

Efficacy of Applied Relaxation and Cognitive—Behavioral Therapy in the Treatment of Generalized Anxiety Disorder

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ABSTRACT

Nondirective (ND), applied relaxation (AR), and cognitive behavioral (CBT) therapies for generalized anxiety disorder (GAD) were compared. The latter 2 conditions were generally equivalent in outcome but superior to ND at postassessment. The 3 conditions did not differ on several process measures, and ND created the greatest depth of emotional processing. Follow-up results indicated losses in gains in ND, maintained gains in the other 2 conditions, especially CBT, and highest endstate functioning for CBT. AR and CBT thus contain active ingredients in the treatment of GAD; support exists for further development of imagery exposure methods or cognitive therapy because of their likely role in promoting maintenance of change with this disorder. Expectancy for improvement was also associated with outcome, suggesting the need for further research on this construct for understanding the nature of GAD and its amelioration.

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Controlled studies of cognitive—behavioral treatments (including relaxation, anxiety management, and cognitive therapy) for generalized anxiety disorder (GAD) have found these techniques to produce greater improvement than no treatment and to yield maintained gains up to 2 years later, despite chronicities of several years (Barlow et al., 1984; Barlow, Rapee, & Brown, in press; Blowers, Cobb, & Mathews, 1987; Borkovec & Mathews, 1988; Borkovec et al., 1987; Butler, Cullington, Hibbert, Klimes, & Gelder, 1987; Butler, Fennell, Robson, & Gelder, 1991). These initial studies have been disappointing, however, in two ways: The degree of clinically significant change has not been large, and comparisons among various therapies or elements have been generally nonsignificant. Thus, research has yet to rule out rival hypotheses concerning the active ingredients of treatments for GAD, including the crucial possibility that nonspecific factors account for the observed gains.

In the present study, we attempted to increase the efficacy of a behavioral and a cognitive—behavioral

treatment by certain technique emphases based on theory and recent basic research findings regarding the nature of GAD. Moreover, an attempt was made to conduct a controlled outcome investigation with a methodology and design (contrasting applied relaxation [AR], cognitive—behavioral therapy [CBT], and nondirective therapy [ND]) that would hopefully allow unambiguous elimination of two of the most likely rival hypotheses in prior studies: nonspecific factors and the relaxation training component.

As does all anxious experience ([Lang, 1968](#)), the anxiety of a GAD client involves a process of interacting systems (attentional, conceptual, imaginal, physiological, affective, and behavioral) that unfolds over time in continual response to a constantly changing environment. Several features, however, may distinguish the process of GAD from those of other anxiety disorders (cf. [Borkovec, Shadick, & Hopkins, 1991](#)): (a) less obvious environmental triggers of the anxiety or behavioral avoidance to them; (b) preattentive bias to multiple threat cues with rapid cognitive avoidance on detection; (c) predominance of verbal-linguistic worry, which may function to avoid aspects of anxious experience by suppressing fear-related imagery, somatic activation, and emotional processing; and (d) unusual somatic features that include inhibition of the sympathetic autonomic system, a restriction in the range of its variability, and a resulting physiological inflexibility both at rest and when challenged. GAD clients are thus hypothetically stuck in chronic, habitual modes of multisystem interactive responding, with each occurrence of the process functioning as a defensive reaction to threat and resulting in a sequence of anxious responses that acquires greater habit strength from repetition.

These observations suggest some useful emphases in the relaxation and cognitive—behavioral treatments of GAD: (a) the central importance of self-observation in detecting the initiation of the anxiety process earlier in its interactive sequence; (b) particular therapeutic attention to chains of worrisome thinking as one of the most crucial early cues for coping deployments; (c) the necessity of clinically thorough relaxation training (e.g., applied relaxation training; [Ost, 1987](#)); (d) the usefulness of multiple relaxation methods that target different response-system levels and increase flexibility, including teaching a generalized letting-go response to illusory thoughts and aversive images about the past or future; and (e) frequent in-session practice of all of these emphases to facilitate early cue detection and the strengthening of coping responses.

The possible function of worry for escaping anxiety-provoking imagery to avoid somatic anxiety also suggests the importance of imagery exposures to anxiety-related internal and external cues. The pervasiveness of worrisome thinking and its typical catastrophic predictions suggests the particular value of cognitive therapy. The habitual nature of interactive anxiety process suggests the need for frequent rehearsal of cognitive and relaxation coping skills in response to detected cues to strengthen new habits. Consequently, a cognitive—behavioral treatment that includes AR, self-control desensitization that involves accessing anxiety-related images and worrisome thoughts and practicing coping skills in response to them, and cognitive therapy used along with relaxation during imagery exposures should be a rather powerful method for change in GAD.

Several methodological features crucial for clear interpretation of GAD outcome research were incorporated in this study. First, because interrater reliability for GAD is the lowest among the anxiety disorders ([Barlow, 1988](#)), independent assessors from separate interviews must agree on the diagnosis to avoid false positives. Second, conditions must not differ in credibility and expectancy for improvement ([Kazdin & Wilcoxon, 1976](#)); otherwise, condition effects are confounded by differential demand or expectancy effects. Third, if nonspecific factors are to be ruled out by the use of a relationship therapy, that condition must not be inferior to other conditions on relationship factors and ideally would provide high levels of therapeutic process hypothesized by its theory to be the active ingredient for change. We used a nondirective condition, enlisted an expert nondirective therapist to provide adjunctive supervision, assessed the quality of the therapeutic relationship by means of the Relationship Inventory ([Barrett-Lennard, 1986](#)), and measured the depth of client emotional processing

by means of the Experiencing Scale, one of the most reliable methods of assessing change process in experiential therapy. We chose a simple, reflective listening—ND only to provide a nonspecific condition for control purposes; our intention was not to do a comparative outcome study contrasting the best available experiential therapy with cognitive—behavioral methods.

