, and anxiety relating to tests, speaking, stage performance, flying, dating, darkness, snakes, rats, and annoyance with children—but the most frequently studied target was speech anxiety.⁴ In 20 of the studies group designs were used in order to make treatment condition comparisons. Only Bruch (1978) used a control group of normal subjects. Most of the studies used both behavioral and self-report measures of anxiety, but only Kanter and Goldfried (Note 4) and Trexler and Karst (1972) attempted to assess the physiological channel as well.

Both case studies report successful treatment with self-statement modification, but the results of the group studies are, of course, less clear cut. In comparisons of self-statement modification -treatment, self-statement modification was found to be superior to no-treatment about 80% of the time. Self-statement modification is almost always superior to attention placebo conditions. The results of comparisons between self-statement modification and other treatments, such as systematic desensitization and prolonged exposure, are mixed. On both self-report and behavioral measures, self-statement modification is superior to other treatments in about 37% of the comparisons, and in about 45% of the comparisons, the treatments are not differentially effective. Of the 11 studies that examined generalization of effects to nontarget anxieties, about half failed to find treatment effects. In most of the follow-up comparisons, usually restricted to self-report measures taken 1 to 8 months after treatment, specific treatments were found to be superior to control groups.

In summary, the research data support self-statement modification techniques as effective over no-treatment and attention placebo in reducing anxiety, as measured by self-report and behavioral techniques. The data comparing self-statement modification and other types of treatments are mixed. For example, prolonged exposure is superior to self-statement modification for agoraphobia (Emmelkamp, Kuipers, & Eggera, 1978) and the reverse is found for test anxiety (Goldfried, Linehan, & Smith, 1978). The many variations of the self-statement approach make comparisons quite complex, and component analyses should be made in order to isolate the crucial elements. In particular, the role of relaxation in self-statement approaches should be assessed.

METHODOLOGICAL ISSUES AND SUGGESTIONS FOR FUTURE RESEARCH

While all of the studies we reviewed contained one or more methodological flaws, as a group the studies generally support the effectiveness

⁴ It should be noted that the Kanfer, Karoly, and Newman (1975) study was not conducted with a clinical population, and clinical treatment per se was not the goal.

of coping-skills training for the treatment of anxiety. The majority of the studies demonstrated substantial therapeutic effects in the form of increased behavioral performance and a reduction of reported anxiety at both post-treatment and follow-up assessments. The evidence in support of generalized effects is much less clear, perhaps because the self-report assessments typically employed in these studies are insufficiently sensitive to change.

Although the data from the coping-skills training studies appear promising, numerous methodological problems in previous research suggest one adopt a cautious position. If this new research area is to avoid the problems associated with much of the previous therapy analog research and make important contributions to clinical practice, then experimenters must be alert to the methodological problems such as subject selection, assessment instruments, and nonspecific treatment factors.

Subject Selection

Because of the prevalence of anxiety reactions, these problems are attractive targets for therapy outcome research. While suitable subjects seem abundant, it appears that some of the studies have selected minimally anxious subjects. The greater the discrepancy between experimental subjects and clinically anxious individuals, the more hazardous it is to generalize experimental findings to actual clinical populations. Reviews of the therapy analog research on small animal phobias (Barrios, 1977b, 1978; Bernstein & Paul, 1971) indicate that demand characteristics may be responsible for behavior change when insufficiently anxious subjects are employed. In order to insure that minimally anxious individuals are excluded from the studies, a high-demand-for-nonanxious-behavior task should be employed in screening prospective subjects. Also incentives and payoffs other than relief of experienced anxiety should not be offered for participation. Taking such steps will increase the similarity of research subjects to clinic patients and hence improve the external validity or generalizability of the research findings. Possibly the best course of action, although not always feasible, is to secure subjects from distressed populations, e.g., clinic samples. Of course, if theoretical issues are under investigation, or if the patient population of interest consists of minimally anxious subjects, then such concerns are minimized.

