RELATIONSHIPS BETWEEN DEPRESSION, CAUSAL ATTRIBUTION, MOOD, AND REWARDED AND PUNISHED PERFORMANCE OUTCOMES

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ABSTRACT

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Following the learned helplessness paradigm, the present investigation assessed the effects of depression, experimentally controlled task outcomes, and experimenter response to subjects' task outcome, on subjects' causal attributions for outcome, self-reported mood, achievement aspirations, recall of performance, and subsequent cognitive performance. A series of four ten-trial cognitive discrimination problems were employed with 252 undergraduate psychology students who scored either below 4 or above 10 on the Beck Depression Inventory. Task outcomes were controlled by providing subjects with either contingent feedback leading to successful task outcomes, or noncontingent feedback and experimentally induced failure. In addition, subjects received one of three types of feedback on task outcome: (a) reward feedback conditions provided monetary reward and both verbal and nonverbal experimenter responses perceived by the subject as

rewarding and supportive, (b) neutral feedback conditions provided only informative and affectively neutral verbal experimenter responses, and (c) punishment feedback consisted of monetary fines and punishing and evaluatively negative experimenter responses. This format provided for a 2 x 2 x 3 nonrepeated measures design with depression classification, task outcome, and feedback condition as between-subjects factors. Optimal posttreatment performance was associated with successful outcome, reward feedback, and the absence of depression. Poorest performance was associated with depression, failure, and punishment. Failing depressed subjects showed a unique systematic behavioral response to positive feedback, in which their performance exceeded that expected for either depressed subjects or nondepressed subjects manifesting learned helplessness effects. Failing depressed subjects who received punishment feedback exhibited extremely impaired performance suggesting a "double-helplessness" effect. Depressed subjects, relative to nondepressed subjects, made attributions for failure which were more internal and stable, and attributions for success which were more external and unstable. All outcomes were perceived by depressed subjects as relatively less controllable, and all of their causal attributions for outcome varied significantly less as a function of task outcome than did the attributions of nondepressed subjects. Nondepressed subjects in whom helplessness had been induced did not make causal attributions similar to depressed subjects, calling into

question the validity of the learned helplessness phenomenon as an analog of reactive depression. Depressed subjects demonstrated strong relationships between feelings of sadness, anger, and anxiety and feedback mode, while for nondepressed subjects, higher anger scores associated with punishment was the only systematic mood-feedback relationship found. Depressed subjects held higher achievement aspirations than did nondepressed subjects, and underestimated their task performance under conditions of success with a low frequency of punishment. The results were discussed in terms of their implications for existing cognitive, learned helplessness, and behavioral models of depression. The complexity of the relationships between the variables studied suggests the necessity for an integrated cognitive-behavioral model of depression which also takes into account environmental and interpersonal response factors.

To Doreen

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INTRODUCTION

Of all codified categories of problems in living, depression is by far the most common (Shane, 1974). Beck (1973) asserts that over 12% of the general population will at some time experience an episode of depression of sufficient clinical severity to warrent treatment. Lehmann (1971) has noted that the death rate from all causes for depressed females is twice, and for males three times, the normal rate. When one considers the many diagnostic categories of which depression is frequently associated, it becomes clear that the problem of depression can hardly be understated.

A resurgence of interest in psychological aspects of depression has become evident in the last 5 to 10 years, and a number of nontraditional and innovative models of depression have been introduced. The most productive and influential of these, in terms of behavioral and cognitive models, were proposed by Lewinsohn (1974), Seligman (1975), and Beck (1962, 1974). More recently, as the interest in this area has grown, theoretical notions both complimentary and supplementary to the comprehensive models noted above have been introduced, reflecting increasing conceptual sophistication

in the areas of behavioral self-control (Rehm, 1977) and cognitive theory (Litman-Adizes, 1976; Rizley, 1978).

While the empirical literature on the psychology of depressive functioning has burgeoned in recent years (see Blaney, 1977; Miller, 1975; Seligman, 1978), a comprehensive review of the literature suggests that theory construction within both the cognitive and behavioral viewpoints has proceeded at the expense of integrative empirical research which would serve to elucidate cognitive-behavioral relationships. The investigation of such relationships might provide useful linkages between the heretofore largely independent cognitive and behavioral theories of depression, and result in a more powerful and useful model encompassing empirically derived functional relationships between verbal-cognitive and overt-motor variables.

The purpose of this research is to investigate and clarify major cognitive-behavioral relationships between causal attributions, mood, and task performance which are suggested by the current body of research and theoretical literature, and to provide a body of data which would suggest areas for future research. More specifically, hypotheses concerning relationships between reward punishment, cognitive distortion, attribution, and task performance were tested, and preliminary data was gathered concerning covariation of mood, expectancy, and aspiration variables with depressed and nondepressed subjects. Prior to presenting the

hypotheses and design of this research, a brief review of relevant theories and models of depression will be given.

THEORIES OF DEPRESSION

Behavioral Models

In brief, Ferster (1973) and Lazaras (1968), focusing on the construct of reinforcement as the crucial variable in the etiology and maintenance of depression, suggest that a loss in the availability of reinforcers in an individual's environment results in a reduced frequency of many normal activities. This behavioral characteristic is salient for most depressed people. In a similar but more discriminative vein, Costello (1972) proposed that the depressed person's general loss of interest in the environment is a function of a loss in reinforcer effectiveness. Costello thus distinguishes between a reduction in the number of reinforcers available to an individual and a reduction in the effectiveness of available reinforcers. It is the latter loss which Costello regards as the initial mechanism which produces and maintains depression.

The concept of reinforcement is further qualified in Lewinsohn's (Lewinsohn, 1974; Lewinsohn, & Atwood, 1969; Lewinsoh, Wernstein & Alper, 1970) model of depression, which to date is the one behavioral formulation which has stimulated a substantial body of research (Blaney, 1977). According to Lewinsohn (1974), depression is seen as an extinction

phenomenon, in which a loss or lack of response contingent positive reinforcement results in reduced rates of overt-motor behaviors and elicits a basic dysphoria. All other cognitive-verbal components of depression are viewed as secondary elaborations of this basic dysphoria. Susceptibility to depression and ability to overcome depression are related to: (1) social skills, (2) the range of events which are potentially reinforcing, and (3) reinforcement availability. Lewinsohn explicitly claims that the critical variable in depressive dysfunction is not rate of reinforcement per se but the rate of response-contingent reinforcement. The observed reduction in frequency of interpersonal responding and voluntary nonverbal communication (Lewinsohn & Graf, 1973; Libet & Lewinsohn, 1973; Youngren & Lewinsohn, 1980) and the confused or aversive reactions elicited in others by depressed individuals' poorly timed verbal and motor behavior (Lewinsohn, 1974; Youngren & Lewinsohn, 1980) are seen as components of a reciprocal determinism resulting in inadequate response contingent reinforcement.

Blaney (1977), in a critical review of the literature, has noted that this model has had at best only modest success in generating either correlational or experimental support, and research activity in this area has diminished considerably. An exception to this trend has been the introduction of a self-control model of depression by Rehm (1977), who has extended the notions of reinforcement variables to include both self-generated covert reinforcement and

punishment as suggested by Kanfer (1970), as well as attribution variables. Rehm's (1977) model differs from Lewinsohn's model in three major respects. First, it adds consideration of covert reinforcement processes, providing additional explanatory power with regard to depressions where the external environment appears to remain constant. Second, the role of punishment, both overt and covert, is considered as a functional component of depression which serves to suppress adaptive, nondepressive behavior. Third, the self-control model provides a means of differentiating cognitive processes and systematically relating them to observable behavioral events manifest in depression. Individual differences in self-control habits are hypothesized to produce differential susceptability to depression in relation to external reinforcement experiences. The process of depression is posited to be a function of: (1) a low rate of self-reward contingent on meeting self-evaluative criteria, (2) a high rate of self-punishment contingent on failure to meet self-evaluative criteria, (3) overly stringent criteria for positive self-evaluation, (4) selective monitoring of negative events, (5) selective monitoring of immediate rather than delayed response consequences, and (6) inaccurate causal attribution of responsibility for outcomes (Rehm, 1972). The last three of these processes has been explicitly proposed in recent cognitive models of depression. Rehm's inclusion of these processes reflects the continued trend of behavioral theory to include cognitive variables (Mahoney, 1974;

Miechenbaum, 1977), and implies the usefulness of integrating behavioral and cognitive models within a covert operant framework in which cognitive stimuli are assumed to elicit functional behavioral relationships in the same manner as do overt stimuli, in common with all of the models relevant to the presently proposed research, Rehm approaches depressive conditions in terms of how they are created and maintained rather than "what they are," that is, processes rather than products, thus facilitating the explication of testable hypotheses. Phenomena such as increased response latencies to environmental stimuli are not considered as "reflecting" depression but as elements of depression itself, which is an ongoing process (Wener & Rehm, 1975).

Cognitive Models

Beck (1967, 1976) has evolved a cognitive model of depression which is part of a larger model of emotional disorders in general. According to Beck (1963, 1976), all psychogenic disorders are primarily thought disorders. He asserts that all types of abnormal behavior patterns share the same kinds of formal and logical cognitive distortion. Beck's principle explanatory construct is the schema. Introduced by Miller, Galanter, and Pribram (1960), shemata are conceptualized as clusters of assumptions, attitudes and beliefs concerning objects, events or relations, and act as mediators between stimulus input and behavioral response. The reader is referred to Miller et al. (1960) for a

comprehensive review of this construct system. Of immediate relevance to the current study, however, is the nuclear concept of cognitive processes as progenitors of affective and behavioral responses.

The assumptions for Beck's model are: (1) a person's reaction to a given situation depends on his conceptualization of the situation in terms of its personal connotations, meanings, and significance for him, (2) the cognitive content or meaning is chained to a particular affect congruent with the cognition, and (3) the significance of a particular event on the "domain" of the person is an important determinant of the affective response. A person's domain is defined as comprising the individual as a physical entity, his personal attributes, and various other animate and inanimate objects in which he has an investment (Beck, 1971).

Beck sees each particular category of abnormal behavior as reflecting a particular ideosyncratic ideational content which constitutes the characteristic schema of the disorder, and to which content appropriate affects are produced. In this paradigm incoming perceptual data are continuously matched against conceptual categories, beginning with broad supraordinate schemata, and progressing to more specific ones. This process, identical in both normal and abnormal individuals, is marked in depressives by the degree of internal distortion of the stimulus situation. A primary triad of cognitive schema are proposed to operate in depressive cognition. These are: (1) a negative view of the

world, (2) a negative view of the self, and (3) a negative view of the future. These views are maintained by paralogical modes of cognition such as selective abstraction, arbitrary inference, and overgeneralization, as well as stylistic and semantic distortions such as exaggeration and inappropriate labelling.

Affective, motivational, and physical manifestations of depression are regarded as secondary derivatives of cognition. Alterations in subjective feeling states are said to follow from variations in cognitive emphasis. Attitude is always the component of depression that must be changed if the depression is to be eliminated (Beck, 1976). Attitudes consist of beliefs, affect, and an action-intention component, but Beck's focus is in beliefs. Beck also acknowledges and encourages the use of behavioral interactions, which he sees as providing experiences which will help counteract depressogenic cognitions. Beck's position is similar to the positions taken earlier by Ellis (1963) and Raimy (1975). While the actual sequence between cognitive and behavioral components as proposed by Beck is not well established, this relationship is ultimately an empirical question. What is more important for present purposes, is that Beck has clearly included in his model provision for some unique set of relationships between cognitive and behavioral events which operate for depressed individuals.

The Learned Helplessness Model

Seligman (1974, 1975) has proposed a model of depression based on a laboratory paradigm of learned helplessness. A situation in which an outcome occurs independently of all voluntary response is said to produce the phenomenon of learned helplessness.

More specifically, Seligman (1975) holds that learned helplessness consists of three interrelated areas of disturbance: (a) reduced motivation to control outcomes, (b) interference with learning that responding controls outcomes, and (c) the elicitation of fear for as long as the subject is uncertain of the uncontrollability of the outcome, followed by the development of depression. This condition subsumes both noncontingent reinforcement and noncontingent punishment. First conducted with infrahuman subjects; noncontingent punishment has been the situation most studied. Learned helplessness has the following properties which parallel the characteristics of depression: (1) lowered response initiation (latency), (2) negative cognitive set (belief that one's actions will be ineffective), (3) dissipation over time, (4) lack of aggression, (5) lessened sexual interest and appetite, and (6) nonrepinephrine depletion and cholinergic activity (Seligman, Klein, & Miller, 1974). Cognition is given an executive role in this model in that depressive retardation is held to be caused by belief in response-reinforcement independence (Seligman, Klein, & Miller, 1974).

An enormous amount of research growing out of this theory has provided only limited and largely ambiguous support for the model (Blaney, 1978; Costello, 1978; Miller & Norman, 1979) and recently Seligman and his colleagues have offered a major reformulation of the learned helplessness model (Abramson, Seligman, & Teasdale, 1978). They have retained perception of response-outcome independence as the keystone of the model, but hold that following this objectively true or misperceived state of affairs, how individuals make causal attributions for their helplessness determines the scope, chronicity, and intensity of their depression. Drawing on the attribution theory work of Weiner and his colleagues (Weiner, 1974; Weiner, Grieze, Kukla, Reed, Rest, & Rosenbaum, 1971), specific manifestations of depression or helplessness are posited as a function of causal attributions within a three-dimensional orthogonal matrix. First, attributions for outcome may be either internal or external to the subject, resulting in either expectation of personal response-outcome independence (personal helplessness) or general response-outcome independence (universal helplessness). Low self-esteem, however is said to be a concommitant only of personal helplessness. Second, attribution along a dimension identified as stable-unstable is said to determine the degree to which a person expects continued similar outcomes. Mood, for example, if perceived to be an outcome determinant, would be expected to be associated with an "unstable" attribution, reflecting a belief that one would achieve a different

outcome when one's mood changed. In contrast, attribution of outcome to a factor such as ability would be expected to lead to expectations that future outcomes will be similar. Finally, Abramson et al. (1978) hypothesize a new attributional dimension of "global-specific" causal factors to account for the degree to which the helplessness syndrome will generalize to other situations. That is, if a person thinks of an indicated causal factor as one which is indigenous to many and varied kinds of situations, the person will tend to expect a similar outcome in any or all of these other situations. In terms of this model, an individual making internal, stable, and global attributions for response-independent outcomes would be expected to demonstrate generalized, chronic helplessness or depression with low self-exteem.

Miller and Norman (1979) independently proposed an attribution theory model of learned helplessness which is remarkably similar to the formulation of Abramson et al. (1978), with the addition of the variables of which they refer to as individual differences (i.e., sex, mood, prior expectancies) and situational cues (i.e., instructions, exposure, stimuli) as situational determinants of the acquisition of learned helplessness behavior. The reader is referred to the detailed review of Miller and Norman (1979) for a comprehensive and exhaustive discussion of this model.

It is important to note that both reformulated models of learned helplessness have been developed largely as an

attempt to explain post hoc the conflictual data generated by the early learned helplessness research. Their ability to generate testable hypothesis is not clear at present, due to the theoretical position that helplessness per se is necessarily acquired through perception of response-outcome independence, and that the attributional part of the model merely shapes the locus, chronicity, and generality of the helplessness phenomenon, although this problem pertains more to Abramson's (Abramson, Seligman, & Teasdale, 1978) model than to that of Miller and Norman (1979), who do not necessarily assume perception of response-outcome independence and provide a more detailed model. The explanatory power of the model as it relates to depression will remain questionable until specific hypotheses are generated which will predict and validate specific patterns of attribution in depressed individuals.

The Causal Attribution Model

The final and most recent models of depression which is relevant to this research originates from neither the learning laboratories nor the clinical settings which spawned the previous models. Cognitively oriented social psychologists, with a background rooted in attribution theory of achievement behavior (Weiner, 1972; Weiner et al., 1971; Weiner & Litman-Adizes, 1979, 1980; Miller & Norman, 1979), have proposed an attributional model of depression which both predates, and surpasses in level of sophistication,

the attributional notions of Abramson, Seligman, and Teasdale (1978).

Litman-Adizes (1976), subsequent to reviewing both the causal attribution literature and the models of depression proposed by Beck (1967) and Seligman (1975), first introduced an explicit attributional model of depression. Utilizing the main perceived causes for success or failure in an achievement situation identified by Frieze (1973), (ability, effort, task difficulty, and luck). Litman-Adizes (1976) expanded the two-dimensional taxonomy of locus of control and stability proposed by Weiner et al. (1971) and employed by Abramson, Seligman, and Teasdale (1978), to a three-dimensional model which incorporates a dimension of intentionality, or control, as proposed by Rosenbaum (1972). She thereby generated a three-dimensional model of attribution which can theoretically embrace both the attributional notions of Abramson et al. (1978) and the clinical observations and predictions of Beck (1967). In short, Litman-Adizes (1976) noted the essential confound inherent in Rotter's (1966) concept of locus of control from which previous attributional research in depression had arisen. This confound operates in that attribution to internal or external causation is confounded with attribution of voluntary control. Litman-Adizes' (1976) model is nonorthogonal and three dimensional. It is consistent in focus of attribution (toward self rather than not- self causal agents) and is

comprised of locus of causality, controllability, and stability dimensions.

Litman-Adizes (1976) avoids the problems of circularity inherent in the reformulated learned helplessness model (Abramson et al., 1978) by foregoing the attractive but misleading luxury of creating an orthogonal model, and carefully attends to possible logical relationships, as schematized below, while maintaining constant focus of causation on self-generated factors:

Locus of Causality:	Internal	External
Controllability:	Controllable	Uncontrollable
Stability:	Unstable	Stable

The schema shows that internal attribution of an event is a logical prerequisite for control by the same person. Only with external causes does it follow that that event is necessarily uncontrolled by the same person. Similarly, when a cause is controllable, it is unstable or has the potential of unstability in that the person can exercise choice, and change the causes. Only when a cause is uncontrollable can it be stable.

According to Litman-Adizes (1976), the essence of depression is uncontrollable internality, the belief that events and outcomes are due to causes which reside within the person, yet she/he has no voluntary control upon them. Depressed individuals' cognitions are said to be characterized by causal attributions for outcomes which are internal, uncontrollable, and stable. Especially when faced with

subjectively unsatisfactory outcomes, the depressed individual will basically communicate the message, "It's my fault, I can't help it, and I can't change."

This model is potentially powerful in that it generates clear and unambiguous predictions about patterns of causal attributions made by depressed individuals. Following Beck (1967), it is held that there is first a nonveridical cognitive representation of reality as failure. It is important to note that this model does not assume logical cue utilization by the user, as have other attribution theorists (e.g., Kelley, 1967), but deals with attribution as a phenomenological event.

The dimensional properties of nonveridical processing of environmental cues typical of depressed individuals are hypothesized to be: (1) internal to him/her, (2) uncontrollable by him/her, and (3) stable over a relatively long period of time (Litman-Adizes, 1976). Attribution of failure to internal causes is said to elicit negative affect toward oneself (Weiner, 1974). Attribution to uncontrollable causes elicits a sense of helplessness or low expectancy of success in the future (Valle & Frieze, 1976). These causal effects are hypothesized to have the tendency to spread and generalize throughout the depressive person's existence to the point of interfering with his daily functioning. Negative thinking about oneself is said to generalize from specific negative performance evaluations to low self-evaluation and self-blame. Low expectancy of success is held to generalize

to pessimism and general hopelessness in domains unrelated to the specific failure. As a consequence of these causal effects, aspects of depression such as suicidal thoughts, paralysis of will, withdrawal and despondency etc., are sustained. In addition, a feedback loop is hypothesized which contributes to increased perception of failure: When a person is pessimistic, helpless, and holds a low self-concept, she/he is prone to perceive further experience as a failure too. Clinical evidence for this feedback loop has been given by Beck. "Irrespective of its origin, the aroused affect becomes part of the stimulus field . . . the patient feels 'I'm feeling so bad, so things must be bad'" (Beck, 1972). He calls this phenomenon a "continuous cognition-affect cycle" (Beck, 1972).

The attributional model of depression shares with Beck's and Seligman's models the assumption of qualitative distortions in the manner the depressive person construes his experience. But since failure alone does not necessarily entail the negative consequences posited by Beck and Seligman, the attributional model further suggests a critical determinant of depression as a process of systematically misperceiving the causes for such failure. The attributional model thus attempts to provide an articulated framework for the linkages between cognitive components and the affective-motivational-behavioral ones. Furthermore, the complimentarity or the attributional model's designation of cognitive processes as the primary determinant of behavioral response

to ongoing task outcomes with the covert self-control model of behavior proposed by Rehm (1977) is obvious, in that fundamentally, both theories assert that how a person interprets his/her experience and what she/he "says to herself" about that experience effects subsequent performance as a function of the valence, intensity, frequency, and duration of their self-evaluative cognitions.

