DEPRESSION AND LEARNED HELPLESSNESS: TASK DIFFICULTY AND SUCCESS-FAILURE ATTRIBUTION

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Paul David Cherry, B. A.
Denton, Texas

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Recent research has shown that experimental subjects are sensitive not only to the presence but also absence of a contingency between their behavior and outcomes. In an aversive situation when the absence of such a contingency is learned, decrements in performance result both in the same situation and in other unrelated situations as well. This phenomenon has come to be called "learned helplessness."

Seligman (1975) has argued that learned helplessness is a good experimental analog for at least some human depressions. Persons who have acquired learned helplessness in the laboratory perform like persons experiencing naturally occurring depression in laboratory tasks involving problem-solving, learning, and processing. In humans, helplessness has been induced by uncontrollable shock, uncontrollable loud noise, and insoluble problems.

Recent studies (Benson & Kennelly, 1976a; Klein & Seligman, 1976) demonstrated that exposure to soluble problems alleviated performance decrements created by helplessness induction procedures or naturally occurring depression. Such studies have not as yet provided any follow-up measures

to determine the persistence through time of these alleviations of helplessness or depression.

This study was designed to compare the effects of exposure to two different sets of soluble discrimination problems, an easy set composed of only two- and three-dimensional problems and a more difficult set composed of problems ranging from two to seven dimensions, both immediately after training and at a 10-day posttreatment follow-up. The subjects were 32 depressed male inmates of a federal correctional institution. It was hypothesized that as a result of meeting and mastering progressively more difficult problems, the group given progressively more difficult problems would show a greater reduction in depression and a greater enhancement of performance on a variety of cognitive measures, both immediately after treatment and at the 10-day posttreatment follow-up.

The results failed to support these hypotheses. Depression scores decreased significantly from pretreatment to posttreatment, but did so equally for the two groups. One of the cognitive measures, the WAIS Digit-Symbol subtest, showed significant improvements from pretreatment to posttreatment, but did equally for the two groups. Significant relationships were found between the subjects' performances on the cognitive tasks, and measures of their tendencies to attribute successes and failures to stable or unstable factors.

Unexpected significant positive relationships were found between depression and performance on the cognitive tasks. The differential effect of the prison environment upon people differing in their intelligence was discussed as a possible explanation of these findings.

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DEPRESSION AND LEARNED HELPLESSNESS: TASK DIFFICULTY AND SUCCESS-FAILURE ATTRIBUTION

This study dealt with depression as viewed in the light of learned helplessness. In particular, the study was focussed on possible improvements in a therapy analog procedure which had been developed as a result of research in this area. Revisions in the therapeutic procedure and in the assessment methodologies were attempted. A brief historical perspective on the literature of learned helplessness, the helplessness theory of depression, and the therapy analog procedure which has evolved from this research will be attempted to clarify the current status of the field.

Overmier and Seligman (1967) pretreated harnessed dogs with a series of inescapable electric shocks. These animals were then placed in a shuttle box in which shocks were administered through a grid floor and in which escape or avoidance was possible by means of jumping over a low barrier to the other side of the box. Dogs pretreated with inescapable shocks learned to escape or avoid shocks in the shuttle box less readily than did dogs not given the inescapable-shocks pretreatment. According to Seligman (1972, 1975), the dogs given inescapable shocks in pretreatment had learned that there was no relationship between their efforts to escape and the actual escape from aversive stimulation. Seligman called this phenomenon "learned helplessness;" organisms exposed to inescapable aversive stimulation in one situation refrain from attempting to escape in a new situation in which relief is actually available. Having learned that responding does not bring about relief in one situation (in which this actually is the case), they are insensitive to response-relief contingencies that do exist in later situations.

Seligman (1975) claimed that not only can organisms learn that their behavior always or sometimes results in a given outcome, or never does, but they can also learn that there is no relationship whatsoever between their responses and a given environmental event. This uncontrollability differs from traditional extinction procedures in some ways. As explained by Seligman, Klein, and Miller (1976), extinction is a situation in which responding never results in reinforcement. Uncontrollability, however, denotes that reinforcement may occur, but when it does occur, it is uncorrelated with the organism's behavior. The probability of reinforcement when a response is given is the same as when it is not given. As in the Overmier and Seligman study, when such a lack of relationship between responding and reinforcement is learned, it is relinquished only with great difficulty. The helpless dogs (those exposed to inescapable shock in pretraining) later sat passively while receiving high-intensity, long-duration shocks.

Learned helplessness also has been demonstrated in man. In several studies, inescapable loud noise has been used in pretraining to induce helplessness (Hiroto, 1974; Klein & Seligman, 1976; Miller & Seligman, 1976; Price, Tryon, & Raps, 1978; Seligman & Miller, 1975). In the Hiroto study, subjects were pretreated with escapable, inescapable, or no loud noise, control of the noise for the escapable group being achieved by means of pushing a button. In the post-treatment phase, subjects were again exposed to loud noise, but all subjects could escape or avoid the aversive stimulation by making the proper manipulations in a hand shuttle box. The group given inescapable loud noise in pretreatment displayed performance deficits on the shuttle box task relative to the other two groups.

Hiroto and Seligman (1975) demonstrated the pervasiveness of helplessness. Subjects exposed to inescapable aversive stimulation (loud noise) later performed more poorly on a cognitive task (unscrambling word anagrams) than did subjects given escapable or no loud noise. Conversely, subjects given insoluble cognitive tasks (discrimination problems) showed performance deficits later when attempting to escape loud noise by means of movements in a hand shuttle box. Price et al. (1978) replicated this second finding.

These results show that exposure to insoluble problems produces effects similar to those of uncontrollable aversive physical stimulation, and that the effects of helplessness may be seen in performance deficits on later tasks quite dissimilar to those initially used in helplessness induction. Helplessness is not response-specific, but represents a general cognitive interference.

Seligman (1975) claimed that the negative effects of helplessness may be seen in three spheres--cognitive, motivational, and emotional. Examples of cognitive interference have been described above. Motivationally, helplessness lowers the incentive to respond. Overmier and Seligman's helpless dogs only rarely attempted escape or avoidance. Thornton and Jacobs (1971) found that helpless human subjects rarely attempted to escape electric shock, although means were available to do so.

Two emotional problems are seen as stemming from helplessness. First, anxiety results from unpredictable aversive stimulation and, therefore, may accompany helplessness (since the uncontrollable helplessness-inducing events often are unpredictable also). Roth and Bootzin (1974) found that college students exposed to insoluble problems showed greater anxiety and were more easily frustrated on later measures than were subjects in their control groups. The most pervasive emotional disorder related to helplessness, however, is depression.

Depression

Seligman (1972, 1975) proposed a learned helplessness theory of depression. Simply stated, he claimed that depression results when a person believes that he or she has no control over important events. Seligman (1975) stated:

> The depressed patient believes or has learned that he cannot control those elements of his life that relieve suffering, bring gratification, or provide nurture--in short he believes that he is helpless. (p. 92)

Earlier theorists had alluded to helplessness in the etiology of depression. Melges and Bowlby (1969) claimed that a belief in the ineffectiveness of one's plans and action is a central feature of depression. Beck (1970, 1971) formulated a theory of depression which, although it differs on certain points from the learned helplessness theory, does include uncontrollability of major events as an important factor. Beck argued that depression results when one suffers a major loss and believes that no attempts to rectify the loss will succeed. According to Beck, cognitive functioning in the depressed individual is immature; depressed persons are overly sensitive to slight indications of personal failure.

One important progression beyond earlier theories of depression has been the ability of Seligman and his associates to demonstrate in laboratory analog studies the relevance of the helplessness model of depression. In one study (Seligman & Miller, 1975), depressed and nondepressed college students were identified by means of the Beck Depression Inventory (Beck, 1967). In a 3 X 2 design, the depressed and nondepressed subjects then were administered escapable, inescapable, or no loud noise as pretreatment. The test task was to unscramble word anagrams. All of the anagrams in the list had the same scramble pattern (the first letter in the word became the third letter in the anagram, etc., for all anagrams). The nondepressed subjects given inescapable noise had longer latencies in unscrambling the anagrams and required more trials to learn the scramble pattern than did nondepressed subjects given escapable or no loud noise.

Depressed subjects receiving no noise performed worse than nondepressed subjects given no noise; they not only showed deficits on the above two measures but also simply failed to unscramble as many anagrams. Significant correlations were found between Beck Depression Inventory scores and measures of anagram performance for the no-noise groups (_r_'s ranged from .69 to .86). The Multiple Affect Adjective Check List, Today form (Zuckerman & Lubin, 1965) also was administered. Subjects given inescapable noise had higher anxiety, depression, and hostility scores.

Klein and Seligman (1976) administered escapable, inescapable, or no loud noise in pretreatment to depressed and nondepressed college students. The test task was to escape from loud noise by means of movements in a hand shuttle box. Once again, nondepressed subjects given inescapable noise and depressed subjects given no noise displayed test-task performance deficits relative to the nondepressed, no-noise group. Beck Depression Inventory scores (used in selection of the subjects) correlated with measures of success on the test task.

The results of these studies support the helplessness model of depression. In each study, nondepressed subjects receiving inescapable noise and depressed subjects given no such pretreatment displayed test-task performance deficits relative to nondepressed subjects given no noise or escapable noise.

Subsequent studies (Rizley, 1978; Willis & Blaney, 1978) have produced results not supportive of the original helplessness theory of depression and, in fact, have forced major changes within it. These studies dealt with the attribution of successes and failures--the causes to which an individual ascribes the outcomes of his behavior.

Willis and Blaney (1978) had depressed and nondepressed subjects attempt to raise a wooden platform without dislodging a small ball placed on it. The experimenters, however, discretely controlled whether the ball fell off; success on the task was therefore completely determined by the experimenters and unrelated to the subjects' efforts. The initial helplessness model of depression predicted that depressed subjects would view the task as uncontrollable more often than nondepressed subjects (the perception of uncontrollability being its main feature). The results, however, showed that depressed and nondepressed subjects did not differ in their perceived degrees of control. Willis and Blaney therefore argued that a distinction should be made between personal helplessness, wherein an individual attributes uncontrollability to his lack of skills, and universal helplessness, in which an individual ascribes uncontrollability to very high task difficulty.

Rizley (1978) performed research comparing Beck's theory of depression with that of helplessness. Depressed subjects attempted to predict which number, a one or a zero, would next appear in a series presented by the experimenter. The numbers, however, actually were randomly ordered, so that success was a matter of chance. Beck's theory claimed that depressed individuals over-attributed failures to personal incompetence, whereas successes were attributed to external factors (such as task ease or luck). According to the original helplessness theory, depressed individuals nearly always see outcomes as unrelated to their behavior.