Because of the multidimensional nature of anxiety, it is important that multiple-channel screening of potential subjects be conducted whenever possible (Borkovec et al., 1977; Lang, 1969). It is also critical that skill-deficit individuals be eliminated as potential subjects. As stated earlier, coping-skills training programs are aimed at anxious individuals who are not skill deficient. If specific response components necessary for execution of appropriate behavior are absent from the individual's repertoire, an intervention other than coping-skills training is warranted. Thus, comprehensive screening is critical not only to insure the selections of highly anxious subjects but also to restrict participation to those anxious individuals who do not suffer from behavioral deficits.

Assessment Instruments

In order to sensitively examine the efficacy of a treatment it is necessary to employ dependent measures which adequately tap the situations and behaviors of interest. Despite the popularity of self-report scales used to measure anxiety, additional data are needed regarding their psychometric properties and construct validity. Fear Survey Schedules (Geer, 1965; Wolpe & Lang, 1964) are often used as an indicator of subjectively experienced anxiety. In the past, low correlations have been obtained between behavior and critical items on the Fear Survey Schedule. However, this was due possibly to the lack of specificity inherent in the Fear Survey Schedule items (Lick, Sushinsky, & Malow, 1977). It is important that the assessment of different response channels involves the examination of the same situations.

It is also important that complex behaviors such as public speaking and heterosocial interaction are defined satisfactorily so that the working definitions take into account the situational specificity of social appropriateness (Curran, 1977). Differences between anxious and nonanxious individuals will often not be evident across all situations. Summing across situations will mask group-wide discrepancies in many particular situations.

Although test anxiety was a target behavior for a number of the studies reviewed, the behavioral measures rarely revealed any post-treatment group differences. Typically employed behavioral indexes of test anxiety such as grade point average and WAIS block arithmetic and digit subtests have been relatively insensitive to immediate changes in anxiety level. Therefore, more sensitive behavioral measures need to be developed and employed. A few such measures have been devised (Brown, Note 5); however, more extensive examination is warranted.

There are a number of key issues which researchers must attend to when they employ physiological indexes of anxiety. Among these are autonomic response stereotyping (Lacey, 1950, 1956), the law of initial values (Wilder, 1950), and the problem of response definition (Benjamin, 1963; Lacey, 1956). A subject's baseline or prestimulus level of autonomic functioning, unique patterning of responses to the stimulus situations, and the specific statistical transformation of the physiological data which is employed are factors affecting the conclusions yielded by an investigation. In the few studies which included physiological measures, these issues were largely ignored.

Nonspecific Effects

In addition to the threats to internal validity discussed by Campbell and Stanley (1966), researchers must be sensitive to the effects produced by nonspecific treatment factors. The studies which have evaluated the extent to which therapeutic effects may be attributed to a specific coping-skills training therapy ingredient beyond nonspecific treatment effects have generally not determined whether coping-skills training and nonspecific control conditions are equal in perceived credibility and in sub-

jects' expectancy for improvement. There is apparently a need to devise alternative conditions which control for credibility and client expectation. Among the alternative strategies are attention placebo, treatment element control, and empirically derived control (Kazdin & Wilcoxon, 1976).

Two major issues arise in assessing treatment credibility and clients' expectancies. First, the format or method of assessment has to be selected. Ideally, several different assessment methods, i.e., self-report ratings, simulators, and unobtrusive measures, should be used in a single study. Each assessment attempt may be methodologically weak, but together they will provide converging evidence regarding treatment credibility and client expectations (Campbell & Fiske, 1959; Webb, Campbell, Schwartz, & Sechrest, 1966).

