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Self-Instructed Relaxation: A Therapeutic Alternative[1]

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A self-instructed relaxation program was compared with therapist-instructed relaxation and waiting list controls. Self-report anxiety measures (IPAT and STAI) and a psychophysiological stress profile (frontal EMG, GSR, heart rate, finger temperature monitored under relaxation and stressor conditions) were utilized pre- and posttreatment to determine efficacy. Self-monitored heart rate, respiration rate, and finger temperature were used to monitor home practice sessions. Subjects reported increased ability to relax and control stress; however, frontal EMG measured under stressor conditions was the only dependent measure to confirm this perception. No between-group differences on any other dependent measures were observed. Reliable changes on all self-monitored home practice measures were observed, suggesting that this procedure is a useful gauge of home practice.

Descriptor Key Words: relaxation; stress profile; stress control; self-instruction.

Lately there has been an increasing move in the direction of approaching stress management from a prophylactic framework (Meichenbaum & Turk, 1976). The success of self-instruction treatments in such areas as assertiveness training, parenting, and time management suggests that self-instruction might be a feasible format for teaching some stress control

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procedures. To date, several self-help manuals have been published (e.g., Lamott, 1975; Mason, 1980; Walker, 1975); however, few of these manuals have been systematically field-tested or report any data attesting to program efficacy. This study field-tested a self-instructional relaxation training program (Hiebert, 1980) utilizing therapist instruction, self-instruction, and control conditions. Self-monitored and machine-monitored physiological indices of relaxation were obtained under relaxation and stressor conditions, and were used as measures of program effectiveness. Self-report anxiety measures were also used.

Self-instruction is an important therapeutic area for investigation for at least two reasons. First, the increasing incidence of stress-related problems in our society (cf. Albrecht, 1979; Antonovsky, 1979) suggests that stress-related disorders will likely continue to occupy a large percentage of a counselor's time. Self-instruction has potential for increasing the number of people receiving treatment while reducing counselor time demands. However, in order to be considered as a viable alternative, self-instruction programs should undergo the type of experimental investigation that underlies most data-based counselor-administered treatments. Second, the plethora of self-help manuals available today suggests that many people who are reluctant to seek counseling are willing to purchase a guide to self-administered therapy. This may attest to a certain amount of stigma attached to seeking professional help, or it may indicate desire to try to handle a problem oneself (with the aid of a manual) before the problem becomes serious enough to necessitate professional assistance. In either case, there seems to be a market for self-instruction materials in the area of stress control. At present, fulfilling the market demand appears to have been more important than ensuring a data base to support self-instructional treatments. If self-help programs are to have predictable effects, and if professionals are to be able to use such manuals as adjuncts to or substitutes for therapy, then data-based support for such self-help programs must be forthcoming.

When field-testing a self-instruction program, several factors must be addressed. First, the program must be clearly delineated and sufficiently motivating to be completed by most people. Glasgow and Rosen (1978) point out that dropout rates, often as high as 50%, are a major problem in research investigating self-administered treatments. Marshal, Presse, and Andrews (1976) suggest that this problem could be alleviated by minimal therapist contact consisting, perhaps, of a weekly telephone call. Such minimal contact is intended primarily to sustain motivation and, typically, no procedural or substantive input is given. Given the high dropout rates of strictly self-instruction programs, minimal contact might be the only practical way for ensuring an adequate sample, while at the same time maintaining a non-counselor-administered program.

A second problem to be addressed in research regarding self-instruction treatments is the adherence to the independent variable conditions (Horan, 1980). Participant behavior must be monitored closely enough to ensure that the program was followed. In self-administered treatments this becomes problematic, for the monitoring must be unobtrusive enough so as not to confound the treatment with counselor-administered programs, but extensive enough to permit realistic assessment of the degree to which the program was followed.