Rizley's results supported Beck's position: depressed subjects attributed "failures" to personal incompetence and "successes" to external factors.

The above criticisms have resulted in basic changes in learned helplessness theory and its relation to depression (Abramson, Seligman, & Teasdale, 1978). In its revised form, success and failure attributions play a major role. Three orthogonal dimensions are considered important in relation to these attributions: internal-external, global-specific, and stable-unstable.

Internal attributions occur when an individual sees himself as the cause of outcomes, while the outer environment is seen as the causal factor in external attributions. Global attributions are those made to widely influential factors such as intelligence; specific attributions are those made to more delimited causes, such as mathematical ability. Stable attributions involve long-term factors, such as ability or task difficulty, while unstable attributions involve time-limited causes, such as luck or effort (one may try harder in the future).

In its revised form, learned helplessness is not a unitary phenomenon, but depends upon the interactions of the above three aspects of outcome attribution. More specifically, the theory states that depressed persons attribute negative outcomes to internal, global, and stable factors, and positive outcomes to external, specific, and unstable factors. Their failures lead to expectations of future long-standing, personal, and situationally diverse failures, while their successes do not lead to expectations of future successes. The degree of certainty of the belief in uncontrollability determines the intensity of helplessness in general, while the importance of the negative outcomes determines the severity of the affective disorder (depression).

In 1970, Meyer (reported in Weiner, 1974) obtained results which supported this theory. He had subjects repeatedly "fail" or "succeed" at a digit-symbol substitution task by adjusting the criterion. After each trial, he ascribed the outcome to ability, effort, task difficulty, or luck. After "failures," the subjects' expectations of success on the next trial were lower when the experimenter attributed the recent failure to (lack of) ability or to high task difficulty (stable factors) than when he attributed their failures to lack of effort or luck (unstable factors). After "successes," expectations of another success were higher when the successes were attributed to the stable factors.

In another study (Dweck, 1975), helpless and nonhelpless children (identified through ratings of classroom behavior) were given a series of math problems. The helpless children were further divided into two groups. Subjects in a success-only group were always told that they had successfully solved the problems, while subjects in the attribution-retraining group sometimes were told that they had failed. The latter group was told that their "failures" were due to insufficient effort.

Dweck developed the Effort versus Ability Attribution Scale, a simple five-item questionnaire dealing with failures on the math problems. For each item on the scale, the children could attribute failure either to lack of ability or insufficient effort. Testing prior to and after attribution training revealed that the children in the attribution-retraining group increased their choice of (lack of) effort alternatives significantly, but the success-only group registered no such changes. Failures on a later series of math problems led to deteriorated performance for the success-only group. The attribution-retraining subjects, however, maintained or improved their performance levels after failures.

In summary, the learned helplessness theory of depression in its current form is more complex than it was originally. Mediating attributions are now a part of the causal chain. Uncontrollability leads to depression and/or helplessness when causal attributions for the uncontrollability are made in certain directions--namely, to internal, stable, global factors.

Therapy

The learned helplessness theory of depression and research related to it have led to innovative forms of therapy. Common to these approaches is the attempted induction of a belief in personal control over one's environment. In one study (Schulz, 1976), college students visited persons in a home for the aged. Measures of physical and psychological health were taken prior to and after the visitation program. Results indicated that the elderly persons who could stipulate the time they were to receive visits (controllability) and those who were simply aware of the visitation time (predictability) improved more on measures of psychological health than persons unaware of the time of the next visit and those not receiving visits. The controllability and predictability groups reported that they felt lonely less often, were happier, and were more hopeful. They also showed less deterioration on measures of physical health. (All four groups showed some decline in physical health, as would be expected in that setting.)

Langer and Rodin (1976) conducted a similar study in a nursing home. Patients on one floor were given "responsibility-induction" instructions stressing what they could do for themselves, while patients on another floor received instructions detailing what the nursing home staff did for them. Measures of physical and psychological health were taken later. The responsibility-induction group had made more progress in these two areas than the group informed about staff services provided for them. They were judged to be more alert and they interacted more frequently with staff and friends. Results of a follow-up study (Rodin & Langer, 1977) performed 18 months later indicated that these gains had been maintained. The death rate for the responsibility-induction group during the intervening time period also was less than that of the second group.

The results of laboratory studies demonstrate that an increased belief in controllability has beneficial effects. Benson & Kennelly (1976a) had four groups in their study. One group was given soluble discrimination problems with response-contingent feedback to their solution attempts. That is, they were told that they were correct or wrong, depending on their actual accuracy. A second group was given insoluble problems. They were given random "correct" and "incorrect" feedback on individual trials within a problem, and at the end of each problem were told that they had failed at their final, overall solution attempt (see below). A third group was given insoluble problems, but they were always told that they were "correct" both on individual trials and at the end of each problem when they proposed their overall solution. There finally was a control group, for whom no problems were given in pretraining.

The problems themselves were modeled after those of Levine (1971). Each problem consisted of a card packet with two four-dimensional designs per card on the side facing the subjects. The four dimensions had two values each, as follows: letter (X or T) letter size (large or small), letter color (red or blue), and border around the letter (dashed or solid). The values changed sides from card to card, sometimes appearing in the design to the subjects' right, and sometimes in the one to the left. One value (for example, large letter) was the "solution" to the problem. The design bearing this value was correct for all cards in the problem packet. During the individual card trials, a subject guessed which design, right or left, was correct. Feedback from the experimenter, for the soluble-problem group, allowed the subjects to eliminate irrelevant (incorrect) values and ascertain the correct value. At the end of a card packet, subjects could solve the problem by naming the correct value.

The test task after this was to unscramble a list of anagrams, all with the same scramble pattern. The group given insoluble discrimination problems and random feedback during pretraining required more trials to learn the scramble pattern than did the always-correct group and the no-problems control group. More importantly, the group given soluble problems and response-contingent feedback learned the scramble pattern faster than the always-correct or control groups. These results suggest that exposure to controllable tasks may produce effects opposite to those produced by exposure to uncontrollable tasks--that is, competence may result, instead of helplessness.

Klein and Seligman (1976) performed a therapy analog study based on this logic. They created eight groups using depressed and nondepressed subjects (based on Beck Depression Inventory scores), escapable, inescapable, or no loud noise in pretreatment, and zero, four or twelve soluble Levine-type discrimination problems administered after the noise as therapy. Lastly, the test task for all groups was to escape or avoid noise by means of manipulations in a hand shuttle box.

There were several important results. First, helplessness was induced through exposure to inescapable noise--nondepressed subjects given inescapable noise and no therapy (discrimination) problems performed worse on the shuttle-box task than did nondepressed subjects given no noise or escapable noise (and no problems). Secondly, depression mimicked the laboratory-induced helplessness; depressed subjects given no noise or therapy problems performed more poorly on the test task than nondepressed subjects given no noise or problems. Thirdly, when depressed subjects and the nondepressed subjects who received inescapable noise were given 12 discrimination problems as therapy, they performed as well on the test task as did nondepressed subjects given no noise or problems. This study, then, was a further demonstration that laboratory-induced helplessness and naturally occurring depression were related, and that exposure to soluble problems could overcome both.

The Benson and Kennelly (1976a) and Klein and Seligman (1976) studies had several limitations to which the present study was addressed. Both studies employed college students as subjects, as have most earlier helplessness studies. Helplessness researchers have drawn criticism due to this (Buchwald, Coyne, & Cole, 1978). In the present study, depressed inmates in a federal correctional institution were enlisted as subjects.

The difficulty level of the discrimination problems has not been varied--all were four-dimensional problems. The present study contrasted a depressed group given increasingly difficult problems as therapy to another depressed group given as many problems, but all of low-difficulty level. It was hypothesized that the group given gradually more difficult problems would show greater reductions of depression than the group given simple problems only. This notion was supported by Burgess (1968) who claimed that depressed persons often attempt difficult tasks for which they are unprepared, fail because of this, and become even more depressed. In therapy, he had depressed clients attempt only simple tasks at first. These mastered, the client could then move on to more difficult undertakings. The more difficult tasks could be accomplished when the depressed clients were more confident of their abilities.

In previous studies, all procedures--pretreatment, therapy problems, test tasks, and psychometric measures--were completed on the same day. In the present study, the therapy-problems procedure was spread out over 5 days. Two follow-ups were conducted, one immediately after the last therapy problems were administered and another 10 days later.

Finally, in the present study, an attribution questionnaire similar to Dweck's scale was utilized. It was hoped that from it a more in-depth understanding of the role of attributional changes occurring during the alleviation of helplessness could be gained.

Method

Subjects

The subjects were 32 male inmates from the Springfield Camp at the Medical Center for Federal Prisoners in Springfield, Missouri. The basic purpose of this facility is to provide medical-surgical or psychiatric services to males from any federal prison. Inmates in the Camp section, however, serve sentences there to provide work assistance and are not patients.

A list of all Camp inmates was obtained, and from it, a priority-list of persons who were asked to participate in the study was constructed by means of a table of random numbers. Inmates were seen in small groups during subject selection. It was emphasized that participation was purely voluntary, with no reward for participation nor censure for refusing to participate to be expected. All inmates in these small groups were told that the study dealt with psychological adjustment.

The Beck Depression Inventory was administered to all inmates willing to complete it. Inmates falling into any of the following categories were dismissed and not asked to participate: those whose Beck Depression Inventory scores were less than nine--the cutoff used by Miller and Seligman (1976) and Willis and Blaney (1978), those who would be leaving the Medical Center within the next 2 months and those whose jobs required constant attendance (in that they sometimes involved emergencies). About 10% of the Camp inmates fell into this last category. Inmates were interviewed in the order in which they appeared on the priority-list until 32 subjects were enlisted.

The Beck Depression Inventory Scores were ordered into 16 pairs of closest scores. One inmate from each pair was randomly assigned to the group to receive increasingly difficult problems (high-difficulty group), and the other was assigned to the group which was to be given only simple problems (low-difficulty group).

Data on the subjects' ages, the length of their present sentences, and the time already served on their present sentences also were collected during the selection interviews. The means and standard deviations for these demographic data appear in Table 1. The treatment groups did not differ in

Table 1

Group Means and Standard Deviations for Demographic Data

	Age		Sentence Length		Time Served	
Group	*M*	*SD*	*M*	*SD*	*M*	*SD*
High-difficulty	37.38	9.06	44.06	33.24	12.75	16.26
Low-difficulty	31.56	8.02	47.69	34.54	16.88	12.11

Note: Age data represent years; Sentence Length and Time Served data are in months.

their sentence lengths, $t(30) = .30$, $p > .05$, nor were the means for the time already served significantly different, $t(30) = .81$, $p > .05$. The high-difficulty group was slightly older than the low-difficulty group, $t(30) = 1.92$, $.10 > p > .05$.