Second, the point in time that expectancy for improvement is assessed must be considered. Clients' expectations for improvement should be assessed at several points in therapy. Assessment should be conducted at the beginning, during, and at the end of treatment. If possible, assessment should also be done independently of the actual therapy study itself, as in studies using preinquiry, quasi-control techniques (Borkovec & Nau, 1972). It should be noted that the timing of assessment may contribute directly to the expectancies that clients report. Also different methodological and interpretive problems result with different times of expectancy assessment. For example, assessing expectancies early in treatment may sensitize clients to treatment or may not adequately reflect the expectancies generated by the treatment procedure because of insufficient exposure to the intervention (Kazdin & Wilcoxon, 1976). Assessing expectancies during and after treatment may also present interpretive difficulties in that the extent to which expectancy for change is reported may be solely a function of the behavior changes resulting from treatment. At present, the most widely recommended strategy is for researchers to assess expectancies for improvement at several different points in the therapeutic process.

External Validity

In addition to the concerns about analogue subject characteristics (Barrios, 1977b), there are a number of factors which affect the external validity of laboratory fear and anxiety assessment. Among them are the nature of the behavioral assessment procedure (Lick & Unger, 1975), the sampling of situations (Eisler, Hersen, & Miller, 1975), discrepancies in response topography, and the reactivity of the laboratory context (Bernstein, 1973). It is obvious that there is a need for data from unobtrusive assessment and for cross-validated data, i.e., data correlating subjects' performance on laboratory tests with information about their functioning outside the laboratory.

Lick and Unger (1977) reviewed the available theoretical and empirical material relevant to the external validity of laboratory tests and concluded that the measures do not provide data that currently allow prediction of how subjects will function in naturalistic situations targeted by treatment.

In this respect, it is unclear whether current laboratory tests have this predictive ability and, if so, what levels of laboratory performance correspond to substantial improvements in functioning in the natural environment. The only way to answer this question is to collect data on subjects' functioning in the natural environment and to correlate these data with laboratory test performance. Lick and Unger (1977) suggest several different approaches to examining the extra laboratory behavior of subjects, including unobtrusive observation, obtrusive observation, social validation (Kazdin, 1977), and self-monitoring. Although problems are associated with each of these methods, recent procedures have been developed which increase their reliability (Bornstein, Hamilton, Carmody, Rychtarik, & Veraldi, 1977). It is obvious that researchers should employ several of these approaches in cross-validated research, since convergent agreement between even two of them would substantially increase our confidence in the validity of naturalistic assessments.

Follow-up Assessment and Generalized Effects

In light of the costs, difficulties in data collection, and the likelihood of experimental contamination, the specification of an appropriate follow-up interval is a critical issue (Mash & Terdal, 1977). It has been suggested that the length of the follow-up interval should be a function of the nature of the assessment, features of the target behavior, practical considerations and costs, and the social importance of the behavior. With respect to coping-skills training, the follow-up interval should be largely determined by the purpose of the assessment and the characteristics of the behavior(s) to be examined.

Follow-up assessment of coping-skills training programs is concerned primarily with the maintenance of treatment effects and the application of the skill to nontarget anxiety-provoking situations. The client must be afforded sufficient time to be exposed to various anxiety-provoking situations and the opportunity to apply the coping skill. For example, a client who received treatment for snake phobia requires an appropriate time period following termination of treatment in order to determine whether the technique is effective in reducing anxiety associated with test taking. Also since the greater the length of the follow-up interval the larger the probability of experimental contamination and confound, follow-up assessment should be conducted within a reasonable time frame. On the basis of the findings from our review it seems that a 6- to 8-week follow-up interval may be appropriate for many programs. Studies which employed a follow-up assessment of this length generally obtained some support for the occurrence of generalized effects.

