J. Behav. Ther. & Exp. Psychiat. Vol. 12, No. 2, pp. 145-151, 1981.
Printed in Great Britain.

0005-7908/81/020145-07 $02.00/0

AN OPERANT REINFORCEMENT METHOD OF TREATING DEPRESSION

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Summary—A method of treating depression based on an operant reinforcement perspective was evaluated with 29 depressed persons. The procedure included increased reinforcer utilization, behavioral contrast, overcorrection, reinforcer sampling and stimulus control by positive events. Also, training was given in skills related to the cause of the depression such as communication, job-finding, marital and study skills. A behavioral measure of individual goal attainment was taken in addition to three common subjective measures. Improvement occurred after the first two sessions, increased with successive sessions, and was maintained at follow-up with a mean of 87% goal attainment and a 78% reduction of self-rated unhappiness. The degree and speed of improvement on the behavioral, as well as subjective, measures seemed at least as great as obtained by previous cognitive or behavioral programs.

Depression has been analyzed in learning theory terms as the loss of reinforced behavior (Ferster, 1966), with varying emphasis on the loss of social skills (Lewinsohn, Weinstein and Shaw, 1968; Liberman and Raskin, 1971), learned helplessness (Seligman, Klein and Miller, 1976), or social labelling (Ullmann and Krasner, 1975). Many case studies involving 1 or 2 persons have been reported which have used such learning-based therapies (Hanaway and Barlow, 1975; Hersen *et al.*, 1973; Reisinger, 1972) with encouraging results, but few comprehensive treatment programs based on a behavioral model have been devised and evaluated until very recently (see overview by O'Leary and Wilson, 1975; Wilson and O'Leary, 1980). Notable exceptions have been the studies by McLean, Ogston and Grauer (1973) and McLean and Hakstian (1979). Since the concept of depression is basically subjective, understandably several cognitive models of depression have been formulated which view depression as resulting from defective cognitions (Beck, 1963; Ellis and Harper, 1961). One cognitive behavior program has recently been evaluated with a sizeable clinical sample with very favorable results (Rush *et al.*, 1977).

The present study evaluated a method of treating depression which was based on an operant reinforcement analysis, using a fairly sizeable sample of clinically depressed persons. The program stressed an increase of reinforcement, as have the previous operant programs, but also attempted to modify directly the verbal behavior associated with depression as have the previous cognitive behavioral programs.

The present conception of depression is that of an emotional state induced by a reduction of reinforcers, either real or apparent, which results in loss of the behaviors maintained by the reinforcers and generalizes to other behaviors as well. The loss of behaviors is accompanied by a verbal preoccupation with that loss and this altered verbal behavior may receive social reinforcement. This conception suggests several directions for treatment. The

Grateful acknowledgement is made to P. Levison and R. Steck for their invaluable administrative support and to M. McMorrow for the extensive assistance in the data analysis.

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This research was conducted at Anna Mental Health Center.

frequency of engaging in reinforcing activities should be increased as well as increasing those responses which lead to reinforcers. New skills where needed should be taught to obtain the reinforcers. To reduce the verbal preoccupation with inadequacies (low probability of being reinforced), the person should be taught to emphasize positive attributes and reinforcers. To obtain a behavioral contrast effect (Nevin, 1973) of reinforcers (Reynolds, 1961), and aversive stimuli (Brethower and Reynolds, 1962; Azrin and Holz, 1966), the existing level of reinforcement loss should be contrasted with the even greater levels of reinforcement loss of others.

The patient's verbal preoccupation with reinforcement loss should be discouraged by the counselor; instead, statements about the remaining sources of reinforcement should be encouraged. The overcorrection principle (Azrin and Nunn, 1973; Azrin and Besalel, 1980) could be used to interrupt and inhibit negative self-labelling. The "reinforcer sampling" procedure (Ayllon and Azrin, 1968) could be used to promote continued reinforcer utilization by having the person sample existing reinforcing stimuli. Generalization should be structured through a social support (Azrin and Nunn, 1973) procedure by teaching the person how to prompt positive labelling and positive reinforcers from others.