Design

Two groups of depressed subjects, matched on the basis of their Beck Depression Inventory Scores, were formed--those who were to receive as therapy increasingly difficult discrimination problems, and those who were to receive as therapy a set of low-difficulty problems. This design differed from that of Klein and Seligman (1976) in that the no-problems control group was excluded. Their study had demonstrated the general utility of exposure to soluble problems as a therapy for helplessness and depression. The present study was focussed on the question of whether gradual increases in soluble-problem difficulty during treatment would provide a more effective therapy for depression.

Materials

Therapy problems and instructions. Soluble Levine-type discrimination problems were administered as therapy for depression. A total of 62 such problems was created--18 problems each at the two- and three-dimensional levels and 6 problems each at dimensional levels four through seven. There were also two practice problems at the two-dimensional level. Each problem of dimensional levels two through four consisted of 10 cards, while those at higher dimensional levels had 15 cards. White index cards, size 10.2 X 15.2 cm., were used. On each card there was a stimulus pattern on the right and one on the left (both on the side facing the subjects). The dimensions comprising the patterns, with values within each dimension appearing in parentheses, were as follows: letter (*X* or *T*), letter size (large or small), line position (a line beneath or above the letter), composition of the line (dashed or solid), extra numeral to the right of the letter (*1* or *2*), number of dots at the top of the pattern (one or two), and total pattern color (red or blue).

A complete description of the first problem presented at the seven-dimensional level appears in Appendix A. Reproductions of the first two cards in that problem appear in Appendix B. See Appendix C for a list of all of the dimensions used in each of the 62 problems, including denotation of the correct pattern feature (dimensional value) for each problem.

If color was not used as a dimension in a problem, then one invariant color was used for both designs on all cards in the packet. Large letters were used in all designs if letter size was not a dimension. If letter was not a dimension, all designs had an *X*, or all had a *T*.

For two-dimensional problems, no values appeared together on the same side of any two consecutive cards. (For example, on a two-dimensional problem, a design on one card might be a red *T*, but the next card would have a blue *T*.) For three- and four-dimensional problems, no values were paired together for more than two consecutive cards. For all higher-dimensional problems, no values were paired together for more than three consecutive cards. These requirements were intended to help subjects eliminate irrelevant values and arrive at a correct solution. The instructions read to all subjects prior to beginning the discrimination problems were:

> I'm going to show you some problems made up of card packets like this one (indicating the first instructional problem). Each card has two designs on it, one on your left, and one on your right. Something in the designs makes one or the other correct for each card. For each card you tell me which side you think is correct--your right or your left. You will have 15 seconds per card. I'll tell you if you are correct or wrong. In this way you can learn what it is that makes one side or the other correct. Soon, you should be able to get each card correct. The correct side can be right or left, depending on each card, but only one thing about the designs determines the correct side.

Then, pointing to the first instructional problem, the researcher continued:

> For instance, here, if red were correct, then you would choose the side with the red design for all the cards in this pack, regardless of the letter. Or, if T were correct, you would choose the side with T,

> regardless of its color. Later, I will ask you what it was that made one side or the other correct for all the cards in this packet, but please wait until I ask to tell me. Okay, let's practice on this pack.

The first instructional problem was then administered, during which time subjects' questions about the procedure were answered. Then, the second instructional problem was presented, prefaced by:

> Now, we have another problem, but you can solve it in the same general way.

During the administration of this second problem, any further questions were answered. After this, the subjects progressed into the main group of two-dimensional problems.

Psychometric measures. The Beck Depression Inventory was administered during the pretreatment subject-selection interviews, and was given again as part of the 10-day posttreatment follow-up. The Digit-Symbol subtest of the WAIS (Wechsler, 1955) was administered at the beginning of the first therapy problems session and as part of the 10-day posttreatement follow-up. Friedman (1964) has shown that depressed persons have difficulty with timed tasks such as this. The Multiple Affect Adjective Check List, Today form, was given during the immediate posttreatment follow-up, and anxiety, depression, and hostility scores were obtained. The Abstract portion of the Shipley Institute of Living

Scale (Shipley, 1940), a timed test composed of logical series to be completed by the subject, was administered during the 10-day posttreatment follow-up.

A 16-item success-failure attribution questionnaire was constructed (Questionnaire 1--see Appendix D). This questionnaire, which was intended to measure the effects of the therapy problems procedure on the perceived causes of behavioral outcomes, was administered during both the immediate posttreatment and the 10-day posttreatment follow-ups. Nine items dealt with successes and seven dealt with failures. Subjects had to choose between an effort or ability (unstable versus stable factor) alternative on each of the sixteen items. The success and failure items were treated as separate scales during data analysis.

Three 11-point mood scales were created to measure current levels of sadness, lack of control, and worries about the future (Questionnaire 2--see Appendix E). These were similar to one used by Klein and Seligman (1976) to measure sadness, except that subjects circled the ratings on paper rather than using a pointer. The mood scales were administered during the immediate posttreatment and 10-day posttreatment follow-ups.

Finally, a list of 20 five-letter anagrams was given as part of the immediate posttreatment follow-up (see Appendix F). This list was the same as was used in the Benson and

Kennelly (1976a) study. As in their study, three measures of performance were recorded on this task: trials to criterion (solution of three consecutive anagrams in 15 seconds or less, with no subsequent failures to solve), number of anagrams failed (100 seconds maximum being allowed per anagram), and average response latency (failed anagrams were assigned a latency of 100 seconds). The same scramble pattern, 3-4-2-5-1, was used for all words (the first letter in the anagram was the third letter of the word, and so on). The trials-to-criterion measure was intended to assess the rapidity with which this pattern was learned. The instructions read to each subject prior to the anagrams task were:

> I'm going to show you some scrambled words. I have scrambled the letters of the words and want you to unscramble them as fast as you can and tell me the words. There might be a pattern that would help you unscramble them more quickly, but if there is one, you will have to figure it out for yourself. Do you have any questions?

Procedure

An outline of the experimental procedure appears in Figures 1 and 2. As described earlier, 32 depressed inmates were identified from Beck Depression Inventory scores and were divided into matched groups on the basis of these scores. Subject selection was completed approximately one week prior to the start of the therapy-problems procedure.

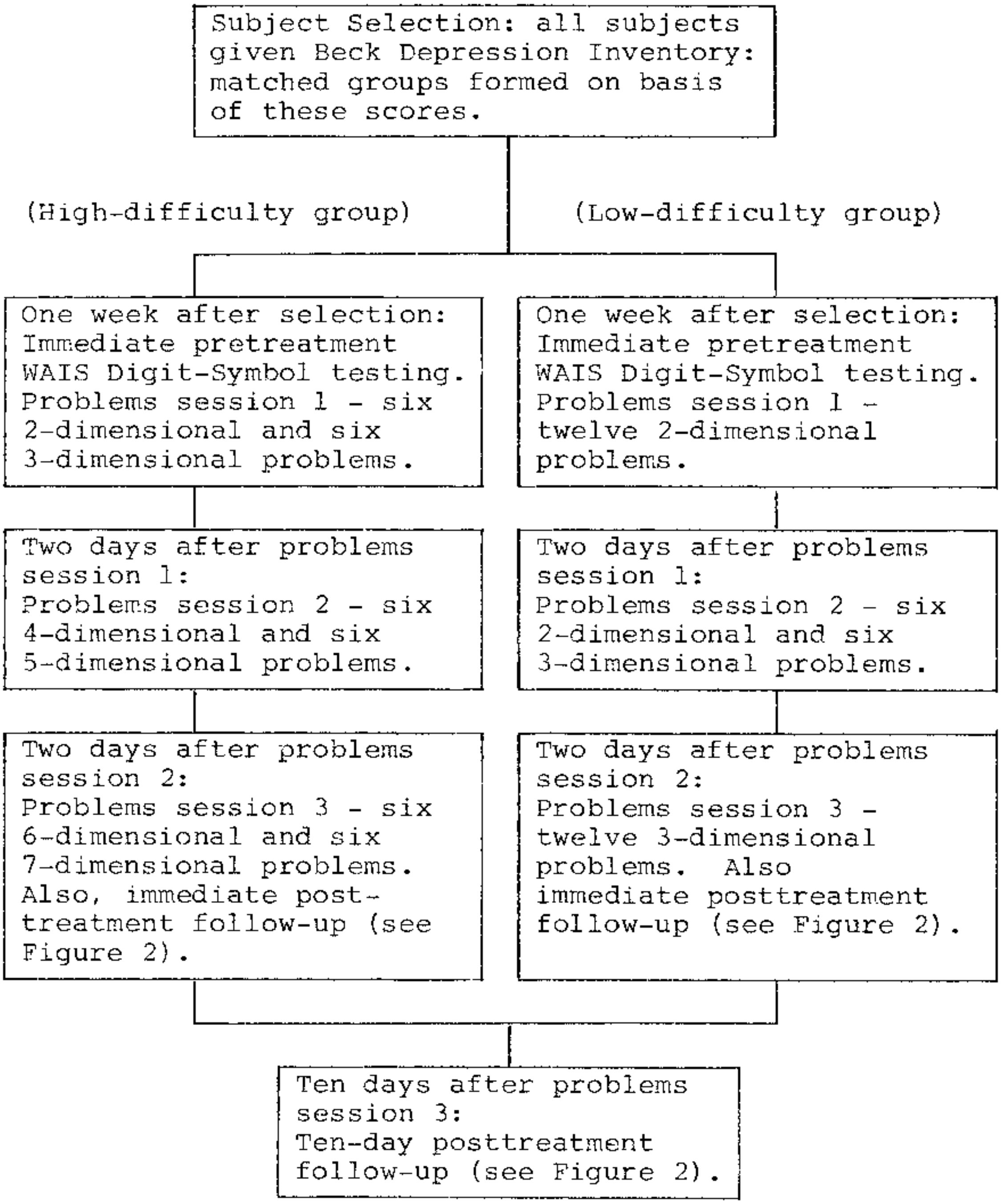


Figure 1. Experimental procedure

Immediate Posttreatment Measures
1. Attribution Questionnaire
2. Mood Scales (sadness, lack of control, worries about future)
3. Multiple Affect Adjective Check List
4. Anagrams
10-Day Posttreatment Follow-up Measures
1. WAIS Digit-Symbol Subtest
2. Shipley Institute of Living Scale, Abstract
3. Beck Depression Inventory
4. Attribution Questionnaire
5. Mood Scales (sadness, lack of control, worries about future)

Figure 2. Posttreatment assessment measures

Administration of the therapy problems required three sessions for each subject, spread out over 5 days on an every-other-day basis. Half of the subjects were given sessions on a Monday-Wednesday-Friday schedule, while the others were seen on Tuesday-Thursday-Saturday. Sixteen subjects were seen each week; therapy was completed for all 32 subjects after two (consecutive) weeks. Eight subjects from each group (high- and low-difficulty) were seen each week, with four from each group each week randomly assigned to the daily schedules (Monday-Wednesday-Friday or Tuesday-Thursday-Saturday, as above). For all subjects, 12 problems were attempted each session, for a total of 36. Subjects in the high-difficulty group attempted six problems from each of two different dimensional levels each session. They began with two- and three-dimensional problems in the first session, attempted four- and five-dimensional problems in the second session, and in the third session worked on six- and seven-dimensional problems. Subjects in the low-difficulty group attempted 12 two-dimensional problems in the first session, 6 two-dimensional and 6 three-dimensional problems in the second session, and 12 three-dimensional problems in the third session.