A third problem area lies in assessing skill acquisition. Not only must participants follow the program but there must be some measure of the degree to which following the program resulted in learning the skills the program purported to teach. When relaxation is the target skill, both self-report and physiological dependent measures must be taken. Barrios and Shigetomi (1979) report that only 6 of the 62 relaxation studies they reviewed used any physiological dependent measures. Thus, most studies merely indicate what happens when people participate in relaxation programs. In order to draw conclusions about the effects of learning to relax, it is necessary to determine that it is possible for the person to achieve a state of lowered physiological arousal. Further, the physiological measures are likely to be most useful if they are taken under stressor, as well as baseline, conditions. DeGood and Adams (1976) and Light (1981) offer evidence suggesting that treatment effects that do not show up under baseline conditions may appear under stressor conditions and that some treatment effects do not transfer from baseline to stressor conditions. Therefore, in field-testing a self-instructed relaxation treatment, some assessment of change in physiological functioning must be taken as a precondition for drawing conclusions about the effects of learning to relax. If physiological measures are not taken, researchers are restricted to making statements about the effects of following relaxation instructions.

A fourth concern to be addressed when field-testing self-instructed treatment centers on comparing the self-instruction format with other therapeutic alternatives. This concern might be addressed in a way similar to that used for investigating automated desensitization, initially comparing self-administered programs to no-treatment controls (cf. Phillips, Johnson, & Geyer, 1972), then progressing to a comparison of self-administered and therapist-administered programs (cf. Baker, Cohen, & Saunders, 1973), and finally large studies utilizing multiple treatment groups and appropriate controls (cf. Rosen, Glasgow, & Berrara, 1976). In field-testing self-instructed relaxation programs, a similar pattern might be followed ultimately comparing self-instruction with the best available alternative, counselor-instructed relaxation.

The present study was an attempt to address all four concerns. A self-instruction relaxation manual was prepared by the first author and

distributed for peer review. After peer suggestions were incorporated, the manual was sent to a cross section of potential users for reaction. Finally, the manual was presented in an open forum of therapists and academics, where reactions and suggestions were solicited on both substantive and procedural levels. The final version of the manual (Hiebert, 1980) incorporated feedback from the above review process. The manual was then field-tested under self-administered conditions (Hiebert, 1982) and a therapist-directed group format (Hiebert & Eby, 1984) with positive results. The present study was a more extensive field test, using self-instructed, counselor-instructed, and control conditions. Further, suitable monitoring procedures were established to determine the degree to which subjects followed the program, and physiological dependent measures were utilized in addition to self-report measures. The details of the study are provided below.

METHOD

Subjects

Ninety-one subjects were recruited through newspaper and campus announcements inviting participation in a project investigating different procedures for training relaxation. Volunteers were assigned randomly by the project receptionist to one of four treatment groups: self-instruction I, self-instruction II, therapist instruction, waiting list control. Subjects in treatment had to turn in, weekly, a daily record of their home practice. Volunteers who failed to do this were dropped from the subject pool. To be retained in the study, volunteers had to engage in home practice five or more times per week and hand in all daily practice records. At posttesting, 63 subjects remained, giving a retention rate of 69%, which is somewhat higher than that of many self-instruction studies (see Glasgow & Rosen, 1978). The retention rate was consistent across all three treatment conditions. In the final sample there were 40 females and 23 males ranging in age from 18 to 54. The mean age was 30.2. Sixty-seven percent of the sample were students. None of the subjects had a psychiatric history. The sample might best be described as comprising average people, wishing to learn relaxation in order to cope more effectively with their daily lives.

Treatment

There were four treatment conditions: self-instruction I, self-instruction II, therapist instruction, and waiting list control.

Self-Instruction. After pretesting, self-instruction subjects were given a copy of *Self-Relaxation: Learn It, Use it* (Hiebert, 1980) and were told to follow the instructions in the manual. Subjects were then instructed how to self-monitor their heart rate and respiration rate, and how to use a small thermometer to measure finger temperature. Subjects were also given a cassette recording of two of the relaxation scripts in the manual and were told to use the tape in the manner described in the manual. Finally, subjects were told that they would be contacted weekly by a project staff person to remind them to turn in their data sheet and pick up a new one.