METHOD

Subjects

Twenty-nine persons participated in response to a newspaper advertisement and referral by other agencies or friends. The mean age was 27.4 yr and the mean years of education was 14.5 yr. Seventeen were female, 15 were attending college, 16 were employed, and 10 were married of whom five had children. Only one person was receiving medication for depression. All participants were included in the data analysis who attended at least two sessions whether or not they completed the scheduled treatment. All clients sought help for depression. With regard to suicidal tendencies, examination of the relevant items on the Beck Inventory showed that four reported "I feel I would be better off dead", one reported "I have definite plans about committing suicide", fifteen reported "I am having thoughts of harming myself but would not carry them out", and nine reported "I don't have any thoughts of harming myself". Thus, 69% reported having suicidal thoughts or plans. Five persons (17%) had scores of 30 or more on the Depression Inventory which is characterized as severe depression (Beck *et al.*, 1961), and another five persons had scores of 25 or greater with a characterization of moderate depression for a total of 34% persons designated as moderately or severely depressed. Only 4 persons (14%) had a score of 10 or less which is the presumed range for non-depressed persons.

Experimental design

The experimental design was a wait-list, within subjects design in which a 2-week waiting period was scheduled after the intake session. Since some persons were suicidal, a longer wait-list period or a no-treatment control group could not be considered.

Response measures

The response measures taken were (1) the Depression Inventory (Beck *et al.*, 1961), (2) the D scale of the MMPI, and (3) a self-report of the percentage of time the client was unhappy (Azrin, Naster and Jones, 1973), (4) in addition to these subjective measures, the clients recorded selected behaviors related to their personal treatment objectives (see description below). The Depression Inventory and unhappiness measures were taken at the intake session, at each treatment session and after a follow-up period (mean of 7 weeks). The measure of individual goal attainment was not obtained at intake prior to the wait-list period since the specification of positive goals in behavioral terms constituted part of treatment. This measure was first taken at the initial session, at each session thereafter, and at the follow-up. The D scale of the MMPI was given only at the intake session and at the end of counseling because of the large amount of time it required.

Individual treatment objective measure

For the measure of attainment of individual treatment objectives, each person stated what change he/she desired, the objective to be stated in behavioral terms if possible and in terms of a specific frequency or duration. Statements of at least four such treatment objectives were obtained from each person. That frequency of the behavior which was listed as the treatment objective was designated as the 100% level and the existing frequency as the 0% level; thereafter, the frequencies recorded on a given day were expressed as a percentage of the desired change for data analysis. For example, a person might state as an objective that he would like to have zero crying episodes, but was now having five such episodes per day. Zero crying episodes per day would be designated as 100% goal attainment, five episodes per day as 0% gain, 2 episodes per day as 60% gain, 1 per day as 80%, etc. Or the goal might be to be able to work 8 hr per day when the current level was only 2 hr. Eight hours would constitute the 100% level, 2 hr the 0%, and a 6 hr increase would be the goal. An increase to 4 hr per day would be two-sixths or 33% of the goal; an increase to 6 hr per day would be four-sixths or 67% of the goal. Not working at all on a given day would be minus two-sixths or −33% goal attainment; conversely, working 10 hr per day would be eight-sixths

or +133% goal attainment. Each goal was converted to a percentage; a single score was calculated for each person by averaging the percentage scores for that person's several goals. This method of analyzing the individual treatment objective data made possible an assessment of progress relative to the treatment goals of the individual expressed in behavioral terms in contrast with the other assessment measures which were subjective and also reflected the normative expectations of the therapist or test instrument designer.

The sessions were about 1.5 hr in duration and were scheduled weekly. Tape recordings of the session were reviewed by the co-authors. A behavioral contract was signed by the counselor and patient at the start of counseling outlining their responsibilities to each other. Four to ten sessions were intended to be used dependent on the progress. The actual mean number attended was 6.8 sessions (median 5) since some participants discontinued unilaterally especially when they felt either that no further help was needed or that insufficient progress was made. The post-treatment date was, therefore, taken as the last session attended; all persons were included who attended two or more sessions even if the scheduled number of sessions was not completed.