In the first session, the subject was seated in the researcher's office and was administered the WAIS Digit-Symbol subtest. Next, he received the instructions for the therapy problems and practiced on the two problems provided for that purpose. When a subject indicated that he clearly understood the procedure, he advanced to the main 12 problems for that session.

For each card of every problem, the subject indicated which side he felt was correct. The researcher responded with "correct" or "wrong," depending on the accuracy of the choice. Time allowed per card was 15 seconds, with a warning after 10 seconds had elapsed that only 5 remained.

The maximum number of presentations was twice through each problem (card packet). Subjects who responded correctly to the last five cards of the first presentation were asked to name the correct value (solve the problem).

If a subject did not respond correctly to the last five cards of the first presentation (a restriction used to prevent guessing), or if he failed on his first solution attempt, he was presented the cards again. After the second presentation, all subjects were asked for their solution to the problem, regardless of their accuracy on the individual cards. Only one problem solution attempt was accepted per request.

The immediate posttreatment follow-up data were collected as soon as the last problem of the third session had been attempted. Subjects first completed the attribution questionnaire and the three mood scales dealing with sadness, lack of control, and worries about the future. The Multiple Affect Adjective Check List, Today form, was given next. The anagrams task was given last.

The 10-day posttreatment follow-up was performed 10 days after the third problems session. The WAIS Digit-Symbol subtest and the Shipley Institute of Living Scale, Abstract portion, were administered first. Subjects then completed the Beck Depression Inventory, the attribution scale, and the mood scales. All of the originally selected subjects completed the entire experimental procedure.

Results

Data from measures administered only once were analyzed using t tests for correlated means. Data from measures administered twice were analyzed by means of 2 X 2 (Treatment Groups X Test Administrations) analyses of variance, with repeated measures on the second factor. The analyses were performed in the manner described by Keppel (1973), in which subjects were included as a third factor. Analyses of covariance were performed on data from several of the measures.

Beck Depression Inventory

The scores obtained on this measure from testing during subject selection served as the basic matching variable. The matching procedure resulted in groups very nearly equal on initial Beck scores, $t(15) = 1.02$, $p > .05$. The high-difficulty group evidenced significant reductions between subject selection testing and the 10-day posttreatment follow-up, $t(15) = 3.27$, $p < .01$; the low-difficulty group also demonstrated (marginally) significant reductions, $t(15) = 2.05$, $.10 > p > .05$. The treatment groups did not differ significantly on Beck scores at the 10-day posttreatment follow-up, $t(15) = .16$, $p > .05$. Table 2 contains the means and standard deviations of the Beck Depression Inventory scores from testing during subject selection and during the 10-day posttreatment follow-up.

An analysis of covariance was also performed on the 10-day posttreatment follow-up Beck scores, using the Beck scores obtained during subject selection as the covariate. No significant difference was noted between the adjusted treatment-group means, $F(1,14) = .002$, $p > .05$.

Table 2

Group Means and Standard Deviations of the Beck Depression Inventory Scores

Group	Subject Selection		10-Day Posttreatment	
	M	*SD*	*M*	*SD*
High-difficulty	14.19	5.50	10.94	6.60
Low-difficulty	14.75	7.13	11.25	5.68

Unexpected significant positive correlations were found between the 10-day posttreatment Beck scores and the WAIS Digit-Symbol scores from the immediate pretreatment testing, $r(30) = .48$, $p < .01$ and the 10-day posttreatment testing, $r(30) = .49$, $p < .01$. (See Table 18 of Appendix G for the entire correlation matrix.) Because the Beck and WAIS Digit-Symbol scores both correlated positively with the Multiple Affect Adjective Check List Hostility scores, a partial correlation removing Hostility effects from the other two variables above was performed. It did not succeed in lowering the Beck and Digit-Symbol correlations significantly.

In the 22 days between subject-selection testing and the 10-day posttreatment follow-up, the inmates, of course, moved somewhat closer to the ends of their sentences. To investigate whether this was a factor in reducing Beck scores between testings, a correlation was computed between Beck Depression Inventory change scores and the time remaining on the inmates' sentences. These variables were found to be marginally related, $r(30) = .34$, $.10 > p > .05$. Inmates with more of their sentences remaining had greater Beck score reductions. This finding may be explained by the fact that inmates who had longer sentences, and in most cases more unserved time remaining, had higher subject-selection Beck scores, $r(30) = .48$, $p < .01$, and greater score reductions between testings, $r(30) = .33$, $.10 > p > .05$.

WAIS Digit-Symbol

Means and standard deviations for the WAIS Digit-Symbol scores obtained from the immediate pretreatment testing and the 10-day posttreatment follow-up testing are presented in Table 3. A 2 X 2 (immediate pretreatment testing versus 10-day posttreatment follow-up testing X high- versus low-difficulty groups) analysis of variance was performed, with

Table 3

Group Means and Standard Deviations of the WAIS Digit-Symbol Scores

	Immediate Pretreatment		10-Day Posttreatment	
Group	*M*	*SD*	*M*	*SD*
High-difficulty	50.69	11.49	55.81	11.67
Low-difficulty	47.19	8.38	56.00	9.62

repeated measures on the first factor. The analysis results are presented in Table 4. The Treatment Groups main effect was not significant, $F(1,15) = .25$, $p > .05$. The main effect due to testings, $F(1,15) = 72.08$, $p < .01$, and the interaction, $F(1,15) = 5.09$, $p < .05$, both were significant.

Table 4

Summary of Analysis of Variance of WAIS Digit-Symbol Scores

Source	SS	df	MS	F
A (treatment groups)	43.89	1	43.89	.25
S (subjects)	3887.36	15	259.16	
A X S (error A)	2686.86	15	179.12	
B (testings)	777.01	1	777.01	72.08**
B X S (error B)	161.74	15	10.78	
AB (interaction)	54.38	1	54.39	5.09*
A X B X S (error AB)	160.36	15	10.69	

*$p < .05$.
**$p < .01$.

Further comparisons of the means in the interaction were made using the Tukey (a) technique (Winer, 1971). For both the high- and low-difficulty groups, the 10-day posttreatment follow-up means were significantly greater than the immediate pretreatment means (for both, $p < .01$). There were no significant differences between the high- and low-difficulty group means at either testing.

An analysis of covariance was performed on the 10-day posttreatment Digit-Symbol scores using the immediate pretreatment Digit-Symbol scores as the covariate. The adjusted 10-day posttreatment mean for the high-difficulty group was 54.40, while that of the low-difficulty group was 57.41. The low-difficulty group adjusted mean was marginally greater than that of the high-difficulty group, $\underline{F}(1,14) = 4.52$, $.10 > \underline{p} > .05$.

A correlation was performed between the Digit-Symbol change scores and the time remaining to be served on the inmates' sentences. There was a trend for inmates having more remaining time to show greater Digit-Symbol improvements, $\underline{r}(30) = .31$, $.10 > \underline{p} > .05$. A partial correlation was performed to remove variance related to Beck Depression Inventory change scores from the above two variables. It did not succeed in significantly reducing the relationship between Digit-Symbol change scores and remaining prison time.

Multiple Affect Adjective Check List

Means and standard deviations for Anxiety, Depression, and Hostility scores from the Multiple Affect Adjective Check List appear in Table 5. No significant differences were found between treatment groups for Anxiety, $\underline{t}(15) = 1.33$, $\underline{p} > .05$, or Depression, $\underline{t}(15) = .24$, $\underline{p} > .05$. There was a tendency for the low-difficulty group to have greater Hostility scores, $\underline{t}(15) = 1.77$, $.10 > \underline{p} > .05$.

Anagrams

Means and standard deviations for the anagrams task (administered during the immediate posttreatment follow-up)

Table 5

Group Means and Standard Deviations of the Multiple Affect Adjective Check List Scores

Group	Anxiety		Depression		Hostility	
	M	*SD*	*M*	*SD*	*M*	*SD*
High-difficulty	7.81	2.92	15.88	5.51	8.13	3.74
Low-difficulty	9.44	3.91	15.31	8.40	10.13	3.92

appear in Table 6. Data for the trials-to-criterion measure, the average correct response latency, and the number of anagrams unsolved (failures) are presented. Subjects who never

Table 6

Group Means and Standard Deviations for the Anagrams Task

Group	Trials to Criterion		Latencies		Failures	
	M	*SD*	*M*	*SD*	*M*	*SD*
High-difficulty	14.88	6.75	39.19	30.27	7.13	6.53
Low-difficulty	15.69	5.06	45.09	20.22	6.31	3.90

met the trials-to-criterion requirements were assigned a score of 20 (the number of anagrams in the list). For each anagram, 100 seconds maximum were allowed for solution; if a word was not correctly identified, that 100 seconds was entered as the response latency.

Comparisons between the treatment-group means revealed no significant differences for trials to criterion, $t(15) = .36$, $p > .05$, average response latency, $t(15) = .62$, $p > .05$, or failures to unscramble, $t(15) = .51$, $p > .05$. Analysis of covariance was also performed on these three measures, using subjects' ages as the covariate. No significant differences were noted between the adjusted treatment-group means for trials to criterion, $F(1,14) = .04$, $p > .05$, average response latency, $F(1,14) = .00$, $p > .05$, or failure to unscramble, $F(1,14) = .67$, $p > .05$.

Shipley Institute of Living Scale, Abstract

Means and standard deviations for the Shipley Abstract portion are presented in Table 7. The treatment-group means did not differ significantly, $t(15) = 1.07$, $p > .05$. Analysis of covariance was performed, using the subjects' ages as

Table 7

Group Means and Standard Deviations of the Shipley Abstract Scores

Group	M	SD
High-difficulty	10.63	6.14
Low-difficulty	8.44	4.14

the covariate. No significant difference was noted between the adjusted treatment-group means, $F(1,14) = 1.18$, $p > .05$.