Method

Subjects

Of 508 clients referred from agencies and news advertisements, 442 were ruled out for not meeting criteria. Eight clients dropped out at early stages of treatment (2 in ND, 2 in AR, and 4 in CBT). Three clients (all in AR) were removed because of deteriorating condition (increasing depression). The average age of 55 remaining completers was 37.5 years ($SD = 13.1$). The average duration of the problem was 17.1 years ($SD = 17.2$). Ethnic composition was as follows: 51 participants were White, 2 were Black, 1 was Hispanic, and 1 was Indian. Thirty-six participants were women; 19 were men. Thirty-four were married, 16 were single, and 5 were divorced. Nine clients were referred from agencies; the remainder responded to advertisements. Four clients in each therapy condition were taking anti-anxiety drugs. They agreed to maintain dosage during the trial with a physician's approval; diary monitoring indicated that all complied with this request. All of these characteristics were evenly distributed and nonsignificantly different among conditions. Multivariate analyses of variance (MANOVAS) indicated that agency referrals versus responders to advertisements and drug-taking versus non-drug-taking clients did not differ in severity on pretherapy measures or in outcome at any period and differed demographically only on age: Referrals were younger than responders to advertisements, and the drug-taking group was older than the non-drug-taking group.

Procedure Selection and assessor outcome ratings.

Clients were admitted from 1987 to 1991. Clinical assessors (6 advanced clinical psychology graduate students thoroughly trained in diagnostic interviewing following the *Diagnostic and Statistical Manual of Mental Disorders* (3rd ed., rev.; *DSM—III-R*) conducted a 30-min phone interview followed by a diagnostic interview using the Anxiety Disorders Interview Schedule—Revised (ADIS—R; [DiNardo & Barlow, 1988](#)) and including the Hamilton Anxiety Rating Scale (HARS; [Hamilton, 1960](#)), the Hamilton Rating Scale for Depression (HRSD; [Hamilton, 1959](#)), and Assessor Severity of GAD Anxiety Symptoms (a scale ranging from 0—8 points; [Barlow et al., 1984](#)). A second ADIS—R was given within a week by one of the therapists. A client was admitted if both interviewers agreed on the following points: GAD was the principal diagnosis; panic disorder criteria were not met; assessor severity was rated 4 (moderate) or greater; no other psychosocial therapy was ongoing; the client had not previously received any of the methods of the study; no medical contributions to anxiety symptoms (e.g., hypoglycemia, thyroid problems) were present; no antidepressant medication was being taken; and there was an absence of severe depression, substance abuse, psychosis, and organic brain syndrome. The ADIS—R and rating scales were repeated 10—14 days after the 12th session and at 6- and 12-month follow-ups. The same assessor for a particular client conducted both pre- and post-assessments in all instances and at follow-up when possible; all were unaware of the condition.

Self-report outcome measures.

After the first ADIS—R, the client completed a daily diary three times a day for 2 weeks before therapy, throughout therapy (including the 10—14 days after Session 12 for post-assessment), and for 1 week before each follow-up. In the diary, clients rated their average level of anxiety during the preceding time block on a 100-point Diary Severity scale and entered the frequency of acute, intense (> 50 on the diary

severity scale) anxiety episodes (the Diary Episodes measure) (see [Barlow et al., 1984](#)). Clients also attended a session to complete the State—Trait Anxiety Inventory—Trait Anxiety subscale (STAI; [Spielberger, Gorsuch, & Lushene, 1970](#)); the Zung Self-Rating of Anxiety scale (ZSRA; [Zung, 1975](#)); the Reactions to Relaxation and Arousal Questionnaire (RRAQ, [Heide & Borkovec, 1983](#)), a factor-analytically derived measure of fear of relaxation; the Penn State Worry Questionnaire (PSWQ; [Meyer, Miller, Metzger, & Borkovec, 1990](#)), a measure of worry that distinguishes GAD from all other anxiety disorders ([Brown, Antony, & Barlow, 1992](#)); and the Beck Depression Inventory (BDI; [Beck, Ward, Mendelson, Mock, & Erbaugh, 1961](#)). These measures were repeated at the postassessment and follow-up ADIS—R sessions. Random assignment to conditions took place within each wave of 3 clients; assignment to therapist was random within restrictions of availability and caseload.

Process measures.

At the end of the first therapy session, clients completed a three-item credibility scale (9-point) and a 0%—100% expectancy of improvement scale ([Borkovec & Mathews, 1988](#)). The Relationship Inventory ([Barrett-Lennard, 1986](#))—a measure of client perception of therapist warmth, empathy, and congruence—was given at the end of Sessions 1, 4, 8, and 12. Clients in AR and CBT also rated how much relaxation-induced anxiety they experienced (9-point scale) at the end of relaxation training sessions ([Borkovec & Mathews, 1988](#)) and recorded the daily frequency of formal relaxation practice between sessions.