Toward an Integration

As noted earlier, research related to the models of depression reviewed above has not, in general, been sensitive to examining complementary theoretical notions and empirical data which might usefully be united to provide a more powerful and comprehensive cognitive-behavioral model. The three general approaches to the study of depression which have been discussed above were originally formulated such that there appeared to be few common elements between them. Yet over time, in an evolutionary manner, these models have been revised such that the potential complimentarity between them is difficult to ignore. The behavioral model, evolved from a narrow focus on stimulus-response mechanisms to include both social and self-reinforcement variables, and consideration of factors such as expectancies, aspirations, self-evaluation, and recall of past experience, within a broad social learning framework (Kanfer, 1970; Lewinsohn, 1974; Rehm, 1977). The cognitive model of depression has its roots in the theory of Beck (1967, 1971, 1976) who has increasingly

noted the importance of consideration of reinforcement phenomena. Causal attribution theorists, working from a social psychological rather than a clinical background, have articulated Beck's theory in terms of how an individual's cognitions regarding causes of personal events will effect mood, attitude, expectancy of future events, and subsequent behavior (Litman-Adizes, 1976, 1978; Miller & Norman, 1979; Heckhausen, Meyer, & Cook, 1972; Weiner, Russell, & Lerman, 1979). The learned helplessness model, originally concerned primarily with response-outcome contingencies and personal beliefs regarding these relationships as reflected in shifts in expectancy of success on similar subsequent tasks, has been reformulated with a heavy emphasis on causal attribution (Seligman, 1978; Miller & Norman, 1979).

This theoretical and empirical convergence, which is apparent in a comprehensive review of the depression literature, has gone largely unnoticed by those working within the three "camps" noted above. It is striking how cross-referencing of research between these groups is almost non-existent. This study is an attempt to begin a formal integration of the convergent aspects of the pre-existing research noted above and below by examining the interrelationships between some of the key variables hypothesized by the learned helplessness, attribution, and reinforcement models of depression. These variables include experimenter determined task outcome, environmental response, subject causal attribution for outcome, mood, subject expectancies and

aspirations, task performance, recall of reinforcement and subject self-evaluation. A 2 x 2 x 3 non-repeated measures design is employed to accommodate depressed and non-depressed subjects who through experimenter manipulation either succeeded or failed on a cognitive-descrimination task which followed the design of Levine (1966, 1971). Subjects then received either social support and monetary reward for success, social and monetary punishment for failure, or socially and affectively neutral but informational feedback on their trial-to-trial performance. Following the experimental manipulations, dependent variables included attributions for their task outcomes, self-rated mood measures and anagram and digit symbol tasks. Complete details of this somewhat complex procedure are provided in the method section beginning on page 44.

The present research design thus provided a framework for investigation of model-integrative hypotheses regarding: (a) induction of interference (learned helplessness) effects, (b) causal attributions for success and failure, (c) interactions between reinforcement, attribution, and mood, (d) shifts in subject expectancy of success, (e) recall of reward and punishment, and (f) interactions between aspirations and self-evaluations. Each of these areas of interest is examined in detail regarding both previous research and the hypotheses posed in this investigation.

INTEGRATIVE RESEARCH AND HYPOTHESES

Induction of Interference Effects

An experimental paradigm typically used with human subjects by researchers working with the learned helplessness model has been to induce helplessness or interference effects in subjects by either the presentation of inescapable primary aversive stimuli, such as loud noise (Fosco & Geer, 1971; Gatchel, Paulus, & Maples, 1975; Gatchel & Proctor, 1976; Geer, Davison, & Gatchel, 1970; Glass & Singer, 1976; Hiroto & Seligman, 1975; Klein & Seligman, 1976; Krantz, Glass, & Snyder, 1974; Miller & Seligman, 1975, 1976; Thornton & Jacobs, 1971, 1972; Wortman & Brehm, 1975), and/or employing punishing verbal or nonverbal stimuli to elucidate the subject's experimently controlled failures on a task the subject has been led to believe is solvable (Benson & Kennelly, 1976; Gatchel, Paulus, & Maples, 1975; Gatchel & Proctor, 1976; Hiroto & Seligman, 1975; Klein, Fencil-Morse, & Seligman, 1976; Miller & Seligman, 1973; Roth & Bootzin, 1974; Roth & Kubal, 1975). As Eastman (1976) has pointed out, it can be seen that this model employs two conceptually different routes to helplessness, one via direct aversive stimulation, the other via insuring that the subject's goal-seeking behavior is unsuccessful. It should be noted, however, that

in the group of studies cited above which focus on unsolvable tasks as the key independent variable, interpretation of any causal effects have been confounded by the addition of supplemental negative and/or punishing feedback to the failure experience per se. The person in this type of situation would be learning that not only was his/her goal-seeking behavior ineffective, but that in addition arbitrary inescapable punishment contingent upon failure was unavoidable. Eastman (1976) notes that this sort of "double-strength" induction procedure is likely to result in a profound learned helplessness phenomenon. Demonstrating a systematic relationship between presentation of aversive stimuli and failure feedback, and occurrence of the helplessness phenomenon is not sufficient, however, to draw conclusions regarding causal mental mechanisms which might determine the subject's maladaptive response of helplessness. Yet Seligman and his colleagues claim that performance deficits which have observed on post-induction experimental tasks are due to a perception of response-outcome independence, i.e., inescapable failure. It seems clear that the data they have presented is amenable to other, more parsimonious interpretations which more closely correspond to the manifest variables in the experimental situation. For example, VanderJagt (1977), Blaney (1978), and Buchwald, Coyne, and Cole (1978), have independently argued that based on the available date, the performance deficits reported in the helplessness research to date appear to be a function of the subjects' experience of

failure in the experimental condition, rather than an expectancy of response-outcome independence, a concept which Seligman has steadfastly argued is the key to the understanding of both helplessness and depression (Hiroto & Seligman, 1975; Seligman, 1978). Although research such as that of Kuiper (1978) has unequivocably demonstrated that depressed individuals are as aware of environmental contingencies as nondepressed individuals. In any event, as stated by Buchwald et al. (1978), unless it can be shown that induction procedures that do not involve failure regularly produce interference effects in human subjects, invoking the concept of perceived noncontingency would be gratuitous. To date, only one study has demonstrated a helplessness effect associated with noncontingent success (Griffith, 1977). Furthermore, VanderJagt (1977) has argued that it is not necessary and erroneous to advocate a belief of response-outcome independence as a causal factor in helplessness and depression when the occurrence of intense unavoidable punishment is sufficient to produce performance deficits similar to those observed with depressed subjects or nondepressed subjects with whom helplessness has been induced. Seligman has not dealt with this issue directly, but his recent revision of learned helplessness theory (Abramson, Seligman, & Teasdale, 1978; Seligman, 1978) continues to hold perception of response-outcome independence as the keystone of learned helplessness theory. Seligman's (1978) revised assertion that depressed and/or helpless

individuals see less of a response-outcome relationship than nondepressed, nonhelpless persons, rather than no relationship, seem both vague and ineffectual as an attempt to salvage this construct of learned helplessness theory. Indeed, the question arises as to whether either the experience of failure or the experience of punishment is necessary or sufficient to produce performance deficits. While it is of course possible that neither of these factors play a decisive role in the emergence of performance decrements, a review of the literature cited above suggest that the role of punishment may be critical. It must also be remembered that the existence of differential effects of punishment and failure for nondepressed, versus depressed and/or helpless persons, seems likely, in light of the literature reviewed above.

In the current investigation, the following relationships are hypothesized:

(a) A main effect of depression is hypothesized for performance on post-treatment tasks, in which nondepressed subjects will perform better than depressed subjects.

(b) A main effect of outcome is hypothesized for performance on post-treatment tasks, in which subjects succeeding on the treatment task will perform better on subsequent performance measures than subjects who fail.

(c) An interaction effect of feedback by depression is hypothesized in which punishment is associated with decreased performance on post-treatment tasks for depressed subjects.

(d) A three-way depression by feedback by outcome interaction effect was hypothesized, in which subsequent task performance will be minimally affected for nondepressed subjects who were reinforced while succeeding in the treatment task, while performance would show maximum decrements for depressed subjects who were punished for failing. It is expected that punishment will elicit interference effects to a greater extent with depressed subjects than with nondepressed subjects. Similarly, positive reinforcement is not expected to inhibit the elicitation of performance deficits for depressed, failing subjects.

The present study therefore provides for replication of preceding research on the basic helplessness induction phenomenon, and, in addition, extended that paradigm to investigate the notion that depressed and nondepressed subjects are differentially sensitive to facilitory and suppressive effects of reinforcement and punishment, respectively.

These hypotheses were based on the notion that reward and punishment amplify the experience of success or failure for depressed and nondepressed subjects in a differential manner conforming to the pre-existing cognitive schema of the individual. According to this schema, nondepressed subjects will demonstrate resiliance to both failure and punishment, exhibiting a "self-serving bias" (Kuiper, 1978; Miller, 1976; Nelson & Craighead, 1977) in which negative outcomes and feedback have little effect on performance and are apparently ignored. Depressed subjects, on the other hand,

will show little responsivity to success and reward, but would exhibit increased performance decrements associated with failure feedback and punishment. These effects are suggested by data presented by Hammen and Krantz (1976) on depressive cognitions, as well as by Beck's (1967) theory in that failure and punishment are congruent with the depressed person's negative triad of cognitive schema, and should therefore be easily accepted into and reinforce this pattern of thought. Although Rizley (1978) has reported stereotypic responses by depressed subjects seemingly insensitive to failure feedback, the research cited above suggests punishment in conjunction with failure will elicit the hypothesized response pattern.

Causal Attribution

A number of studies have been conducted in which the role of causal attributions in helplessness has been systematically examined (Abramson & Alloy, 1980; Alloy, Crocker, & Tabatchnik-Kayne, 1980; Coyne, Matalsky, & Lovelle, 1980; Dweck, 1975; Dweck & Repucci, 1973; Etaugh, Cooley, & Stern, 1980; Griffith, 1977; Klee, Miller, & Norman, 1980; Klein, Fencil-Morse, & Seligman, 1976; Kuiper, 1978; Pasahow, 1980; Seligman, Abramson, Semmel, & Von Baeyer, 1979; Sweeney, Golin, & Schaffer, 1980; Tennen & Eller, 1977; Wortman, Panciera, Shusterman, & Hibscher, 1976). The results of these research efforts have been inconsistent in their support of either learned helplessness theory or attribution

theory. Indeed, reviewers of the data do not even agree as to whether the general trend of the data supports Seligman's (1978) theory (Miller & Norman, 1979) or refutes it (Wortman & Dintzer, 1978). Due to serious methodological problems with the early studies, and considerable differences in conceptualization and definition of variables in the later studies, this body of literature is not likely to represent a true test of the relationships between causal attributions and helplessness or depression.

For example, Litman-Adizes (1978, 1980) has recently presented data which partially supports the attribution model of depression as well as the views of Beck (1967), but flaws in her dependent measures of attribution may have resulted in artifactual results. In that study subjects were able to endorse six causes for outcomes concurrently, although such multiple endorsements might be theoretically inconsistent (e.g., giving a high rating to both ability and luck). Subjects were therefore not necessarily making choices along the a priori theoretical dimensions, but particular combinations of response scales could yield significant dimensional differences.

Elig and Frieze (1978, 1979) have dealt with methodological and theoretical issues of measurement of causal attribution, and recommend the use of multiple bipolar measurement scales as devised by Weiner, Nierenberg, and Goldstein (1976) to avoid these problems. This new methodology keeps theoretical dimensions separate at all times,

in effect forcing the subject to make theoretically "pure" decisions as to causal agents. This serves to maintain conceptual clarity and increase construct validity. That the multiple-bipolar technique may prove enlightening is suggested by a preliminary reanalysis of Litman-Adizes' (1978) data by the present author. Reorganization of the data into composite scores for each of the hypothesized "pure" attributional dimensions suggests that her reported findings would not have emerged had the Weiner et al. (1976) method been employed. The overwhelming weight of the data generated in the most recent studies noted above, however, strongly suggests that there are in fact psychologically significant relationships between depression and attributions for performance, although to date there has been little consensus on how to proceed with this investigating these relationships.

Dweck (Dweck, 1975; Dweck & Reppucci, 1973) has reported that following experience with noncontingent failure (unsolvable Block Designs), those subjects who showed the largest performance deficits tended to attribute their performance to ability (an internal-stable cause), while minimal deficits were associated with attributions to effort (an unstable cause). Klein, Fencil-Morse, and Seligman (1976) found that external attributions for failure alleviated performance deficits for depressed subjects on an anagrams test task. Similarly, Tennen and Eller (1977) found internal-stable attributions for a training task were associated with

performance deficits while external-unstable attributions did not share this relationship. Pasahow (1980) also reported performance to be related to attributions made along the dimension of stability-unstability. These studies support Klein et al's. (1976) assertion that depressed individuals' performance deficits are a function of not only the experience of failure, but also the attributions which are made for that outcome. The theory that depressed individuals' causal attributions for outcome differ systematically from those of nondepressed individuals has been supported by a number of studies (Abramson & Alloy, 1980; Kuiper, 1978; Litman-Adizes, 1978, 1980; Seligman et al., 1979; Sweeney et al., 1980) with only one report of no support whatever (Klee et al., 1980). This supportive research has repeatedly shown that depressed individuals internal and stable attributions for failure, relative to nondepressed individuals, who attribute failure to external-unstable causes. This pattern has been called the self-serving bias/self-blaming bias polarity (Miller & Ross, 1975; Kuiper, 1978), although recent data suggests that not only are depressed individuals accurately aware of environmental contingencies, but that their perception of causal variables is veridical, while nondepressed individuals distort self-favorably both in the case of success as well as failure (Abramson & Alloy, 1980; Alloy et al., 1980; Kuiper, 1978).

The importance of the stability dimension in causal attributions for outcome is obvious in the case of depression

as it relates to the prediction function served by attribution (Bandura, 1977; Weiner et al., 1971). In addition to providing a viable explanation for past behavior, an attribution also provides an individual with information pertaining to his or her level of personal efficacy when faced with similar situations in the future. Thus, it is theoretically apparent how internal and stable attributions for negative outcomes might be effective in reducing the depressed individuals' future motivation to "try" (Beck, 1967) and may also account for depressed individuals' negative expectations for performance on future tasks (Loeb, Beck, & Diggory, 1971).

Indeed, Sweeney (Sweeney, Galin, & Schaeffer, 1980), using a cross-logged panel correlational analysis of attributional style scale (see Seligman et al., 1979) responses and Beck Depression Inventory scores, has presented data which suggests that not only are internal and stable attributions for failure correlated with depression, but that stability attributions are a causal agent of depression, while unstable attributions for success may also function as a cause of depression.

Two shortcomings of the research reviewed above, in addition to the methodological and attribution measurement problems already noted, involve the issue of perceived contollability and the effect of environmental response on subsequent attributions of outcome. With regard to the controllability variable, with the exception of Litman-Adizes (1978, 1980), all of the research cited above has confounded

internality with controllability or has not considered controllability as a causal dimension. For example, Klee et al. (1980) reported perceived control to be correlated with the absence of depression but failed to recognize this variable as an attributional element while Abramson, Seligman, and Teasdale (1978) assume internality and controllability to be congruent. As noted in the earlier discussion of the attributional model of depression, both Litman-Adizes (1976, 1978, 1980) and Wortman and Dintzer (1978) have been strident in their opinion that controllability is a discrete and critical variable in understanding both the learned helplessness and depressive phenomena. To date, no study has examined the effects of reward and punishment on the causal attributions for success and failure by depressed and nondepressed subjects.

The following relationships are hypothesized in this experiment:

(e) All subjects will make greater internal attributions following success than following failure.

(f) Depressed subjects, relative to nondepressed subjects, will make causal attributions for failure which are more internal, uncontrollable, and stable. Their attributions for success will be, relative to nondepressed subjects, more external, uncontrollable, and unstable.

(g) Nondepressed subjects who exhibit interference effects on performance tasks will make attributions similar to depressed subjects.

The first two of these hypotheses are predicted both from the theoretical attribution models and the research results previously reported. The third hypothesis is a necessary test of learned helplessness, if it is to be validated as cognitively analogous to reactive depression. Although helpless behavior has been elicited from nondepressed subjects, it does not automatically follow that their cognitive functioning is similar to that of depressed subjects although both groups may exhibit similar behavior. Should nondepressed, helpless subjects exhibit markedly different causal attributions, the explanatory power of helplessness theory will be subject to serious question.

Mood

The current research design also has the capacity to examine self-reported changes in mood as a function of environmental response and outcome, and to examine systematic relationships of mood to causal attributions. As previously detailed, Lewinsohn (1974) and Rehm (1977) assert that a loss or lack of response contingent positive reinforcement will elicit a basic dysphoria. Similarly, Seligman (1975) holds that procedures designed to induce an expectation of noncontingency specifically lead to depression. Studies which have employed either the failure to escape from aversive stimulation paradigm or noncontingent failure have reported increased sadness, hostility and anxiety as a result of the induction procedures (Coyne, Metalsky, &

Lavelle, 1980; Gatchel, Paulus, & Maples, 1975; Gatchel & Proctor, 1976; Griffith, 1977; Klein, Fencil-Morse, & Seligman, 1976; Raps, Reinhard, & Seligman, 1980; Roth & Kubal, 1975; Teasdale, 1978; Willis & Blaney, 1978).

While these results support Seligman's (1975) contention of noncontingency leading to depression, the role of anxiety appears to be, in the view of the current author, more likely to play a key role not only in the production of laboratory performance deficits but also in the decrements in social skills posited by Lewinsohn and his colleagues (Lewinsohn, 1974; Youngron & Lewinsohn, 1980). The current author theorized previously (VanderJagt, 1977) that punishment may elicit anxiety which interferes with instrumental responding. Gotlib and Asarnow (1979) reported that performance deficits were associated with anxiety level but not to level of depression. Miller (1975) has suggested that performance deficits exhibited by depressed individuals are the result of distracting, task-irrelevent cognitions, and Litman-Adizes (1978) and Hammen and Krantz (1976) have presented data that is supportive of these ideas. Gotlib and Asarnow (1979) have noted the demonstrated fact that high levels of anxiety have an impairing effect on performance of complex cognitive tasks (e.g., Mandler & Watson, 1966; Spence & Spence, 1966), and have also posed the notion that anxiety elicited during helplessness induction procedures, rather than helplessness or depression, is responsible for observed performance deficits. Similarly, Coyne (Coyne, Metalsky, & Lovelle, 1980)

and his associates have proposed a reinterpretation of helplessness effects in terms of the attentional redeployment model developed in the area of test anxiety research. Lavelle, Metalsky, and Coyne (1979) found that only high test-anxious, as opposed to low test-anxious subjects demonstrated helplessness effects following an induction procedure. Taken as a whole, the above studies appear to strongly support VanderJagt's (1977) notion that anxiety elicited by punishment in helplessness induction procedures may result in attentional deficits as the subject orients to competing anxiety related cognitions rather than to task oriented thoughts, thus leading to decreased performance. This theory would also suggest that low levels of state anxiety would facilitate performance, while high levels of state anxiety would be debilitating, reflecting Malmo's (1979) inverted-U function between performance and arousal. Gotlib and Asarnow (1979) have reported results supportive of this notion.

It seems clear, then, that the roles of anxiety, anger, and depression within the learned helplessness phenomena must be studied with regard to initial affect levels, and procedure-engendered situation effects, as well as differential sensitivities to induction procedures between depressed and nondepressed individuals. The proposed research provides the unique opportunity to observe the effects of reinforcement and punishment in concert with the experience of success and failure. The following hypotheses are made:

(h) Depressed subjects will report a greater degree of subjective sadness and higher Depression Adjective Check List (DACL) scores than will nondepressed subjects.

(i) Subjects who fail on the treatment task will report a greater degree of subjective sadness, anxiety, anger, and higher DACL scores, than will those who are successful.

(j) For nondepressed subjects, lower sadness and anger scores will be associated with success and reward. For depressed subjects, higher sadness, anxiety, and DACL scores will be associated with failure and punishment.

Hypothesis (j) is also predicted from Weiner's (Weiner, 1971; Weiner, Heckhausen, Meyer, & Cook, 1972) theory that internal attributions and especially ability attributions, maximize affect, while external attributions minimize emotional reactivity. Sohr (1977) has recently made a cogent criticism of this notion on both theoretical and empirical grounds, and Weiner has since posited a more complex relationship between attributions and affect which in its current form appears relatively inaccessible to empirical test (Weiner, 1977). Nonetheless, the proposed research design afford the opportunity for observation of certain specific attribution and performance/mood relationships as they might be found.

Expectancy Shifts

Miller and Seligman (1973), drawing on data and conclusions presented by Rotter, Liverant, and Crowne, (1961),

argued that subjects who believed that outcomes were not contingent on their responses (and hence, were depressed subjects) would respond to skill tasks as though they were chance tasks and thus would show smaller trial-to-trial changes in expectancy of subsequent trial success than subjects perceiving outcomes as response contingent. While Seligman and his colleagues reported confirmation of this hypothesis on six occasions (Klein & Seligman, 1976; Miller & Seligman, 1973, 1976; Miller, Seligman, & Kurlander, 1975), seven additional studies have failed to confirm these earlier findings. Detailed critiques of these research efforts are provided by Buchwald, Coyne, and Cole (1978) and Costello (1978).

It appears however, that the direction and magnitude of expectancy change data is not so critical an issue as the question of what these results mean. It is unclear what systematic differences in size of expectancy change represents, if these differences are found. Dweck and Gilliard (1975), Sacco and Hokanson (1978), and Wollert (1977) have argued that various elements of the methodology of expectancy change measurement may be responsible for the reported shifts. Of specific interest to the proposed research are the claims by Weiner and McMahon (McMahon, 1975; Weiner, Heckhausen, Meyer, & Cook, 1972; Weiner, Nierenberg, & Goldstein, 1976), that small expectancy changes are due to unstable attributions. They presented correlational data that supported this claim. Furthermore, this notion is

theoretically congruent with the attributional model of depression (Litman-Adizes, 1976) as well as Miller and Seligman's (1973) data. The proposed research affords the opportunity to replicate the work of Weiner et al. (1972) and to extend this research to investigate possible relationships between stability attributions for success and failure with depressed and nondepressed subjects receiving reinforcement and/or punishment.