A second analysis of covariance using the immediate pretreatment WAIS Digit-Symbol scores as the covariate also did not result in a significant difference, $F(1,14) = .41$, $p > .05$.

Attribution Questionnaire

The 16-item success-failure attribution scale was administered during the immediate posttreatment follow-up and the 10-day posttreatment follow-up. Nine items dealt with failures and seven with successes; the failure and success items were analyzed as separate scales (see Table 8 for means and standard deviations). Scores on the failure scale represent the number of (lack of) effort alternatives chosen; success scale scores are the number of ability alternatives chosen.

Table 8

Group Means and Standard Deviations for the Attribution Questionnaire

	Failure Scale		Success Scale	
Group	M	SD	M	SD
Immediate Posttreatment				
High-difficulty	7.63	1.59	2.75	1.73
Low-difficulty	7.19	1.33	2.50	1.59
10-Day Posttreatment				
High-difficulty	7.63	1.54	2.50	2.07
Low-difficulty	7.63	1.23	2.88	1.26

Two measures of reliability were computed for the scales. Measures of item-consistency were made by means of four Kuder-Richardson (KR-20) coefficients, one for each scale at each posttreatment follow-up. They were as follows: success scale, immediate posttreatment follow-up, $r = .55$; success scale, 10-day posttreatment follow-up, $r = .57$; failure scale, immediate posttreatment follow-up, $r = .47$; failure scale, 10-day posttreatment follow-up, $r = .45$ (for each, $df = 30$, $p < .01$). Test-retest correlations were also computed: for the success scale, $r(30) = .70$, $p < .01$, and for the failure scale, $r(30) = .72$, $p < .01$.

Comparisons were made by means of 2 X 2 analyses of variance. An examination of Table 9 reveals that there were no significant Treatment Groups or Testing main effects for either scale, nor were there significant interactions.

Subjects who chose more effort alternatives on the failure scale (immediate posttreatment) also showed lower anagram latencies, $r(30) = -.37$, $p < .05$, and fewer anagram failures, $r(30) = -.43$, $p < .05$. The same anagram measures were also correlated with the 10-day posttreatment follow-up failure scale scores--for latencies, $r(30) = -.40$, $p < .05$; for failures to solve, $r(30) = -.46$, $p < .01$. Subjects who on the success scale (10-day posttreatment follow-up) attributed success to ability also scored higher on the Shipley Abstract portion, $r(30) = .38$, $p < .05$, and on the 10-day posttreatment administration of the WAIS Digit-Symbol, *r*(30) = .44, *p* < .05.

Table 9

Summaries of Analyses of Variance for the Attribution Questionnaire

Source	*SS*	*df*	*MS*	*F*
	Failure Scale			
A (treatment groups)	.76	1	.76	.19
S (subjects)	53.73	15	3.58	
A X S (error A)	59.99	15	3.99	
B (testings)	.76	1	.76	2.81
B X S (error B)	3.99	15	.27	
AB (interaction)	.77	1	.77	1.93
A X B X S (error AB)	5.98	15	.40	
	Success Scale			
A (treatment groups)	.07	1	.07	.02
S (subjects)	82.94	15	5.43	
A X S (error A)	63.43	15	4.23	
B (testings)	.07	1	.07	.07
B X S (error B)	14.43	15	.96	
AB (interaction)	1.55	1	1.55	2.35
A X B X S (error AB)	9.55	15	.66	

Mood Scales

The mood scales were administered during the immediate posttreatment follow-up and during the 10-day posttreatment follow-up. Table 10 contains the means and standard deviations of the results from these measures. On the first scale, higher scores reflect greater degrees of sadness. Higher scores on the second scale reflect greater feelings of helplessness or lack of control. On the third scale, higher scores indicate greater doubt about the future.

Table 10

Group Means and Standard Deviations for the Mood Scales

	Sadness		Helplessness		Worry	
Group	M	SD	M	SD	M	SD
	Immediate Posttreatment					
High-difficulty	4.88	2.19	4.00	2.99	3.94	3.15
Low-difficulty	5.50	1.83	4.25	3.32	3.31	1.37
	10-Day Posttreatment					
High-difficulty	4.25	1.53	2.75	1.98	3.00	2.60
Low-difficulty	4.81	1.80	3.38	1.86	3.56	2.50

Comparisons were made by means of three 2 X 2 analyses of variance. An examination of Table 11 reveals that there were no significant Treatment Groups main effects for any of the scales. Similarly, there were no significant changes

Table 11

Summaries of Analyses of Variance for the Mood Scales

Source	*SS*	*df*	*MS*	*F*
	Sadness			
A (treatment groups)	5.64	1	5.64	.94
S (subjects)	74.98	15	5.00	
A X S (error A)	89.61	15	5.97	
B (testings)	6.89	1	6.89	3.41
B X S (error B)	24.36	15	2.02	
AB (interaction)	.01	1	.01	.01
A X B X S (error AB)	16.24	15	1.08	
	Helplessness			
A (treatment groups)	.07	1	.07	.01
S (subjects)	173.44	15	11.56	
A X S (error A)	83.93	15	5.60	
B (testings)	18.07	1	18.07	2.82
B X S (error B)	95.93	15	6.40	
AB (interaction)	.55	1	.55	.15
A X B X S (error AB)	56.45	15	3.76	
	Worry About Future			
A (treatment groups)	.02	1	.02	.00
S (subjects)	118.11	15	7.87	
A X S (error A)	166.23	15	11.08	
B (testings)	1.89	1	1.89	1.07
B X S (error B)	26.36	15	1.76	
AB (interaction)	5.62	1	5.62	1.37
A X B X S (error AB)	61.61	15	4.11	

between testings on any of the scales, although there was a trend toward sadness reductions, $F(1,15) = 3.41$, $.10 > p > .05$. The interactions were not significant.

Subjects claiming to have less control (immediate post-treatment) had higher Beck Depression Inventory scores (10-day posttreatment), $r(30) = .40$, $p < .05$. They also scored higher on all scales of the Multiple Affect Adjective Check List (for Anxiety, $r = .47$, $p < .01$; for Depression, $r = .53$, $p < .01$; for Hostility, $r = .41$, $p < .05$). Similar relationships were found between lack of control (10-day posttreatment) and Multiple Affect Adjective Check List scores (for Anxiety, $r = .53$, $p < .01$; for Depression, $r = .61$, $p < .01$; for Hostility, $r = .51$, $p < .01$).

Therapy Problem Failures

Table 12 contains the means and standard deviations for failures on the therapy problems. The success rate on the problems was high for both groups, 87% and 96.7%, respectively, for the high- and low-difficulty groups. The difference between the mean number of failures was still significant, however, $t(15) = 3.18$, $p < .01$.

For further evaluative purposes, the high-difficulty group (only) was split at the median based on the number of discrimination problems failed. The low-failure subgroup failed an average of 1.50 problems (standard deviation = 1.12), while the high-failure subgroup averaged 8.00 failures

Table 12

Group Means and Standard Deviations
for Therapy Problem Failures

Dimension Level	Low-Difficulty Group		High-Difficulty Group	
	$\underline{M}$	$\underline{SD}$	$\underline{M}$	$\underline{SD}$
2	.25	.44	.19	.53
3	.94	1.14	.50	.62
4			1.00	1.00
5			.88	.99
6			1.06	1.09
7			1.06	.96
Total	1.19	2.03	4.69	3.93

(standard deviation = 3.04). Eight subjects were in each subgroup.

An analysis of the trials-to-criterion measure on the anagrams task showed that the low-failure subgroup required fewer trials to learn the scramble pattern than did the high-failure subgroup, $\underline{t}(14) = 4.66$, $\underline{p} < .01$. They also had better performances on the Shipley Abstract portion, $\underline{t}(14) = 4.58$, $\underline{p} < .01$. Means and standard deviations used in these analyses appear in Table 13.

WAIS Digit-Symbol and Beck Depression Inventory scores were analyzed by means of 2 X 2 (high- versus low-failure subgroups X testings) analyses of variance, with repeated

Table 13

Means and Standard Deviations of the Anagrams Criterion and Shipley Scores for High- and Low-Failure Subgroups of the High-Difficulty Group

	Anagrams Criterion		Shipley Abstract	
Subgroup	*M*	*SD*	*M*	*SD*
Low-failure	9.75	6.22	15.25	2.59
High-failure	20.00	0.00	5.00	5.10

measures on the second factor. Means and standard deviation used in the Digit-Symbol analysis appear in Table 14.

Table 14

Means and Standard Deviations of the WAIS Digit-Symbol Scores for the High- and Low-Failure Subgroups of the High-Difficulty Group

	Immediate Pretreatment		10-Day Posttreatment	
Subgroup	*M*	*SD*	*M*	*SD*
Low-failure	58.25	6.55	62.25	8.10
High-failure	43.13	10.34	49.38	11.12

The low-failure subgroup had better WAIS Digit-Symbol performances than the high-failure subgroup, $F(1,14) = 8.74$, $p > .05$. Scores also increased between the immediate pretreatment testing and the 10-day posttreatment follow-up, $F(1,14) = 14.60$, $p < .01$. The interaction did not reach significance, $F(1,14) = .71$, $p > .05$. (See Table 15 for the summary of this analysis.)

Table 15

Summary of Analysis of Variance of WAIS Digit-Symbol Scores for the High- and Low-Failure Subgroups of the High-Difficulty Group

Source	*SS*	*df*	*MS*	*F*
Between subjects	4081.00	15		
A(failure subgroups)	1568.00	1	1568.00	8.74*
Subjects within groups	2513.00	14	179.50	
Within subjects	421.00	16		
B (testings)	210.00	1	210.00	14.60**
AB (interaction)	10.25	1	10.25	.71
B X Subjects within groups	200.75	14	14.38	

$^{*}p < .05$.
$^{**}p < .01$.

Means and standard deviations used in the analysis of variance of the Beck Depression Inventory scores appear in Table 16. The high- and low-failure subgroups did not differ

Table 16

Means and Standard Deviations of the Beck Depression Inventory Scores for the High- and Low-Failure Subgroups of the High-Difficulty Group

	Subject Selection Testing		10-Day Posttreatment	
Subgroup	*M*	*SD*	*M*	*SD*
Low-failure	15.38	6.63	13.63	7.45
High-failure	13.00	3.16	8.25	4.15

significantly in their Beck scores, $F(1,14) = 1.80$, $p > .05$. Scores decreased between the testing during subject selection and the 10-day posttreatment follow-up, $F(1,14) = 14.88$, $p < .01$. The interaction was not significant, $F(1,14) = 3.17$, $p > .05$. See Table 17 for the results of this analysis.