Clients' utterances during 10-min tape-recorded segments from Sessions 2—12 were scored for depth of emotional processing on the 7-point Experiencing Scale (cf. [Klein, Mathieu-Coughlan, & Kiesler, 1986](#)) by undergraduate raters who were unaware of the existence of different conditions and to the session number of the randomly presented tapes. Segments selected were from Minutes 5—15 when client—therapist interaction was least structured by protocol (typically involving a review of the past week) in all conditions and no formal cognitive or behavioral methods were taking place. Raters underwent 80 hrs of training with manuals and practice tapes devised by [Klein, Mathieu, Gendlin, and Kiesler \(1969\)](#). Each segment was rated for mode (average level) and peak (highest level) by two independent raters. Interclass correlations with Finn's adjustment ([Whitehurst, 1984](#)) were .931 for mode and .916 for peak. After reliability checking, raters differed by 1 point on 28.7% and 29.8% of mode and peak segments, respectively, and the average of the two scores was used. If more than a 1-point discrepancy occurred (which occurred on 8.5% and 7.2% of mode and peak segments, respectively), the entire team listened to the segment and provided a group consensus rating.

Therapists.

Two experienced therapists (1 female, 1 male, with an average of 9.0 years of clinical experience) and two advanced clinical graduate students (1 female, 1 male) conducted therapy. One of the experienced therapists saw 40% of the clients; each of the others treated 20%. Each therapist saw a nearly equal number of clients in each condition. Three had served as therapists in the [Borkovec and Mathews \(1988\)](#) study. Further protocol training involved instruction and demonstrations by T. D. Borkovec, viewing of tapes, and role play, all following detailed protocol manuals. The fourth therapist treated 1 pilot client with the CBT protocol before seeing his first study client. T. D. Borkovec provided weekly individual supervision on all cases to ensure protocol adherence and quality therapy. R. Lundy, who has trained clinicians for 40 years in ND methods, listened to three randomly selected session tapes for each ND client and met individually with therapists to provide feedback to ensure high-quality ND.

Therapy conditions.

Sessions occurred twice per week for 12 sessions before postassessment, with two fading or termination sessions during the last 3 weeks. The first four sessions were 90 min in duration; the remaining were 1 hr sessions.

In the first ND session, clients were told that therapy would involve exploration of life experiences in a quiet, relaxed atmosphere; the goal was to facilitate and deepen knowledge about self and anxiety. Therapy involved an inward journey that would change anxious experience and increase self-confidence. The therapist's role would be one of providing a safe environment for self-reflection and of helping to clarify and focus on feelings as the therapeutic vehicle to facilitate change. The clients' role was described to emphasize their unique efforts to discover new strengths through introspection and affective experiencing. The final 30 min were devoted to actual ND. The manual instructed therapists to create an accepting, nonjudgmental, empathic environment, to continuously direct client attention to primary feelings, and to facilitate allowing and accepting of affective experience using supportive statements, reflective listening, and empathic communications. Direct suggestions, advice, or coping methods were prohibited. As daily homework for use in subsequent sessions, clients kept a written journal to elaborate on observations about the day's events, their thoughts, feelings, images, anything that they did differently, what effect those changes had, and insights about their reactions. Subsequent sessions began with an opportunity to ask questions, followed by a review of the week. After these initial 15 min, formal ND commenced, following the aforementioned procedures.

In the first AR session, clients were told that therapy would involve learning new coping techniques for reducing anxiety and worry. Anxiety was described as involving a habitual spiral process wherein threat detection leads to interacting anxious reactions that include thoughts (especially worry), images, somatic reactions, affect, and avoidance. Treatment would thus involve clients' (a) self-monitoring of their reactions and their sequential nature and learning to catch the spiral earlier, (b) intervening early with a variety of relaxation responses to anxious thoughts, feelings, and images to disrupt anxious spirals and thereby create new habits, and (c) focusing attention on present experience rather than on mentally created past events or future possibilities. After rationale presentation, the progressive relaxation training rationale and demonstration were provided, following Bernstein and Borkovec's (1973) manual. Then clients were trained in and allowed to practice slow, paced, diaphragm breathing to provide an immediate relaxation method for daily deployment upon anxiety cue detection. The importance of formal relaxation practice twice a day and frequent application was emphasized. Daily diaries were used to note early cues identified, with emphasis placed on worrisome thoughts, fear images, and bodily reactions. Sessions 2—12 involved review of the week and homework and further work on identifying early cues, anticipating stressful events and cues to be used for coping, and formal relaxation training with mediational diaphragmatic breathing at the end. Relaxation training followed the procedures and schedule of Bernstein and Borkovec's (1973) manual, including cue-controlled relaxation, differential relaxation, and imagery techniques; discussions increasingly focused on the flexible choice of relaxation methods, including the notion of letting go of anxious internal events. Frequent in-session application was encouraged: The therapist periodically intervened when an increase in tension or anxiety was noticed and asked the client to detect the cues and apply extant coping skills; eventually, clients did this on their own during the session. Homework emphasized frequent application of relaxation techniques, focus on living in the present, and behavioral approach tasks to provide opportunities for extinction of anxiety and for deployment of relaxation skills.

