

A Component Analysis of Cognitive Restructuring¹

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The present study was conducted to assess the contribution of the following components of cognitive restructuring: (a) extinction, (b) insight into negative self-statements, (c) knowledge and rehearsal of coping statements, and (d) a combination of insight into negative self-statements followed by learning and rehearsal of coping statements. Sixty communication-apprehensive subjects were divided among the four treatment groups and a waiting list control group. A low-anxious group also was included to test the validity of the dependent measures. Each treatment group met for five 1-hour weekly sessions. On both self-report and behavioral measures, the coping statement group improved more than the negative self-statement or extinction groups. The combination of the components produced the largest improvement at posttreatment and at a 6-week follow-up. These results suggest that while all of the components produce some improvement, the coping statement component is of primary importance to cognitive restructuring. Implications and further research directions are discussed.

Cognitive behavior modification has grown rapidly since Ellis's seminal writing (1962) on rational-emotive therapy (RET). Beck (1970, 1976), D'Zurilla and Goldfried (1971), and Meichenbaum (1969, 1977) have developed variations of cognitive restructuring that differ in emphasis on the logical analysis of irrational beliefs and the direct teaching of coping statements incompatible with anxiety. These procedures have been effective

¹This article is based on a dissertation by the first author under the direction of the second author in partial fulfillment of the requirements for a Ph.D. at West Virginia University. The authors appreciate the assistance of Jan Anderson, Robert Beverly, and Eva Feindler, who served as therapists. Frederic Glogower is now a staff member at the U.S. Naval Hospital, San Diego, California. James McCroskey is Chairperson of the Speech Communication Department at West Virginia University.

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treatments for clinical problems such as test anxiety (Meichenbaum, 1972), speech anxiety (Meichenbaum, Gilmore, & Fedoravicius, 1971; Fremouw & Zitter, 1978), assertive-refusal behavior (Thorpe, 1975), anger (Novaco, 1975), and depression (Rush, Beck, Kovacs, & Hollon, 1977).

To understand the therapeutic process underlying cognitive restructuring, research has been conducted to evaluate the contributions of extinction, insight into negative self-statements, and learning coping statements. In a study of the cognitive restructuring technique developed by D'Zurilla, Wilson, and Nelson (1973), Wein, Nelson, and Odorm (1975) demonstrated that reattribution of fear from external stimuli to self-statements was more effective for snake phobias than an extinction procedure. A component analysis of stress inoculation for pain showed that extinction had no effect while coping skills produced significant improvement (Horan, Hackett, Buchanan, Stone, & Demchik-Stone, 1977). Goldfried, Linehan, and Smith (1978) also reported that cognitive restructuring had a significantly greater effect than just an extinction procedure in the treatment of test anxiety.

In the first component analysis of cognitive restructuring, Wine (1970) reported that test-anxious subjects who learned coping statements significantly improved compared to subjects in an "insight" group that only concentrated on the examination of negative self-statements. Based on these results, Meichenbaum (Note 1) warned that just insight into negative self-statements without learning coping statements may increase anxiety. Thorpe, Amatu, Blakey, and Burns (1976) reexamined the role of insight into negative self-statements and the use of general coping statements for treatment of speech anxiety. Based on a RET form of cognitive restructuring, they compared (a) general insight (discussion of Ellis's 11 irrational ideas), (b) specific insight (discussion of the 4 irrational ideas most relevant to public speaking), (c) instructional rehearsal (instruction and rehearsal of four general coping statements that relate to the common irrational ideas), and (d) insight plus rehearsal (a combination of specific insight and instructional procedures). The general and specific insight groups improved significantly more on the self-report measures than did the rehearsal or combination groups but none of the treatments produced significant improvement on behavioral measures. Based on this data, Thorpe et al. (1976) concluded that insight into maladaptive self-statements contributes more to cognitive restructuring than the use of coping statements. This direct contradiction with the results reported by Wine (1970) and the failure to replicate the effectiveness of the combination procedure for speech anxiety (Meichenbaum et al., 1971; Fremouw & Zitter, 1978) may be due to several procedural differences among studies. Thorpe et al. treated teen-agers 15 to 17 years old instead of college students, employed a shorter length of treatment (five 30-minute sessions compared with five to eight 1-hour sessions) and

taught only four general coping statements instead of specific statements for before, during, and after a speech.