Table 17

Summary of Analysis of Variance of the Beck Depression Inventory Scores for the High- and Low-Failure Subgroups of the High-Difficulty Group

Source	SS	df	MS	F
Between subjects	1053.87	15		
A (failure subgroups)	120.12	1	120.12	1.80
Subjects within groups	933.75	14	66.70	
Within subjects	182.00	16		
B (testings)	84.50	1	84.50	14.88*
AB (interaction)	18.00	1	18.00	3.17
B X Subjects within groups	79.50	14	5.64	

*$p < .01$.

Discussion

For the most part, the data offer little support of the major hypotheses. The high-difficulty group did not evidence greater reduction of depression, as measured by the Beck Depression Inventory, than did the low-difficulty group. There were no significant differences between the treatment groups on Multiple Affect Adjective Check List Depression scores. The high- and low-difficulty groups did not significantly differ on the mood scale measures of sadness, lack of control, or doubts about the future at either the immediate posttreatment or 10-day posttreatment follow-ups.

Beck Depression Inventory scores for both groups dropped significantly between subject selection and the 10-day posttreatment follow-up. As mentioned earlier, this study was intended as a refinement of earlier therapy analog studies which had already shown that exposure to soluble problems was an effective method of reducing depression. A no-problems control group was not utilized in the present study for this reason and because of the difficulty in obtaining subjects who met the depression criterion for inclusion.

It is possible that the therapy-problems procedure was responsible for the depression reductions. If this is so, it appears that subjects experiencing higher, more extreme degrees of depression were the most beneficially affected. Subjects who had higher Beck scores at the subject-selection testing showed greater reductions when tested again during the 10-day posttreatment follow-up. Another possibility is that the therapy procedure interacted with sentence length to produce greater reductions in depression for those inmates facing longer incarcerations. Inmates with longer sentences had higher Beck scores at subject selection and evidenced greater score reductions between testings.

It is unlikely that events in normal institutional life would act to bring about depression reductions. The unpleasantness of incarceration and the continuity of an established routine would be far more likely to maintain mood levels or produce even greater maladjustment. Nonetheless, in the absence of a no-problems control group, it still must be considered a possibility that the Beck Depression Inventory score reductions are a regression to the mean effect.

WAIS Digit-Symbol scores for both treatment groups improved significantly between the immediate pretreatment testing and the 10-day posttreatment follow-up. Neither group improved more significantly than the other. The analysis of covariance performed on the 10-day posttreatment scores (using the immediate pretreatment scores as covariate) did show marginally greater gains between testings for the low-difficulty group. This result is very likely an effect of regression to the mean. The low-difficulty group had somewhat (but not significantly) smaller immediate pretreatment scores.

The absence of a no-problems control group makes it impossible to specify the cause of the Digit-Symbol improvements on the part of both groups. These improvements may be a result of exposure to soluble problems, or they, too, may simply be an effect of regression to the mean.

Exposure to more difficult problems also did not result in better performances on the other measures of cognitive ability. The high- and low-difficulty groups did not differ significantly on the three anagrams measures or the Shipley Abstract portion.

The high-difficulty group did fail more of the therapy problems than the low-difficulty group, but this factor does not appear to have contributed to the absence of the hypothesized results. The high-failure subgroup of the high-difficulty group was not found to have had higher depression scores than the low-failure subgroup. Thus, it seems that failure rate and depression were not related in this study. Possibly, this is due to the fact that the high- and low-difficulty groups both succeeded on most of the discrimination problems administered to them. Benson and Kennelly (1976a) found that success on all of their soluble problems was not a prerequisite for induced competence. That the low-failure subgroup also performed better than the high-failure subgroup on measures of cognitive ability is not surprising, since the discrimination problems themselves are a cognitive task. Those relationships most likely stem from the fact that similar abilities are required for success in each case.

Subjects who on the attribution questionnaire attributed failures to lack of effort (unstable factor) performed better on measures of cognitive abilities than those who attributed failures to lack of ability (stable factor). Also, subjects who attributed success to ability performed better on cognitive tasks than those who attributed success to effort. These results support the theoretical positions of Abramson et al. (1978) and Weiner (1974), who claim that attributions of success to unstable factors and attributions of failures to stable factors lead to depression, helplessness, and lower achievement.

Exposure to more difficult problems on the part of the high-difficulty group did not produce success-failure attributions different from those made by the low-difficulty group. This may explain why the treatment groups did not differ in level of depression. The revised learned helplessness theory of depression places emphasis on outcome attributions as an important etiological factor. Because the treatment groups made similar outcome attributions, it might be expected that they would evidence similar degrees of depression.

Perceived lack of control was positively related to depression; this finding supports learned helplessness theory. Similarly, the finding that perceived lack of control and anxiety are positively related supports the theoretical position of Seligman (1975). He claimed that anxiety stems from unpredictability of aversive stimulation, and that uncontrollability and unpredictability often occur together.

The positive correlations between the WAIS Digit-Symbol and Beck Depression Inventory scores are surprising, considering the research of Friedman (1964) and others, who have shown that depressed individuals usually score lower than normals on timed performance tests. The present anomalous results may stem from the uniqueness of the subjects' situation in this study. Incarceration, in which an inmate is powerless to control events most important to him, would qualify as an uncontrollable aversive experience.

If this experience affects brighter individuals to a greater degree than the not-so-bright, then this relation is understandable. The brighter, more able individuals, as measured by the WAIS Digit-Symbol subtest, probably were more depressed by their incarceration. Similar differential effects of uncontrollability were found in a study by Benson and Kennelly (1976b). Internal (locus of control of reinforcement) subjects given insoluble problems in pretreatment later showed performance deficits on an anagrams task relative to internals given soluble or no problems in pretreatment. Externals given soluble problems performed better on the anagrams than externals given insoluble or no problems. That is, there was an interaction between internal-external locus of control and controllability-uncontrollability.

The results of the present study contain a number of implications for further research in this area. Long-term follow-ups should be included in therapy or therapy-analog studies to measure the effects of the experimental procedure across time. The results of the present study suggest that reductions in depression resulting from exposure to soluble problems may continue beyond the point of immediate post-treatment assessment. The inclusion of a no-problems control group in future studies would be helpful in determining whether depression reductions are due to experimental procedures or to other factors influencing the subjects.

Even in light of the present findings, if long-term effects are desired, careful attention still must be given to the selection of problem difficulty levels. Results from some laboratory studies (Jones, Nation, & Massad, 1977; Kennelly, Crawford, Waid, & Rahaim, submitted for publication, 1979; Nation & Massad, 1978) indicate that partial reinforcement procedures better immunize subjects against helplessness than do those involving continuous reinforcement. Thus, problems should be difficult enough so as to produce at least occasional failures on individual problem trials or on a few overall problem solution attempts. Yet, they must not be so difficult that subjects cannot eventually succeed. The main immunizing effect appears to be that persons learn to exert effort in the face of at least occasional failures. Learning this during therapy procedures should better prepare a person for naturally occurring uncontrollability, and result in longer lasting ameliorative effects.

Subjects and experimental settings need to be varied so as to acquire knowledge about the effectiveness of this therapy for differing populations. Institutional settings in particular provide the opportunity to study effects of long-term uncontrollable aversive experiences. Care must be taken to understand background institutional factors which may confound experimental results. The inclusion of a no-problems control group, as mentioned above, would be helpful in this regard.

As in the present study, a variety of assessment measures should be employed. This allows for investigation of performance changes on measures of cognitive ability, while still providing attention to affective changes. Further investigations of success-failure attributions are needed. It would be interesting to note changes in these attributions when individuals are exposed to long-term uncontrollability. Scales devised in the future for such purposes might be constructed not only to measure attributions along the stable-unstable continuum, but also global versus specific and internal versus external causal ascriptions.

Appendix A

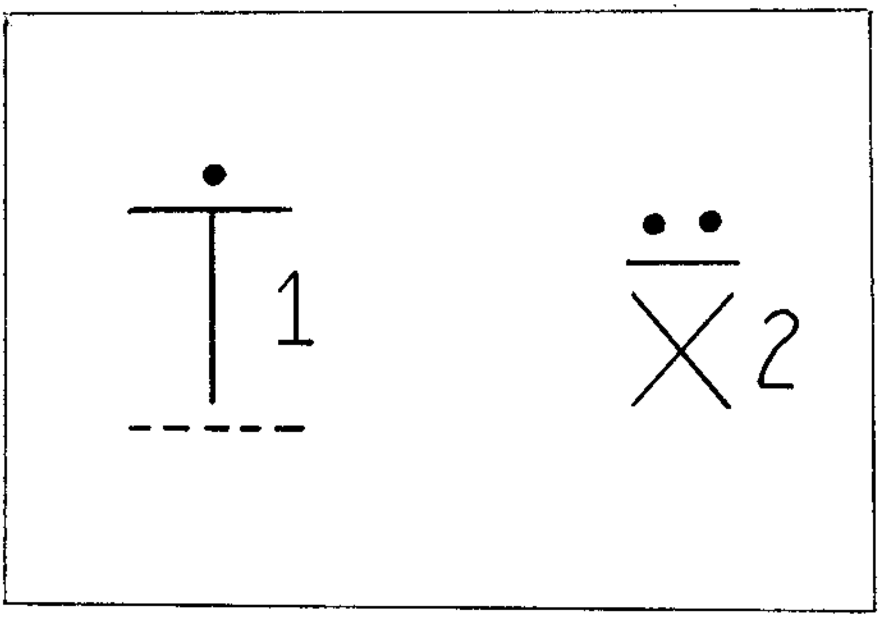
Description of Cards in First Seven-Dimensional Problem

Card	Left Side	Right Side
1	Large T, one dot, dashed underline, numeral 1, red pattern color.	Blue, small X, solid overline, two dots, numeral 2.
2	Blue, large T, solid overline, one dot, numeral 2	Red, small S, dashed underline, two dots, numeral 1.
3	Red, large X, solid underline, two dots, numeral 2.	Blue, small T, dashed overline, one dot, numeral 1.
4	Red, small X, dashed underline, one dot, numeral 1.	Blue, large T, solid overline, two dots, numeral 2.
5	Blue, small X, solid underline, one dot, numeral 2	Red,large T, dashed overline, two dots, numeral 1.
6	Blue, small X, dashed underline, two dots, numeral 1	Red, large T, solid overline, one dot, numeral 2.
7	Red, small T, solid underline, two dots, numeral 1.	Blue, large X, dashed underline, one dot, numeral 2.
8	Blue, large X, solid overline, one dot, numeral 2.	Red, small T, dashed underline, two dots, numeral 1.
9	Red, large X, dashed underline, one dot, numeral 1.	Blue, small T, solid overline, two dots, numeral 2.
10	Red, small X, dashed overline, two dots, numeral 1.	Blue, large T, solid underline, one dot, numeral 2.