The client was given several forms to fill in which emphasized the positive reinforcers rather than the problems, and/or served as the basis for the counselor's arrangement of positive reinforcers.

Desirable Attitude List

A form list of 15 attitudinal statements was presented and the person designated which ones applied to him. The statements were explicitly stated in such a manner that they were positive attributes which could be expected to apply to almost everyone, i.e., "Caring about people", "Being concerned about justice", etc. The person was then given a blank form on which to write down "as many nice qualities about yourself" as they could think of, using the specific items on the Desirable Attitude List as a model.

Happiness Reminder List

A list of 18 activities was read by the person who designated which ones applied. As with the Desirable Attitude List, each item could be expected to apply to almost all persons such as "Having enough money to live on", "Some music I enjoy", "Some foods I like", etc. A blank form (Pleasant Activities Listing) was given to the person on which he/she listed "the activities and events that were pleasant, meaningful, or interesting to you in the past", using the "Happiness Reminder List" of examples as a model.

Possible Pleasant Activities Prompting List

To identify reinforcing activities which could be scheduled later as well as to emphasize those that now existed for the person, a list of 50 sample recreational activities was given which he/she used to designate which items applied. Examples were "reading", "movies", "dancing", etc. A second list of possible and, probably, pleasurable activities was constructed containing 43 items, each of which the person rated on a 1–4 scale as to the degree of enjoyment obtained from each activity. This scale rating enabled the counselor to determine the priority of scheduling the various activities.

Pleasant people

The person made a listing of all the people he/she liked similar to the above listings of activities and events.

Self-praise

The client practiced making positive statements about himself/herself using as a guide the items designated in the Desirable Attitudes List and Nice Qualities List. Should another person fail to provide an expected reinforcer, the client role-played an appreciation reminder, or compliment-reminder procedure designed to prompt praise from the other person.

Reinforcer utilization

A daily and weekly schedule was arranged for the person to engage in reinforcing activities using the Pleasant Activities List, Pleasant Activities Prompting List, and People-I-Like List as a guide. Among these activities was a recommended "Happy Talk" procedure in which the person was to arrange a brief period of conversation each day with a designated friend dealing only with pleasant topics of mutual interest, not with problem solving.

Traumatic Events List

A list of 42 events was designed, each of which was intended to be viewed as a very severe aversive event, but very few of which, if any, were likely to apply to a given person, i.e., "Became blind", "My house burned down", "My spouse was crippled in an accident", "I was excommunicated", etc. This list was intended to induce behavioral contrast.

Nonaversive correlates of traumatic events

For those clients who were depressed because of a traumatic or unpleasant event, emphasis was put on the nonaversive aspects of the event by having them list on a form (a) possible negative aspects of the situation if the problem had not occurred (If I hadn't been fired, I'd be stuck in the same job with people I don't like) and (b) all positive aspects that occurred because of this problem (My family had never been so good to me before I had this problem).

Positive interaction training

For those persons whose depression centered on unsatisfactory social relations, reinforcer-facilitating social skills were taught as described in the reinforcement-based marital (Azrin, Naster and Jones, 1973; Azrin *et al.*, 1980) and parent–youth (Besalel and Azrin, in press) counseling programs which included training in giving compliments, showing appreciation, "happy talk" periods, prompting appreciation and compliments, etc. In addition, the person was taught how to request reinforcers (Positive Request Procedure), how to react to an annoyance caused by others (No-Blame Procedure), how to make agreements (behavioral contracting), how to identify probable reinforcers of friends, and other such procedures used in the marital and youth counseling program.

Marital, vocational or educational reinforcement

In addition to communication and social problems which were dealt with by the Positive Interaction Training described above, common sources of depression were marital, vocational and study problems. For those with severe marital problems, an abbreviated form of the reciprocity marital counseling program was given with the spouse present (Azrin, Naster and Jones, 1973; Azrin *et al.*, 1980); those with severe employment problems were counseled according to the behaviorally-based Job Club format for obtaining employment (Azrin, Flores and Kaplan, 1975; Azrin and Besalel, 1980); those who had academic difficulties were counseled how to arrange and follow a definite study schedule.