The relaxation manual begins with a discussion of the physiological components of a stress reaction and the way in which relaxation could control physiological reactivity. The effects of regular relaxation are then outlined (cf. Benson, 1975), and a procedure is given for using self-monitored heart rate, respiration rate, and finger temperature as measures of relaxation (cf. Lamott, 1975). A 5-week relaxation training program is then laid out. During the 1st week, participants practice with a prerecorded progressive relaxation script. The taped instructions include (a) relaxation induction through tensing and relaxing muscle groups beginning at the hands and moving systematically through the arms, head, upper body, and legs, (b) a visualization counting exercise accompanied by the suggestion for deepened relaxation, (c) open-ended imagery ("Imagine yourself in your favorite relaxation place") intended to serve as a covert reinforcer, and (d) a breathing cue intended to become a conditioned stimulus that would elicit relaxation. During the 2nd and 3rd weeks participants listen to an "auto-suggestive relaxation" (read self-hypnosis) tape. In the 4th and 5th weeks, use of a tape-recorded program is faded out in favor of practice by recall. The manual concludes with a section on using relaxation. In this section users are told (a) how to use relaxation for "immunization" purposes (cf. Benson, 1975; Blanchard & Epstein, 1978; White & Fadiman, 1976); (b) a procedure for utilizing cue-controlled relaxation (see Barrios & Shigetomi, 1979); (c) how to develop the ability to relax differentially (Walker, 1975); (d) how to use covert modeling to promote skill acquisition (see Kazdin, 1973; Rimm & Masters, 1974); and (e) how to utilize their skill at relaxing in a self-desensitization program.

The procedure in both self-instruction groups was identical; however, the groups were monitored by different researchers in order to assess generalizability across counselors. The agenda for the weekly telephone contacts was standardized before the project began. The researchers comments were confined to reminders to turn in the data sheets. When substantive or procedural questions arose, the participants were referred to the manual for answers.

Therapist Instruction. Subjects in the therapist instruction group followed the same program as subjects in the self-instruction group, except

that the program was delivered by a trained therapist for 5 weekly sessions of 1 hour each. Each session had a substantive portion and a practice portion. The substantive portion was devoted to explaining the concepts covered in the manual and reviewing the home practice. The practice portion of the weekly session consisted of having the subject follow the instructions on a prerecorded relaxation tape. This tape was the one used by self-instruction subjects in order to maintain consistency across relaxation induction procedures. People in the therapist instruction group did one session of home practice per day, going through the relaxation sequence as best they could from memory.

Waiting List Controls. Subjects in this group were told that before treatment could begin it was necessary to have a stable measure of stress level. This would be accomplished by having them complete two assessments, 5 weeks apart. Thus, control subjects were pretested and post-tested at the same time as treatment subjects; otherwise they had no therapist contact. After the second assessment, control subjects were given the self-instruction treatment, monitored by the receptionist.

Dependent Measures

Both self-report and physiological measures were used in this study in a repeated-measures design.

Self-Report Measures. Two standardized anxiety inventories were used: The IPAT Self-Analysis Form (Cattell, 1957) and the State-Trait Anxiety Inventory (Spielberger, 1968). Both instruments demonstrate adequate reliability (Guilford, 1959; Kendall, Finch, Auerbach, Hooke, & Mikeulka, 1976; Scheier, 1967; Spielberger, Gorsuch, & Lushene, 1970), and validity (Cattell & Scheier, 1963; Cohen, 1965; Kendall et al., 1976; Martuza, 1974; Spielberger et al., 1970). The IPAT was chosen because IPAT scores tend to correlate highly with physiological measures of anxiety (Cohen, 1965; Smith, 1973). The STAI was chosen because it has been used extensively in anxiety research, and because it has subscales for both trait (STAI-T) and state (STAI-S) anxiety. Higher scores indicate higher anxiety on both the IPAT and the STAI. In addition to the standardized assessments, all subjects completed a pretraining survey, requesting demographic data and several measures of treatment expectancy. All subjects also completed a post-5-week survey at posttesting, in order to assess subjective measures of program adherence, and benefit and impact of training.