VanderJagt (1977) has suggested that differences in reinforcement and punishment methodologies may be responsible for the reported inconsistent findings of expectancy shifts. That position is reiterated and elaborated here. As detailed previously, increased internality of causal attribution theoretically intensifies affective responses (Weiner et al., (1971; Weiner et al., 1972). Furthermore, it has been proposed, and early data are supportive, that depressed individuals tend to make more internal attributions for failure than do nondepressed individuals (Klein, Fencil-Morse, & Seligman, 1976; Kupier, 1978; Litman-Adizes, 1976, 1978; Rizley, 1978). The sensitivity of depressed individuals to negative feedback has also been well documented (Beck, 1967; Hammen & Krantz, 1976; Lobitz & Post, 1979; Nelson & Craighead, 1977; Wortman & Rehm, 1975). It follows then that observed differences in expectancy changes between depressed and nondepressed subjects may be a function of an interaction of internal causal attribution and punishment. The following hypothesis was proposed:

(k) Magnitude of expectancy shifts will be inversely related to punishment and internal attributions.

Minimum expectancy shifts are thus expected for subjects who are punished for failure and make internal causal attributions for outcome. Theoretically, this hypothesis is congruent with Rehm's (1977) model and this effect would be further enhanced by unstable attributions, and dampened by stable attributions. This aspect of the proposed research again provides for comparison of the efficacy of attributional versus behavioral elicitation constructs, and may suggest possible cognitive-behavioral linkages.

Recall of Reinforcement

Nelson and Craighead (1977) and Lobitz and Post (1979) have reported findings which support the notions of Beck (1967) and Rehm (Rehm, 1977; Weiner & Rehm, 1975) that depressed individuals are particularly sensitive to negative feedback and overestimate the frequency of events that promote negative self-evaluation and task irrelevant negative cognitions. Task irrelevant cognitions may include self-punishing statements, such as labelling oneself "stupid" or "inadequate," and Rehm (1977) has suggested that this kind of covert self-punishment may serve to suppress instrumental behavior in the same manner as overt punishment by others. This leads to the possibility that observed differences in performance between depressed and nondepressed subjects may be significantly influenced by what a person "says to

herself" about an experience of failure. Following Rehm's (1977) line of thinking, differences between depressed and nondepressed persons in how they interpret their experiences to themselves could effect their subsequent performance as a function of the intensity, frequency, and duration of their self-evaluative cognitions. Such cognitions would also be expected to influence their responsiveness to subsequent environmental feedback regarding their performance. There is a growing body of data which supports this notion. VanderJagt (1977) noted differential patterns of response to reinforcement by depressed and nondepressed subjects, and Costello (1978), Lewinsohn (1974), and Rizley (1978) have suggested that depressed individuals appear to exhibit a loss in effectiveness of reinforcement. Nelson and Craighead (1977) have reported inverse patterns of response to and recall following, reward and punishment between depressed and nondepressed subjects. The theoretical explanation for this phenomenon is that high rates of positive feedback and low rates of negative feedback are least consistent with the depressed person's expectations, and thereby subject to the most distortion. In the current research design, subjects in the "reward" conditions were rewarded on about 70% of their task trials when in a "success" group, and on 30% of their task trials when in a "failure" group. Similarly, subjects in punishment conditions were punished on 70% of the trials when in a "failure" group, and about 30% of the time when in a "success" group. These experimental conditions

closely paralleled those employed by Nelson and Craighead (1977). In addition to an "objective" recall of the number of reinforced or punished task trials, as measured by Nelson and Craighead (1977), subjects also were asked to make "subjective" ratings of their performance, on a scale of 1 to 10. In this way, possible systematic relationships between objective recall and subjective evaluation were able to be examined for both depressed and nondepressed subjects.

The following hypothesis followed those of Nelson and Craighead (1977):

(1) With a high rate of reinforcement, depressed subjects will underestimate their reinforced performance, relative to nondepressed subjects. Conversely, at a low rate of punishment, depressed subjects will overestimate the amount of punishment received, relative to nondepressed subjects.

Aspiration and Self-Evaluation

Golin and Terrell (1977) have investigated differences between nondepressed and mildly depressed subjects on levels of aspiration relative to nondepressed subjects, resulting in the perception of average performance as unsuccessful. Since such findings have important implications in that they support Beck's (1967, 1976) cognitive model of depression, replication and clarification of this phenomenon appeared desirable. The current research design easily accommodated collection of data regarding expectancy for success, and

minimum and maximum aspiration levels as assessed by Golin and Terrell (1977). In addition, the current research generated repeated measures on these variables, providing information on change patterns as a function of reward and punishment. Based on the limited reported research in this area, the following hypotheses were made:

(m) Depressed subjects will exhibit higher levels of minimum and maximum aspiration on the task relative to nondepressed subjects.

(n) An inverse relationship will exist between aspiration levels and subjective self-evaluation.

(o) Nondepressed subjects will alter aspiration levels as a function of outcome and environmental feedback, while depressed subjects' aspirations will remain relatively rigid regardless of outcome and environmental feedback.

As aspirations rise while actual performance remains constant, it was expected that the obtained performance level be subjectively evaluated as increasingly negative, as a result of the increasing discrepancy between the person's performance standard and his/her actual performance (Bandura, 1971). Since performance outcomes in this study were experimentally controlled and identical for both depressed and nondepressed subjects, higher aspirations by depressed subjects lead to greater standards-performance discrepancies. The last hypothesis is congruent with Beck's (1967) clinical observations and theoretical notions regarding the relatively impermeable and rigid cognitive set of depressed persons.

It also fits well with Bandura's (1971) theory noted above, and if supported would help account for observed patterns of self-reinforcement and recall with depressed person (e.g., Wortman & Rehm, 1975; Craighead & Nelson, 1977).

Summary

The current research design provides for replication of earlier research in the areas of helplessness induction, causal attributions, associated mood changes, expectancy shifts, recall of reinforcement, aspirations, and self-evaluation. The unique contributions of this research included the discrimination between, and inclusion of, task outcome and environmental response as distinct variables relevant to all of the above areas of helplessness and depression research and the use of new, theoretically consistent methodology in the study of causal attributions.

Based on the hypotheses presented above, a composite representation of a depressed or learned helpless subject in the current experiment would be a person who performs worse on complex cognitive tasks than nondepressed, nonhelpless individuals, and who exhibits increased performance deficits associated with failure and punishments. She/he would attribute their poor performance to stable, uncontrollable, and internal causes, blaming themselves and manifesting intensified sadness, anxiety, and depression associated again with failure and punishment. She/he would be rigid in his/her performance. On the other hand, the hypothesized

nondepressed subject would show adequate cognitive performance regardless of positive or negative environmental response to success, taking the credit for this outcome with internal, stable, and controllable attributions, while disavowing responsibility for failure with external, unstable attributions. Failure and punishment would be associated with anxiety and anger, and would demonstrate a self-serving bias in overestimating his/her success while underestimating his/her failures.

METHOD

Subjects

Subject selection involved a two-step assessment procedure: First, a screening session to identify depressed and nondepressed individuals on a preliminary basis, and a second assessment to finalize each subject's classification before assignment to an experimental condition. For the screening session, introductory psychology students at Michigan State University completed the Beck Depression Inventory (BDI); (Beck, Ward, Mendelson, Mock, & Erbough, 1961) and Rotter's Internal-External scale.

Students scoring either below 4 or above 10 on the BDI were contacted by telephone, and asked to participate in an experiment allegedly investigating "relationships between mood, attitude, and concept formation." Subjects received partial course research credit for their participation, and individual appointments were scheduled with those agreeing to participate.

Upon each subject's arrival at the laboratory, informed consent was obtained following a brief description of the study and before proceeding with any aspect of the experimental procedure. Subjects were told that they would be asked to respond to a number of questions concerning their

mood and attitude, while performing a number of concept formation and cognitive-motor tasks and receiving positive or negative feedback based on their performance. Subjects were guaranteed anonymity and the right to withdraw from participation in the experiment at any time without penalty. Subjects were also informed that they would receive only partial feedback and debriefing at the end of the experimental session, and would be asked to self-address an envelope which would be used to send them a full explanation of the research after the data collection had been completed. This method of obtaining informed consent conforms to the guidelines of the University Committee on Research Involving Human Subjects at Michigan State University.

Following this orientation, subjects completed the BDI and the I-E scale. Subjects scoring below 4 on the BDI were classified as "nondepressed," and those subjects scoring above 10 were classified as "depressed." Subjects scoring in the middle range of the BDI were thanked, told that they had scored in the "most typical way" and that we had an adequate number of subjects, and excused from the experiment. Following assignment to one of the diagnostic groups, each subject was randomly assigned to one of six experimental conditions (three levels of reward, neutral, or punishment feedback with either a success or failure experience), under the restrictions that an equal number of subjects be assigned to each cell, and that roughly equal male/female ratios be maintained in all cells. Additionally, in order to control

for possible systematic effects of time-related variables, including vicissitudes of the academic quarter, equal numbers of depressed and nondepressed subjects were maintained throughout the data gathering process by randomly rejecting subjects from the expected larger pool of nondepressed subjects. Participation in the experiment was restricted to subjects between the ages of 18 to 35 inclusive. This process continued until 21 subjects were assigned to each cell, a total of 252 subjects.

The overall design of the experiment was thus a 2 x 2 x 3 factorial design as shown below in Table 1.

Table 1.--Experimental Design

Level of Depression	Task Outcome	Reward(R)	Neutral(O)	Punishment(P)
		Conditions		
		R	O	P
Depressed	Success			
	Failure			
Nondepressed	Success			
	Failure			

Apparatus and Materials

Beck Depression Inventory

The Beck Depression Inventory is a self-report instrument which measures depth of depression. The individual items of the BDI were clinically derived and represent 21 categories

of symptoms and attitudes, each category descriptive of a specific behavioral manifestation of depression (Beck, 1972). Four of five self-evaluative statements which comprise a graded series reflecting symptom severity are included for each category. The inventory items do not reflect any theoretical constructs of etiology or psychological processes in depression, but are based solely on their relationship to overt behavioral manifestations of depression. Each graded item is assigned a weighted value of from 0 to 3 according to its degree of intensity. Total test scores, which range from 0 to 63, are therefore a function of both the diversity and intensity of manifestations of depression reported.

Beck and his colleagues (Beck, 1972) have devoted considerable work to developing this instrument. Internal consistency has been established for the BDI, all categories correlating positively with total score (range .31 - .68; p .001). Split-half reliability was found to be .86, with a Spearman-Brown correction yielding a coefficient of .93. Indirect assessment of test stability showed parallel changes in the BDI and clinical ratings of depth of depression. Validation attempts were similarly comprehensive. Beck (1972) reports biserial correlation coefficients between BDI scores and clinical ratings of depth of depression of from .65 to .75. Similarly, the BDI was reported to correlate with Lubin's Depression Adjective Check-List (r=.66) and the MMPI D-scale (r=.75), these correlations being higher than these latter instruments correlated with each other. In

addition, the BDI has been shown to be discriminative between depression and anxiety, as well as predictive of changes in clinical rating (Beck, 1972). In an examination of the effect of extraneous background variables on BDI scores, race, age, and vocabulary test scores were shown to be uncorrelated with BDI scores (Beck, 1972). A small negative correlation ($r = -.163$) was found between educational level and BDI score, principally generated by scores of white male subjects. While statistically significant ($p < .01$), this correlation accounts for only 2.5% of the total score variance and appears to be trivial in terms of psychological significance. Beck (1972) found a significant correlation ($r = .180$; $p < .01$) in his sample population between sex and BDI score, with women in the group tending to be more depressed. While this data cannot be overlooked, it accounts for only 3.6% of the total variance, while it is consistent with a similar correlation between sex and clinical ratings of depth of depression, thereby providing additional informal validation evidence. Data strongly supportive of the above findings has recently been reported by Reynolds and Gould (1980). Construction validity of the BDI has been supported by confirmation of theoretically based hypotheses concerning the construct of depression as presented by Beck (1972). These hypotheses include the notions that depressed people are more likely to report dreams with themes of deprivation and failure, they are likely to identify with "losers" on projective tests, to have a history of deprivation during the

developmental period, and typically react to experimentally induced failure with an abnormally large drop in self-esteem.

Based on the above data, the Beck Depression Test (BDI) appears to be reasonably reliable and valid self-report measure of depression, well suited for use in this type of experimental paradigm.

Treatment Task

The treatment task for all groups was composed of a series of four four-dimensional stimulus patterns adopted from Levine (1966, 1971) and similar to those used in previous related research in this area (Benson & Kennelly, 1976; Hiroto & Seligman, 1975; Klein, Fencil-Morse, & Seligman, 1976; Litman-Adizes, 1978; Tennen & Eller, 1977). Each of the four dimensions had two values: (a) letter (A or T), (b) letter shading (striped or unstriped), (c) letter size (large or small), and (d) type of border surrounding the letter (circle or square). Each of the four problems consisted of ten stimulus cards. Stimulus patterns were presented one at a time on 12.5 x 17.5 cm white index cards. For each card the subject was asked to point to one side of the card and the experimenter gave feedback as to whether that side contained the correct value. In this manner the subject would attempt to identify the correct value for each problem. A sample stimulus card and instructions are presented in Appendix C.

Test Tasks

All subjects received a series of 20 five-letter anagrams similar to those used by Hiroto and Seligman (1975). Each of the anagrams was selected from a list of anagrams of known mean solution time (Tressalt & Mayzner, 1966), and letter order was arranged in a standard sequence: 5-3-1-2-4. Examples are ERLKC and OUHLG. These anagrams, composed of .64 cm letters, were presented to the subject one at a time on 12.5 x 17.5 cm white index cards.

All subjects also completed a digit symbol substitution task adopted from the Wechsler Adult Intelligence Scale (Wechsler, 1955). Instructions were similar to those used with a standard administration of this test with the exception that subjects were timed to completion of the measure rather than imposing a time limit. Administration of the digit symbol and anagrams tasks was counter-balanced.

Anagram Experience Rating

As an attempt to reduce spurious between-subjects variance as reported by Benson and Kennelly (1976) in the anagram outcome measure, subjects were asked to rate their experience with anagrams or word puzzles on a 10-point scale immediately prior to presentation of the anagrams. While such a rating is a less direct measure of anagram solving ability than a pretest with a series of unpatterned anagrams as suggested by Benson and Kennelly (1976), it decreases the potential effect on expectancy and persistence of a more intrusive measure (Feather, 1969) and has been

shown to be a fair estimate of anagram solving ability (Tennen & Eller, 1977).

Sliding Mood Scales

Three sliding scales were used to monitor sadness, nervousness, and anger. Each scale consisted of a question about the subject's present mood (e.g., "How sad are you feeling right now?"), a 7-point scale ranging between two extremes (e.g., extremely happy, extremely sad), and a movable pointer placed at the midpoint of the scale when given to the subject. This apparatus followed the design developed by Beck for Klein, Fencil-Morse, and Seligman (1976). Subjects were asked to make these ratings both prior to and after the treatment task, and following the test task.

Depression Adjective Checklist

In order to assess changes in depressive cognitions during the course of the experiment, the Depression Adjective Check-List (DACL), (Lubin, 1967) was administered following each presentation of the sliding scales for mood. A substantial amount of data attests to the reliability and validity of the DACL. Split-half reliabilities range from .82 to .93, and the DACL has been found to correlate with the BDI from .38 to .50, depending on the specific DACL form employed.

Expectancy, Recall, and Evaluation Scales

Prior to the beginning of the treatment task subjects were asked to estimate the total number of task trials they would get correct on the entire four-series task, on a scale from 0 to 40.

Prior to each series of ten trials of the treatment task, subjects were asked to indicate the number of trials they expected to get correct on that series on a scale from 0 to 10.

Following completion of the treatment tasks subjects were asked to estimate the total number of trials they got correct on a scale of 0 to 40, and to rate their performance on a 10-point scale ranging from "extremely poor" to "extremely good."

Aspiration Scales

Prior to each series of trials of the treatment task each subject was asked to mark "the number of trials you would actually like to get correct" on a scale of 0 to 10, thus indicating their maximum goal rating for that series. Subjects were then asked to "mark the least number of trials that you would be "satisfied with," on a scale of from 1 to 10, thus indicating their minimum goal rating for that series of trials.

Attribution Scales

Following completion of the treatment task, subjects were asked to make causal attributions for their success or

failure on the task by responding to a series of multiple bipolar 0-point rating scales similar to those developed by Weiner, Neirenberg, and Goldstein (1976). Subjects were asked to mark five rating scales each of which was consistent with respect to two of the three dimensional anchors of locus of causality, stability, and controllability, but which differed along the remaining dimension. For example, the subject was asked, "Did you succeed (fail) on this task because you are always good at these kinds of tasks or because these kinds of tasks are always easy (difficult)?" The anchors on this sample scale, "always good" and "task always easy," are identical on the stability (stable) and controllability (uncontrollable) dimensions, but differ in perceived locus of causality, with ability internal task difficulty external. In a similar manner judgments were made between: (2) "mood" and "luck," unstable and uncontrollable causes differing in locus of causality, (3) "always good (bad)" versus "mood," internal and uncontrollable causes differing in stability, (4) "task always easy (hard)" versus "lucky (unlucky)," external and uncontrollable causes differing in stability, and (5) "(did not) tried especially hard" versus "mood," internal and unstable causes differing in controllability. Thus, these five scales generated judgments which were each made in a single theoretical dimension, and accounted for all of the logically consistent causal positions proposed by Litman-Adizes (1976) in her nonorthogonal model of causal attribution.

In addition, subjects were asked to rate their attributions for their outcome on three 10-point scales along the dimensions of locus ("the causes of my outcome lie completely within me"), and controllability ("this outcome was totally controllable" versus "not at all controllable by me"). As suggested by Litman-Adizes (1978), causal attribution dimensions may not be ethno-scientific but rather represent scientific efforts to impose dimensionalization. These three ratings were included to provide useful data regarding this issue, which has obvious implications for understanding discrepancies in reported phenomenology. Finally, each subject was asked to rate on a scale of 1 to 10 "how certain you are of the accuracy of this rating" for each of their eight attributional endorsements. Copies of these scales may be found in Appendix D.

Procedure

Nine trained, undergraduate experimenters participated in the research. Sex of experimenter was roughly counterbalanced for both sex of subject and experimental condition, although equal n's were not maintained. Experimenter-subject gender and cell data were recorded to allow thorough examination of the data regarding possible experimenter effects. One experimenter worked with each subject on an individual basis.

Following the subject's arrival at the laboratory and orientation to the experiment (see Appendix B), he/she was

seated at a small table across from the experimenter, and completed the BDI and the I-E scale. The subject was then assigned to an experimental condition on the basis of his/her BDI score and a randomly generated cell assignment list. An outline of procedures and dependent measures can be found in Table 1.

Next, subjects were asked to complete the sliding mood scales by rating "how you're feeling right now," and then completed the first form of the DACL. Following this, subjects were told:

> This part of the experiment deals with concept formation and you will be looking at cards like this one (experimenter shows first sample stimulus card). On each card there are two figures. One has a square and one has a circle; one has an 'A' and one has a 'T'; one is striped and one is plain; and one is large and one is small. One of these eight values of the four dimensions will be associated with the correct figure in each problem series. When you are presented with each card, I want you to point to one side of the card to indicate your choice. I will give you feedback on your response, and in this way you will be able to learn the value which determines the correct figure. I'll say 'next' when it is time to turn to the next card. Remember, just choose one side of the card by pointing.

The object for you is to figure out what the correct value is so that you can choose correctly as often as possible. I will give you up to 15 seconds for each card. Do you have questions at this point?

Five sample trials of a four-dimension problem were then presented, with feedback and clarification. Following this, subjects were again asked if they had any questions. After answering any further questions, the experimenter told the subject:

We are ready to begin. You will be given four problems made up of ten cards each, for a total of 40 trials. Before seeing the first card, I want you to estimate the total number of trials you will get right on this entire 40-trial task. That is, of 40 trials, how many will you get correct?

The subject made his/her initial task performance estimate and was then told:

Before we begin the first series of ten cards, tell me the number of trials you would like to get correct, between none and ten, on this first series (subject makes maximum aspiration choice). Now please tell me the least number of trials in this first series of ten you would <u>be satisfied with</u> to get correct (subject makes minimum aspiration choice). Finally, tell me the number of trials you think you will actually get correct

on this series (subject gives series expectation). We will now begin the first series. I will present you with ten cards.

Subjects received different types of feedback based on their cell assignment. They were instructed as follows:

Subjects in the null feedback cells:

I will give you feedback on each trial, and in this way you will be able to determine the correct value. At the end of ten cards, I will ask you to tell me the correct value. OK, let's start.

Subjects in the reward cells:

Whenever you get a trial <u>correct</u>, I will be sure to let you know. Whenever you don't get a trial correct, I'll just be quiet. In this way you will be able to determine the correct value. At the end of ten cards, I will ask you to tell me the correct value. OK, let's start.

Subjects in the punishment cells:

Whenever you get a trial <u>wrong</u>, I will be sure to let you know. Whenever you get a trial correct, I will just stay quiet. In this way you will be able to determine the correct value. At the end of ten cards, I will ask you to tell me the correct value. OK, let's start.