Diverse problem areas

To identify all areas of behavioral distress, the persons were given a "Happiness Scale" on which they rated their degreee of happiness in each of eight areas: household responsibilities, sex, communication, social activities, money, care of children, independence and personal habits. Skill training and greater reinforcer utilization could then be arranged in the areas identified as a problem.

Mood reversal

The overcorrection rationale (Azrin and Besalel, 1980) suggested that the depressed state be "overcorrected" by teaching the person to engage in compensatory positive statements whenever a depressed state or response occurred. Thus, the counselor taught the person to make the self-praise statements identified earlier whenever a depressed comment or mood occurred.

Individual behavioral objectives

Establishing specific behavioral objectives was one of the means of assessing progress, as noted above, but also served as a treatment procedure. The procedure emphasized the specific behaviors which were to be established thereby diverting discussion from past or amorphous events. For example, a complaint about losing a job might be translated into the behavioral objective of having a job interview every day until a job was obtained.

Self-reminder form

The participant was given a form on which to record each day the activities which were assigned to be carried out between sessions. These activities included each of the individual goals and each of the reinforcing activities scheduled by the counselor as well as the various positive interaction activities (compliments, appreciation, offers to help, etc.) relevant to that person. The completed form served as the starting point of discussion for each session thereby emphasizing what the person had done to help him/herself.

During each session, the counselor followed a session plan outline and reviewed the contents of the various forms which had been completed by the participant prior to the session. During the initial session, all of the procedures were briefly discussed and role-played, such as the self-praise, mood reversal, happy talk period, etc., and practiced further, as needed, during subsequent sessions rather than attempting mastery of a procedure before proceeding to the next one.

RESULTS

Table 1 presents the mean and median score of the four measures. The follow-up data were available from 14 persons. Only a slight decrease, less than 16%, occurred in the Depression Inventory and unhappiness measures after the waiting period for either the mean or median for both measures. The change from pre-treatment to post-treatment or to follow-up was substantial for all four measures. As indicated by the asterisks in Table 1, all of the post-treatment and follow-up responses were significantly different from the intake scores for each of the four measures, and for the

Table 1. Scores on 4 assessment measures: The Beck Depression Inventory, the stated percentage of time spent being unhappy, the D scale of the MMPI, and the percentage attainment of the individual treatment objectives

	Intake		Post-wait-period		Post-treatment		Follow-up	
Measure	$\overline{X}$	Median	$\overline{X}$	Median	$\overline{X}$	Median	$\overline{X}$	Median
Depression Inventory	20.6	20	17.3	17	6.9*	1*	2.8*	0.5*
Percentage unhappy	56.5	50	53.9	50	26.1*	22*	12.5*	12.5*
MMPI—D Scale	78.6	80	—	—	55.6*	53*	—	—
Individual objective (percentage attainment)	—	—	15.8	8	77.8*	70*	86.8*	86.5*

A decrease in depression is indicated by lower scores for the Beck, unhappiness, and D scale measures, and by a higher score for the individual objectives. The asterisk (*) indicates a significant difference between that score and the score at intake at the $P < 0.001$ level according to the *t*-test for the means and the Wilcoxin test for the medians (Siegal, 1956).

means as well as the medians ($P < 0.001$) using the t-test for the means and the Wilcoxin Test (Siegel, 1956) for the medians. For the individual objective measure, the comparison was with the post-waiting period measure, since the objectives were not formulated until that time.

The mean Depression Inventory score decreased by 67% (median by 95%) after treatment and by 86% (median 98%) at the follow-up. In absolute terms, the mean Depression Inventory score at follow-up was 2.8 with a median of 1.0 (0–10 has been designated as the normal range). The stated percentage of time spent being unhappy was 12.5% at follow-up vs 56.5% initially. For the individual treatment goals, about 75% attainment was achieved at post-treatment and 87% at follow-up as compared with the initial level of about 12%.