Physiological Measures. After completing the paper-and-pencil measures, subjects were escorted into an adjoining room for a psychophysiological stress profile (PSP, cf. Budzynski & Peffer, 1980). Frontal EMG, skin resistance, peripheral skin temperature, and heart rate were monitored under relaxation and stressor conditions. All measurements were

taken using a Colbourn Modular Instruments System. The monitoring modules interfaced with a microprocessor-based printing counter, making data collection fully automated. The specific protocol for the PSP was as follows: Subjects were given a 10-minute acclimatization period where the instrumentation was demonstrated and the purpose of the physiological recording was explained. After this, the appropriate sensors were connected. Subjects were then told to relax for 15 minutes using whatever procedure they usually used to relax (B1). Subjects were then given two standard stressors for 3 minutes each, followed by a 2-minute recovery period. The first stressor (S1) was a serial 7s task (Budzynski & Peffer, 1980). Subjects were told to begin at 1,000 and subtract 7 until told to stop. After 3 minutes subjects were requested to stop, report their answer, and then relax for 2 minutes (R1). The second stressor (S2) was a reading comprehension test. Subjects were given the two highest subtests of the Gilmore Oral Reading Test and were told to read each paragraph silently, after which they would be asked questions about what they read. In order to prevent recording artifact, subjects remained silent during both 3-minute stressor periods, and were asked for their answer after the 3-minute stressor periods had elapsed. S2 was followed by a 2-minute recovery period (R2), which was followed by a 15-minute relaxation period (B2) in which subjects were again told to relax as much as possible using whatever procedure they usually used to relax. In total, the physiological recording spanned 40 minutes.

Staff

The therapists were two male senior master's students in counseling psychology. They had both completed 240 hours of supervised practicum in addition to specialized apprenticeship in stress management and relaxation. The therapists completed stress profiles alternately, and each monitored one self-instruction group. One of these therapists conducted the therapist-instructed sessions. The receptionist was an undergraduate student with no clinical background. His responsibilities were scheduling subjects, answering telephones, administering the self-report assessments, and coding data.

RESULTS

Self-Report Measures

The IPAT and STAI data were analyzed using a 4 × 2 ANOVA for repeated measures (see Table I). Generally speaking, there were no

Table I. Means and Standard Deviations for Self-Report Anxiety Measures[a]

		Group			
	Time	Self-instruction I	Self-instruction II	Therapist instruction	Scale control
STAI-S	Pretest	38.7	36.9	43.6	39.9
		(9.39)	(8.93)	(11.91)	(6.02)
	Posttest	40.8	44.0	47.8	43.8
		(9.82)	(10.37)	(8.49)	(9.86)
STAI-T	Pretest	36.4	34.0	35.4	37.1
		(10.36)	(12.36)	(13.21)	(9.46)
	Posttest	36.9	36.3	39.7	38.6
		(9.36)	(10.23)	(11.15)	(8.56)
IPAT	Pretest	34.1	36.4	40.3	36.4
		(12.19)	(14.63)	(11.86)	(10.62)
	Posttest	31.6	29.0	35.0	32.2
		(12.32)	(10.55)	(12.83)	(9.98)

[a]Upper numbers are means, lower numbers are standard deviations.

significant pretest differences between groups, STAI-S scores increased during the study, $F(1, 59) = 13.5, p = .001$, while STAI-T scores remained the same and IPAT scores decreased, $F(1, 59) = 17.6, p = .001$. There were no significant interactions, suggesting that the changes were uniform across all treatment groups. These findings suggest that transient anxiety levels increased during the course of treatment, perhaps because of increased environmental demands (e.g., term papers and exams). The concomitant effect on trait anxiety is less clear, because STAI-T scores remained stable, but IPAT scores decreased. This finding underscores the necessity of interpreting test scores in the light of the instrument being used. In this case, one might tend to place more emphasis on the IPAT scores because past studies (e.g., Cohen, 1965; Smith, 1973) have indicated they correlate highly with physiological measures of anxiety. In the present study, however, no significant differences were found in the correlations among the STAI-S, STAI-T, IPAT, and physiological baseline measures at either pretest or posttest, nor did any of the correlations reach a statistically reliable level.