Ancillary Issues

Most therapy research has involved the application of a complex treatment package to individuals with a delineated problem but who were heterogeneous with respect to many other characteristics. The studies reviewed here are no exceptions. Such investigations may perpetuate the

uniformity myth (Kiesler, 1971) and do not answer the question of what specific treatment procedures are effective with what type of individual. More investigations are needed to examine the interplay between subject characteristics and treatment components. For example, using the locus of control personality variable, behavior therapists (Best, 1975; Best & Steffy, 1975; Snowden, 1978) have devised treatment variations to facilitate the reduction of addictive behaviors for internal and external subjects. This approach may prove to be fruitful for coping-skills researchers. Also, investigators need to examine the effectiveness of coping-skills training with populations other than college students. Eighty-five percent of the studies reviewed employed college students as subjects. The general utility of the procedures would be better understood if future investigations used children, adolescents, and other potentially relevant subject populations.

Our review disclosed a number of selectively minor, but common, errors in data analysis that deserve brief mention. First, a number of the studies found no significant between-group differences, but then proceeded to analyze pre-post, within-group changes. When significant pre-post changes were found only for the treatment group, the investigators concluded that this was demonstration of the technique's superiority over the other condition. Such a conclusion is unjustified. The data may indicate a trend and not an equivocal demonstration of superiority (Wade & Hartmann, 1978). Researchers should be sensitive to this issue. Second, a number of the investigations employed the group application of treatments. However, the data analyses failed to take into account the possibility that subjects' scores may in part be influenced by the group of which they are members. Failure to consider the contribution of group composition on the data analysis may result in spurious findings (Meyers, 1972).

Barrios (Note 6) has outlined some of the methodological difficulties in assessing the efficacy of coping-skills training programs, especially with single-subject designs. Among the factors which researchers must attend to are the problems in assessing generalized effects, the differential onset of anxiety reactions, and the differential lag in treatment effects. Barrios (Note 6) recommended that intensive investigations of single subjects be conducted in order to gain valuable information which would allow us to predict when treatment effects are expected to occur.

It is apparent from the review that there is a substantial need to conduct component analyses on the various treatment programs. In general, the active ingredients of each training program have not been isolated. There is also a need for comparative outcome studies. The relative effectiveness of the various techniques has not been adequately demonstrated. In order to provide the most efficient and least expensive treatment, such investigations should be conducted. Although a number of researchers speculated on the preventive potential of the techniques, no study to date has focused specifically on prevention. Needless to say, such investigations are warranted.

CONCLUSIONS

Despite the methodological shortcomings of each of the studies as a group they provide convergent support for the efficacy of coping-skills training. The review indicates that some of the techniques have been investigated more extensively and have received greater empirical support than others. For example, Anxiety Management Training was the least researched procedure despite the fact that the technique was described in the early 1970s (Suinn & Richardson, 1971). It is apparent that many more investigations of AMT are needed before the questions relating to it are answered.

Although the review reveals that coping-skills training programs are more effective than no treatment, mixed results were obtained with regard to their superiority to traditional behavioral treatments and attention placebo control conditions. In addition, judgment must be suspended with respect to generalized effects produced by coping-skills training. The differences between studies finding generalized effects and those not finding them are unclear. Future research in these areas is clearly warranted.

Perhaps the area which is in need of the greatest amount of investigation and for which coping skills possess considerable potential is prevention. Shigetomi and Barrios (Note 7) have speculated on a number of advantages which coping-skills training programs have over previous attempts to prevent fears and anxieties. Unfortunately, research on the application of coping-skills training for prevention is practically nonexistent. Notable exceptions are studies by Peterson and Shigetomi (Note 8) and Langer, Janis, and Wolfer (1975) which examined the effects of coping-skills approaches in preventing pain and anxiety in patients undergoing surgery. The coping strategies were found to be highly successful, but unfortunately the treatments employed consisted of various aspects of all of the techniques reviewed and were brief in duration. Because of their multimodal nature, the studies were excluded from the present review.

This review has evaluated the literature on five coping-skills training programs for the management of anxiety and has discussed several recommendations for future refinements in research. At this time, the evidence supports the overall applicability and effectiveness of the techniques. It is hoped that the present review and the current interests in self-control, prevention, maintenance, and generalization of treatment effects will stimulate rigorous research on these coping-skills procedures.

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