Examination of the data for the individuals showed that all persons had a decrease in the Depression Inventory score at post-treatment and at follow-up; all but three persons had a decrease in unhappiness scores (these three were unchanged) at post-treatment but all decreased at follow-up. For the individual goal attainment measure all but two persons had an increase at post-treatment and all increased at follow-up. For the MMPI D scale, all but one person was improved at the post-treatment. Although almost all persons showed improvement, as indicated above, 8 of the 29 persons (28%) did not have very favorable outcome measures in an absolute sense at their last assessment. Each of these eight persons had Depression Inventory scores greater than 10, reported being unhappy over 25% of the time, and attained less than 60% of their individual treatment objectives. Conversely, 18 of the 29 persons (62%) had very favorable outcomes in an absolute sense on all measures at their latest measurement: these 18 persons had Depression Inventory scores of less than 10, reported unhappiness less than 25% of the time, and attained at least 60% of their individual treatment objectives. For the MMPI D scale, all but one of the post-treatment scores were less than 70 which may be taken as an arbitrary cut-off level for the depressed state.

The mean number of sessions was 6.8 (median of five sessions). Since the Depression Inventory and unhappiness measure were obtained at each session, the changes in these measures during the course of treatment can be determined. The mean Depression Inventory score decreased from the pre-treatment level of 17.3 to 13.3 after one session, to 9.5 after two sessions, and 8.6 after five sessions. Similarly, the reported level of unhappiness was reduced from the pre-treatment mean level of 56.5% to 38.5% after one session, 33.6% after two sessions, and 24.5% after the fifth session. For both measures, most of the reduction occurred before the third session with less change thereafter.

The several methods of assessment were found to correlate with each other to a moderate degree showing a Pearson $r = 0.44$–0.71 between the various measures taken at the intake session. Each of the r values was significant at $P < 0.05$.

To determine whether the program was differentially effective for differing degrees of depression, a comparison was made between those 15 persons with a Depression Inventory score of less than 21 and the 16 persons scoring 21 or more. The mean score was 14.8 for the less depressed group and 26.8 for the more depressed. The mean percentage reduction in the Depression Inventory score at post-treatment was 65% for the more depressed group and 70.9% for the less depressed group, the difference being statistically non-significant ($t = 0.028$) in a comparison of the percentage reduction between groups.

DISCUSSION

The depression treatment program appeared to have reduced the patients' problems. All four measures showed an improvement of the mean scores at the end of treatment and the benefit endured at the 7-week follow-up. In contrast, little or no change in scores occurred after the wait-list period. The benefits occurred primarily within the first two sessions and the mean number of sessions given, 6.8, was relative-

ly small (median, five sessions). Some improvement occurred after treatment for virtually all persons on all four measures, with 62% of the persons having a very favorable score on all measures at the final measurement period. The overall degree of improvement from the pretreatment level to follow-up was fairly substantial: 86% reduction of the mean Depression Inventory score (median 98%), about 75% reduction in the unhappiness rating, and 86% attainment of the individual treatment goals. The degreee of improvement of the severely depressed patients was comparable to those who were less depressed. These results indicate that the treatment program was effective at a substantial level within few sessions and the benefits endured.

The degree of improvement in the present study seems to compare favorably with that of other programs which have been evaluated very recently. Rush *et al.* (1977) used 20 sessions (vs the present mean of 6.8 sessions) and obtained an 80% reduction (vs the present 86%) in the Depression Inventory score of their cognitive behavior therapy program. McLean and Hakstian (1979) used 10 sessions and obtained a reduction of about 60% of the Depression Inventory score for their behavior therapy program which also focused on increasing positive interactions with the environment somewhat similar to the present emphasis. Shipley and Fazio (1973) obtained a 15 point reduction of the MMPI score after brief problem solving therapy vs the present 27 point reduction. Taylor and Marshall (1977) obtained about a 50% reduction of the Depression Inventory scores after cognitive or behavioral treatment, but an 85% reduction under a combined program of six sessions. The present benefits appear as great as those obtained previously and in a relatively brief period.