In a series of planned post hoc analyses the specific items in the Pretraining Survey and the post-5-week survey were analyzed. No between-group differences were found in expected treatment outcome, past exposure to relaxation training or meditation, or coffee, tea, and alcohol consumption. Generally speaking, treatment subjects found the program beneficial (53.6% answered 3 or 4 on a scale of 0 = no benefit to 4 = very beneficial) and felt low anxiety at the end of treatment (57.8% answered 0 or 1 on a scale of 0 = no anxiety to 4 = very anxious). Additionally, 30.3%

of the subjects attributed the treatment effects primarily to the explicitness of the program, 62.8% thought it was a combination of the program materials and their own efforts, with only 7% attributing treatment effects primarily to their own efforts. Therefore, it seems that treatment subjects found the programs beneficial in reducing anxiety and attributed the effect mostly to the treatment program.

Physiological Measures

Machine-Monitored Measures. The machine-monitored physiological measures were analyzed using a 4(group) × 2(time = pre/post) × 4(condition = B1, S1, S2, B2) ANOVA for repeated measures, repeated on the last two factors. Unreliability of the GSR module resulted in sufficient loss of GSP data so as to render that data unusable. Therefore, the analysis was conducted only with the EMG, skin temperature, and heart rate data. These data are reported in Tables II, III, and IV, respectively. The cell sizes vary across the measures because recording artifact made some of the data unusable.

Table II. Means and Standard Deviations for Frontal EMG (μv)[a]

		Condition			
Group	Time	B_1	S_1	S_2	B_2
Self-instruction I	Pretest	2.13	3.75	4.13	1.95
		(.05)	(1.77)	(1.64)	(.65)
n = 12	Posttest	1.99	2.78	3.44	2.01
		(.48)	(.85)	(.99)	.71
Self-instruction II	Pretest	2.67	3.59	3.11	2.42
		(.90)	(2.32)	(1.00)	(.35)
n = 10	Posttest	2.16	2.98	3.78	2.65
		(.51)	(1.37)	(2.14)	(.72)
Therapist instruction	Pretest	2.14	2.91	3.25	2.12
n = 15		(.69)	(.85)	(1.02)	(.59)
	Posttest	2.00	2.66	3.30	2.14
		(.52)	(.60)	(1.01)	(.65)
Control	Pretest	2.25	2.49	3.07	2.28
n = 14		(.81)	(.68)	(.90)	(.86)
	Posttest	2.43	2.54	2.99	2.29
		(.66)	(.69)	(.80)	(.58)

[a]Upper numbers are means, lower numbers are standard deviations.

Table III. Means and Standard Deviations for Peripheral Skin Temperature (°C)[a]

Group	Time	Condition			
		B_1	S_1	S_2	B_2
Self-instruction I	Pretest	32.09	31.91	31.36	30.99
		(2.78)	(2.68)	(2.52)	(2.58)
$n = 14$	Posttest	32.08	31.97	31.80	31.45
		(2.81)	(2.62)	(2.54)	(2.68)
Self-instruction II	Pretest	33.17	32.83	32.40	32.45
		(2.38)	(2.36)	(2.39)	(2.57)
$n = 14$	Posttest	32.92	32.85	30.66	32.69
		(2.70)	(2.57)	(7.46)	(2.80)
Therapist-instruction	Pretest	34.00	33.61	33.34	32.36
		(2.14)	(2.12)	(2.11)	(2.57)
$n = 17$	Posttest	34.87	34.56	31.34	34.13
		(1.55)	(1.86)	(8.54)	(2.12)
Control	Pretest	32.39	32.08	31.48	31.42
$n = 17$		(2.78)	(2.62)	(2.77)	(2.78)
	Posttest	34.07	33.83	33.56	33.66
		(2.17)	(2.23)	(2.24)	(2.27)

[a]Upper numbers are means, lower numbers are standard deviations.