To clarify these conflicting results, the present study is a component analysis of the cognitive restructuring procedure developed by Meichenbaum (1969, 1972) applied to the treatment of communication apprehension. Communication apprehension (CA) is defined as the fear or anxiety associated with either real or anticipated communication with another person or persons. More generalized than state anxieties such as public speaking anxiety, CA is conceptualized as a trait and is negatively correlated with academic achievement and social adjustment (McCroskey, 1977). This study assesses the following components of cognitive restructuring: (a) the role of extinction, i.e., exposure to the anxiety-provoking stimuli, (b) the role of the identification and monitoring of negative self-statements, (c) the role of knowledge and rehearsal of coping statements, and (d) the combination of exposure, identification of negative self-statements, and rehearsal of coping statements.

METHOD

Subjects

The Personal Report of Communication Apprehension (PRCA) (McCroskey, 1970) was administered to 600 undergraduates enrolled in an introductory speech communication course at West Virginia University. Based on data from over 12,000 college students and 4,000 nonstudent adults, the PRCA mean ranges from 73 to 75 and the standard deviation ranges from 13 to 15 (McCroskey, in press). Sixty volunteers who scored 84 or above on the PRCA formed the high CA group. The 29 males and 31 females ranged in age from 18 to 24 ($\bar{X} = 19.1$) years and had a mean PRCA score of 91.1 ($SD = 7.4$).

To validate the assessment procedures, data from 14 students who scored among the lowest 10% of the 600 students was combined to form a low CA group. This group had a mean PRCA score of 51.3 ($SD = 5.4$).

Instruments

Behavioral Measures. Because subjects with communication apprehension rarely participate in group discussions (McCroskey, 1977), behavioral measures were selected to assess the frequency, length, and overall style of participation in a group discussion. Trained observers recorded the

number of verbalizations (TotFreq) and the number of responses at least three words long with a subject and predicate (FreqL) made during a 15-minute small group discussion. Response length was defined from when the subject began speaking until another person responded. After the discussion, observers evaluated each subject on the Interaction Behavior Measure (IBM) (McCroskey & Wright, 1971). The IBM generates global ratings on three factors: IBMF1 (tension), IBMF2 (relevance), IBMF3 (verbosity). Each factor is composed of two bipolar, 7-point scales that are completed after observing a subject's verbal and nonverbal behavior. McMurphy (Note 2) demonstrated the reliability and the concurrent validity of the IBM with Bales's Interaction Process Analysis (1950). Eight graduate students were trained on the behavioral measures while observing practice groups.

Self-Report Measures. The State Anxiety Scale (SAS) (Spielberger, Gorsuch, & Lushene, 1970) consists of 20 items describing feelings at the moment prior to the group discussion. The PRCA (McCroskey, 1970) is a 25-item scale of anxiety in public communication situations such as meetings or speeches. To assess generalization of anxiety, the two subscales of the Social Anxiety Scale (Watson & Friend, 1969) were administered. The 28-item Social Avoidance and Distress Scale (SAD) measures interpersonal anxiety in social situations. The 30-item Fear of Negative Evaluation Scale (FNE) reflects worry about others' opinions.

Procedure

Students who scored 84 or above on the PRCA were recruited by telephone to participate in a voluntary treatment program. Following the recruitment, a class exercise was conducted in which two subjects participated in a discussion group with four other students. The groups completed a 15-minute discussion exercise while a trained observer unaware of the identity of the high CA subjects evaluated each subject on the behavioral measures. Prior to the small group discussion, subjects completed the SAS. They completed the SAD and the FNE following the discussion. After the pretreatment assessment, subjects were rank-ordered on PRCA scores and randomly distributed in blocks of five to the five conditions for treatment. The waiting list control subjects were told that treatment would be provided later in the semester and that a second meeting would be necessary.