In CBT, all AR procedures were used, except that the extensive time spent in discussions of early cue detection and ways of relaxing in daily life was instead devoted to self-control desensitization (Goldfried, 1971) and brief cognitive therapy. CBT clients were told in the rationale that (a) imaginal rehearsal of coping methods would facilitate fear extinction and coping response habit acquisition, (b) cognitive therapy would reduce anxiety-maintaining thoughts and beliefs, and (c) use of cognitive products from cognitive therapy during imaginal rehearsal would provide cognitive coping along with

relaxation skills. Desensitization began in Session 4, cognitive therapy began in Session 5, and both were conducted in every session thereafter. During desensitization, after the client was deeply relaxed, external and internal anxiety cues were presented until the client signaled the presence of anxiety. The client then continued imagining the external situation while imagining that he or she was using relaxation skills in that situation. At the elimination of anxious feelings, he or she imagined continued use of these skills for 20 s and then turned off all imagery and focused only on relaxation for 20 s. Scenes were repeated until the client could no longer generate anxiety or was able to eliminate it rapidly (5—7 s). Cognitive therapy followed Beck and Emery's (1985) methods, except that only 10—15 min per session were devoted to it. Its primary goal was to produce cognitive coping responses (both self-statements and perspective shifts) for use during desensitization; if time or client readiness allowed, emphasis was placed on applying cognitive therapy skills more generally. Within these restraints, the cognitive therapy included thought and underlying belief identification, logical analysis with probability and evidence searching, developing alternative thoughts and beliefs, behavioral testing of beliefs, and decatastrophization. Emphasis was placed on multiple, flexible, alternative perspectives. The therapist routinely used the Socratic method to elicit cognitive change. The daily diary was used for monitoring the various stages of cognitive therapy applications. ¹

Integrity checking.

Audiotapes from 20% of the sessions in each condition were checked for adherence by clinical graduate students, who listened to entire sessions in each case and marked every therapist utterance against a checklist of allowed and disallowed interventions representing all techniques from all conditions. Of 7,642 statements so scored, one statement in an ND session indicated a minor provision of advice, one in another ND session conveyed a minor piece of factual information, and two statements in one AR session involved an interpretive reflection and the potentially explicit identification of an error in thinking.

Results

Preliminary Analyses

Means and standard deviations on the eight anxiety and two depression measures for each condition at each assessment are presented in Table 1. Follow-up data were based on clients who completed particular measures. Two-way analyses of variance (ANOVAS; Condition \times Therapist) on all 10 pretherapy measures indicated no significant main or interaction effects involving condition ($p > .20$). There was a main effect for therapist on the pretherapy STAI. Consequently, and to provide a base-free measure of change, all postassessment and follow-up scores were converted to residualized gain scores (Tucker, Damarin, & Messick, 1966).

Postassessment Improvement Between-groups change.

Using two-way multivariate analyses of variance (MANOVAS; Condition \times Therapist) conducted separately on anxiety and depression gain scores, we found a significant condition effect on anxiety measures, $F(16, 90) = 2.25, p < .01$, and a marginally significant condition effect on the depression scores, $F(4, 102) = 2.25, p < .07$. Univariate ANOVAS with Tukey post hoc comparisons indicated that (a) AR and CBT were both significantly more improved on the HARS, univariate $F(2, 54) = 6.02, p < .01$, and on the RRAQ, $F(2, 54) = 7.40, p < .01$, than ND was; (b) CBT was superior to ND on the Assessor Severity scale, $F(2, 54) = 4.28, p < .02$, and on the PSWQ, $F(2, 54) = 4.74, p < .02$, with AR levels close to those of CBT; and (c) AR produced greater gain on the Diary Severity scale, $F(2, 54) = 3.67, p < .04$, and the Diary Episodes measure, $F(2, 54) = 4.81, p < .02$, than ND did, with CBT levels

close to those of ND. No effects emerged from the univariate analyses of the STAI or the ZSRA. CBT was also superior to ND on the HRSD, univariate $F(2, 54) = 3.49, p < .04$, and on the BDI, $F(2, 54) = 3.81, p < .03$, with AR levels close to those of CBT. No main or interaction effects involving the therapist factor were found in any of the aforementioned analyses.²

Within-group change.

Within-condition correlated t tests with Bonferroni correction conducted on change pre- to post-assessment indicated improvement on all 10 outcome measures for AR and CBT ($t(16) = 3.51$ to $11.27, p s < .03$ to $.001$) and on 5 measures for ND ($t(16) = 3.51$ to $7.94, p s < .03$ to $.001$). ND clients did not change significantly on RRAQ, STAI, PSWQ, the Diary Severity measure, and the BDI.

Clinically significant change.

The degree to which a client showed clinically meaningful gain was defined in two ways using the eight anxiety measures. Responder status was defined by 20% change from pretherapy level. Endstate functioning was defined by either a score after therapy that fell within 1 standard deviation of the mean of normative samples or a score that exceeded a face-valid level of meaningful change when norms were not available. For the latter, meaningful endstate was defined as 2 (mild) or less on the 9-point Assessor Severity scale, 20 (slight anxiety) or less on the Diary Severity scale, and 0 on the Diary Episodes measure. The top of [Table 2](#) presents the frequency and percentage of clients in each condition who met these criteria for low (0—2 measures), moderate (3—5 measures), and high (6—8 measures) responder status and endstate functioning. AR and CBT more often generated clinically meaningful change than ND on both responder status, $\chi^2(4, N = 55) = 14.58, p < .01$, and endstate functioning, $\chi^2(4, N = 55) = 13.84, p < .01$.