There was a significant main effect for condition on all variables, indicating that the stressors were functioning as stressors, $F(3, 141) = 38.5$, $p = .001$ for EMG; $F(3, 174) = 8.1$, $p = .001$ for skin temperature; $F(3, 153) = 21.37$, $p = .001$ for heart rate. The only physiological dependent measure to show a differential treatment effect was frontal EMG. Specifically, for frontal EMG there was a significant three-way interaction indicating a differential treatment effect across the four groups, $F(9, 141) = 2.3$, $p = .02$. Scheffé post hoc comparisons indicated a significant ($p < .05$) prepost decrement for all treatment groups under stressor conditions. The self-instruction I group had lower posttreatment EMG for both stressors. The self-instruction II group had lower posttreatment EMG for the first stressor but higher EMG for the second. Additionally, the self-instruction II group had lower posttreatment EMG during the first baseline period. The therapist instruction group had lower posttreatment EMG during the first stressor. The EMG levels for the control group showed no significant prepost change. Thus, the frontal EMG data indicate that the self-instructed subjects were more able to control their relaxation during a

Table IV. Mean and Standard Deviations for Heart Rate (Beats per Minute)[a]

Group	Time	Condition B_1	S_1	S_2	B_2
Self-instruction I	Pretest	66.68	71.39	71.23	62.21
		(10.90)	(12.13)	(13.25)	(10.38)
	Posttest	65.50	72.59	70.66	63.87
$n = 12$		(9.30)	(12.52)	(12.09)	(9.24)
Self-instruction II	Pretest	68.73	73.43	71.46	68.00
		(13.00)	(13.98)	(16.36)	(12.42)
	Posttest	68.31	71.86	71.21	66.79
$n = 11$		(13.46)	(12.85)	(13.03)	(10.75)
Therapist instruction	Pretest	65.26	71.14	69.29	62.91
		(8.35)	(10.58)	(8.32)	(7.53)
$n = 17$	Posttest	70.48	75.03	67.87	70.58
		(12.53)	(14.23)	(19.38)	(13.77)
Control	Pretest	69.05	75.99	71.01	63.51
$n = 15$		(9.48)	(13.68)	(13.36)	(10.62)
	Posttest	70.65	73.27	73.90	67.69
		(7.60)	(9.28)	(9.39)	(7.54)

[a]Upper numbers are means, lower numbers are standard deviations.

stressor than were no-treatment controls. Additionally, self-instructed and therapist-instructed subjects were equally able to produce this effect.

Self-Monitored Measures. All treatment subjects self-monitored heart rate, respiration rate, and skin temperature before and after daily home practice sessions. In order to determine the usability of these measures, at posttest subjects were asked to self-monitor these measures sequentially, while the recording equipment monitored heart rate and skin temperature and the experimenter monitored respiration rate. The correlation between self-monitored and machine/therapist-monitored measures was high, $r = .94$ for heart rate, $r = .95$ for skin temperature, $r = .97$ for respiration rate. These correlations are all significant beyond $p = .01$.

Having established that subjects can self-monitor these measures accurately, 3(group) × 2(pre/post practice) × 5(weeks) ANOVAs for repeated measures on the last two factors were conducted on the home practice data. A significant main effect for time was observed for all three measures, $F(1, 39) = 203.94$, $p = .001$ for heart rate, $F(1, 39) = 106.42$, $p = .001$ for respiration rate, $F(1, 39) = 39.96$, $p = .001$ for skin temperature (see Tables V, VI, and VII). This indicates that subjects were

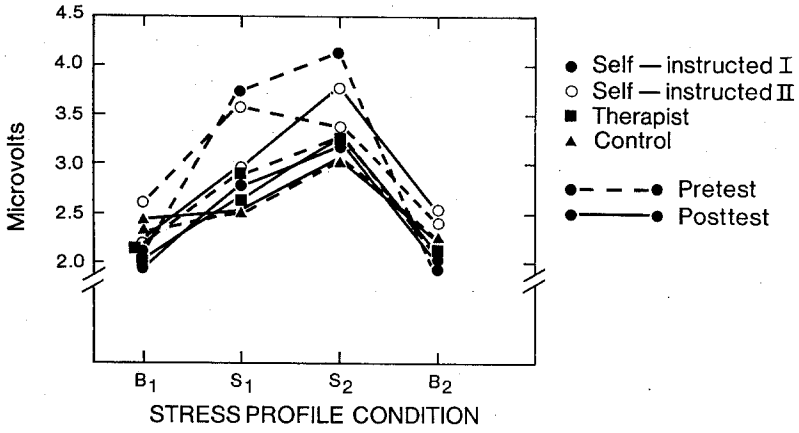

Fig. 1. Frontal EMG.