A posttreatment assessment was conducted 1 week after the last treatment session. The procedure was identical to the pretreatment assessment except the discussion exercise was different and a posttreatment questionnaire also was administered. Follow-up data were collected 6 weeks after the

posttreatment assessment. The PRCA, SAD, and FNE were mailed to each subject and returned by 52 of 60 subjects.³

Therapists

FDG and one female graduate student from the psychology department and a male and female graduate student in the speech communication department served as therapists. Both psychology students had course work and supervised experience with the cognitive therapies while the others were inexperienced. The therapists received a detailed treatment manual for each condition and 5 hours of training by WJF prior to the treatment program.⁴ Each therapist conducted groups in two treatment conditions. In each treatment condition, one experienced and one inexperienced trainer individually conducted a group. The pairs of trainers were assigned to create different pairs of trainers for each condition.

Treatments

The treatment groups met 1 hour per week for 5 weeks in groups of five to six subjects led by one therapist.

Extinction (ext) ($N = 12$). Subjects were given the rationale that they could extinguish anxiety by "getting in touch" with their feelings and discussing their anxiety. Told that anxiety could be reduced through repeated exposure to their anxiety-arousing experiences, subjects were asked to describe previous anxiety-arousing situations. Between sessions they were required to record any feelings of CA. At the following training session these experiences were discussed. To standardize the treatment in each condition, groups discussed specific topics such as campus improvements and women's rights. Before, three times during, and after the exercise, subjects were asked to label and discuss their feelings during the discussion. The discussion of negative self-statements or coping statements was discouraged.

Insight into Negative Self-Statements (nss) ($N = 11$).⁵ Subjects were told how negative self-statements interfere with performance and underlie CA. They were asked to describe their negative self-statements and how these cognitions affect their communication. The therapists then identified

³Copies of the assessment instruments, group exercises, and procedures are available upon request.

⁴Treatment manuals are available upon request.

⁵Due to scheduling problems, 1 of the 12 subjects randomly assigned to the *nss* condition could not attend either scheduled session. This person was reassigned to the *w/c* condition to produce 11 subjects in the *nss* and 13 subjects in the *w/c* group.

three common irrational themes inherent in these statements (necessity for approval, perfectionism, and life's unfairness). Between sessions, subjects were required to record their negative self-statements for review the next session. In the sessions, subjects were given standardized topics for group discussion. Before, three times during, and after the exercise, group members identified any negative self-statements they made. The discussion of any coping statements was discouraged.

Knowledge and Rehearsal of Coping Statements (cs) ($N = 12$). Subjects were told that coping statements can reduce CA and improve communication performance. They learned specific coping statements for before (e.g., "What is it I want to say? It's only a short comment"), during (e.g., "Speak slowly, I can handle this") and after (e.g., "That's better. What do I want to improve next time?") communication situations. Between sessions, subjects were required to rehearse coping statements and to record them in a diary for review the next session. Before, three times during, and after group exercises, they rehearsed aloud coping statements. The discussion of any negative self-statements was discouraged.

Combination Procedure (comb) ($N = 12$). Subjects learned the role of negative self-statements in anxiety and how incompatible coping statements can reduce anxiety. They described their negative self-statements and identified the three common irrational themes underlying these statements. Subjects then learned coping statements, which they rehearsed and monitored between sessions. Before, three times during, and after group exercises, they identified negative self-statements and rehearsed coping statements.

Waiting List Control Group (wlc) ($N = 13$). These subjects participated in both the pre- and posttreatment assessment. Five of the subjects received treatment after the posttreatment assessment.

RESULTS

Reliability and Validity of Dependent Measures. To determine interrater reliability for the behavioral measures, simulated discussion groups were conducted prior to the pre- and posttreatment assessments. Four observers independently rated a 15-minute discussion. For each combination of pairs among the four observers, agreement scores were calculated by dividing the smaller frequency score by the larger one. At the pretreatment assessment, reliability for the FreqL measure ranged from .74 to .91, with a mean agreement score of .87. At the posttreatment assessment, the agreement scores ranged from .78 to .93, with a mean of .89. Interrater reliability for the TotFreq scores produced a range of agreement scores at pretreat-

ment from .83 to .96, with a mean reliability of .90. At the posttreatment assessment, the agreement scores ranged from .80 to .95, with a mean of .90.