Subjects assigned to "success" conditions received contingent feedback on their performance. Previous studies have shown that virtually all college students are able to

correctly solve these problems. Subjects assigned to "failure" conditions received noncontingent feedback according to a predetermined fixed random pattern, receiving two successful trials on the first series, three successful trials of the second and third series, and two successful trials on the fourth and final series. Subjects in the failure conditions did thus undergo a standard helplessness induction procedure as employed in previous studies. In all "failure" series the final trial was judged as incorrect, and all series hypotheses were also judged as incorrect. Due to the serial presentation of stimuli at 15 second intervals, it is not difficult to become confused when trying to remember previous stimuli and receiving noncontingent feedback. The noncontingent nature of the feedback is typically not recognized, the task retains face validity, and the subject believe she/he has truly failed. This assumption was checked for validity in all cases during the debriefing process. Any case of subject recognition of the actual contingencies was also readily apparent during the reporting of causal attributions for their performance. In these cases the experimenter clarified this possibility during the debriefing session. Subjects recognizing the actual noncontingent nature of the feedback were dismissed from the study. This occurred for only six subjects during the experiment.

Subjects in the neutral feedback cells:

All subjects received some form of informative feedback on every task trial, to avoid the operation of any

"blank trial" phenomena (Levine, 1971). Based on cell assignment, subjects received trial-by-trial feedback as follows:

Subjects were told "match" or "no match," spoken with a flat or neutral affective expression, based on either the accuracy of their response (contingent feedback groups). Following their guess as to the series hypothesis, the experimenter similarly responded "match" or "no match," followed by, "We are now going to begin a new problem series," and continued with the procedure.

Subjects in the reward cells:

Subjects in the reward conditions were told "Yes, that is the right answer," accompanied by a nod, smile, and an enthusiastic tone of voice, based on either the accuracy of their response (contingent feedback groups) or the predetermined feedback schedule (noncontingent feedback groups). As per the subject's instructions, the experimenter remained silent on failure trials. In addition, for each successful trial the subject was given 5 cents in coin, placed in a small box on the table. The experimenter said, "Good, and this is for you to keep," on the first successful trial, showed the subject the coin, and deposited the coin in the box. For subsequent successful trials the coins were dropped into the box as the positive feedback was given. Contingent feedback subjects were told, "Very good, that is the correct solution," at the end of each successful series, before moving on the next problem series.

It is important to note here the training procedures employed with the experimenters in order to assure uniform perception of positive and supportive feedback by subjects in this experimental condition. Experimenters were encouraged to modify the specific form of their verbal response to provide trial-to-trial variation in order to maintain an impact of being genuine and spontaneous. Similarly, non-verbal cues such as body orientation and facial expression were experimented with by each experimenter in order for her/him to learn how to facilitate an encompassing and congruent message of support and praise that was experienced as such by the subject. Due to individual differences in voice, body build, and general appearance, the actual forms of this feedback mode varied considerably between experimenters, within the limits of the basic model of one-phrase feedback described above. During training, experimenters practiced their response repertoires with each other and were rated and given subjective feedback on their impact by their colleagues. Following consensus on each experimenter's ability to deliver consistent, experimentally positive feedback, experimenters ran a series of pilot subjects who were debriefed with a specific focus on their experience of the experimenter's feedback.

Upon receiving consistent positive ratings from both pilot subjects and the author of this research, the experimenter was cleared to begin laboratory data collection. At random intervals during the 7 month data collection period,

experimenter performance was monitored and rated to avoid the occurrence of gradual "slippage" or change in the feedback procedure over time.

Subjects in the punishment cells:

Prior to the start of the first series of trials each subject in the punishment conditions were given either $1.00 (success conditions) or $1.50 (failure conditions) in 5 cent coins placed on the table by the experimenter with the comment, "This is for you." Subjects in these punishment cells were told, "No, that is wrong" on failure trials, accompanied by a frown, negative head shake, and the removal of 5 cents from the table. As per the subject's prior instructions, the experimenter remained silent on successful trials. Outcomes were determined as in the other conditions. Following a "failure" subject's guess at each series hypothesis, she/he was told, "No, you have failed that series," again accompanied by nonverbal expression of disappointment. Success condition subjects in punishment cells were told, "Now we are going to begin the next series," at the completion of each problem series.

Experimenters underwent the same training process with regard to delivery of negative feedback as with positive feedback. Nonverbal cues such as sighs, rolling of eyes, tapping fingers, and frowns were employed, as well as intonations interpreted as impatience, derogation, and disgust by raters and pilot subjects. Again, the response repertoire of each individual experimenter was tailored to elicit

uniform subject experience of being genuinely punished. Experimenter responses were in all cases, however, limited to the response parameters stated above.

At the conclusion of each of the four problem series, and prior to the start of the next series, subjects were asked to give maximum and minimum aspiration goals and a series expectancy estimate, as described previously. In this way a total of four measures of these variables were collected. Immediately following the conclusion of the fourth series of trials the subject was again asked to complete the sliding mood scales and a second form of the DACL. The subject was then asked to, "Please mark on these scales (placed in front of the subject, (1) the total number of trials you get correct out of the total of 40 trials, and (2) how you think you did on this task on this scale of 1 to 10." The scale presented to the subject was anchored by the phrases "extremely poor" and "extremely good."

The subject's attention was then directed to the causal attribution scales and she/he was asked to complete them. Following this, subjects were introduced to the test tasks. Subjects who failed the treatment task were told, "You failed the perceptual-discrimination task. Now I would like you to try some other tasks." The test task portion of this research was composed of the anagrams and digit symbol tasks, which were counterbalanced in presentation. For the anagrams task the subject was told:

> Now I want you to solve some anagrams. Anagrams are words with their letters scrambled. The problem for you is to unscramble the letters to make a word. When you've found the word tell me what it is. There could be a pattern or a principle by which to solve the anagrams, but that's up to you to figure out. Before we begin, please rate your experience with anagrams or word puzzles on this 10-point scale.

The experimenter then presented the subject with the rating scale anchored by the words "none" and "very experienced." The anagrams were then given, with subjects allowed a maximum of 100 seconds to solve each of the 20 problems. As the subject worked on the anagrams the experimenter recorded the following dependent measures: (a) the number of correct responses, with failure to solve defined as a solution time of 100 seconds, (b) the response latency of each anagram, (c) the number of trials to criterion, criterion defined as five correct solutions in less than 10 seconds each after which no further errors occur, and (d) whether at the end of the task the subject could identify the fixed solution pattern of the anagrams. The subject was asked if he/she noticed any pattern to the anagram solutions, and if so what it was specifically.

For the digit symbol test, the subject had the test form placed in front of the subject and she/he was told:

Look at these boxes. Notice that each has a number in the upper part and a mark in the lower part. Every number has a different mark. Now look here (pointing to samples), where the upper boxes have numbers but the lower boxes are blank. You are to put in each of these squares the mark that should go there, like this (the experimenter demonstrates with the first three samples). Now, when I tell you to begin, I want you to fill in the squares correctly as fast as you can, without skipping any. Do you have any questions?

The experimenter recorded: (a) the total time to completion of the test, and (b) the total number of errors.

Immediately following completion of the second test task, the subject was then directed to the sliding mood scales for the third and final time, and also completed a third form of the DACL. The subject was then asked to rate on a scale of 1 to 10 anchored by the words "very poor" and "very good," how well she/he did on the two tasks, and rate on a similar scale how well she/he would do on a similar set of tasks in the future.

Then the subject was told:

The formal experiment is now over. Please relax for a couple of minutes and I will ask you to complete just one more form. This study is examining systematic relationships between mood, attitude, performance, outcomes, and subsequent performance.

> Some subjects receive more difficult kinds of problems which made succeeding very difficult, while other subjects receive problems and tasks of a less difficult nature. (For failure subjects): Your problems have been especially difficult. While I cannot give you full information on all aspects of the research at this time, I can let you know that part of this study was designed to learn about the resilience of people following their experience with difficult tasks. (The experimenter then said as an aside): By the way, under the conditions of this experiment, you did very well on the anagram and digit symbol tests. We would appreciate it if you did not discuss details of this experiment with those who might be asked to participate in the study later in the term.

The experimenter then asked a short series of open-ended questions (e.g., what was it like for you to be in this experiment?, what parts did you like or dislike?) to help the subject air any conflictual thoughts or feelings about his or her experience. All experimenters were trained in fundamentals of active, empathic listening, and attempted to communicate to the subject a sense of participation in the study as opposed to have been "used" as a subject.

The subject then completed the BDI, and it was scored immediately by the experimenter, out of the subject's sight. Subjects who showed an increase in BDI score of 3 or more

points relative to their score on the first administration, and whose score was above 12, were referred to the author of this research for a personal interview. At that time the nature of the research was fully disclosed and discussed, and the author assessed the depressive condition of the subject. Intensely depressed subjects were advised of counseling services available at the Counseling Center, and the author followed up this interview with a telephone call to the subject after 2 weeks had passed. Eight subjects who met the above criteria were interviewed and referred to the Counseling Center.

RESULTS

Prior to statistical analysis of the hypotheses under examination, an investigation of possible experimenter effects was conducted by performing a two-way univariate analysis of variance for unequal n's (Nie, Hull, Jenkins, Steinbrenner, & Bent, 1975; Winer, 1971) on each of the major dependent measures, using experimenter and experimental cell assignment as between subjects factors. No systematic relationships were found between experimental and dependent measures, all p's>.10. Similarly, a three-way univariate analysis of variance on initial BDI scores was performed using depression classification, task outcome, and feedback condition as between subjects factors, in order to establish the fact of between cell equivalence of depression level within depression classifications. No significant differences were found between treatment cells within either the nondepressed or depressed groups (all F's<.35, p>.50). With the a priori assumptions of experimenter and BDI between group equivalence met, the investigation proceeded to the data analysis proper.

Induction of Interference Effects

Six dependent measures were used to assess interference or helplessness effects: (a) mean response latency for the

20 anagrams, (b) mean number of correct anagram responses, with failure to solve defined as a solution time of 100 seconds, (c) mean trials to criterion, with criterion defined as five correct anagram solutions in less than 10 seconds each, after which no further errors occurred, (d) mean scores of whether or not the subjects could identify the anagram solution pattern at the conclusion of the task, solution scored as 1 and nonsolution socred as 0, (e) the mean total time to completion of the digit symbol task, and (f) the mean number of errors on the digit symbol task.

Initially, an analysis of variance was performed on subjects' prior experience ratings, with depression classification, outcome, and feedback condition as between subjects factors. This analysis revealed significant differences between groups for both depression condition, $F(1,239)=7.18$, $p<.01$, and task outcome, $F(1,239)=6.18$, $p<.02$. Multiple classification analysis (Nie et al., 1975) revealed that nondepressed subjects reported slightly more experience with anagrams than did depressed subjects, and subjects in the success conditions similarly reported slightly more anagram experience than did subjects in the failure conditions. There were no interaction effects. No psychologically significant correlations between prior anagram experience ratings and anagram dependent measures were found, the largest relationship being a Pearson coefficient of $r=.11$, $p<.05$, with the number of correctly solved anagrams.

Analyses of covariance with prior anagram experience serving as the covariate, were then run on the dependent measures. As predicted, the experimental treatment procedure had effects on subsequent task performance. The means and standard deviations for the six behavioral dependent measures are shown in Appendix M. The results for the latency, number correct, criterion, solution, and time to completion measures are plotted in Figures 1 through 5 and summarized in Appendix N. These tests revealed multiple main effects and interaction effects. A main effect of depression was found, thus supporting Hypotheses A, for: (a) mean latency, $F(1,239)=3.75$, $p<.05$; (b) number of correctly solved anagrams, $F(1,239)=11.16$, $p<.001$; (c) mean trials to criterion, $F(1,239)=4.41$, $p<.05$; (d) pattern solution, $F(1,239)=7.40$, $p<.01$; and (e) time to completion on the digit symbol task, $F(1,239)=7.19$, $p<.01$. The total errors on digit symbol measure failed to reach significance, $F(1,239)=.46$, $p>.10$. Nondepressed subjects solved more anagrams, reached criterion earlier, demonstrated shorter latencies and solved the pattern more often than depressed subjects, who were also slower to complete the digit symbol task.

Analysis of covariance of the six behavioral measures also revealed a main effect of outcome, as posited by Hypothesis B, for: (a) mean latency, $F(1,239)=11.01$, $p<.001$; (b) number of correctly solved anagrams, $F(1,239)=7.49$, $p<.01$; (c) mean trials to criteria, $F(1,239)=4.41$, $p<.05$; and (d) pattern solution, $F(1,239)=4.87$, $p<.05$. Subjects

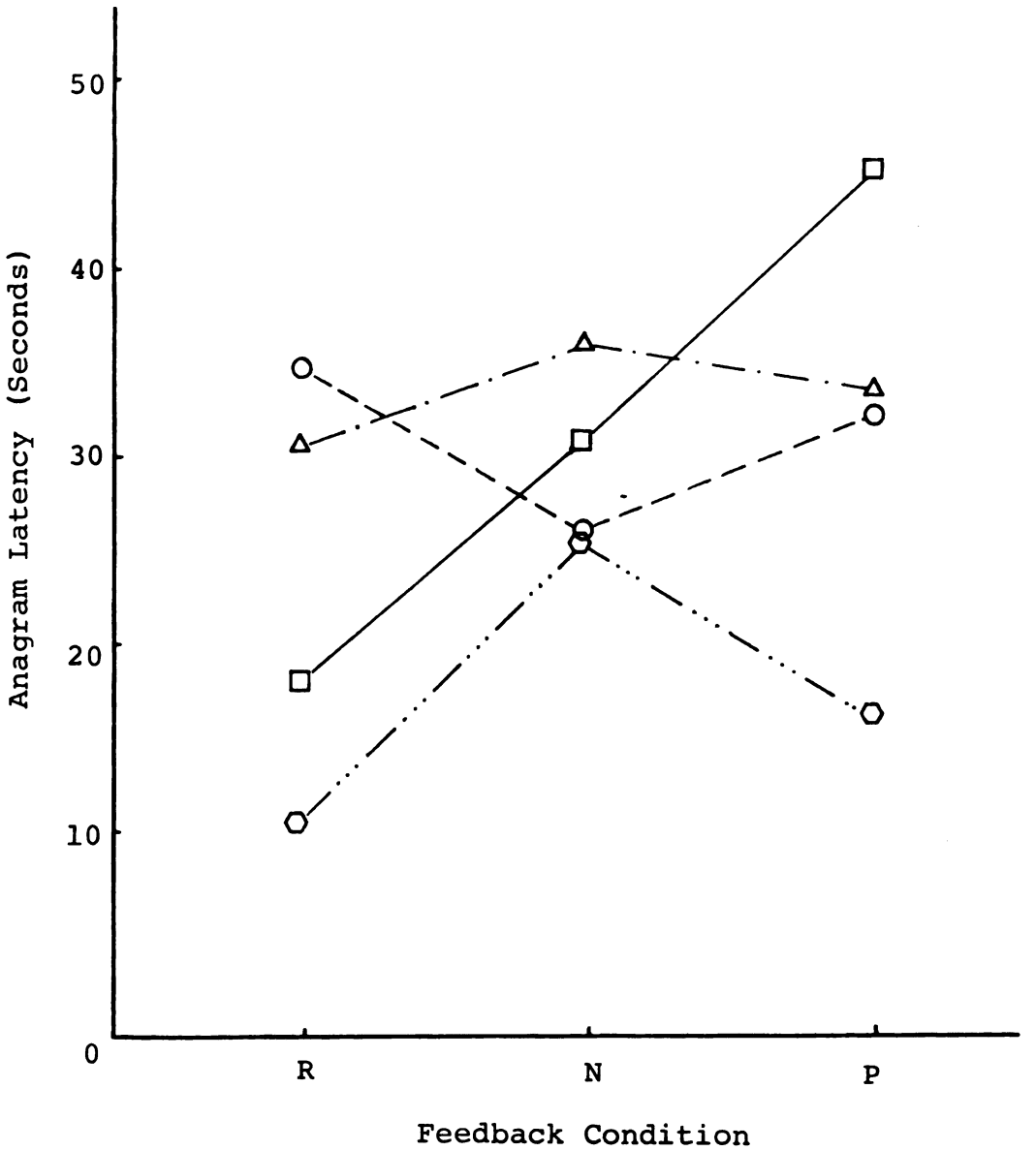


Figure 1. Mean Anagram Latency by Treatment Condition.

Note: R = Reward; N = Neutral; P = Punishment;

⬡—···— ⬡ = nondepressed success

△—·—·△ = nondepressed failure

○– – – – –○ = depressed success

□————□ = depress failure

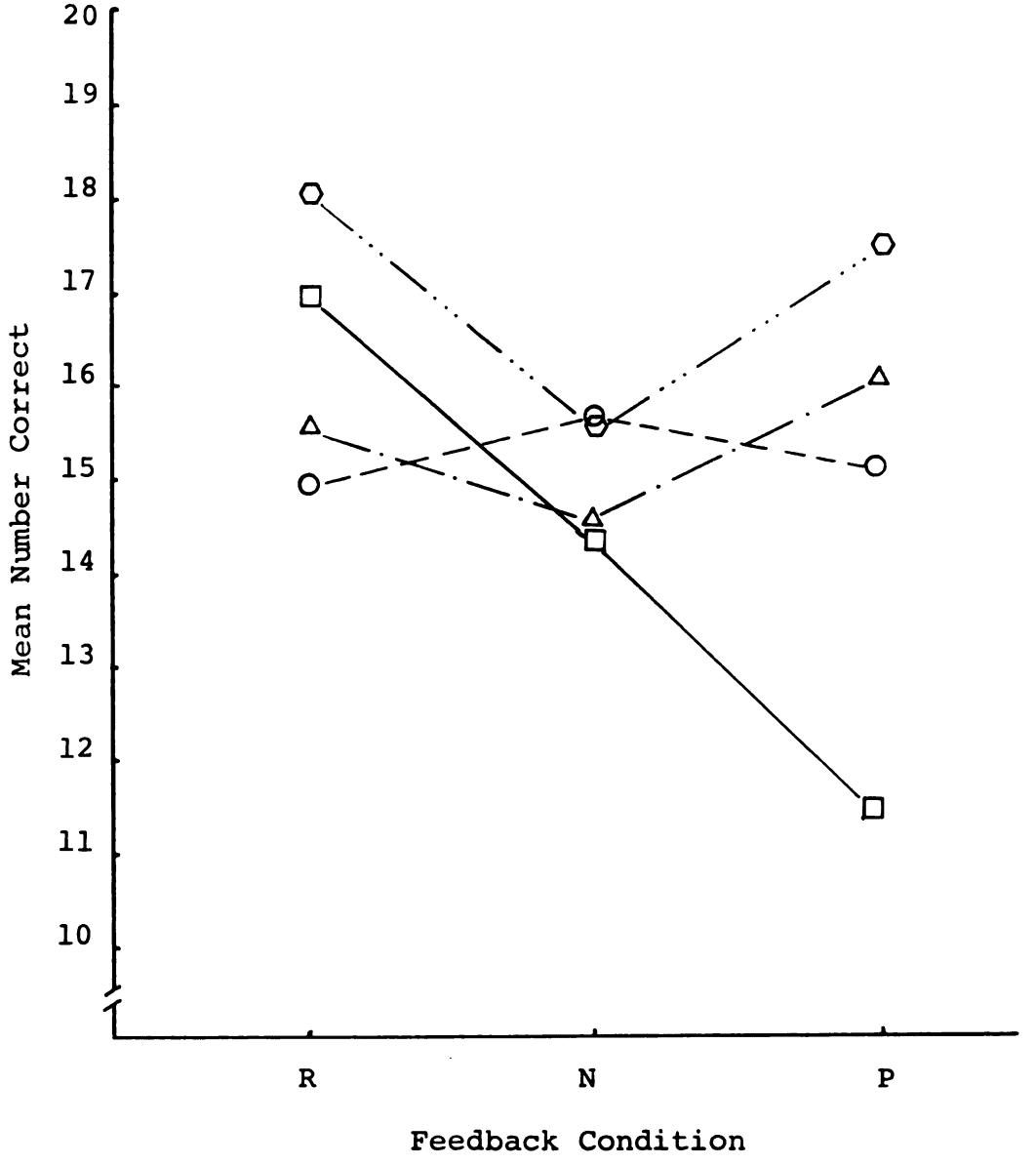


Figure 2. Mean Number of Correctly Solved Anagrams by Treatment Condition.