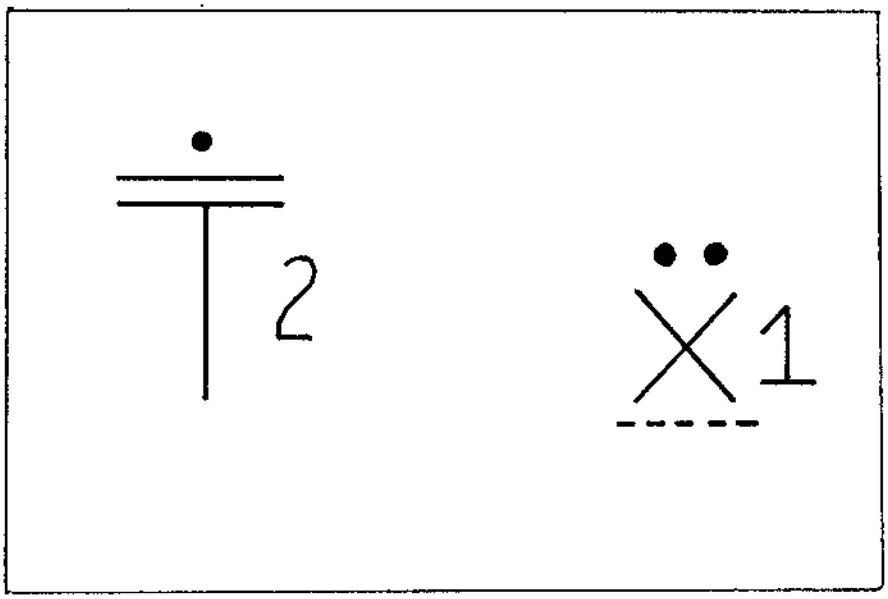
Card	Left Side	Right Side
11	Red, small T, solid underline, two dots, numeral 2.	Blue, large X, dashed overline, one dot, numeral 1.
12	Blue, large T, dashed overline, two dots, numeral 1.	Red, small X, solid underline, one dot, numeral 2.
13	Blue, large X, dashed underline, one dot, numeral 2.	Red, small T, solid overline, two dots, numeral 1.
14	Blue, large X, solid underline, two dots, numeral 1.	Red, small T, dashed overline, one dot, numeral 2.
15	Red, small X, dashed overline, one dot, numeral 1.	Blue, large T, solid underline, two dots, numeral 2.

Appendix B

Cards 1 and 2 from the first seven-dimensional therapy problem are reproduced below at three-fourths of their actual size. Actual cards were 10.2 x 15.2 cm.



Card 1



Card 2

Appendix C

Dimensions Appearing in Discrimination Problems

The list below presents the dimensions used in creating the 62 discrimination problems. Problem numbers appear to the left. The first six two- and three-dimensional problems listed were given to both the high- and low-difficulty groups. The correct design features appear in parentheses after each description.

Two-Dimensional Problems

Instructional problems:

a. Letter, color (red).

b. Numeral, color (blue).

1. Letter, letter size (small letter).

2. Letter, numeral (numeral 1).

3. Line dashed or solid, line position (solid line).

4. Letter, number of dots (one dot).

5. Color, line dashed or solid (solid line).

6. Letter, line position (line above).

7. Color, letter size (large letter).

8. Color, number of dots (two dots).

9. Line position, number of dots (line below).

10. Numeral, number of dots (numeral 2).

11. Numeral, line position (line above).

12. Line dashed or solid, number of dots (dashed line).

13. Line position, letter size (large letter).

14. Number of dots, line dashed or solid (two dots).

15. Numeral, line dashed or solid (numeral 1).

16. Letter size, line dashed or solid (small letter).

17. Number of dots, letter size (one dot).

18. Numeral, letter size (large letter).

Three-Dimensional Problems

1. Letter, line dashed or solid, number of dots (dashed line).

2. Color, letter, number of dots (blue).

3. Letter, letter size, line position (letter X).

4. Numeral, color, line position (numeral 2).

5. Color, letter, letter size (small letter).

6. Letter, line position, numeral (line below).

7. Letter, line dashed or solid, line position (line above).

8. Number of dots, numeral, color (red).

9. Color, letter, line position (letter T).

10. Letter, numeral, line dashed or solid (solid line).

11. Letter size, color, number of dots (one dot).

12. Letter, numeral, letter size (small letter).

13. Line position, number of dots, color (line above).

14. Line dashed or solid, number of dots, color (blue).

15. Number of dots, numeral, line position (numeral 1).

16. Color, letter size, numeral (large letter).

17. Number of dots, numeral, letter (two dots).

18. Color, line dashed or solid, line position (line below).

Four-Dimensional Problems

1. Letter, color, number of dots, numeral (one dot).

2. Letter, color, line position, number of dots (letter X).

3. Letter, color, line dashed or solid, numeral (solid line).

4. Letter, letter size, line dashed or solid, number of dots (one dot).

5. Letter, color, line position, numeral (line below).

6. Letter, letter size, color, line position (letter T).

Five-Dimensional Problems

1. Letter, color, line dashed or solid, line position, number of dots (blue).

2. Letter, letter size, color, line dashed or solid, line position (line above).

3. Letter, letter size, color, line dashed or solid, number of dots (letter T).

4. Letter, letter size, line dashed or solid, line position, numeral (small letter).

5. Letter, letter size, color, line dashed or solid, line position (dashed line).

6. Letter, line dashed or solid, line position, number of dots, numeral (letter X).

Six-Dimensional Problems

1. Letter, letter size, color, number of dots, line position, numeral (letter X).

2. Letter, letter size, line dashed or solid, number of dots, color, line position (solid line).

3. Letter, letter size, line dashed or solid, number of dots, line position, numeral (line below).

4. Letter, letter size, color, line dashed or solid, line position, numeral (numeral 2).

5. Letter, letter size, line dashed or solid, line position, number of dots, numeral (large letter).

6. Letter, color, letter size, line dashed or solid, number of dots, line position (dashed line).

Seven-Dimensional Problems

Each of the seven-dimensional problems featured the entire array of design variations. The correct features for each problem at this level are listed below.

1. One dot

2. Red

3. Line above

4. Two dots

5. Dashed line

6. Line above

Appendix D

Questionnaire 1

For each item below, circle either letter _a_ or letter _b_, depending on which choice completes the sentence most truthfully for you.

1. When I make a mistake, it's usually because

    a. I don't think things through well enough, or
    b. I'm not very wise when it comes to making decisions.

2. When I have trouble understanding what I read in magazines, it's usually because

    a. I don't pay enough attention to what I'm reading, or
    b. I'm just not a very good reader.

3. Usually when I don't know how to do something, it's because

    a. I'm just not a very intelligent person, or
    b. I don't try hard enough to learn.

4. I still have some bad habits, because

    a. I don't try hard enough to give them up, or
    b. I don't have much self-control.

5. When I don't have enough money, it's usually because

    a. I don't have what it takes to earn a lot, or
    b. I wasn't very careful with the money I had.

6. My friends like me because

    a. I am a friendly person, or
    b. I try hard to get along with them.

7. When I am able to hold a job, it's because

    a. I am a pretty dependable person, or
    b. I try hard to do what is expected of me.

8. I'm in prison now because

   a. I am a criminal, or
   b. I didn't try hard enough to obey the law.

9. Most of my health problems are due to

   a. My basic body structure, or
   b. My not taking care of myself.

10. When people say good things about me, it's usually because

   a. I try hard to please others, or
   b. I am a likeable guy.

11. When I reach goals I set for myself, it's usually because

   a. I have quite a bit of talent, or
   b. I work hard to get what I want.

12. When I did well in school, it was usually because

   a. I'm a pretty bright person, or
   b. I worked hard at my studies.

13. At times I'm not sure about my future, because

   a. I haven't tried hard enough to make good plans, or
   b. A person like me just can't plan things ahead of time.

14. I sometimes get into trouble because

   a. I don't try hard enough to control myself, or
   b. I am just a bad person at heart.

15. When I have been able to form good friendships with women, it's usually been because

   a. I'm just the kind of guy they seem to like, or
   b. I have tried very hard to be friendly.

16. When I am able to control my temper, it's because

   a. I am a calm person, or
   b. I try to keep from getting angry.

Appendix E

Questionnaire 2

For each item below, circle one number only to show how you are feeling _right now_.

Example

How comfortable do you feel today? Very comfortable 0 1 2 3 4 5 6 7 8 9 10 Very uncomfortable. If you feel comfortable, you would have circled one of the lower numbers. Or, if you were uncomfortable, you would have circled one of the higher numbers. The more uncomfortable you were, the higher the number you would have circled.

Now do the same for these questions:

1. How happy are you?

Very happy 0 1 2 3 4 5 6 7 8 9 10 Very sad

2. Do you feel like you can do anything to improve your situation?

Yes, very much so 0 1 2 3 4 5 6 7 8 9 10 No, not at all

3. How do you feel about your future?

Very good 0 1 2 3 4 5 6 7 8 9 10 Much doubt, worried

Appendix F

Anagrams List and Solutions

1. BLOEN (NOBLE)
2. ULATF (FAULT)
3. INRKD (DRINK)
4. RSUTB (BURST)
5. BOARL (LABOR)
6. DGUEJ (JUDGE)
7. DENXI (INDEX)
8. NAALC (CANAL)
9. EMNYE (ENEMY)
10. NDAYD (DANDY)
11. ARUDG (GUARD)
12. NCAYF (FANCY)
13. NSEED (DENSE)
14. TCAHH (HATCH)
15. AVRYG (GRAVY)
16. VEERF (FEVER)
17. ECLTE (ELECT)
18. NDAYH (HANDY)
19. ASREE (ERASE)
20. BIATH (HABIT)

Appendix G

Pearson Correlations

For easier reference to the table below, the variables have been assigned numbers. The definitions below correspond to higher scores on each measure. Variable numbers which appear in Table 18 are to the left in the following list.