For the Interaction Behavior Measure, interrater reliability was calculated using Ebel's intraclass reliability measure of average correlation among raters (Guilford, 1954). At the pretreatment assessment simulated discussion group this yielded reliabilities of .92 for IBMF1 (tension), .58 for IBMF2 (relevance), and .98 for IBMF3 (verbosity). At the posttreatment, reliabilities were .94 for IBMF1, .75 for IBMF2, and .93 for IBMF3.

To test the validity of the dependent measures, pretreatment data from 14 students who scored in the lowest 10% on the PRCA were compared to the 60 subjects. The means and standard deviations for the high and low communication-apprehensive groups and each treatment are presented in Table I. An analysis of variance revealed significant differences between groups ($p < .001$) on all the dependent measures except IBMF2 (relevance), which showed a strong trend ($p < .075$). Therefore, all the measures except IBMF2 were judged to be of sufficient reliability and validity.

The pre-, post-, and follow-up data for each treatment are presented in Table I. One-way analyses of variance among treatments revealed no significant differences at pretreatment on any measure. However, there was some variability among groups and a trend toward significance on the FNE ($F(4,55) = 2.28, p < .08$). Therefore, analyses of covariance were used for analyses of treatment effects with the pretreatment score as the covariate and the posttreatment or follow-up score the dependent variable. Differences between individual groups were tested with planned t tests of adjusted mean scores (Winer, 1962).

To test differential effectiveness of the therapists within treatments, a Therapist X Treatment analysis of covariance was calculated on posttreatment scores. Because no significant Therapist X Treatment interactions were found, data for each treatment were combined across therapists.

To assess the credibility of the treatment programs, subjects rated their expectation of improvement from 1 (no improvement) to 9 (very extensive improvement) after the first session. An analysis of variance of the mean expectations of improvement (5.09 for *ext*, 5.08 for *nss*, 5.27 for *cs*, and 5.36 for *comb*) was nonsignificant. Since expectations did not differ among groups, differential treatment effects cannot be attributed to the subjects' initial expectations of improvement.

Treatment Comparisons

Behavioral Measures. The mean change on behavioral measures from pretreatment to posttreatment is presented in Figure 1. Analyses of covari-