more relaxed at the end of home practice sessions than they were at the beginning. Additionally, for respiration rate and skin temperature there were significant time by week interactions, suggesting a training effect over the 5-week practice periods for both variables, $F(4, 156) = 3.56$, $p = .01$ for respiration rate and $F(4, 156) = 2.71$, $p = .03$ for skin temperature.

Table V. Means and Standard Deviations for Self-Monitored Heart Rate Before and After Home Practice Sessions[a]

		Week				
Group	Time	1	2	3	4	5
Self-instruction I	Prepractice	65.52	67.00	65.07	65.68	65.83
		(9.04)	(9.61)	(9.18)	(7.89)	(9.42)
	Postpractice	60.38	62.68	61.32	61.58	62.20
$n = 13$		(9.62)	(9.44)	(9.39)	(8.65)	(9.05)
Self-instruction II	Prepractice	73.38	73.86	73.80	72.99	73.59
		(10.24)	(10.38)	(10.64)	(11.33)	(9.98)
	Postpractice	67.66	68.06	66.80	66.79	66.70
$n = 13$		(9.72)	(9.88)	(8.95)	(10.07)	(9.57)
Therapist instruction	Prepractice	68.89	69.21	71.42	70.46	71.31
		(9.51)	(10.33)	(8.61)	(9.70)	(9.42)
$n = 16$	Postpractice	63.70	64.75	65.97	65.68	66.71
		(7.63)	(9.52)	(7.74)	(8.62)	(8.18)

[a]Upper numbers are means, lower numbers are standard deviations.

Table VI. Means and Standard Deviations for Self-Monitored Respiration Rate Before and After Home Practice Sessions[a]

Group	Time	Week 1	2	3	4	5
Self-instruction I $n = 12$	Prepractice	13.62	12.97	12.53	12.63	12.91
		(2.40)	(3.40)	(2.61)	(2.97)	(3.12)
	Postpractice	11.34	10.81	10.75	11.45	10.85
		(2.45)	(2.50)	(2.34)	(2.78)	(2.72)
Self-instruction II $n = 12$	Prepractice	15.23	14.44	13.86	13.93	13.94
		(3.24)	(3.66)	(3.53)	(3.94)	(4.27)
	Postpractice	11.60	10.98	10.51	11.25	10.53
		(2.83)	(3.25)	(3.17)	(3.76)	(3.62)
Therapist instruction $n = 14$	Prepractice	16.42	15.37	15.93	15.24	15.05
		(4.38)	(2.93)	(3.90)	(3.75)	(3.57)
	Postpractice	14.49	13.25	13.44	13.26	12.72
		(4.73)	(3.81)	(3.48)	(3.83)	(3.87)

[a]Upper numbers are means, lower numbers are standard deviations.

Table VII. Means and Standard Deviations for Self-Monitored Skin Temperature (°F) Before and After Home Practice[a]

Group	Time	Week 1	2	3	4	5
Self-instruction I $n = 12$	Prepractice	84.61	83.61	82.96	84.29	85.72
		(7.87)	(7.98)	(8.14)	(7.26)	(6.89)
	Postpractice	86.31	86.85	87.62	88.35	89.54
		(6.21)	(4.99)	(4.93)	(5.06)	(4.62)
Self-instruction II $n = 12$	Prepractice	86.94	87.36	87.00	88.45	89.14
		(5.22)	(6.06)	(5.00)	(5.09)	(4.75)
	Postpractice	89.32	89.70	89.90	90.85	91.08
		(4.35)	(5.38)	(3.80)	(3.00)	(3.59)
Therapist instruction $n = 14$	Prepractice	91.72	90.29	91.31	91.87	91.97
		(2.37)	(3.85)	(3.34)	(3.95)	(3.22)
	Postpractice	92.65	93.03	92.52	93.84	94.05
		(1.96)	(1.79)	(3.39)	(1.64)	(1.48)

[a]Upper numbers are means, lower numbers are standard deviations.