Note: R = Reward; N = Neutral; P = Punishment

⬡—···—⬡ = nondepressed success

△—·—△ = nondepressed failure

○— — — —○ = depressed success

□————□ = depressed failure

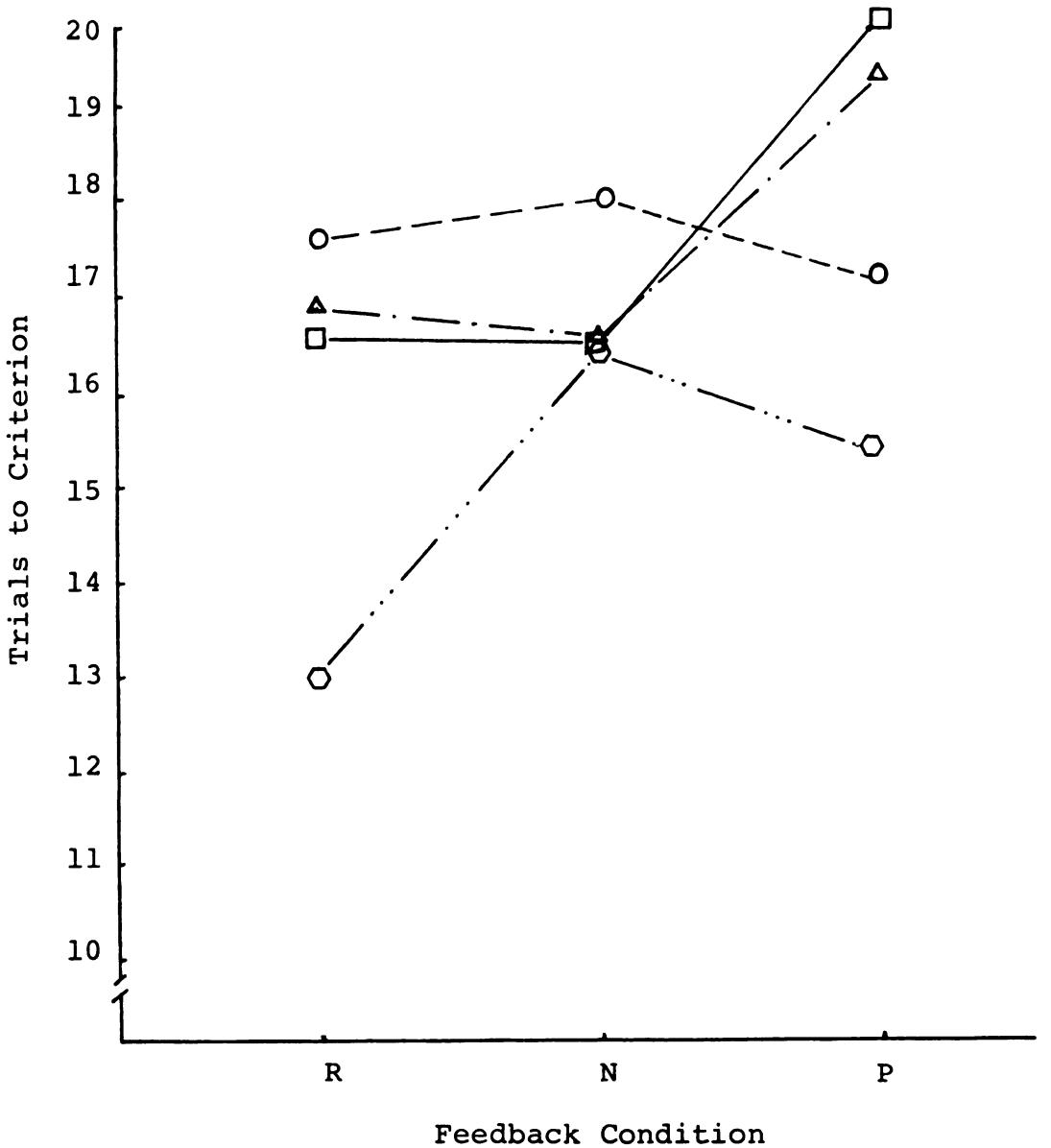


Figure 3. Mean Number of Anagram Trials to Criterion by Treatment Condition.

Note: R = Reward; N = Neutral; P = Punishment

⬡—···—⬡ = nondepressed success

△—·—△ = nondepressed failure

○— — — —○ = depressed success

□————□ = depressed failure

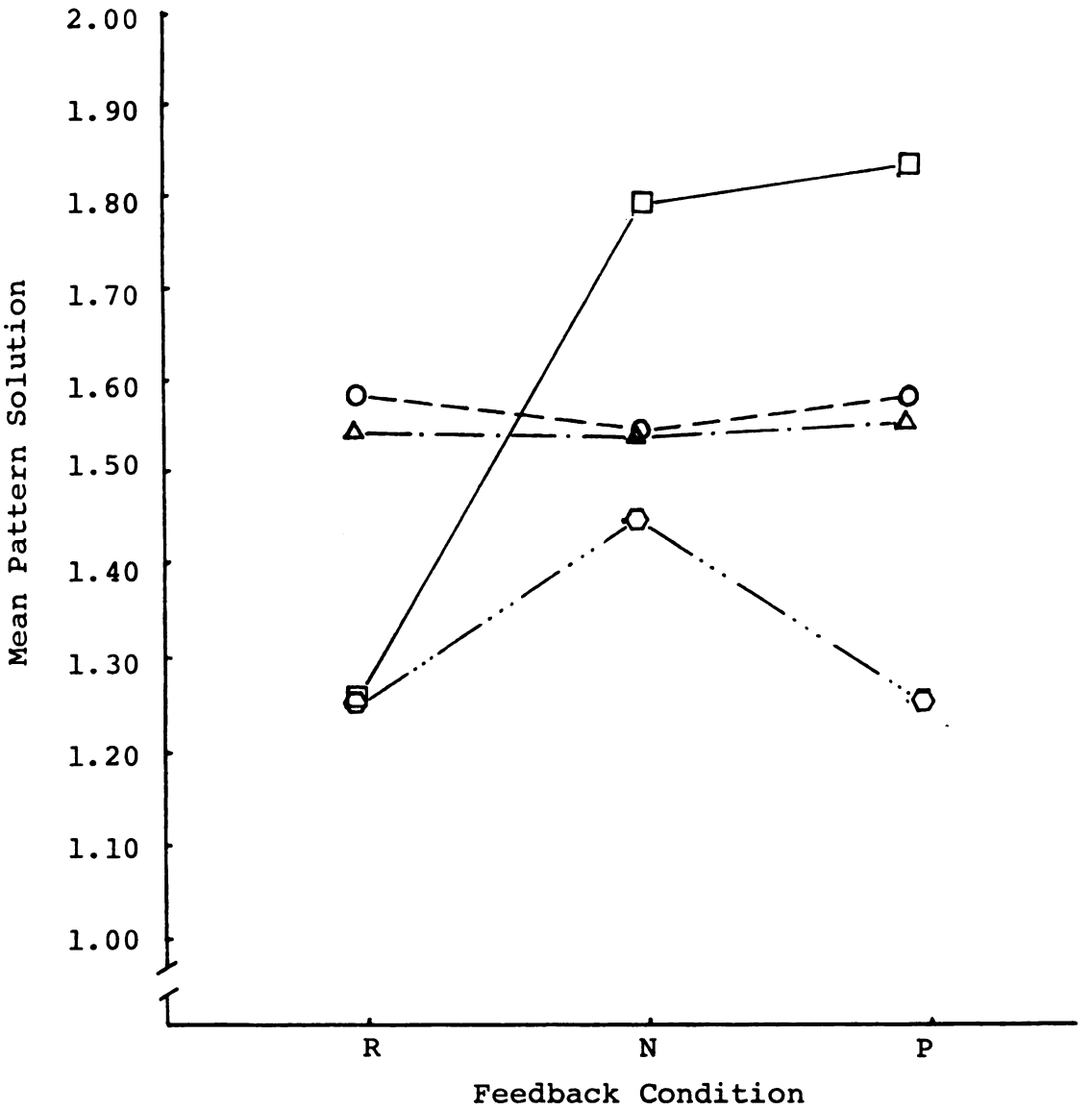


Figure 4. Mean Number of Correct Anagram Pattern Solutions by Treatment Condition.

Note: R = Reward; N = Neutral; P = Punishment

○——···——○ = nondepressed success

△——·——△ = nondepressed failure

○— — — —○ = depressed success

□———— □ = depressed failure

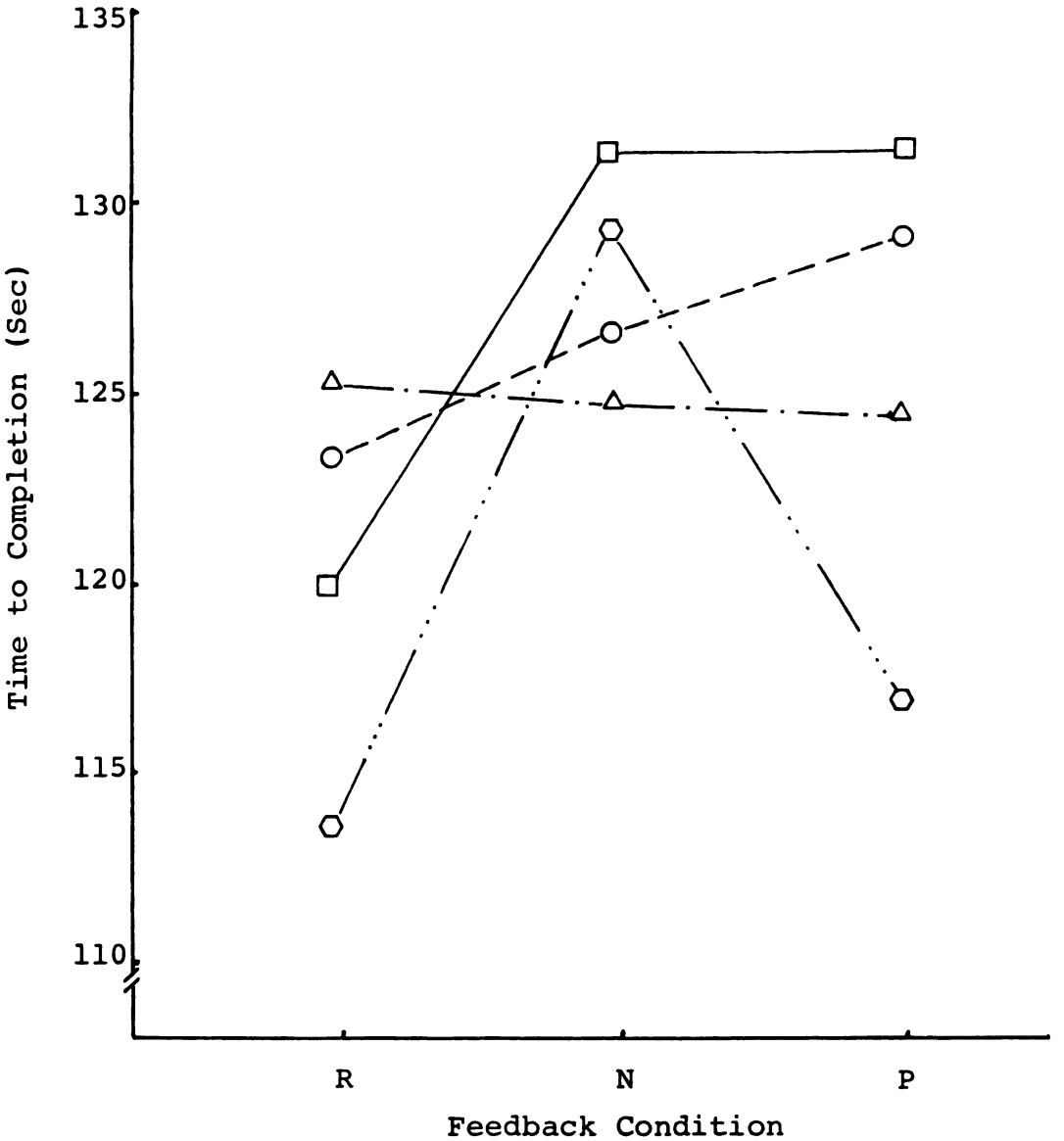


Figure 5. Digit Symbol Completion Time by Treatment Condition.

Note: R = Reward; N = Neutral; P = Punishment

○——···——○ = nondepressed success

△——·——△ = nondepressed failure

○— — — —○ = depressed success

□————□ = depressed failure

who succeeded outperformed subjects who failed on all of the anagram measures. The digit symbol time to completion measure approached statistical significance, $F(1,239)=3.08$, $p<.10$, while the total errors measure did not reach significance, $F(1,239)=.01$, $p>.10$.

The feedback x depression interaction posited in Hypothesis C was also supported by the data for anagram latency, $F(1,239)=5.80$, $p<.01$, and number correct, $F(1,239)=5.81$, $p<.01$. The remaining four behavioral dependent variables did not reach statistical significance. A Tukey-B multiple range analysis of the data showed that for depressed subjects, punishing feedback was associated with longer latencies and fewer correct anagrams, while rewarding feedback was associated with shorter latencies and a greater number of correct anagrams. Performance on these two measures was significantly different ($p<.05$) between the rewarded and punished groups. No such systematic relationship was found for nondepressed subjects. Furthermore, the data analysis revealed that the interaction effect noted above was entirely due to differences within the depressed failure category, where the three groups demonstrated significant differences between themselves on all of the anagram measures. The reward feedback with failure subjects showed unexpectedly good performance, reaching statistically undifferentiated performance with even the best of the nondepressed groups, while the depressed subjects who were punished for failure demonstrated uniquely poor performance.

Feedback condition for depressed subjects who failed correlated r=.55 (p<.001) with mean anagram latency, r=.54 p<.001) with the number of correct anagrams, r=.38 (p<.001) with trials to criterion and r=.29 (p<.01) with time to completion on the digit symbol task, illustrating this strong interaction effect. No such significant relationships were found with depressed subjects who succeeded on the treatment task nor either of the nondepressed outcome groups.

The overall three-way depression x feedback x outcome interaction predicted in Hypothesis D was strongly supported by four of the six behavioral dependent measures: (a) mean anagram latency, $F(2,239)=7.14$, p<.001; (b) number of correct anagrams, $F(2,239)=4.94$, p<.01; (c) anagram pattern solution, $F(2,239)=3.58$, p<.05; and (d) digit symbol time to completion, $F(2,239)=3.4$, p<.05. An a posteriori analysis using the Tukey-B multiple range test showed that optimum performance on all dependent measures except digit symbol errors was associated with success and the absence of depression, while performance decrements were associated with depression, failure, and punishment. The analysis showed that on each of these dependent measures the performance of nondepressed subjects who succeeded and were rewarded was significantly (p<.05) better than that of all other groups. Conversely, depressed subjects who failed and were punished performed significantly (p<.05) worse on those measures than all other groups, with the exception of depressed failing subjects in the neutral feedback group,

from whom they did not significantly differ ($p>.10$) on the mean number correct and pattern solution measures.

It is important to note that the main effects reported above do not appear to be artifacts of the significant two- and three-way interaction. Not only were main effects of depression classification and task outcome found for the anagram latency and number of correctly solved anagrams, measures, but also the trials to criterion, pattern solution, and digit symbol completion time measures, for which no significant interactions were found. Additionally, the ranges of the anagram latency and number correct score of the three failing depressed groups bracketed the mean scores for both nondepressed failing and depressed successful groups, and the ground mean of the depressed failing subjects did not significantly differ ($p<.50$) from either of these other groups. This strongly suggests that the reported significant main effects are independent of the feedback and depression interaction.

Causal Attributions

Prior to the analysis of the causal attribution scores two additional attribution ratings were calculated for each subject. An additional internal-external attribution rating consisted of the summed scores of the two bipolar scales on this dimension, each of which was constructed to be internally consistent with regard to the stability and control dimensions. Similarly, an additional stable-unstable

attribution rating was calculated by summing the scores of the two bipolar scales on this dimension, which were constructed to be internally consistent with regard to the locus of control and controllability dimensions. The data analysis was thus carried out on a total of ten attribution scales. In all cases, lower scores indicate more internal, stable, or controllable attributions, relative to higher scores. Means and standard deviations for all attribution measures can be found in Tables 2, 3, and 4; and Figures 6, 7, and 8.

Two-way analyses of variance were performed on each of the four measures, using depression level and outcome as between subjects factors. Strong outcome X depression interaction effects were found for all four of the attribution measures, all F's>16.01, p<.001. An a posteriori inspection of the data employing the Tukey-B (p<.05) method was undertaken in order to elucidate the above results. This analysis revealed that for the direct internal-external attribution measure, nondepressed subjects who failed externalized their results significantly more than any other group. On the bipolar ratings, however, the nondepressed subjects rated the causes for their outcomes as both more internal for success and more external for failure than the depressed groups, who did not differ from each other. For the nondepressed subjects, internality attributions were significantly correlated with outcome on all four measures, with a mean correlation of r=.51, p<.001. No significant correlations were found between internality attributions

Table 2.--Mean Internal-External Attribution Ratings by Treatment Condition

Depression Level	Attributions	Treatment Condition											
		S_R		S_N		S_P		F_R		F_N		F_P	
		M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
NONDEPRESSED													
	Due to me/others (direct)	2.38	1.56	3.14	1.80	2.67	1.74	4.38	2.09	4.29	2.08	6.00	2.70
	Always good/bad vs. task easy/hard	3.90	2.23	4.95	2.36	4.05	2.25	5.24	1.64	6.19	1.83	6.29	1.93
	Good/bad mood vs. luck	3.90	2.88	3.33	1.59	3.62	2.01	6.81	1.89	6.24	1.76	7.05	1.72
	Bipolar composite	7.80	3.31	8.29	2.85	7.67	4.05	12.05	2.71	12.43	2.86	13.33	2.67
DEPRESSED													
	Due to me/others (direct)	2.95	2.42	2.43	.93	3.76	1.04	2.86	1.71	2.95	1.47	3.95	2.90
	Always good/bad vs. task easy/hard	5.48	1.83	5.10	1.57	5.19	1.47	4.81	1.54	4.00	1.30	5.52	1.81
	Good/bad mood vs. luck	4.43	2.25	5.81	2.04	4.95	1.40	5.52	1.97	4.33	1.65	6.62	1.86
	Bipolar composite	9.91	2.84	10.91	3.03	10.14	1.88	10.33	2.65	8.33	2.50	13.14	2.63

Note. Each cell contains 21 subjects. S_R = success rewarded; S_N = success, neutral feedback; S_P = success with failures punished; F_R = failure with reward for successes; F_N = failure, neutral feedback; F_P = failure punished.

Table 3.--Mean Stability Attribution Ratings by Treatment Condition

Depression Level	Attribution	Treatment Condition											
		S_R		S_N		S_P		F_R		F_N		F_P	
		M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
NONDEPRESSED													
	Typical/not typical (direct)	2.57	2.04	3.14	1.71	3.09	2.17	6.81	2.69	7.14	1.68	7.10	2.86
	Always good/bad vs. good/bad mood	3.57	2.01	4.19	1.81	4.05	2.40	4.43	1.43	4.62	1.86	4.14	1.65
	Always easy/hard vs. good/bad luck	3.90	2.36	3.62	1.47	3.43	1.47	5.52	1.97	4.95	1.96	4.52	1.81
	Bipolar composite	7.48	3.01	7.81	2.77	7.48	3.25	9.95	2.87	9.57	2.68	8.87	2.89
DEPRESSED													
	Typical/not typical (direct)	4.19	2.36	2.38	.92	3.43	1.63	5.95	2.18	5.76	1.64	7.33	1.88
	Always good/bad vs. good/bad mood	5.76	2.09	4.48	2.11	5.90	2.00	4.81	1.57	5.52	1.63	5.10	1.92
	Always easy/hard vs. good/bad luck	6.52	2.42	5.33	1.80	4.62	1.50	5.33	1.56	4.95	1.75	4.38	2.45
	Bipolar composite	12.29	3.27	9.81	3.16	10.52	2.16	10.14	1.15	10.48	1.91	9.48	3.44

Note. Each cell contains 21 subjects. S_R = success rewarded; S_N = success, neutral feedback; S_P = success with failures punished; F_R = failure with reward for successes; F_N = failure, neutral feedback; F_P = failure punished.

Table 4.--Mean Controllability Attribution Ratings by Treatment Condition

Depression Level	Attribution	Treatment Condition											
		S_R		S_N		S_P		F_R		F_N		F_P	
		M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
NONDEPRESSED													
	Controllable vs. not controllable (direct)	3.38	2.60	3.14	1.59	3.71	2.83	5.43	2.46	4.67	2.22	6.48	2.84
	Tried hard/did not try hard vs. good/ bad mood	3.29	2.35	3.95	1.91	4.29	2.15	4.19	1.29	3.48	1.57	4.43	1.47
DEPRESSED													
	Controllable vs. not controllable (direct)	3.86	2.69	2.81	1.12	3.90	1.37	4.52	2.29	3.95	2.27	5.19	2.54
	Tried hard/did not try hard vs. good/ bad mood	4.29	2.69	4.67	1.65	5.00	1.55	5.14	1.06	5.29	1.49	4.91	1.45

Note. Each cell contains 21 subjects. S_R = succcess rewarded; S_N = success, neutral feedback; S_P = success with failures punished; F_R = failure with reward for successes; F_N = failure, neutral feedback; F_P = failure punished.