Table 1. Mean Pretreatment, Posttreatment, and Follow-Up Scores on CA Measures^a

Treatment	N	Self-report measures				Behavioral measures										Generalization measures			
		PRCA		SAS		FreqL		TotFreq		IBMF1		IBMF2		IBMF3		SAD		PNE	
		\bar{X}	SD	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD
W.L.C.																			
Pre	13	88.3	5.0	35.6	6.3	7.6	5.3	14.6	8.7	8.9	2.6	5.2	1.9	9.2	3.9	10.2	5.7	19.4	7.2
Post	13	90.5	10.7	35.5	6.9	7.8	6.4	14.1	9.0	10.2	1.5	4.1	1.4	7.7	2.7	9.6	4.8	17.1	8.4
Follow-up	8	91.5	6.3													10.5	7.0	15.8	7.7
Extinction																			
Pre	12	91.3	7.1	39.2	11.6	7.1	5.4	16.2	9.5	8.8	3.8	5.7	2.6	9.8	3.8	12.3	7.2	16.3	9.0
Post	12	81.0	4.9	32.5	5.9	8.5	5.4	16.3	7.2	10.2	1.9	4.9	1.4	8.1	1.7	7.2	4.7	11.4	8.4
Follow-up	12	76.3	11.1													5.2	4.0	11.3	10.0
N.S.S.																			
Pre	11	92.2	10.4	44.2	9.3	4.9	3.1	10.2	4.4	6.9	2.9	6.1	2.0	10.9	3.6	13.2	5.9	24.5	4.2
Post	11	82.3	10.5	38.3	8.5	7.3	3.6	13.5	6.1	9.3	2.0	4.0	1.7	10.1	2.4	9.4	5.7	18.0	5.8
Follow-up	11	81.0	14.0													9.1	7.2	15.9	9.2
C.S.																			
Pre	12	91.0	7.1	43.2	8.9	4.2	2.5	12.8	6.4	7.3	1.9	5.6	1.4	11.2	2.1	11.8	6.8	18.1	7.8
Post	12	76.0	9.6	33.3	8.2	9.4	3.4	19.4	8.4	9.5	1.3	4.7	1.5	7.6	3.6	7.5	4.8	12.7	6.6
Follow-up	11	75.4	10.8													7.8	6.9	11.4	9.0
Combination																			
Pre	12	93.1	7.5	42.3	11.9	5.3	3.8	10.1	6.1	6.6	3.1	5.0	1.1	9.7	3.6	13.0	8.4	21.0	6.1
Post	12	75.5	9.6	32.7	7.5	11.5	4.2	21.5	10.3	10.6	2.5	3.8	1.3	5.4	1.7	8.2	7.4	14.3	8.0
Follow-up	10	76.7	9.0													7.7	7.4	15.4	7.7
HiCA Sample																			
Pre	60	91.1	7.4	40.8	10.0	5.9	4.3	12.8	7.5	7.8	3.0	5.5	1.8	10.2	3.4	12.1	6.7	19.9	7.4
Post	60	81.1	10.5	34.3	7.4	8.9	4.8	17.0	8.4	10.1	1.9	4.3	1.4	7.6	2.9	8.2	5.4	14.2	7.9
Follow-up	52	79.5	11.8													7.9	6.5	13.8	8.8
LoCA Sample																			
Pre	14	51.3	5.4	30.3	6.3	12.8	3.8	21.6	7.1	11.1	2.7	4.4	1.7	6.6	1.8	.86	1.2	9.1	4.8

^aPRCA is Personal Report of Communication Apprehension; SAS is State Anxiety Scale; FreqL is Frequency of Long Verbalizations; TotFreq is Total Frequency of Verbalizations; IBM is Interaction Behavior Measure - F1 is tension, F2 is relevance, F3 is verbosity; SAD is Social Anxiety and Distress Scale, FNE is Fear of Negative Evaluation Scale.