The issue of assessment is especially cogent for the study of depression since depression is often considered as a mental state. Consequently, questionnaires such as the Depression Inventory and the Depression Adjective Check List (Lubin, 1965) are commonly used and consist of self-descriptions of mental states which are presumably associated with depression. Given that the degree of mental depression is to be measured, a more direct method might be to ask the persons to denote their degree of unhappiness as was done with the unhappiness measure in the present study. Another, and possibly more valid, measure would seem to be a behavioral measure such as the present measure of attainment of individually defined behavior goals. This measure was found to be practicable in the present study in that all persons were able to formulate at least four treatment goals. Almost all of these goals were behavioral, i.e. going out on a date at least once a week, or losing 10 pounds to be more attractive. However, a few of the goals designated mental events and permitted of no obvious translation into a behavioral dimension, such as "not feeling sad" or "not thinking about my boyfriend". Therefore, this study did not succeed entirely in obtaining a behaviorally defined outcome measure. One solution is to deal only with behaviorally defined objectives since they permit the therapist to program and validate their occurrence more definitively. Also, this emphasis on activities has been found to be more beneficical (Turner, Ward and Turner, 1979) and, as noted by McLean and Hakstian (1979), the goal attainment and behavioral focus of such a procedure seemed to be a critical feature for the patients.

The present study attempted to devise and implement a treatment program for depression based on an operant and behavioral format. The general procedures for increasing reinforcer utilization were fairly similar to those in previous studies but other procedures were somewhat distinctive such as reversing the apparent loss of reinforcement by behavioral contrast and by systematically uncovering existing sources of reinforcement, both of these procedures requiring no actual increase of reinforcers. A second feature of the present program was to deal directly with the verbal behavior which is often the principal index of a depressed mental state. The program promoted positive statements

to others as well as about oneself in the belief that the emotional state would be altered by the changed verbalizations and reinforcer utilization in a circular relationship. A strict behavioral approach also would have obtained reliability measures of the behaviors. The present study was fairly successful in obtaining behavioral specification as an outcome measure in its use of the measure of individualized behavioral goals, but the absence of reliability measures constitutes a methodological shortcoming which should be remedied in future attempts at a strict behavioral model.

REFERENCES

Ayllon T. and Azrin N. H. (1968) Reinforcer sampling: A technique for increasing the behavior of mental patients, *J. Appl. Behav. Anal.* **1**, 13–20.

Azrin N. H. and Besalel V. A. (1980) *Job Club Counselor's Manual: A Behavioral Approach to Vocational Counseling*. University Park Press, Baltimore, Maryland.

Azrin N. H. and Besalel V. A. (1980) *How to Use Overcorrection*. H. & H. Enterprises, Lawrence. Kansas.

Azrin N. H., Besalel V. A., Bechtel R., Michalicek A., Mancera M., Carroll D., Shuford D. and Cox J. (1980) Comparison of reciprocity and discussion-type counselling for marital problems, *Am. J. Family Ther.* **8**, 21–28.

Azrin N. H., Flores T. and Kaplan S. J. (1975) Job-finding club: A group assisted program for obtaining employment, *Behav. Res. Ther.* **13**, 17–27.

Azrin N. H. and Holz W. C. (1966) Punishment. In *Operant Behavior: Areas of Research and Application* (Ed. by Honig W. K.). Appleton-Century-Crofts, New York.

Azrin N. H., Naster B. J. and Jones R. J. (1973) Reciprocity counseling: A rapid learning-based procedure for marital counseling, *Behav. Res. Ther.* **11**, 365–382.

Azrin N. H. and Nunn R. G. (1973) Habit reversal: A method of eliminating nervous habits and tics, *Behav. Res. Ther.* **11**, 619–628.

Beck A. T. (1963) Thinking and depression, *Archs Gen. Psychiat.* **9**, 36–45.

Beck A. T., Ward C. H., Mendelson M., Mock J. and Erbaugh J. (1961) An inventory for measuring depression, *Archs Gen. Psychiat.* **4**, 561.

Besalel V. A. and Azrin N. H. (in press) The reduction of parent-youth problems by reciprocity counseling, *Behav. Res. Ther.*

Brethower D. M. and Reynolds G. S. (1962) A facilitative effect of punishment on unpunished behavior, *J. Exp. Anal. Behav.* **5**, 191–199.