Summary of Results

The subjective self-reports of subjects on the post-5-week survey indicated that participants found the two treatment formats equally effective, and more effective than a control condition. However, the STAI and IPAT scores do not confirm the subjects' impressions, nor do most of the physiological data. Only the EMG data measured under stressor conditions indicated any differential treatment effect. Baseline measures did not contain any significant differences. The self-monitored data suggest some within-session change during home practice; however, there were no incremental training effects across the 5 weeks, and within-session variability remains quite high. The high correlations between self-monitored and machine/experimenter-monitored measures indicate the potential usefulness of these home practice measures; however, further research will be necessary to determine if correlations between actual and self-monitored measures taken during home practice are comparable to those obtained under laboratory conditions in this study.

DISCUSSION

The above data offer only limited support for the efficacy of the self-instruction program field-tested in this study. The subjective impressions of the subjects, and the EMG data monitored under stressor conditions, agree that the self-instruction and therapist-instructed programs are equally effective and that both training formats are more effective than a waiting list control condition. However, these results are not corroborated by the other machine-monitored physiological data or by the STAI or IPAT results. The majority of data in this study suggests that the treatments are equivalent, but no better than the control condition. Perhaps part of the reason for the somewhat weak treatment effect is the moderate pretest anxiety levels of the subjects and replication with sample, demonstrating that higher initial anxiety levels might yield a more pronounced result. However, such a conjecture must await further empirical testing.

In spite of these mixed results, several important observations merit consideration. The first comes from the interface between the self-report and the physiological measures. Although subjects reported increased ability to relax and lower anxiety at the conclusion of treatment, only one physiological channel (frontal EMG) indicated any change, and that occurred only under stressor conditions. This indicates the necessity of taking physiological data in relaxation studies and in recording those data

under both stressor and relaxation conditions. Our data agree with those of DeGood and Adams (1976) and Light (1981) in suggesting that some treatment effects may not show up under baseline conditions, that treatment effects may not transfer from baseline to stressor conditions, and that self-reported relaxation measures may not agree with physiological assessments of relaxation.

Second, the psychophysiological stress profile we adapted from Budzynski and Peffer (1980) appears to be a useful procedure for obtaining physiological dependent measures. The significant condition effect reported above suggests that both the serial 7s task and the reading test were functioning as stressors across all treatment groups. An analysis of experimenter-by-stress profile results suggests that the procedure can be standardized to the point that the results are independent of the experimenter.

A third observation arises from the self-monitored home practice data. These data were easy and inexpensive to obtain. They were also found to be accurate indicators of physiological functioning when measured under laboratory conditions. It would seem that therapist and clients alike can work to satisfy Barrios and Shigetomi's (1979) criticism that few relaxation studies incorporate procedures to verify that subjects did in fact learn to relax. Further, the self-monitoring process undoubtedly had a motivating effect on the subjects, and likely is responsible in part for the relatively low dropout rate in this study, as compared with other studies involving self-instruction (cf. Glasgow & Rosen, 1978).

Finally, this study is important because it incorporated most of the concerns raised about research in self-instructed therapy. The study was ecologically sound: Our lab was furnished like a typical counselor's office and our experimenters were trained therapists. This increases the generalizability of our results. The independent variables were monitored to determine that subjects did follow their respective programs. The home practice data provided a measure of skill acquisition. Although we did not control for expectancy effects, we assessed expectancy and were able to determine that it was not a major factor biasing our results. Also, we compared our self-instruction treatment with a "best available alternative" and found no differential effects. It is hoped that this study might be heuristic to others and an incentive to field-test the type of self-help programs that are given to clients, in an attempt to maintain counselor credibility. If self-instruction programs pass the scrutiny of rigorous field-testing, the counselors will have a new tool in their repertoire of intervention strategies, a tool that can be used with some degree of predictability.

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