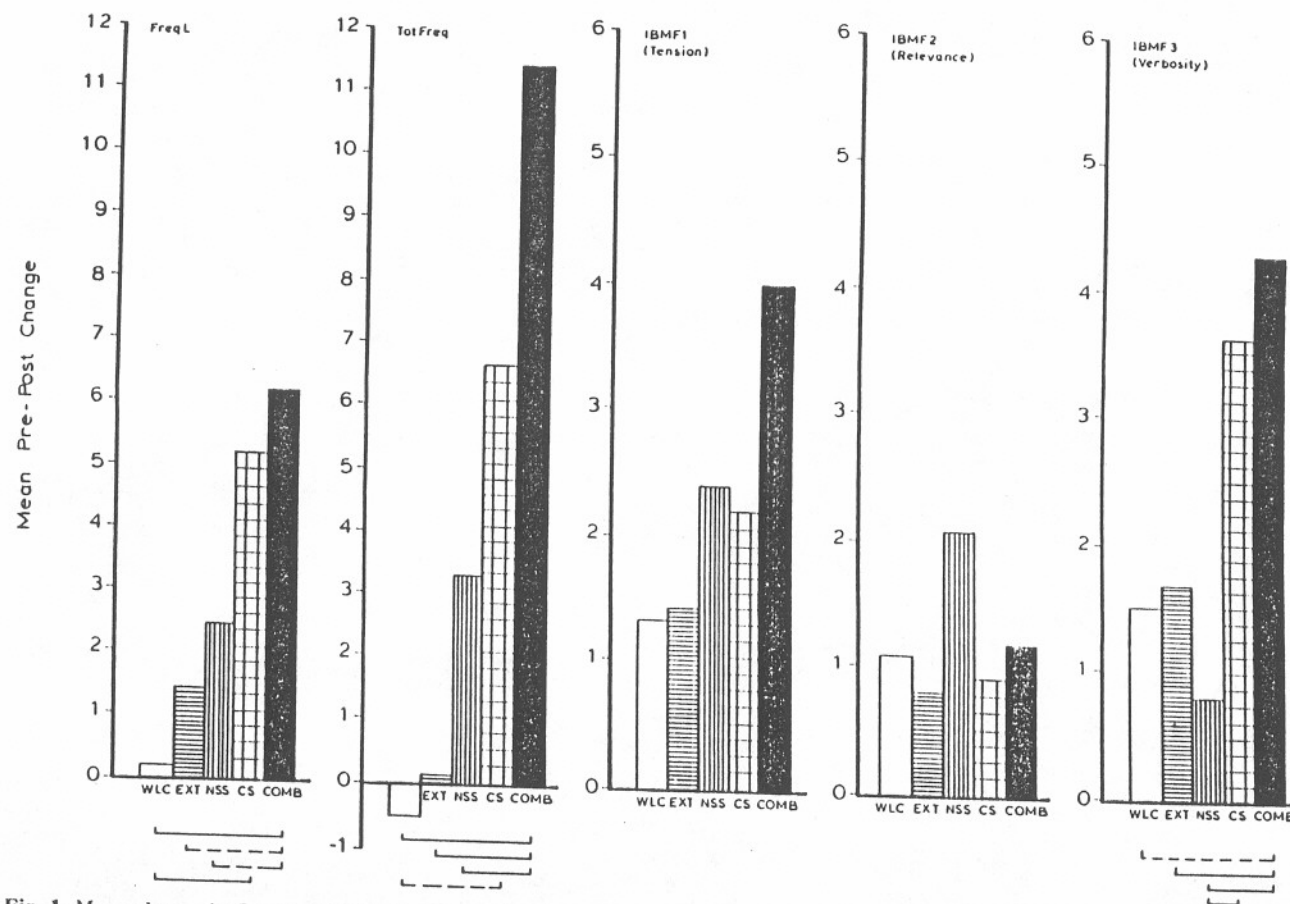


Fig. 1. Mean change in CA on behavioral measures between pre- and posttreatment assessments. Groups connected by brackets differ significantly. Solid line, $p < .01$; dotted line, $p < .05$. Note: Positive mean change scores reflect change in the desired direction (reduction of GA), i.e., reduced tension, increased relevance and verbosity.