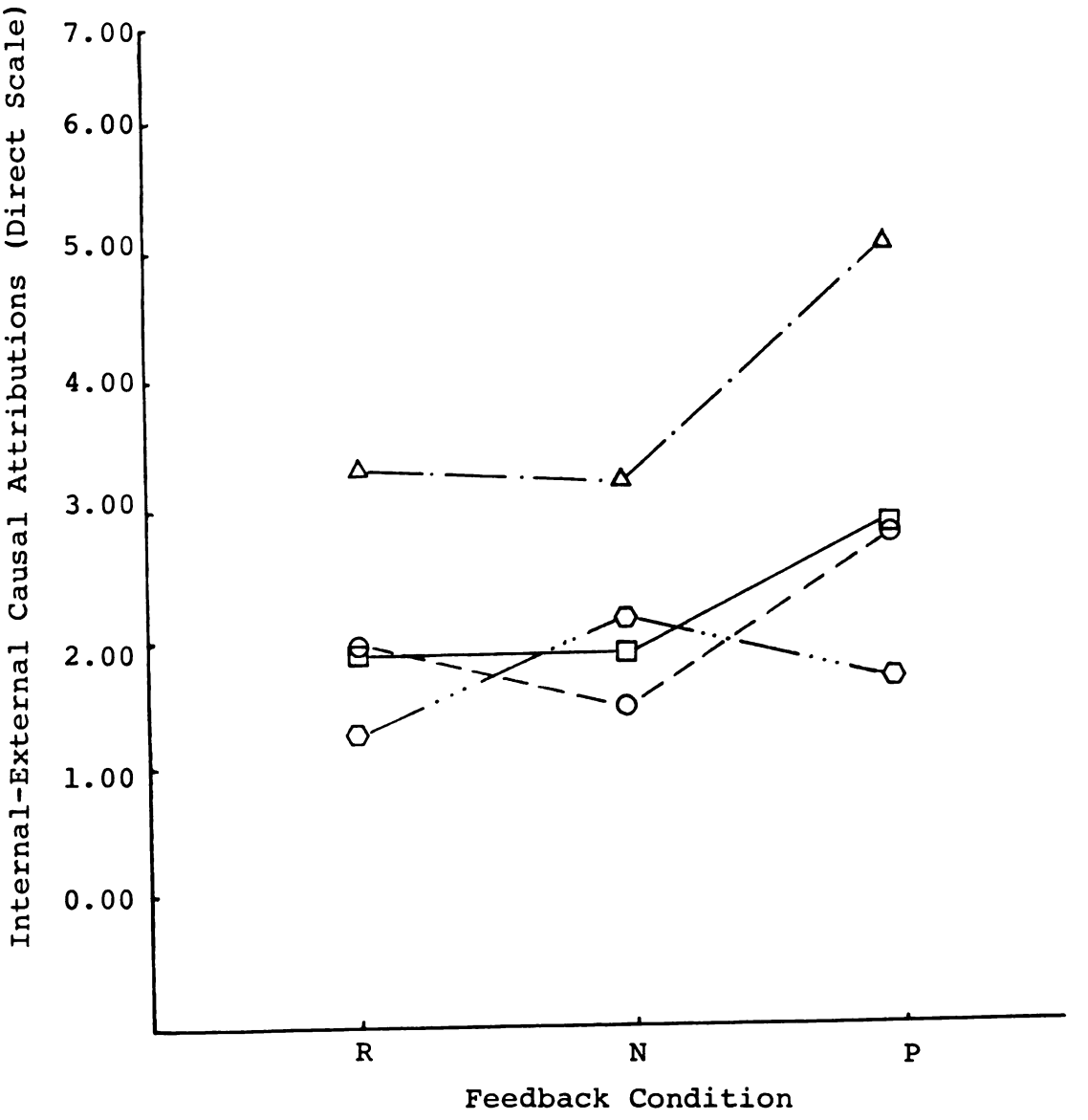


Figure 6. Mean Internal-External Attributions by Treatment Condition.

Note: R = Reward; N = Neutral; P = Punishment

⬡——···——⬡ = nondepressed success

△—— · ——△ = nondepressed failure

○— — — —○ = depressed success

□————□ = depressed failure

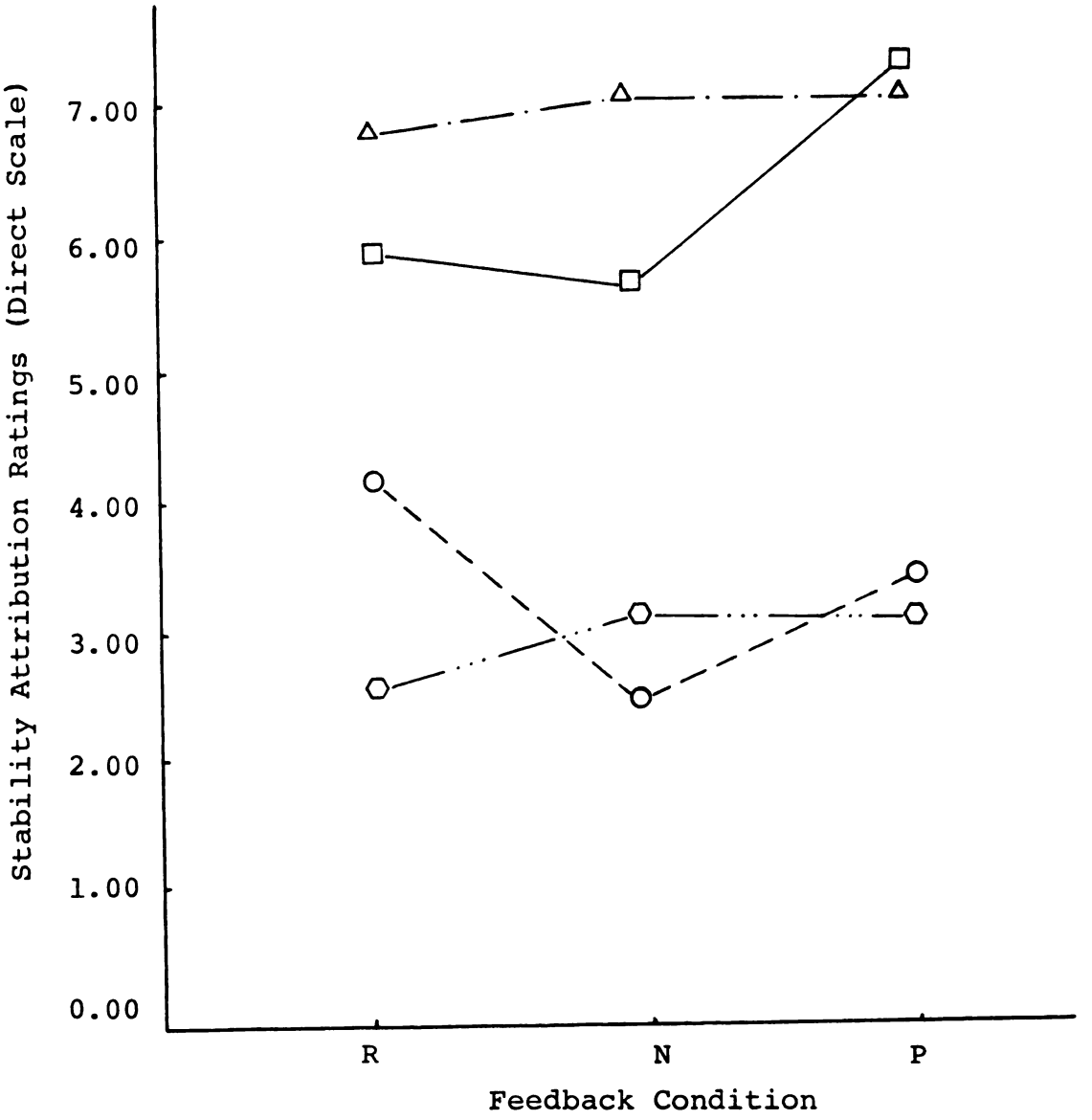


Figure 7. Mean Stability Attribution Ratings by Treatment Condition.

Note: R = Reward; N = Neutral; P = Punishment

○—···—○ = nondepressed success

△—·—△ = nondepressed failure

○— — — —○ = depressed success

□————□ = depressed failure

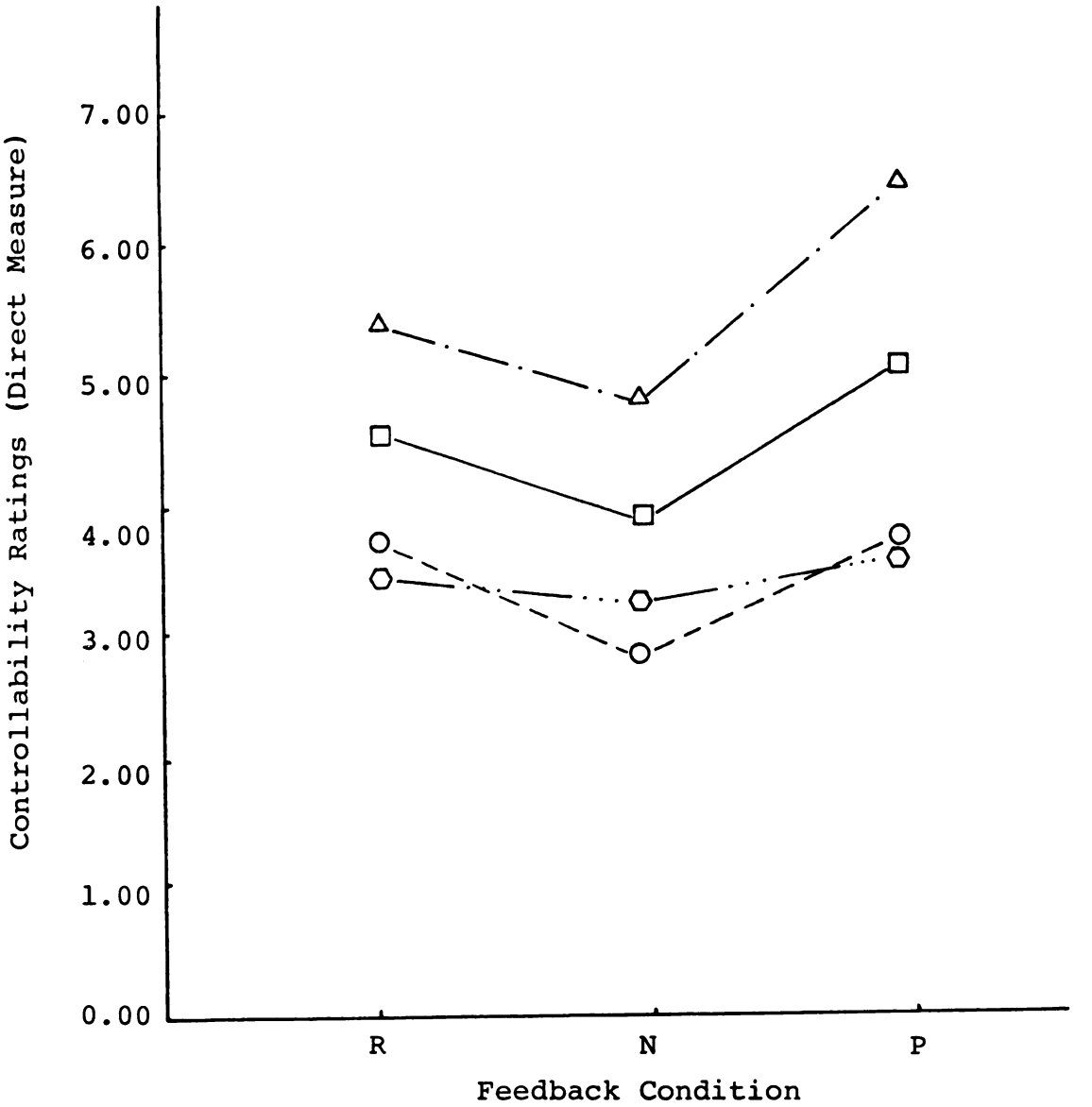


Figure 8. Mean Controllability Attributions by Treatment Condition.

Note: R = Reward; N = Neutral; P = Punishment

⬡——···——⬡ = nondepressed success

△——·——△ = nondepressed failure

○— — — —○ = depressed success

□————□ = depressed failure

and outcome for depressed subjects. It becomes clear then that the main effects for outcome found in this analysis arise from variation in causal attributions by the nondepressed subjects. Successful outcomes were attributed to self rather than other-engendered circumstances, relative to failure outcomes, $F(1,248)=23.51$, $p<.001$, regardless of level of depression. Successful outcomes were also attributed to ability rather than task ease, while failure was attributed to task difficulty rather than lack of ability, $F(1,248)=9.07$, $p<.001$. Mood was considered to be more important than luck as a causal factor by successful subjects relative to failing subjects, $F(1,248)=48.08$, $p<.001$. The composite bipolar attributions for internality produced a similar main effect for outcome, $F(1,248)=42.62$, $p<.001$, all dependent measures providing support for Hypotheses E. A main effect of depression level was found for internal versus external attributions for outcome on the direct measure only ($F(1,248)=7.29$, $p<.01$), the nondepressed subjects making more external attributions, overall, than depressed subjects. The three bipolar measures did not distinguish between depression level on this dimension. These results suggest a unique rigidity in the causal attributions of depressed persons on this dimension, while the nondepressed subjects manifest a self-serving bias, relieving themselves of responsibility for failure while taking perhaps inappropriate credit for success. These results provide strong support for Hypotheses E and F. Nondepressed subjects who

exhibited interference effects on the performance tasks did not make attributions similar to depressed subjects, failing to support Hypothesis G and calling into question the validity of learned helplessness as a model of mild reactive depression, at least with regard to locus of control attributions for task related outcome events.

A final analysis of the internal-external attribution data examined the effects of feedback condition on these attributions by performing three-way analysis of variance on each of the four measures (see Appendix O), using depression level, outcome, and feedback condition as between subjects factors. A significant outcome x feedback interaction was found for the three bipolar measures, all F's$(2,240)=4.89$, $p<.01$. A posteriori comparisons revealed that punishment was associated with greater external attributions for failure with both depressed and nondepressed subjects. No association was found between feedback condition and internal-external attribution ratings for success for either depressed or nondepressed subjects. Multiple classification analysis indicated that overall, rewarded and neutral feedback groups did not differ in their ratings, while punished groups made significantly more external ratings for outcome.

Consequently, main effects of feedback condition on internality attributions were found for the direct measure ($F(2,240)=6.75$, $p<.001$) and the composite bipolar measure ($F(2,240)=3.85$, $p<.05$). The effect of feedback condition on the bipolar ability versus task difficulty measure approached

statistical significance, $F(2,240)=2.76$, $p<.10$, while the mood versus luck measure did not do so ($p>.10$). The reported main effects of feedback condition on internality attributions are thus seen to be a function of the unique effect of punishment in conjunction with failure. Overall, the relative strengths of the effects reported above strongly suggest that causal attributions of internal versus external locus are most related to the outcome of the target event, as opposed to either depression level or feedback condition, with punishment for failure associated with increased externality, and with the range of attribution ratings on these measures by nondepressed subjects for positive and negative events bracketing a relatively restricted range of scores exhibited by depressed subjects, whose ratings are undifferentiated with regard to outcome.

The specific relationships between depressed and nondepressed subjects posited in Hypothesis F regarding stability attributions were examined by T-test. For the failure outcome conditions it was found, as expected, that depressed subjects, relative to nondepressed subjects, made attributions for failure which were more stable ($t(124)=1.68$, $p<.05$) as measured by the direct (typical vs. atypical) scale. Contrary to expectation, depressed and nondepressed subjects did not differ in their stability attributions on the bipolar scale anchored by task ease (stable) and luck (unstable), $t(124)=.33$, $p>.50$. Even more surprising, however, was the result that on the bipolar stability

attribution scale anchored by ability (stable) and mood (unstable) the depressed subjects made attributions which were significantly more unstable for failure than were those of the nondepressed subjects ($t(124)=-2.50$, $p<.01$). The composite stability measure did not distinguish between depressed and nondepressed subjects who failed, $t(124)=-1.37$, $p>.10$.

With regard to the success outcome groups, the bipolar attribution measures anchored by ability versus mood and task ease versus luck, as well as the composite measure, provided strong support for Hypothesis F ($t(124)=-3.85$, $p<.001$; $t(124)=-5.33$, $p<.001$; $t(124)=-6.13$, $p<.001$, respectively) that depressed subjects' attributions for success would be, relative to nondepressed subjects, more unstable. The direct (typical/not typical) measure failed to distinguish between groups ($t(124)=-1.16$, $p<.10$), although there was a trend in the predicted direction.

Due to the inconsistent results reported above, an extended analysis of the stability attribution data was performed employing two- and three-way analysis of variance (see Appendix P) on the dependent measures, using depression classification, outcome, and feedback condition as between subject factors, with appropriate Tukey-B a posteriori analysis. A main effect of depression level was found for bipolar stability attributions, all F's>10.55, $p<.001$. Nondepressed subjects made more stable attributions overall than depressed subjects. A significant interaction between

depression level and outcome was found on the direct measure ($F(1,248)=4.12$, $p<.05$), the bipolar ability versus luck measure ($F(1,248)=12.76$, $p<.001$), and the composite bipolar measure ($F(1,248)=30.58$, $p<.001$). Only the conceptually questionable ability versus mood bipolar scale did not demonstrate this interaction effect ($F(1,240)=2.12$, $p>.10$). Inspection of the group means by the Tukey method revealed that on every dependent measure the successful nondepressed subjects attributed their outcome as significantly ($p<.05$) more stable, while the successful depressed subjects attributed their outcome to unstable factors significantly ($p<.05$) more than any other group, as measured by all three bipolar measures. These results support the notion of the operation of a self-serving bias with successful nondepressed subjects, who expect continued success, and a self-defeating bias with successful depressed subjects, who seem to discount their outcome with unstable attributions. This systematic bias was not found in the failure outcome conditions, where depressed and nondepressed subjects who failed did not differ in their stability attributions. The main effect of depression classification is thus seen as a product of the depression x outcome interaction. An interaction was also found between depression level and feedback condition, $F(2,240)=3.32$, $p<.05$. A posteriori tests revealed that the tendency of successful depressed subjects to make unstable attributions was reversed in the neutral feedback condition, with these subjects making strongly stable attributions,

relative to the other groups, in the absence of either subjectively rewarding or punishing feedback. The stability attribution data provided support for Hypothesis G, that nondepressed failing subjects would make attributions similar to depressed subjects. No significant differences in stability attributions were found between failing depressed and nondepressed subjects (all p's>.05).

Attributions of controllability were examined in the same manner as stability and locus attributions. The bipolar control attribution measure anchored by effort and mood indicated that as predicted in Hypothesis F, depressed subjects rated both their success and failure outcomes as more uncontrollable than did nondepressed subjects (success, $t(124)=-2.18$, $p<.05$; failure, $t(124)=-4.30$, $p<.001$). A two-way analysis of variance of these attribution scores, using depression level and outcome as between subjects factors revealed a main effect of depression level only ($F(1,248)=17.76$, $p<.001$). A Tukey analysis confirmed that success and failure groups did not differ within depression level groups ($p>.10$). Similarly, a three-way analysis of variance with feedback as an additional between subjects factor indicated that feedback condition had no effect on this control attribution measure (all p's>.05). A two-way analysis of variance revealed a main effect for outcome ($F(1,248)=3.39$, $p<.001$. A posteriori analysis indicated that while depressed and nondepressed subjects did not differ in their control attributions for success, both success groups rated themselves as

having significantly ($p<.05$) more control than did depressed subjects who failed. The depressed and failing subjects, however, rated themselves as significantly ($p<.05$) more in control of their outcome than did nondepressed subjects who failed. A three-way analysis of variance including feedback condition as a between subjects variable (see Appendix Q) revealed a main effect of feedback condition ($F(2,240)= 5.53$, $p<.05$) on the direct attribution measure, in addition to the results noted previously. A posteriori analysis indicated that punished subjects made significantly greater attributions of uncontrollability than did subjects in the neutral feedback conditions, who made controllable attributions. Interestingly, the reward feedback group made attributions which as a group were nearly identical with the grand mean for this measure. There were no significant interaction effects. These results also suggest that outcome is a major influence on control attributions, but that once again a self-serving bias may be characteristic of nondepressed subjects who fail and then make relatively extreme attributions asserting their inability to control the situation and thus avoid the negative consequences associated with responsibility for failure. Also, explicit social-evaluative feedback appears to be associated with a diminished sense of control, especially when that feedback is punitive.

As is seen from the data reported above, failing nondepressed subjects did not make control attributions which

were similar to either of the depressed groups, failing to support Hypothesis G, that nondepressed subjects with induced performance deficits would make causal attributions similar to those of depressed subjects.

Taken as a whole, the attribution data reported in this research may be summarized as follows: Overall, the attributional mode of depression is supported by the data. Depressed subjects, relative to nondepressed subjects, exhibited more internal attributions for failure and external attributions for success. Depressed subjects also made relatively stable attributions for failure and relatively unstable attributions for success. Depression level was not associated with differences in perceived control of successful outcomes. In general, however, most of the significant differences reported above accrue from systematic relationships between outcome and feedback factors and ratings made by the nondepressed subjects, who exhibited much greater responsivity to outcome and feedback. Significant differences on nearly all of the dependent attribution measures were the result of seemingly "self-serving bias" patterns by nondepressed subjects. The single major exception to this pattern was depressed subjects strong trend to attribute task outcomes to mood factors when given the chance, regardless of the theoretical construct these factors purported to represent. Punishing feedback was related to increased external, unstable, and uncontrollable attributions regardless of level of depression, although these effects were more

pronounced with nondepressed subjects. From an attributional point of view, the depressed subjects were particularly rigid and unchanging regardless of outcome and feedback variables. Nondepressed subjects who exhibited performance deficits made stability attributions which were similar to those made by depressed subjects, but control and internality attributions made by these groups were significantly different suggesting that the so-called learned helplessness phenomenon and mild depression embody distinctively different cognitive processes as they relate to this type of experimental paradigm.