Follow-Up Improvement

At the 6-month follow-up, 2 ND clients and 1 AR client missed all assessments, and 1 CBT client did not complete the self-report measures. At 12 months, 3 ND and 2 AR clients did not complete assessments, and 2 ND, 1 AR, and 2 CBT clients missed the self-report measures. Therefore, all analyses were repeated separately on (a) clients with complete data and (b) all clients, with missing data replaced by endpoint scores (i.e., last score available). Furthermore, some clients received further treatment after postassessment under two circumstances. Our program requires us to offer some further treatment to clients who do not meet a minimal level of response. Seven such clients (all in ND) accepted and had an average of 3.7 sessions. One client in CBT accepted further treatment but was seen by the protocol therapist for 20 sessions at another agency. Eight additional clients (3 ND, 3 AR, and 2 CBT) reported further outside therapy since postassessment (5 for relationship problems, 1 for anxiety, 1 for depression, and 1 for an unspecified reason; average of 14.0 sessions). Overall, significantly more ND clients received subsequent treatment by 12 months postassessment: 61.1% of ND, 16.7% of AR, and 15.8% of CBT clients, $\chi^2(2, N = 55) = 11.43, p < .01$. This is an index of outcome itself but also has implications for analysis and interpretation of follow-up data. For analysis, we repeated tests separately on (a) clients without further treatment and (b) all clients regardless of further treatment. Implications for interpretation of results are discussed later.

Between-groups change.

Two-way MANOVAS (Condition \times Therapist) were conducted separately on the anxiety and depression measures at both 6- and 12-month follow-ups. No significant effects involving condition or therapist factors emerged at either period, regardless of the use or nonuse of endpoint scores and regardless of the

inclusion or deletion of clients receiving further treatment (see [Footnote 2](#)).

Within-group change.

Within-condition *t* tests with Bonferroni correction were calculated on change from pretherapy to follow-up on all 10 outcome measures, first for clients without missing data and regardless of further therapy. For CBT, improvements on all measures at both follow-up periods were significant, $t s(15) = 3.90$ to 10.49 , $p s < .02$ to $.001$. The same was true for AR ($t s(13) = 3.93$ to 10.45 , $p s < .02$ to $.001$), except for BDI from pretherapy to the 12-month follow-up. For ND, gains at the 6-month follow-up were significant on all measures and at the 12-month follow-up on seven measures, $t s(11) = 3.51$ to 6.81 , $p s < .05$ to $.001$); changes from pretherapy to the 12-month follow-up were not significant for PSWQ, the Diary Episodes measure, or the BDI. When we repeated these tests using endpoint scores, identical results emerged for AR and CBT: All changes were significant except for AR on BDI at the 12-month follow-up. For ND, changes were not significant on the BDI at the 6- or 12-month follow-ups and on RRAQ, STAI, and PSWQ at the 12-month follow-up. The same tests were applied to data excluding clients who received further therapy, separately with and without endpoint scores. Changes at all follow-ups on all measures in both cases were significant for CBT. For AR, all changes were significant except on the BDI and the Diary Severity scale at the 12-month follow-up, both with missing data and endpoint scores. Finally, for ND with and without endpoint analysis, findings on only the Assessor Severity and Diary Severity scales at both follow-ups showed significant change.

Clinically significant change.

The same definitions of responder status and endstate functioning were applied to follow-up data. Of 4 clients missing 6-month data and 10 missing 12-month data, 1 and 5 clients, respectively, had partial information; responder status and endstate functioning were determined for them on available measures by prorating. The bottom of [Table 2](#) presents the frequency and percentage of clients in each condition who met the criteria for low (0—2), moderate (3—5), and high (6—8) responder status and endstate functioning on the 12-month anxiety measures, separately for (a) clients with complete or prorated scores and (b) all clients using endpoint scores. Chi-square test results were nonsignificant at the 6-month follow-up but significant at the 12-month follow-up for both responder status, $\chi^2 4, N = 55 = 12.27, p < .02$, and endstate functioning, $\chi^2 4, N = 55 = 13.80, p < .01$, using endpoint data, and marginally significant on endstate functioning, $\chi^2 4, N = 50 = 8.44, p < .10$, without endpoint data. In all cases, the majority of CBT clients experienced high responder status and endstate functioning, rather than the less favorable outcomes of the other conditions. Although similar differential frequencies existed when clients receiving further treatment were deleted, chi-square tests were not significant because of small cell sizes.

Drug status.

Four clients in each condition were taking drugs at the start of therapy. At the 6-month follow-up, 3 ND, 3 AR, and 2 CBT clients were still on the medication, and 1 new client in each condition had begun medication. At the 12-month follow-up, 3 ND, 3 AR, and 2 CBT clients continued medication, and 1 new client in both ND and AR had begun drugs since the 6-month follow-up. Cell sizes were insufficiently small for chi-square analysis.

Therapeutic Relationship Measures and the Experiencing Scale

Using one-way ANOVAS on each of the three factors of the Relationship Inventory, averaged over its four administrations, we found no condition effect ($p s > .20$). Clients in all three conditions viewed

their therapist highly in terms of regard ($M = 30.12$), empathy ($M = 22.44$), and congruence ($M = 27.32$).

Session tapes were missing for 1 ND client. A MANOVA applied to mode and peak scores of the Experiencing Scale, averaged over 11 sessions, indicated a significant condition effect, $F(4, 100) = 3.43, p < .02$. Univariate tests with Tukey post hoc comparisons found that ND clients experienced deeper emotional processing (for mode and peak, $M_s = 2.76$ and 3.44 , respectively), compared with AR clients ($M_s = 2.44$ and 3.08 , respectively) and CBT clients ($M_s = 2.37$ and 3.11 , respectively), univariate $F_s(2, 51) > 4.98, p_s < .02$.