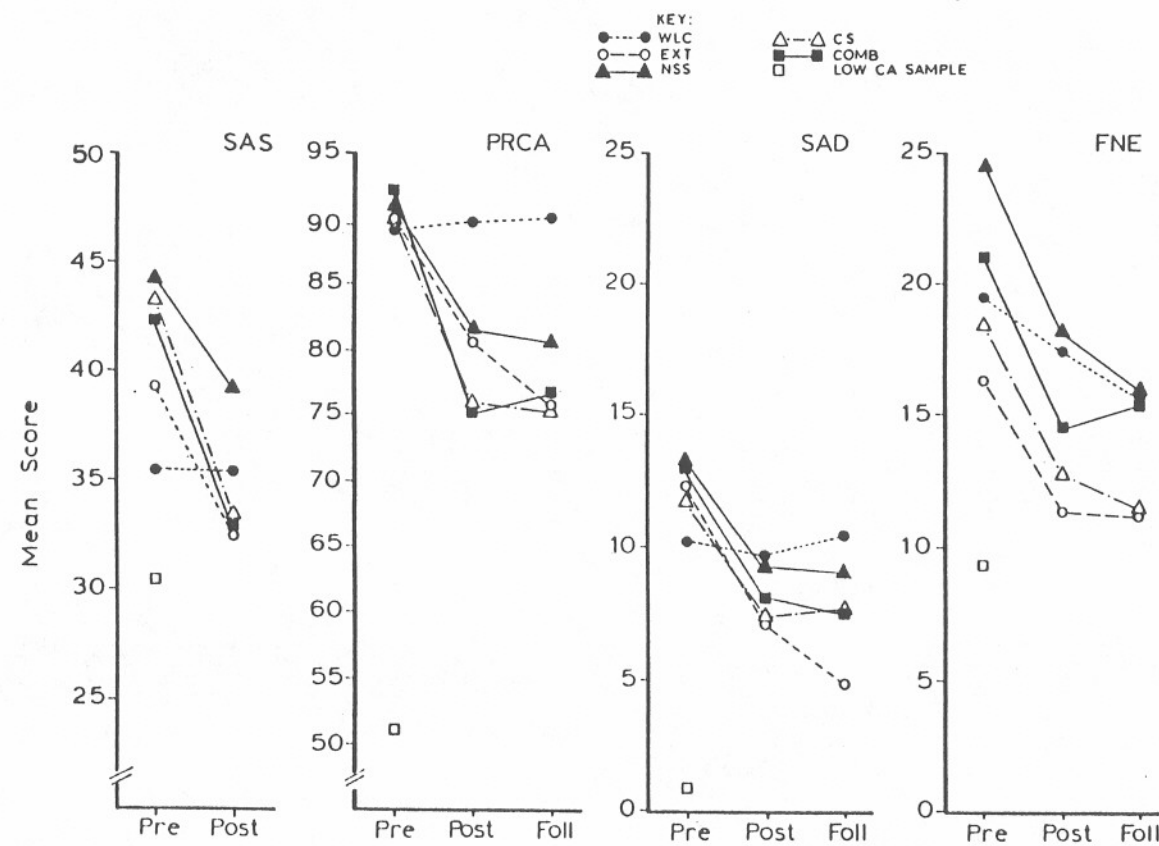


Fig. 2. Mean scores on the SAS, PRCA, SAD, and FNE at pretreatment, posttreatment, and 6-week follow-up.

ance revealed significant treatment effects for FreqL ($F(4,54) = 3.34$, $p < .025$), TotFreq ($F(4,54) = 3.94$, $p < .01$), and IBMF3 (verbosity) ($F(4,54) = 4.96$, $p < .01$). Planned t tests were performed on each of these measures to test for differences between the *wlc* and various component groups. For the FreqL measure, significant differences occurred between the *wlc* and the *cs* groups ($p < .01$) and between the *wlc* ($p < .01$), *ext* ($p < .025$), and *nss* ($p < .025$) groups and the *comb* group. On the TotFreq measure, a significant difference existed between the *wlc* and the *cs* ($p < .025$) group and between the *wlc*, *ext*, and *nss* ($p < .01$) groups and the *comb* group. For the IBMF3 (verbosity), significant differences existed between the *wlc* ($p < .025$), *ext* ($p < .01$), and *nss* ($p < .01$) groups and the *comb*. In addition, the analysis revealed that the *cs* group improved significantly more than the *nss* group ($p < .01$).

Self-Report Measures. The pretreatment, posttreatment, and follow-up data are presented in Figure 2. An analysis of covariance of posttreatment scores revealed a significant treatment effect for the PRCA ($F(4,54) = 9.33$, $p < .001$), while the SAS did not significantly differ among groups ($F(4,54) = 1.61$, $p < .18$). Analysis of the PRCA revealed a significant difference ($p < .01$) between the *wlc* group and each of the component treatment groups. In addition, there was a significant difference between the *nss* ($p < .025$) and *ext* ($p < .05$) groups and the *comb* group. At follow-up, an analysis of covariance of PRCA scores was significant ($F(4,46) = 6.45$, $p < .001$). Analyses showed that the *wlc* group was significantly different ($p < .01$) from the other component groups. Analyses of covariance performed for SAD and FNE scores at posttreatment were not significant although a trend was apparent for the SAD ($F(4,54) = 2.35$, $p < .07$). On both the SAD and FNE, the *comb* group showed more improvement than the *ext* or *nss* groups. At follow-up there were no significant differences among groups on the SAD or FNE.