1. WAIS Digit-Symbol, immediate pretreatment testing.
2. Beck Depression Inventory, subject selection testing.
3. Anxiety scale, Multiple Affect Adjective Check List.
4. Depression scale, Multiple Affect Adjective Check List.
5. Hostility scale, Multiple Affect Adjective Check List.
6. Sadness (mood scale), immediate posttreatment follow-up testing.
7. Lack of control (mood scale), immediate posttreatment follow-up testing.
8. Worries about the future (mood scale), immediate posttreatment follow-up testing.
9. Sadness (mood scale), 10-day posttreatment follow-up testing.
10. Lack of control (mood scale), 10-day posttreatment follow-up testing.
11. Worries about the future (mood scale), 10-day post-treatment follow-up testing.
12. Attribution of failure to lack of effort (attribution questionnaire), immediate posttreatment follow-up testing.
13. Attribution of success to ability (attribution questionnaire), immediate posttreatment follow-up testing.
14. Attribution of failure to lack of effort (attribution questionnaire), 10-day posttreatment follow-up testing.
15. Attribution of success to ability (attribution questionnaire), 10-day posttreatment follow-up testing.
16. Anagrams trials-to-criterion measure.
17. Anagrams average correct response latencies.
18. Anagrams failures to unscramble.
19. WAIS Digit-Symbol, 10-day posttreatment follow-up testing.
20. Beck Depression Inventory, 10-day posttreatment follow-up testing.
21. Shipley Institute of Living Scale, Abstract portion.
22. Age of subjects.
23. Time already served on current conviction.
24. WAIS Digit-Symbol change (improvement) scores.
25. Beck Depression Inventory change (reduction) scores.
26. Length of sentence on current conviction.

Table 18

Correlation Matrix

Vari-able	1	2	3	4	5	6	7	8	9	10	11	12	13
1	1.00												
2	.13	1.00											
3	.21	.24	1.00										
4	.26	.12	.82**	1.00									
5	.34	.25	.74**	.74**	1.00								
6	.45*	.11	.55**	.62**	.58**	1.00							
7	.43*	.20	.47**	.53**	.41**	.47**	1.00						
8	.14	.29	.40*	.50**	.48**	.27	.63**	1.00					
9	.16	-.03	.53**	.61**	.51**	.63**	.52**	.30	1.00				
10	.10	-.06	.31	.23	.33	.03	.29	.26	.27	1.00			
11	-.08	.24	.28	.16	.34	-.15	.22	.54**	.11	.59**	1.00		
12	.15	-.15	.13	.20	.11	-.07	-.18	-.07	.13	-.01	-.03	1.00	
13	.29	.06	.08	.12	.10	.00	.17	-.02	.02	-.01	-.17	.16	1.00
14	.09	-.19	.22	.18	.22	.03	-.21	-.09	.15	-.08	.06	.83**	.01
15	.31	.31	.09	.13	.27	.33	.23	-.01	-.01	-.03	-.21	-.18	.70**
16	-.36*	.27	-.02	.04	-.02	.06	-.19	.12	.10	-.06	-.03	-.25	-.20
17	-.60**	.00	-.17	-.12	-.23	-.22	-.27	-.04	-.06	-.15	-.12	-.37*	-.33
18	-.55**	.01	-.19	-.12	-.26	-.23	-.22	-.06	-.11	-.20	-.19	-.43*	-.29
19	.89**	.22	.24	.26	.38*	.40*	.48**	.21	.14	.21	-.04	.06	.35
20	.48**	.60**	.27	.30	.43*	.41*	.40*	.23	.25	-.04	-.06	-.11	.17
21	.64**	.06	.14	.20	.38*	.30	.19	-.07	-.01	.07	.10	.14	.28
22	-.35	-.11	-.04	.06	-.34	-.26	-.18	-.01	-.17	-.11	-.14	.05	.15
23	.18	.03	.10	.08	.11	.17	.15	.02	-.18	.00	.09	-.18	.32
24	-.14	.20	.09	.02	.13	-.06	.15	.16	-.03	.25	.10	-.20	.16
25	-.38*	.45*	-.03	-.20	-.21	-.34	-.22	.07	-.31	-.03	.33	-.04	-.11
26	.14	.48**	.17	.08	.18	.14	.13	.11	-.13	.12	.25	-.21	.20

Table 18--Continued

Vari- able	14	15	16	17	18	19	20	21	22	23	24	25	26
14	1.00												
15	-.20	1.00											
16	-.29	-.01	1.00										
17	-.40*	-.21	.80**	1.00									
18	-.46**	-.16	.71**	.97**	1.00								
19	-.10	.44*	-.28	-.52**	-.50**	1.00							
20	-.20	.36*	.19	-.04	-.03	.49**	1.00						
21	.29	.38*	-.55**	-.69	-.63**	.50**	.19	1.00					
22	-.07	-.10	.07	.27	.29	-.40*	-.10	-.17	1.00				
23	-.07	.27	-.34	-.32	-.29	.18	-.03	.21	.02	1.00			
24	-.41*	.32	.14	.11	.07	.32	.08	-.25	-.15	.01	1.00		
25	-.01	-.06	.09	.05	.04	-.31	-.44*	-.15	-.01	.07	.14	1.00	
26	-.14	.34	.29	-.36*	-.33	.25	.20	.25	-.09	.62**	.24	.33	1.00

*$p < .05$.
**$p < .01$.

References

Abramson, L., Seligman, M., & Teasdale, J. Learned helplessness: Critique and reformulation. Journal of Abnormal Psychology, 1978, 87(1), 49-74.

Beck, A. Depression. Philadelphia: University of Philadelphia Press, 1967.

Beck, A. Cognitive therapy: Nature and relation to behavior therapy. Behavior Therapy, 1970, 1, 184-200.

Beck, A. Cognition, affect, and psychopathology. Archives of General Psychiatry, 1971, 24, 495-500.

Benson, J., & Kennelly, K. Learned helplessness: The result of uncontrollable reinforcements or uncontrollable aversive stimuli? Journal of Personality and Social Psychology, 1976, 34(1), 138-145. (a)

Benson, J., & Kennelly, K. A re-examination of the relationship between locus of control and learned helplessness. Paper presented at the annual meeting of the Southwestern Psychological Association, 1976. (b)

Buchwald, A., Coyne, J., & Cole, C. A critical evaluation of the learned helplessness model of depression. Journal of Abnormal Psychology, 1978, 87(1), 180-193.

Burgess, E. The modification of depressive behaviors. In R. D. Rubin and C. M. Franks (Eds.), Advances in behavior therapy. New York: Academic Press, 1968, 193-199.

Dweck, C. The role of expectations and attributions in the alleviation of learned helplessness. Journal of Personality and Social Psychology, 1975, 31(4), 674-675.

Friedman, A. Minimal effects of severe depression on cognitive functioning. Journal of Abnormal and Social Psychology, 1964, 69, 237-243.

Hiroto, D. Learned helplessness and locus of control. Journal of Experimental Psychology, 1974, 102, 187-193.

Hiroto, D., & Seligman, M. Generality of learned helplessness in man. Journal of Personality and Social Psychology, 1975, 31(2), 311-327.

Jones, S., Nation, J., & Massad, P. Immunization against learned helplessness in man. Journal of Abnormal Psychology, 1977, 86(1), 75-83.

Kennelly, K., Crawford, D., Waid, L., & Rahaim, S. Partial reinforcement immunizes against helplessness-induced short-term memory deficits. Submitted for publication, 1979.

Keppel, G. Design and analysis: A researcher's handbook. Englewood Cliffs, New Jersey: Prentice-Hall, 1973.

Klein, D., & Seligman, M., Reversal of performance deficits and perceptual deficits in learned helplessness and depression. Journal of Abnormal Psychology, 1976, 85(1), 11-26.

Langer, E., & Rodin, J. The effects of choice and enhanced personal responsibility for the aged: A field experiment in an institutional setting. Journal of Personality and Social Psychology, 1976, 34(2), 191-198.

Levine, M. Hypothesis theory and nonlearning despite ideal S-R reinforcement contingencies. Psychological Review, 1971, 78, 130-140.

Melges, J., & Bowlby, J. Types of helplessness in psychopathological process. Archives of General Psychiatry, 1969, 20, 690-699.

Meyer, W. Selvstverantwortlichkeit und leistungsmotivation. Unpublished doctoral dissertation, Ruhr University, Bochum, Germany, 1970.

Miller, W., & Seligman, M. Learned helplessness and the perception of reinforcement. Behavior Research and Therapy, 1976, 14, 7-17.

Nation, J., & Massad, P. Persistence training: A partial reinforcement procedure for reversing learned helplessness and depression. Journal of Experimental Psychology: General, 1978, 107(4), 436-451.

Price, K., Tryon, W., & Raps, C. Learned helplessness in a clinical population: A test of two behavioral hypotheses. Journal of Abnormal Psychology, 1978, 87(1), 113-121.

Overmier, J., & Seligman, M. Effects of inescapable shock upon subsequent escape and avoidance learning. Journal of Comparative and Physiological Psychology, 1967, 63, 23-33.

Rizley, R. Depression and distortion in the attribution of causality. _Journal of Abnormal Psychology_, 1978, _87_(1), 32-48.

Rodin, J., & Langer, E. Long-term effects of a control relevant intervention with the institutionalized aged. _Journal of Personality and Social Psychology_, 1977, _35_(2), 897-902.

Roth, S., & Bootzin, R. Effects of experimentally induced expectancies of external control: An investigation of learned helplessness. _Journal of Personality and Social Psychology_, 1974, _29_(2), 253-264.

Schulz, R. Effects of control and predictability on the physical and psychological well-being of the institutionalized aged. _Journal of Personality and Social Psychology_, 1976, _33_(5), 563-573.

Seligman, M. Learned helplessness. _Annual Review of Medicine_, 1972, _23_, 407-412.

Seligman, M. _Helplessness_. San Francisco: W. H. Freeman, 1975.

Seligman, M., Klein, D., & Miller, W. Depression. In H. Leitenberg (Ed.), _Handbook of behavior modification and behavior therapy_. Englewood Cliffs, New Jersey: Prentice-Hall, 1976, 168-210.

Seligman, M., & Miller, W. Depression and learned helplessness in man. _Journal of Abnormal Psychology_, 1975, _84_(3) 228-238.

Shipley, W. A self-administering scale for measuring intellectual impairment and deterioration. Journal of Psychology, 1940, 9, 371-377.

Thornton, J., & Jacobs, P. Learned helplessness in human subjects. Journal of Experimental Psychology, 1971, 87, 369-372.

Wechsler, D. Manual for the Wechsler Adult Intelligence Scale. New York: The Psychological Corporation, 1955.

Weiner, B. Achievement motivation and attribution theory. Morristown, New Jersey: General Learning Press, 1974.

Willis, M., & Blaney, P. Three tests of the learned helplessness model of depression. Journal of Abnormal Psychology, 1978, 87(1), 131-136.

Winer, B. Statistical principles in experimental design. New York: McGraw-Hill, 1971.

Zuckerman, M., & Lubin, B. Manual for the Multiple Affect Adjective Check List. San Diego: Educational and Industrial Testing Service, 1965.