Credibility—Expectancy, Relaxation Practice, and Relaxation-Induced Anxiety

One-way ANOVAS on the average credibility scales and on the expectancy scale obtained at the end of Session 1 yielded no significant condition effects ($p_s > .20$; mean credibility, 6.95; mean expectancy of improvement, 68.52%). One-way ANOVAS contrasting AR and CBT on frequency of relaxation practice ($M = 1.55$ times per day) and on the end-of-session scale of anxiety during relaxation training ($M = 1.52$, where 0 = no anxiety and 2 = slight anxiety) found no condition differences ($p_s > .20$). These three measures were correlated with the 10 residualized gain scores at each assessment, and Bonferroni correction was applied; only clients without missing data were included. Relaxation practice frequency for AR and CBT clients was significantly associated with outcome on 2 of 30 correlations: The greater the frequency of formal practice, the smaller the 6-month gain on the RRAQ and the ZSRA. The occurrence of relaxation-induced anxiety correlated with one measure: The greater the anxiety during training, the less reduction on the Diary Severity measure at the 12-month follow-up. Credibility scales did not correlate significantly with any outcome measure. Expectancy significantly predicted outcome on 13 of 30 variables (see [Table 3](#)).

Discussion

AR and CBT were superior to ND at postassessment, as evidenced by between-group comparisons, within-group changes, degree of clinically significant change, and frequency of later further treatment. This occurred although conditions did not differ significantly on credibility and expectancy or on client perception of relationship factors. Most important for methodological control, ND generated superior degrees of depth of emotional processing. Although this reflective listening condition was included only to control for nonspecific factors and not as a thorough experiential therapy approach, it was nonetheless successful in eliciting considerable experiential change process, to an extent greater than in the other therapies. From these results, we have drawn the conclusion that the behavioral therapy and the CBT contain active ingredients in the treatment of GAD, independent of nonspecific factors.³ Furthermore, our attempt to create AR and CBT that are sensitive to what is known about the nature of GAD was successful; percent change and effect sizes produced by these conditions were among the largest among GAD outcome studies on the commonly used measures HARS and STAI ([Borkovec & Whisman, 1993](#)).

AR and CBT did not differ at postassessment. The rival hypothesis that AR was the sole determinant of gain in both conditions (and in the anxiety management and other versions of CBT containing relaxation elements in prior GAD studies) cannot be rejected. Two therapies, however, can lead to equivalent change through different pathways. Successfully learning to let go of somatic arousal or anxiety-provoking thoughts, for example, could lead to changes in attention, behaviors, appraisals, beliefs, and so forth. Alternatively, successfully learning to shift to less threatening perspectives could reduce anxious meanings and reactions within all other interacting systems. Our results contain some evidence for condition differences and the possibility of such differential pathways. AR showed signs of

producing greater responder status and endstate functioning (although not significantly so) at postassessment, largely because of its effectiveness in reducing daily anxiety; it alone was superior to ND on the daily diary. Thus, intensive work on early cue detection and relaxation techniques may have an advantage for yielding quick reductions in daily anxiety. However, CBT was particularly effective on those measures theoretically expected for it (i.e., worry and depression) where it alone was significantly different from ND. Finally, although the numbers were very small and thus preclude adequate statistical testing, CBT had more clients dropping out of therapy, whereas AR alone was associated with cases of deterioration caused by depression.

Interpretation of follow-up results is more complex because of missing data and further treatment. If clients receiving further therapy were deleted from analyses, then (a) power would be severely reduced, especially for comparisons involving ND, and (b) the least successful clients at postassessment (the majority of whom were in ND) would not be included, thus biasing between-condition comparisons. On the other hand, if all clients were to be included in analyses, then differences, or lack thereof, among conditions would be confounded by differential amounts of further therapy; even reductions in relationship problems could significantly affect anxiety symptoms.

MANOVAS revealed no significant effects among conditions at follow-up, with or without endpoint scores and with or without clients receiving further treatment. The conservative conclusion is that type of therapy does not make a difference after 1 year. Other evidence suggests that this is not the case. Follow-up indicated clear maintenance of gains for AR and CBT, independent of the influence of missing data or further treatment. This finding was in contrast to the absence of significant change from pretherapy to the 12-month follow-up for ND (a) on some measures even when clients receiving further treatment were included and, more striking, (b) on most measures when clients receiving further treatment were excluded. Although ND clients who did not receive further therapy made considerable gains by postassessment, all improvements except on the Assessor Severity and Diary Severity scale had statistically vanished 1 year later. Finally, degree of clinically significant change favored CBT at the 12-month follow up; 57.9% of CBT clients were at high endstate functioning versus 26.7% in ND and 37.5% in AR. Thus, the tendency for AR at postassessment to produce the greatest degree of clinically significant change shifted to CBT 12 months later. ⁴

Our results seem to indicate the permanence of change provided by AR and CBT and are suggestive of potentially enhanced improvement in endstate functioning for CBT at long-term follow-up. Efforts to continue the clinical development of each of these interventions will likely yield additional efficacy, especially if those developments draw from existing basic research on the nature of GAD. Further pursuit of the mechanisms of CBT, which promote greater maintenance, appears particularly warranted. Recent GAD research highlights the role of the conceptual predominance of worry and its avoidance of imagery and affect. Unlike AR, CBT contained two elements that targeted both cognitive factors and imagery process and, therefore, may be especially conducive to facilitated maintenance: brief cognitive therapy that is aimed at conceptual change and imaginal exposures to anxiety cues with rehearsal of both cognitive and relaxation coping responses. Either or both of these may contain ingredients for maximizing long-lasting change, and between-group comparisons of each element alone and together would help to isolate the crucial process.