Individual Improvement. To estimate the percentage of subjects who improved in each treatment, data were evaluated for individually significant change scores. The FreqL and the PRCA were selected for this analysis because they furnished data on CA from objective ratings of behavior during a group discussion and from a self-report measure of past CA, respectively. In addition, these two measures were found to discriminate the most significantly between low and high CA groups. Subjects whose pre- to posttreatment scores improved more than 1.65 times the standard error of measurement were classified as "significantly improved" on that measure. This represents a significant change ($p < .05$) in CA level appropriate for comparisons of individual scores (Paul, 1966). On this basis, a subject must improve 7 points on the PRCA and increase FreqL by four verbalizations to be "significantly improved." Improvement rates for each measure are presented in Table II.

Table II. Percentage of Subjects "Significantly Improved" on a Behavioral and Self-Report Index of CA^a

Treatment	N	FreqL	PRCA	Improved on both measures
Waiting list control	13	31%	15%	0%
Extinction	12	17%	67%	8%
Negative self-statements	11	36%	54%	9%
Coping statements	12	67%	83%	50%
Combination	12	67%	100%	67%

^aFreqL is Frequency of Long Verbalizations; PRCA is Personal Report of Communication Apprehension.

In addition, an overall estimate of treatment effectiveness was provided by determining the percentage of subjects in each group that improved significantly on both of these dependent measures. When the data were combined in this manner, 0% of the *wlc*, 8% of the *ext*, and 9% of the *nss* groups improved, as compared with 50% of the *cs* and 67% of the *comb* group. A Chi square revealed that these results were highly significant ($\chi^2 = 21.68$, $p < .001$). A Chi square among the three components of cognitive restructuring, *ext*, *nss*, and *cs*, also revealed significantly different individual improvement rates ($\chi^2 = 7.64$, $p < .025$).

DISCUSSION

The present study was conducted to assess the individual effects of the components of cognitive restructuring. In general, the *wlc* showed the least improvement across the dependent measures. The *ext* and *nss* components showed some improvement although this was usually not significant. The *cs* group tended to show more improvement on both behavioral and self-report measures than any of the other components, and was clearly superior on the individual improvement data. Furthermore, the data again demonstrate that the *comb* procedure is an effective treatment even when administered by an inexperienced therapist. The *comb* training procedure was consistently more effective than any single component on every dependent measure. Although the *comb* group was more effective than the *cs* component group on every dependent measure, this difference did not reach significance. The results suggest that while extinction and identification of negative self-statements produce some improvement, the coping statement component is the primary factor in the cognitive restructuring procedure.

The findings support Wine's (1970) conclusion that coping statements are the major therapeutic component in cognitive restructuring and directly contrast with the Thorpe et al. study (1976) that insight into negative self-statements was the primary component. The results also replicate previous research (Goldfried et al., 1978; Horan et al., 1977; Wein et al., 1975) that extinction plays only a minor role in cognitive restructuring.

To maximize the effectiveness of the cognitive restructuring package, emphasis should be placed on the *cs* component. However, the consistent superiority of the *comb* group over the *cs* group suggests that identification of negative self-statements should continue to be included in the training program. Furthermore, there was no evidence that just identification of negative self-statements increases anxiety as previously suggested by Meichenbaum (Note 1).

On a posttreatment questionnaire, subjects indicated that the therapist's support and the realization that others have similar problems were important components of the treatment process. Perhaps even more revealing were the responses to the question "To what extent do you find yourself making positive self-statements when in anxiety-provoking situations?" Six subjects in the *ext* group answered "moderately" to "extensively" and reported the spontaneous use of self-statements such as "What's the worst thing that can happen to me?" or "I'm just as good as the next person." Seven subjects in the *nss* group also described their use of coping statements to replace negative self-statements. These reports support the observations that spontaneous changes in self-statements may underlie improvement from other procedures that do not directly alter coping statements such as systematic desensitization (Lang, 1969), modeling (Geer & Turteltaub, 1967), or flooding (Marks, Boulougouris, & Marset, 1971).

Future research may address the types of coping statements that are most useful. The fact that some subjects in the *ext* and *nss* groups used general coping statements but did not improve as much as the *cs* or *comb* subjects who learned more specific task-related statements suggests that the type of coping statements employed may be important. A component analysis of types of coping statements for different situations would be useful.

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