Mood

Hypotheses H, I and J, that: (H) depressed subjects would report a greater degree of subjective sadness and higher DACL scores than would nondepressed subjects; (I) that failing subjects would report a significantly greater amount of sadness, anxiety, anger, and higher DACL scores than successful subjects; and (J) that success and reward would be associated with lower reported sadness and anger for nondepressed subjects while failure and punishment would be associated with greater reported sadness, anger, and DACL scores for depressed subjects; were tested by performing three-way univariate analyses of variance on the dependent measures, summarized in Appendix R, using depression classification, outcome, and feedback condition as between subjects factors. Specified paired comparisons were examined by *t*-tests, while a posteriori comparison of interest dictated

by the data were made using the Tukey-B method. Means and standard deviations for all pre- and post-treatment mood measures can be found in Table 5 and Figures 9, 10, 11, and 12.

Analysis of variance of pretreatment self-reported sadness, anger, nervousness, and DACL scores revealed the expected main effect of depression on sadness ($F(1,240)=126.81$, $p<.001$) and DACL scores ($F(1,240)=96.09$, $p<.001$) and nervousness ($F(1,240=13.79$, $p<.001$). Depressed subjects ratings were higher on all of these dependent measures. No other main effects or interactions were found, all p's$>.05$, thereby establishing equivalency between experimental groups within the two depression classification. Additionally, pretreatment BDI scores were found to correlate $r=.62$ with pretreatment sadness scores and $r=.75$ with pretreatment DACL scores, which correlated $r=.72$ with each other, further establishing the construct validity of the dependent measures of sadness.

Posttreatment scores on the mood measures were similarly found to significantly differ between depressed and nondepressed subjects, all F's>34.46, $p<.001$. As predicted, a main effect of outcome on all mood measure scores was also found. Subjects who failed reported greater sadness ($F(1,240)=14.38$, $p<.001$), anger ($F(1,240)=57.64$, $p<.001$), anxiety ($F(1,240)=33.29$, $p<.001$), and DACL scores ($F(1,240)=60.69$, $p<.001$) than subjects who had successful outcomes on the treatment tasks.

Table 5.--Mean Pre- and Post-Treatment Mood Scores

Depression Level	Mood		Treatment Condition											
			S_R		S_N		S_P		F_R		F_N		F_P	
			Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
NONDEPRESSED														
	Sadness	M	1.86	1.19	1.33	1.29	1.01	1.67	1.71	1.71	1.81	2.19	1.71	1.86
		SD	.96	.75	.73	.85	.81	.86	1.23	1.10	1.12	1.21	.96	1.11
	DACL	M	3.76	4.29	2.71	4.62	3.86	5.48	3.95	7.67	3.19	8.38	3.90	9.90
		SD	2.47	2.39	2.28	2.48	3.02	2.94	3.09	4.08	3.01	3.40	2.59	3.60
	Anger	M	1.19	.95	1.14	1.14	1.76	1.86	1.19	1.67	1.62	2.43	1.29	3.10
		SD	.93	.80	.93	.91	1.37	1.31	.87	1.20	1.24	1.50	1.01	1.37
	Nervousness	M	1.67	1.48	1.81	1.43	1.67	1.76	2.05	1.86	2.05	2.57	2.05	2.62
		SD	.56	1.08	1.21	1.12	1.20	1.04	1.47	1.35	1.20	1.40	1.63	1.63
DEPRESSED														
	Sadness	M	3.05	1.95	3.43	3.19	3.52	2.95	3.33	3.19	3.62	3.33	3.14	3.00
		SD	1.32	1.07	.93	.75	1.08	1.12	1.28	1.17	1.30	1.24	1.74	1.34
	DACL	M	10.24	7.14	13.14	12.05	11.48	11.38	11.71	13.76	11.43	12.24	9.48	13.43
		SD	5.57	3.61	4.33	4.17	3.61	3.35	5.36	3.38	4.95	4.71	4.91	2.75
	Anger	M	2.62	1.90	3.33	3.24	2.29	3.05	3.00	3.71	3.24	4.10	2.33	4.10
		SD	1.28	1.19	1.00	.70	1.01	1.07	1.41	1.06	.94	1.51	1.56	1.58
	Nervousness	M	2.24	1.38	2.81	2.81	2.52	2.90	2.24	2.29	2.67	3.62	2.24	4.29
		SD	1.37	.92	.98	1.25	.98	1.00	1.04	1.23	1.15	1.24	1.34	1.55

Note. Each cell contains 21 subjects. S_R = success rewarded; S_N = success, neutral feedback; S_P = success with failures punished; F_R = failure with reward for successes; F_N = failure, neutral feedback; F_P = failure punished.

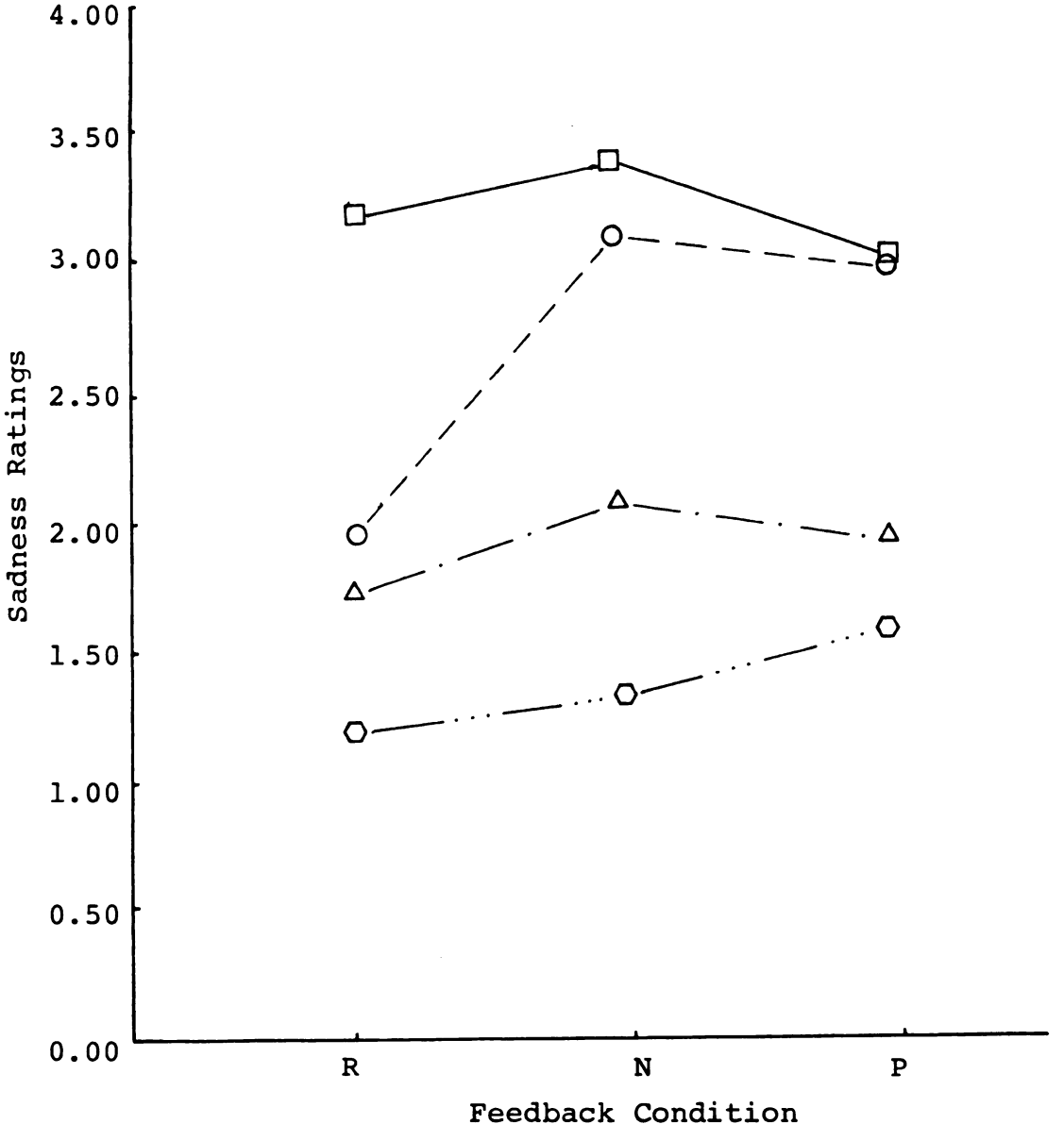


Figure 9. Mean Post-Treatment Sadness Ratings by Treatment Condition.

Note: R = Reward; N = Neutral; P = Punishment

⬡——···——⬡ = nondepressed success

△——·——△ = nondepressed failure

○— — — —○ = depressed success

□————□ = depressed failure

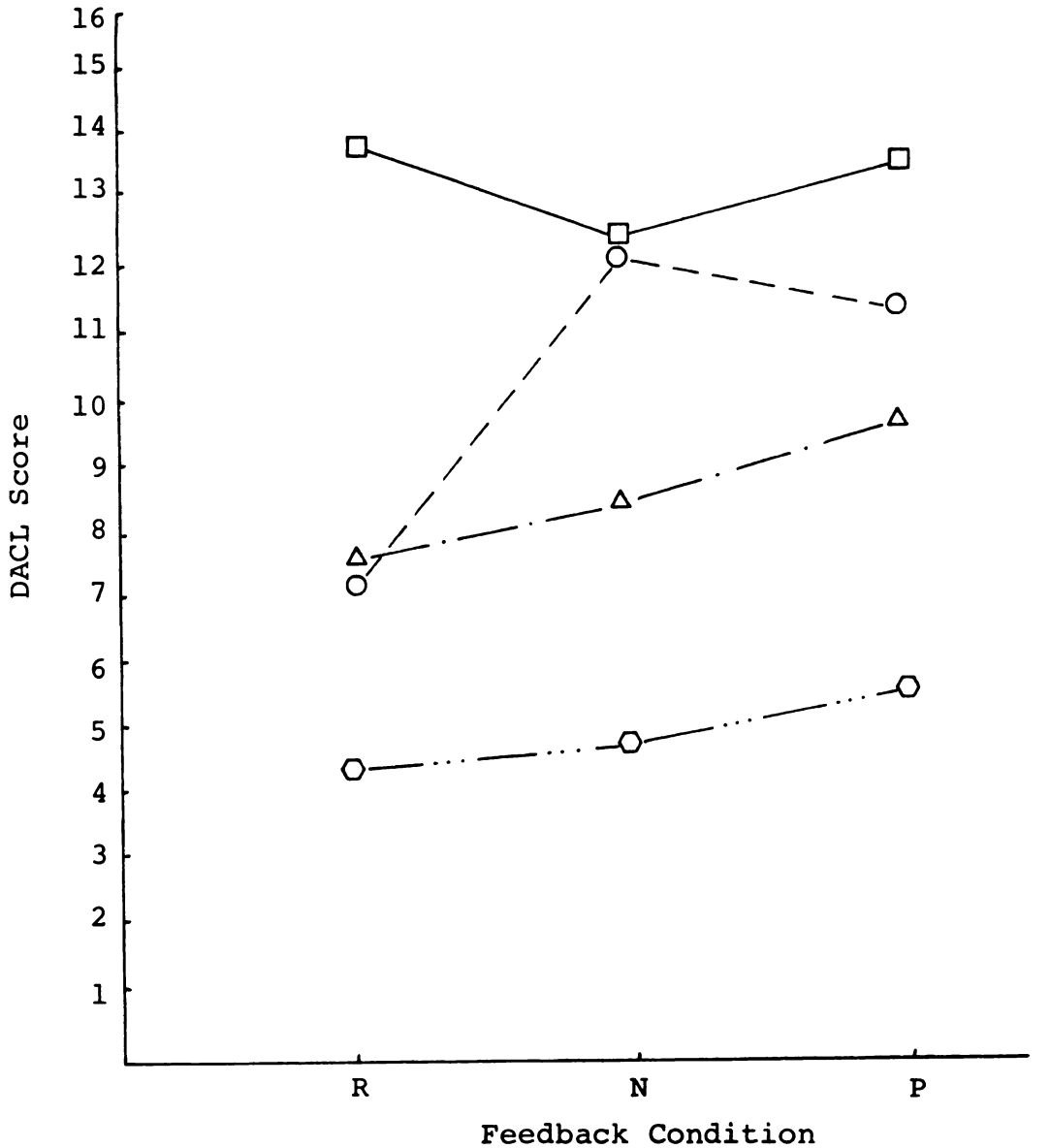


Figure 10. Mean Post-Treatment DACL Scores by Treatment Condition.

Note: R = Reward; N = Neutral; P = Punishment

○——···—○ = nondepressed success

△——·——△ = nondepressed failure

○— — — — ○ = depressed success

□————————□ = depressed failure

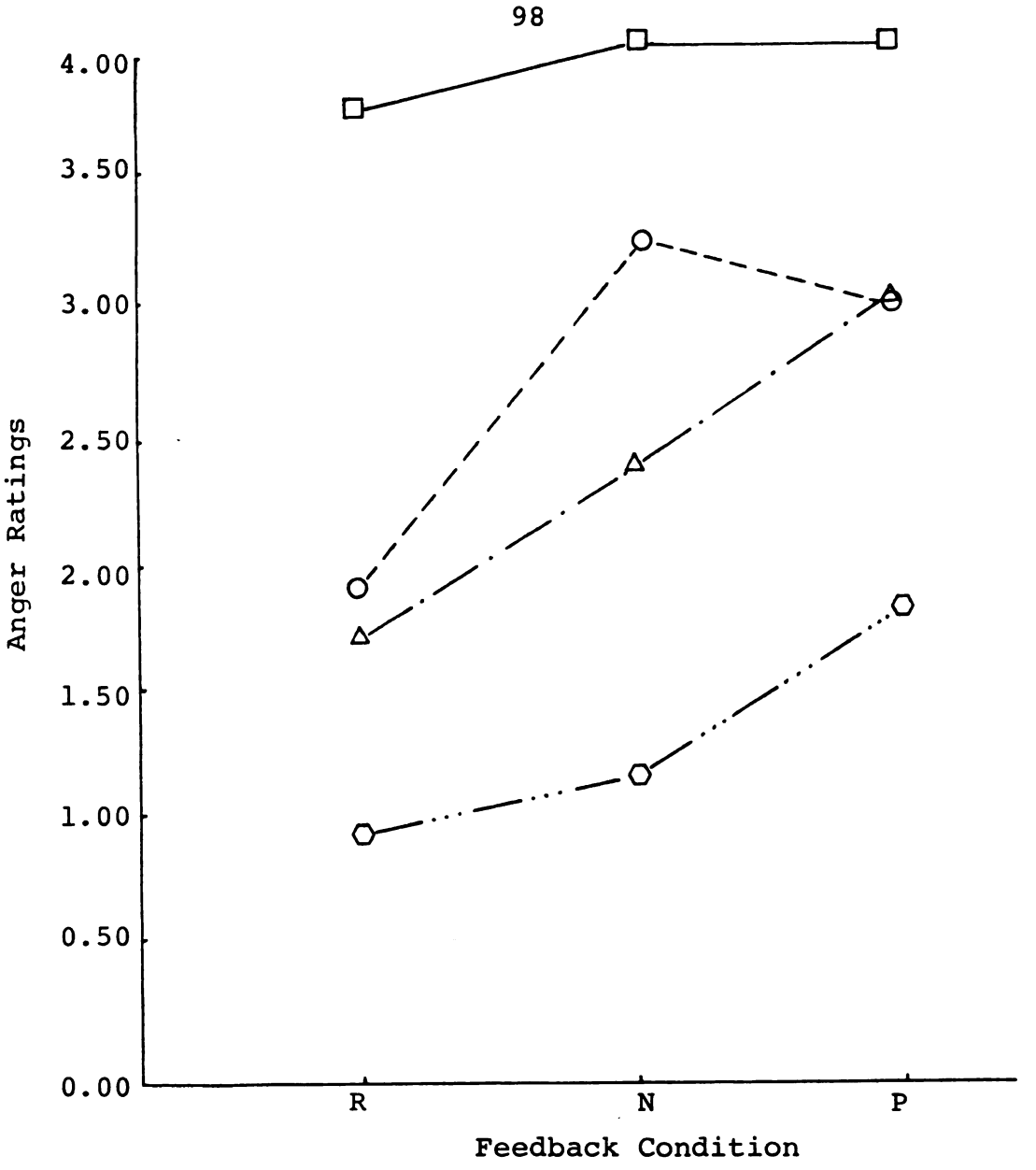


Figure 11. Mean Post-Treatment Anger Scores by Treatment Condition.

Note: R = Reward; N = Neutral; P = Punishment

⬡——···——⬡ = nondepressed success

△——·——△ = nondepressed failure

○— — — —⊙ = depressed success

□————□ = depressed failure

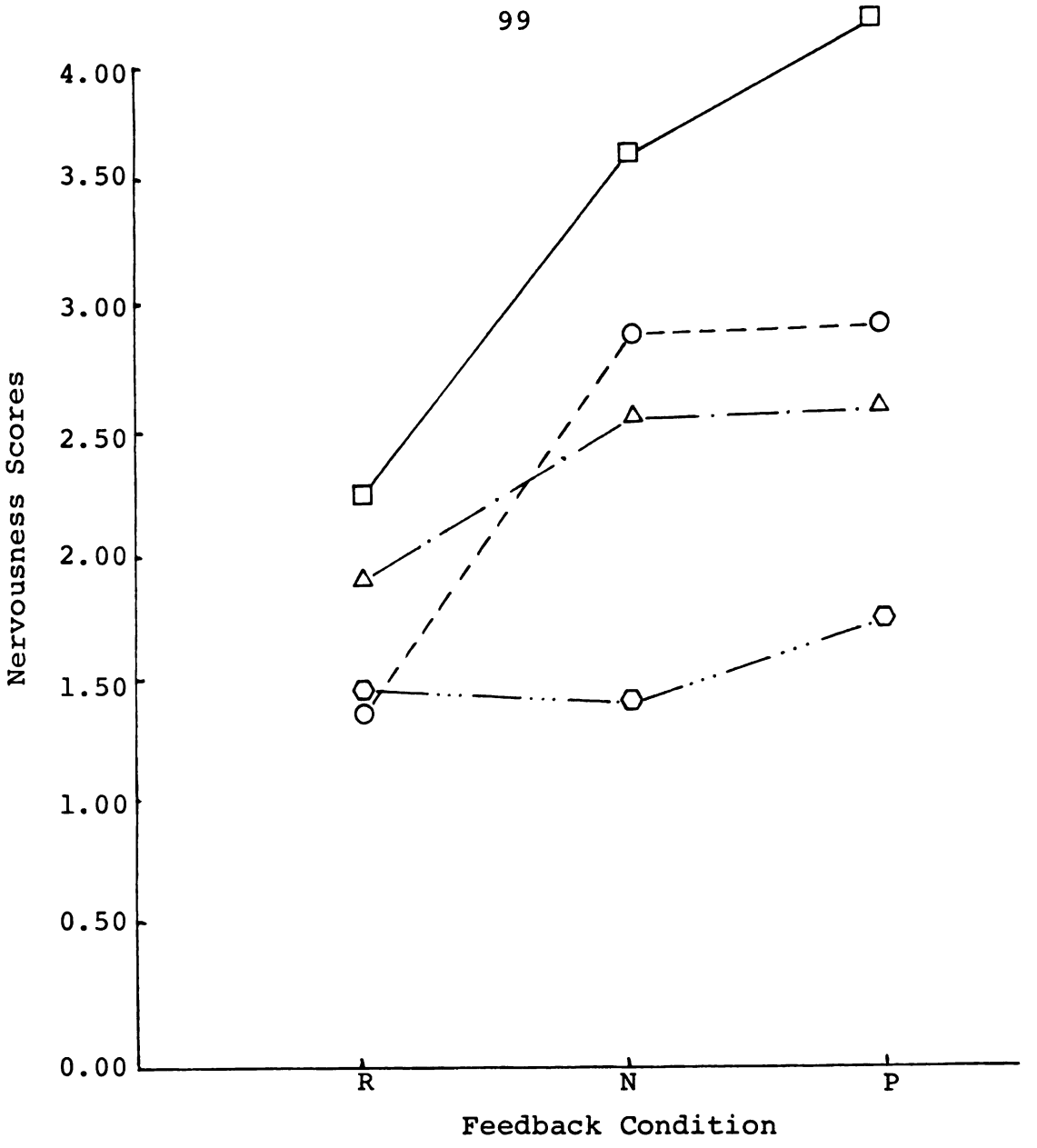


Figure 12. Mean Post-Treatment Nervousness Scores by Treatment Condition.

Note: R = Reward; N = Neutral; P = Punishment

⬡——···——⬡ = nondepressed success

△——·——△ = nondepressed failure

○- - - - -○ = depressed success

□————□ = depressed failure

Given the reported difference between depressed and nondepressed subjects on the pretreatment mood ratings, two-way analyses of variance for each dependent measure were performed on the depressed and nondepressed groups respectively, using outcome and feedback condition as between-subjects factors, since the interpretation of posttreatment score differences across the depression classification variable would be ambiguous.

For nondepressed subjects, a main effect of outcome was found for posttreatment sadness ($F(1,120)=9.31$, $p<.01$), anger ($F(1,120)=25.06$, $p<.001$), nervousness ($F(1,120)=11.85$, $p<.001$), and DACL scores ($F(1,120)=45.58$, $p<.001$). In all cases higher mood ratings were associated with failure. A main effect of feedback condition was found for posttreatment anger ratings only ($F(2,120)=9.87$, $p<.001$). Inspection of this data by Tukey-B a posteriori test revealed that nondepressed subjects who received punishment feedback were significantly more angry ($p<.05$) than both null feedback and reward feedback subjects, who did not differ from each other. The Pearson correlation between posttreatment anger and feedback condition was $r=.34$. There was not a significant outcome x feedback condition interaction effect.