Ellis A. and Harper R. A. (1961) *A Guide to Rational Living*. Wilshire Book Co., California.

Ferster C. B. (1966) Animal behavior and mental illness, *Psychol. Rec.* **16**, 345–356.

Hanaway T. P. and Barlow D. H. (1975) Prolonged depressive behaviors in a recently blinded deaf mute: A behavioral treatment, *J. Behav. Ther. & Exp. Pschiat.* **6**, 43–48.

Hersen M., Eisler R. M., Alford G. S. and Agras W. S. (1973) Effects of token economy on neurotic depression: An experimental analysis, *Behav. Ther.* **4**, 392–397.

Lewinsohn P. M., Weinstein M. S. and Shaw D. (1968) Depression: A clinical-research approach. In *Advances in Behavior Therapy* (Ed. by Rubin R. D. and Frank C. M.). Academic Press, New York.

Liberman R. P. and Raskin D. E. (1971) Depression: A behavioral formulation. *Archs Gen. Psychiat.* **24**, 515–523.

Lubin B. (1965) Adjective checklists for the measurement of depression, *Archs Gen Psychiat.* **12**, 57–62.

McLean P. D. and Hakstian A. R. (1979) Clinical depression: Comparative efficacy of outpatient treatments, *J. Consult. Clin. Psychol.* **47**, 818–836.

McLean P. D., Ogston K. and Grauer L. (1973) A behavioral approach to the treatment of depression, *J. Behav. Ther. & Exp. Psychiat.* **4**, 323–330.

Nevin J. A. (1973) Stimulus control. In *The Study of Behavior Learning, Motivation, Emotion and Instinct* (Ed. by Nevin J. A. and Reynolds G. S.), Chapter 4. Scott, Foresman and Company, Glenview, Illinois.

Nevin J. A. (1973) The maintenance of behavior. In *The Study of Behavior Learning, Motivation, Emotion and Instinct* (Ed. Nevin J. A. and Reynolds G. S.), Chapter 6. Scott, Foresman, Glenview, Illinois.

O'Leary K. D. and Wilson G. T. (1975) *Behavior Therapy: Application and Outcome*. Prentice-Hall, Englewood Cliffs, New Jersey.

Reynolds G. S. (1961) Contrast, generalization, and the process of discrimination, *J. Exp. Anal. Behav.* **4**, 289–294.

Reisinger J. J. (1972) The treatment of "anxiety-depression" via positive reinforcement and response cost, *J. Appl. Behav. Anal.* **5**, 125–130.

Rush A. J., Beck A. T., Kovacs M. and Hollon S. (1977) Comparative efficacy of cognitive therapy and pharmacotherapy in the treatment of depressed outpatients, *Cog. Ther. Res.* **1**, 17–37.

Seligman M. E. P., Klein D. C. and Miller W. R. (1976) Depression. In *Handbook of Behavior Modification and Behavior Therapy* (Ed. by Leitenberg H.). Prentice-Hall, Englewood Cliffs, New Jersey.

Shipley C. R. and Fazio A. F. (1973) Pilot study of a treatment for psychological depression, *J. Abnorm. Psychol.* **82**, 372–376.

Siegel S. (1956) *Nonparametric Statistics for the Behavioral Sciences*. McGraw-Hill Book Company, New York.

Taylor F. G. and Marshall W. L. (1977) Experimental analysis of a cognitive-behavioral therapy for depression, *Cog. Ther. Res.* **1**, 59–72.

Turner R. W., Ward M. F. and Turner D. J. (1979) Behavioral treatment for depression: An evaluation of therapeutic components, *J. Clin Psychol.* **35**, 166–175.

Ullmann L. P. and Krasner L. (1975) *A Psychological Approach to Abnormal Behavior*. Prentice-Hall, Englewood Cliffs, New Jersey.

Wilson G. T. and O'Leary K. D. (1980) *Principles of Behavior Therapy*. Prentice-Hall, Englewood Cliffs, New Jersey.