Neither frequency of practicing relaxation nor relaxation-induced anxiety during training showed much relationship with outcome. The most striking prediction of short- and long-term outcome was found for expectancy. We know very little about expectancy, but the present study and its two predecessors ([Borkovec & Mathews, 1988](#) ; [Borkovec et al., 1987](#)) clearly indicate that it contributes in powerful ways to active and nonspecific therapies in GAD improvement. Elucidation of its mechanisms is an important area of research for this disorder, both for understanding its nature and for therapy

development. Butler et al. (1991) provided potential clues in their clinical and empirical observations that GAD clients show characteristic demoralization, lack of confidence, and fear of losing control. The promise of relief and of the provision of ways of learning greater control (or indeed perhaps the letting go of control) may lead to alternative perspectives about the future and to increased motivation to learn the presented coping methods.

Although the results of our study are encouraging, the evolution of AR and CBT methods for treating GAD must continue. Only one third of the AR clients and a little over half of the CBT clients met criteria for high endstate functioning at the 12-month follow-up. Further basic and applied research will undoubtedly contribute to technique development, but we still make an additional recommendation on the basis of our clinical observations and theory of GAD. If this disorder does indeed reflect cyclically interacting human systems, then integrative therapy that incorporates techniques targeting each system would enhance efficacy (e.g., Fodor, 1987). Such has been the historical rationale of combining relaxation and cognitive therapy in GAD treatment.

However, simply adding elements may not be the only approach for achieving true integration. An exciting possibility is the deliberate deployment of one method to facilitate catalytically the change process of another in a more theoretically meaningful and clinically useful way. Several intriguing questions and implicit experimental designs are thus suggested: Does a deeply relaxed state facilitate any phase of cognitive therapy, such as identification of thoughts or beliefs, logical analysis, or generation of alternatives? Would desensitization of negative emotion surrounding a crucial situation or memory, even a developmentally based one, reduce the degree to which a client feels that a more adaptive belief is less true than a distorted belief, or would it perhaps facilitate the speed with which rational self-statements or beliefs are identified? Integration does not need to be limited to CBT methods. Would a relaxed state deepen the experiential depth of emotional processing? Could cognitive restructuring lessen avoidance tendencies sufficiently to allow the client to access deeper, primary emotion in subsequent experiential therapy segments? Is it possible that first accessing deep, primary affect through experiential techniques can facilitate subsequent cognitive therapy phases? If humans are nonlinear, dynamical systems, as we think they are, then the answers to questions about therapeutic change will ultimately reside in the synergistic incorporation of methods that target all relevant processes and contribute to each other in ways that maximize the effectiveness of each of them.

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1

Further protocol details are available from T. D. Borkovec.

2

Principal-components factor analysis with oblique rotation applied to the 10 gain postscores found two factors (one loading on assessor and questionnaire measures, and one on daily diary variables, accounting for 61.5% and 12.4% of the variance, respectively). A MANOVA revealed a condition effect, $F(4, 102) = 4.50, p < .01$. Each univariate test was significant and showed the same results as prior analyses: CBT and AR had greater gains than ND on Factor 1, and AR showed greater change than ND and CBT on Factor 2. One factor accounting for 66.3% of the variance was found for 12-month gain scores; an ANOVA revealed no condition effect ($p > .40$).

3

Caution is warranted regarding differences involving ND, because of the outcome researchers' dilemma of having to choose between two equally confounded designs. One crosses therapists with conditions, creating a potential difference among conditions on therapist expertise, bias, or expectancy. Alternatively, one can use expert therapists for their preferred condition, creating a potential difference among conditions on therapist characteristics and still without certainty that equal quality of each therapy was provided, although such assumed equation (nearly never empirically assessed) is the reason for this choice. We chose the former design, taking steps to maximize and measure the quality of our nonspecific condition and to minimize therapist effects.

4

CBT included only brief cognitive therapy; effects may be greater if more thorough cognitive therapy is provided.

Table 1.

Table 1
Mean and Standard Deviations on Outcome Measures at Pre-, Post-, and Follow-Up Assessments for the Three Change Conditions

Measure and condition	Follow-up					
	Pre		Post		12 months	
	M	SD	M	SD	M	SD
Hamilton Anxiety Rating Scale						
CBT	20.7	4.2	17.0	3.2	14.4	2.0
CB	20.8	4.0	17.6	3.9	15.6	2.7
CBT	21.4	3.4	16.9	3.7	14.9	2.1
Anxiety Severity Scale						
CBT	4.7	0.6	3.8	0.5	3.0	0.4
CB	4.8	0.4	3.9	0.5	3.4	0.5
CBT	4.8	0.4	3.8	0.5	3.4	0.5
Reactions to Relaxation and Arousal Questionnaire						
CBT	21.1	4.0	22.0	3.6	20.4	3.0
CB	20.6	3.4	17.2	3.8	17.9	3.7
CBT	20.4	3.0	20.9	3.1	19.0	2.9
STAI-Trait						
CBT	51.8	8.9	47.6	6.4	42.9	5.1
CB	50.7	8.0	42.7	7.8	39.1	5.0
CBT	50.7	8.4	46.9	6.7	40.1	5.2
Zung Self-Rating of Anxiety						
CBT	40.0	6.1	34.2	5.0	30.1	3.4
CB	41.9	6.4	35.0	5.9	32.1	3.1
CBT	40.1	5.1	33.9	5.8	30.6	3.9
Penn State Worry Questionnaire						
CBT	61.7	8.1	54.7	5.6	46.1	3.4
CB	60.4	6.9	49.1	5.4	46.0	3.4
CBT	61.3	8.0	48.0	5.9	43.9	3.5
Diary Severity Scale						
CBT	13.0	2.6	12.4	2.3	11.7	2.0
CB	12.7	2.1	12.2	2.0	11.7	1.9
CBT	13.2	2.8	12.4	2.6	11.9	2.1
Diary Negative Affect						
CBT	0.76	0.36	0.56	0.26	0.28	0.24
CB	0.77	0.37	0.56	0.28	0.27	0.27
CBT	0.67	0.36	0.59	0.27	0.25	0.24
General Depression Scale						
CBT	12.0	4.1	8.7	3.6	7.0	3.1
CB	11.9	4.4	8.7	3.7	7.0	3.1
CBT	11.8	4.1	8.2	3.2	6.4	2.7
Week Depression Inventory						
CBT	14.1	3.1	8.9	1.9	6.2	1.4
CB	14.0	3.2	8.8	2.1	6.4	1.5
CBT	13.9	2.9	8.6	1.8	6.1	1.2

Note. CBT = cognitive-behavioral therapy; CB = applied relaxation; CBT = cognitive-behavioral therapy; STAI-Trait = State-Trait Anxiety Inventory—Trait Anxiety Subscale.

Table 2.

Table 3
Mean and Standard Deviations on Outcome Measures at Pre-, Post-, and Follow-Up Assessments for the Three Change Conditions

Measure and condition	Follow-up					
	Pre		Post		12 months	
	M	SD	M	SD	M	SD
Hamilton Anxiety Rating Scale						
CBT	20.7	4.2	17.0	3.2	14.4	2.0
CB	20.8	4.0	17.6	3.9	15.6	2.7
CBT	21.4	3.4	16.9	3.7	14.9	2.1
Anxiety Severity Scale						
CBT	4.7	0.6	3.8	0.5	3.0	0.4
CB	4.8	0.4	3.9	0.5	3.4	0.5
CBT	4.8	0.4	3.8	0.5	3.4	0.5
Reactions to Relaxation and Arousal Questionnaire						
CBT	21.1	4.0	22.0	3.6	20.4	3.0
CB	20.6	3.4	17.2	3.8	17.9	3.7
CBT	20.4	3.0	20.9	3.1	19.0	2.9
STAI-Trait						
CBT	51.8	8.9	47.6	6.4	42.9	5.1
CB	50.7	8.0	42.7	7.8	39.1	5.0
CBT	50.7	8.4	46.9	6.7	40.1	5.2
Zung Self-Rating of Anxiety						
CBT	40.0	6.1	34.2	5.0	30.1	3.4
CB	41.9	6.4	35.0	5.9	32.1	3.1
CBT	40.1	5.1	33.9	5.8	30.6	3.9
Penn State Worry Questionnaire						
CBT	61.7	8.1	54.7	5.6	46.1	3.4
CB	60.4	6.9	49.1	5.4	46.0	3.4
CBT	61.3	8.0	48.0	5.9	43.9	3.5
Diary Severity Scale						
CBT	13.0	2.6	12.4	2.3	11.7	2.0
CB	12.7	2.1	12.2	2.0	11.7	1.9
CBT	13.2	2.8	12.4	2.6	11.9	2.1
Diary Negative Affect						
CBT	0.76	0.36	0.56	0.26	0.28	0.24
CB	0.77	0.37	0.56	0.28	0.27	0.27
CBT	0.67	0.36	0.59	0.27	0.25	0.24
General Depression Scale						
CBT	12.0	4.1	8.7	3.6	7.0	3.1
CB	11.9	4.4	8.7	3.7	7.0	3.1
CBT	11.8	4.1	8.2	3.2	6.4	2.7
Week Depression Inventory						
CBT	14.1	3.1	8.9	1.9	6.2	1.4
CB	14.0	3.2	8.8	2.1	6.4	1.5
CBT	13.9	2.9	8.6	1.8	6.1	1.2

Table 3.

Table 3
Significant Correlations Between First-Session Expectancy Ratings and Therapy Outcome After Randomized Correction

Outcome measure	n	r
Postassessment		
Anxiety Severity Scale	54	-.380
Reactions to Relaxation and Arousal Questionnaire	54	-.326
STAI-Trait	54	-.538
Zung Self-Rating of Anxiety	54	-.440
Penn State Worry Questionnaire	54	-.398
6-month follow-up		
Hamilton Anxiety Rating Scale	51	-.399
STAI-Trait	50	-.583
Zung Self-Rating of Anxiety	50	-.481
Diary Severity Scale	50	-.438
12-month follow-up		
Reactions to Relaxation and Arousal Questionnaire	44	-.451
STAI-Trait	44	-.435
Zung Self-Rating of Anxiety	44	-.469
Penn State Worry Questionnaire	44	-.503

Note. STAI-Trait = State-Trait Anxiety Inventory—Trait Anxiety Subscale.