For depressed subjects, a different pattern of results was obtained. As with nondepressed subjects, a main effect of outcome was found for posttreatment sadness ($F(1,120)=5.60$, $p<.01$), anger ($F(1,120)=32.83$, $p<.001$), anxiety ($F(1,120)=22.67$, $p<.001$) and DACL score ($F(1,120)=19.91$, $p<.001$).

On all of these measures, higher scores were associated with failure. In addition, however, a main effect of feedback condition was also found for all of the dependent measures: sadness ($F(1,120)=3.96$, $p<.05$); DACL ($F(1,120)=3.42$, $p<.05$; anger ($F(1,120)=6.30$, $p<.01$); anxiety ($F(1,120)=24.40$, $p<.001$). A posteriori inspection of this data revealed that reward feedback subjects were significantly ($p<.05$) less sad than neutral feedback subjects. Punished subjects mean sadness score fell in between the mean scores of the reward and null groups, and did not significantly differ from either of them. An outcome x feedback interaction also was found for posttreatment sadness scores, $F(2,120)=3.60$, $p<.05$. Tukey-B analysis showed that the success-rewarded group reported significantly ($p<.05$) less sadness than any other group, and that this difference was entirely responsible for the feedback main effect on sadness scores reported above. Parallel results were obtained on DACL scores, with rewarded subjects scoring as significantly ($p<.05$) less depressed than either neutral or punishment feedback subjects, and an identical outcome x feedback interaction was found ($F(2,120)=8.33$, $p<.001$) for which markedly low scores from the success-reward group were entirely responsible.

Post-hoc analysis of the anger scores also indicated, similar to the sadness score pattern, that rewarded depressed subjects were significantly ($p<.05$) less angry than all other subjects, and again the success-reward group rated themselves significantly ($p<.05$) lower on this measure than any other

group. The rated anger of the other groups did not differ from one another, and although the outcome x feedback interaction effect did not reach statistical significance ($p>.16$), the success-reward group's scores were again significantly ($p<.05$) lower than the scores of all other groups.

Posttreatment ratings of anxiety were also found to differ significantly ($p<.05$) between rewarded subjects and both neutral and punishment feedback groups, who did not differ from each other. No interaction effect was found ($p>.50$). Once again, however the reward-success group reported significantly ($p<.05$) less anxiety than all other groups except the reward-failure group.

The relationship between depression, outcome, feedback, and self-rated mood was found to be considerably different than that stated in Hypothesis J. For nondepressed subjects, lower mood scores were on all measures associated with success, as predicted, but reward was not associated with lower scores. Indeed, feedback condition had no effect on any mood scores with one exception; punishment was associated with greater anger. For depressed subjects, a main effect of outcome was found on all measures, but of far more interest is the fact that feedback main effects were obtained on all dependent measures, and that these effects were attributable to the presence of reward feedback in conjunction with a successful outcome.

Expectancy Shifts

Prior to analysis of the problem-to-problem expectancy change data, initial expectancies for the first treatment problem series were examined to establish between-group equivalency at the beginning of the treatment task. A three-way analysis of variance of initial series expectancy scores, with depression classification, outcome, and feedback as between subjects factors revealed a main effect of depression on initial expectancy scores. The initial expectancies of nondepressed subjects were significantly higher than those of depressed subjects, $F(1,240)=6.17$, $p<.05$. Closer inspection of this statistically significant difference revealed that the depression classification variable was associated with less than 3% of the total variance on this dependent measure, yielding an Eta of .16. On the basis of this evidence of minimal psychological and psychometric significance, the data anlysis proceeded with an emphasis on relationships within the depressed and nondepressed classifications. The analysis of variance on initial expectancy did not yield any other main effects or interaction effects. The means and standard deviations for all groups of expectancy shift scores are found in Table 6 and Figure 13.

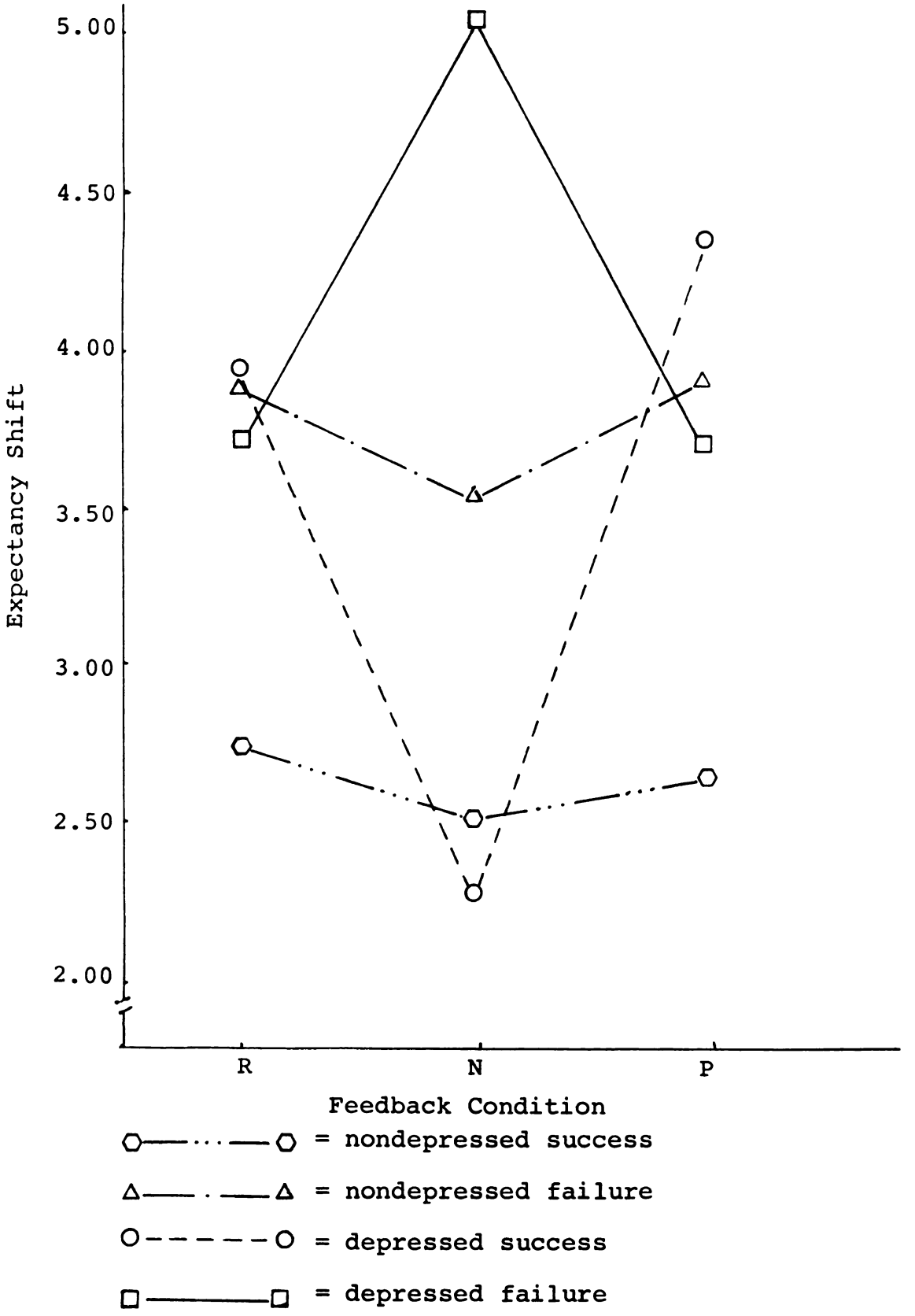
Contrary to Hypothesis K, magnitude of expectancy shifts were not related to internal attributions, as measured by the bipolar attribution scales (all p's$>.10$), although the direct (due to myself-due to others) measure did yield a very small but significant Pearson correlation ($r=.14$, $p<.05$)

Table 6.--Means and Standard Deviations for Expectancy Shifts

Depression Level		Treatment Condition					
		S_R	S_N	S_P	F_R	F_N	F_P
Nondepressed	M	2.76	2.52	2.62	3.86	3.62	3.90
	SD	2.12	1.86	1.75	2.59	1.77	2.07
Depressed	M	3.95	2.29	4.38	3.71	5.14	3.76
	SD	2.99	1.90	1.60	1.55	3.00	2.90

Note. Each cell contains 21 subjects. S_R = success rewarded; S_N = success, neutral feedback; S_P = success with failures punished; F_R = failure with reward for successes; F_N = failure, neutral feedback; F_P = failure punished.

in the predicted direction. Analysis of this relationship within the depressed and nondepressed groups, however, revealed support for Hypothesis J by the nondepressed subjects' data, while for depressed subjects, there were no significant relationships between any attribution dimension scores and magnitude of expectancy changes. In contrast to depressed subjects, internality attributions correlated .30($p<.001$) with expectancy shifts for nondepressed subjects, greater shifts in expectancy being associated with more external attributions. In addition, direct attributions of control and stability were also correlated with expectancy changes, .37($p<.001$) and .39($p<.001$) respectively. Nondepressed subjects made larger expectancy shifts in concert with more uncontrollable and unstable attributions for outcome. This data suggests, as had the causal attribution data



Note: R = Reward; N = Neutral; P = Punishment

Figure 13. Mean Total Shift in Problem Expectancies by Treatment Condition.

reported earlier, that depressed subjects exhibit a particular rigidity in their responses to environmental stimuli, while nondepressed subjects are more responsive and flexible. This pattern was also illustrated by two-way analyses of variance on expectancy change scores, using outcome and feedback condition as between subjects factors, which were performed for the nondepressed and depressed groups, respectively, in order to examine the role of feedback on expectancy shifts as posited in Hypothesis K. For nondepressed subjects, a main effect of outcome was found ($F(1,120)=10.08$, $p<.002$), successful subjects making smaller changes, reflecting the inverse relationship reported above. No other significant effects were found, the data failing to support the hypothesized relationship between punishment and expectancy shifts. Depressed subjects' data, on the other hand, did not yield a main effect for either outcome or feedback condition (all F's<2.40, $p>.10$), but an outcome x feedback interaction effect was discovered ($F(2,120)=6.55$, $p<.01$). An a posteriori analysis of the data revealed a most unexpected pattern of expectancy shift data. Tukey-B analysis indicated that depressed subjects in the neutral feedback condition who succeeded on the treatment task made significantly less ($p<.05$) expectancy shifts than any other depressed treatment group, and exhibited the smallest magnitude of shifts of any group, including the nondepressed groups. Conversely, depressed subjects who failed in the neutral feedback condition made significantly greater

expectancy shifts than any other depressed group, in fact generating the highest magnitude of expectancy shifts of any treatment group. Taken together, these data indicate that in the absence of subjectively evaluative feedback, depressed subjects did not differ from nondepressed subjects in term of expectancy shifts. Subjectively evaluative feedback, however, whether rewarding or punishing, was associated with a rigid pattern of expectancy shifts that was unrelated to task problem outcomes.

Recall of Reinforcement

Objective and subjective recall of performance measures were examined by initially performing a three-way univariate analysis of variance on each measure, using depression classification, task outcome, and feedback condition as between subject factors. These analyses are summarized in Appendix S. The means and standard deviations of these measures are found in Table 7 and Figure 14. On the objective measure, for which subjects estimated the total number of task trials on which they were correct, main effects of depression ($F(1,240)=22.13$, $p<.001$), outcome ($F(1,240)=1198.19$, $p<.001$), and feedback condition ($F(1,240)=6.34$, $p<.01$) were found. Nondepressed subjects, and subjects who succeeded, made higher estimates of their performance than did depressed or failing subjects. There was no interaction effect ($p>.50$) found between depression and outcome. The main effect of feedback condition was found to accrue from significantly lower estimates of performance by subjects who received

Table 7.--Means and Standard Deviations of Performance Estimates

Depression Level	Estimate Measure		Treatment Condition					
			S_R	S_N	S_P	F_R	F_N	F_P
NONDEPRESSED								
	Objective	M	28.19	27.81	29.62	9.91	12.05	8.86
		SD	5.28	4.05	3.11	3.65	3.41	4.13
	Subjective	M	7.00	7.00	7.62	2.38	2.81	2.86
		SD	1.64	1.61	1.16	1.43	1.60	2.08
DEPRESSED								
	Objective	M	26.52	28.86	21.90	9.29	7.86	7.38
		SD	5.18	3.61	6.34	1.49	2.61	4.21
	Subjective	M	6.52	7.33	4.38	2.00	1.86	1.43
		SD	1.60	.97	2.13	.84	.79	1.16

Note.--Each cell contains 21 subjects. S_R = success rewarded; S_N = success, neutral feedback; S_P = success with failures punished; F_R = failure with reward for successes; F_N = failure, neutral feedback; F_P = failure punished.

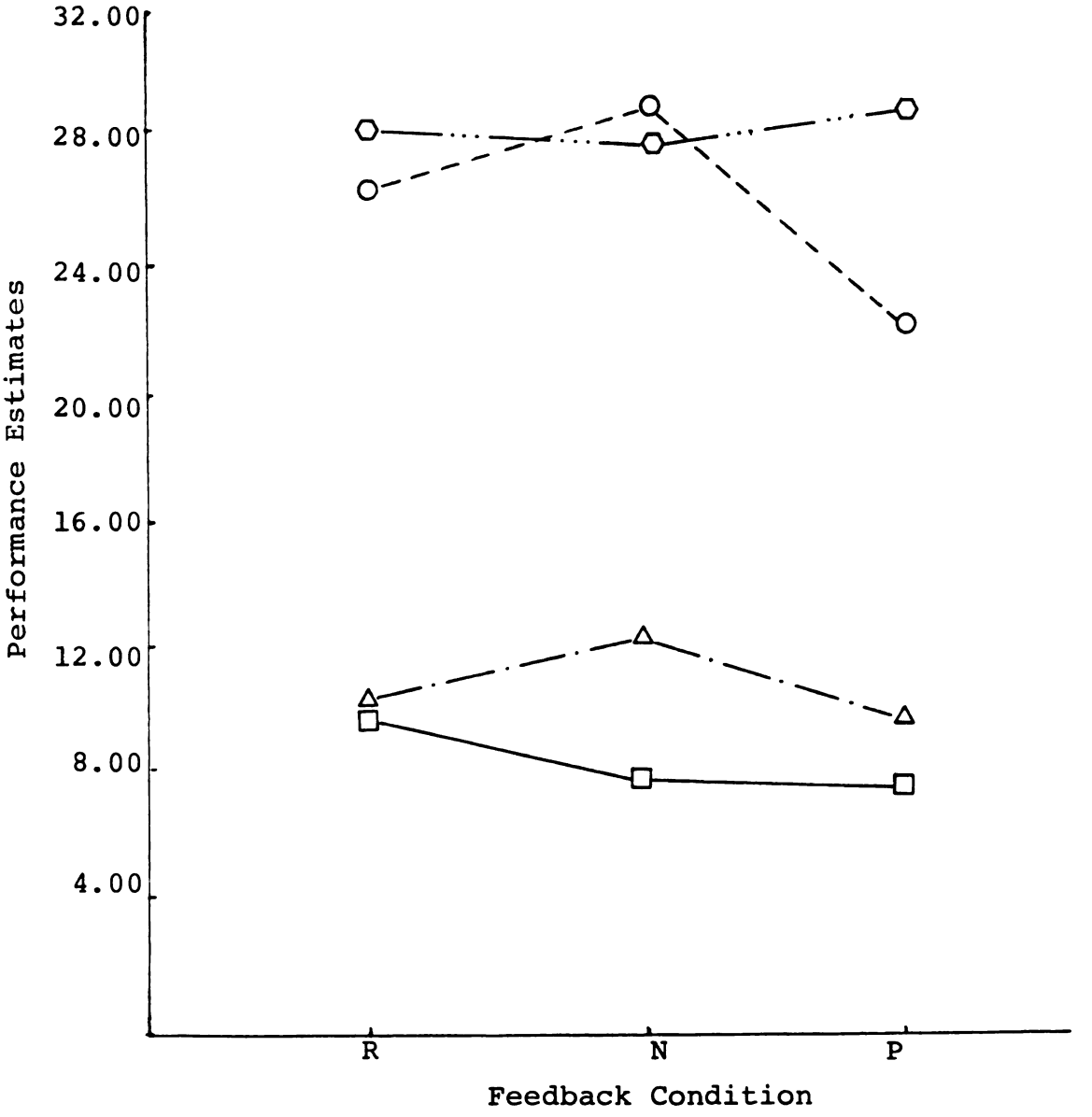


Figure 14. Mean Objective Performance Estimates by Treatment Condition.

Note: R = Reward; N = Neutral; P = Punishment

⬡—···—⬡ = nondepressed success

△—·—△ = nondepressed failure

○- - - - -○ = depressed success

□————□ = depressed failure

punishment feedback. An interaction effect of depression x feedback was found ($F(2,240)=4.40$, $p<.01$) in which punished depressed subjects rated themselves as having performed significantly worse than any other group. Closer inspection of this effect by Tukey-B test revealed that both this interaction effect and a significant three-way depression x outcome x feedback interaction ($F(2,240)=10.26$, $p<.001$) was due to significantly lower ($p<.05$) objective estimates of performance made by successful depressed subjects who received punishment on their relatively few failure trials.

The results of the subjective performance ratings produced identical results, with main effects for all between subjects factors (depression, $F(1,240)=30.14$, $p<.001$; outcome, ($F(1,240)=561.44$, $p<.001$; and feedback, $F(2,240)=4.46$, $p<.01$), a depression x feedback interaction ($F(2,240)=12.35$, $p<.001$), and a depression x outcome x feedback interaction ($F(2,240)=5.76$, $p<.001$), the latter of which accounted for the main effect results (see Appendix S). On both the objective and subjective measures, outcome was most strongly associated with variation in performance ratings (Eta=.89), with depression playing a relatively minor but statistically significant role, (Eta=.12), and punishment in conjunction with successful problem outcomes associated with lower ratings relative to other groups (Eta=.09).

The relationships specified in Hypothesis L, that depressed subjects would underestimate their performance, relative to nondepressed subjects, when receiving a high

rate of reinforcement, and that depressed subjects would overestimate their amount of punishment, relative to non-depressed subjects when receiving a low rate of punishment were examined by t-test. Contrary to prediction, the depressed and nondepressed groups who succeeded and were rewarded on the treatment task did not significantly differ in either their objective or subjective estimates of their performance ($t(40)=1.03$, $p>.10$; and $t(40)=.95$, $p>.10$ respectively), although a trend in the predicted direction was noticeable. Hypothesis L was supported by the data of the depressed and nondepressed subjects who succeeded but were punished for failure trials. Depressed subjects, as predicted, made significantly lower objective and subjective performance estimates than did nondepressed subjects ($t(40)=5.01$, $p<.001$; $t(40)=6.11$, $p<.001$, respectively). These results generally support the notion that depressed and non-depressed persons are differentially sensitive to positive and negative feedback, with depressed persons particularly impacted by punishment in a way which results in systematically negative distortion of their achievement related experiences. The estimated performance of both of the high-reward groups as well as the nondepressed low-reward group, were virtually identical with their actual performance, while the low-reward depressed group's estimates fell far below their actual performance.

Aspiration and Self-Evaluation

Hypothesized differences between depressed and nondepressed subjects on maximum and minimum aspiration levels on the treatment task were examined by computing three-way univariate analyses of variance with depression classification, outcome and feedback condition as between subjects factors on both initial maximum and minimum aspiration rating made prior to the first problem of the treatment task, and mean maximum and minimum aspiration ratings, computed for ratings taken prior to each of the four treatment problems as well as following the final problem. These results are summarized in Appendix T. As predicted by Hypothesis M, a main effect of depression was found for both initial maximum aspiration scores ($F(1,240)=4.60$, $p<.03$) and mean maximum aspiration scores ($F(1,240)=7.51$, $p<.007$). Depressed subjects wanted to achieve at a level significantly higher than that desired by nondepressed subjects. Minimum aspiration ratings, the lowest level of achievement that subjects would be satisfied with, did not discriminate between the depressed and nondepressed subjects (both p's$>.44$). Means and standard deviations of these measures are found in Table 8 and Figures 15 and 16.

Main effects of outcome ($F(1,240)=60.86$, $p<.001$) and feedback condition ($F(2,240)=3.21$, $p<.05$) on mean maximum aspiration scores were also found. Success was associated with higher maximum aspirations, and rewarded subjects' aspirations were found to be significantly higher than those

Table 8.--Means and Standard Deviations of Mean Minimum and Maximum Aspiration Ratings and Mean Total Changes in Maximum Aspiration

Depression Level	Aspiration Measure	Treatment Condition											
		S_R		S_N		S_P		F_R		F_N		F_P	
		M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
NONDEPRESSED													
	Mean minimum aspiration	5.21	1.23	4.51	1.77	4.87	1.68	3.71	1.65	3.48	1.53	3.65	1.32
	Mean maximum aspiration	8.24	1.51	7.74	1.61	9.06	1.11	7.10	2.17	6.25	2.00	6.16	1.58
	Mean changes in maximum aspiration	2.05	2.42	1.52	1.25	2.00	2.21	3.00	3.56	4.19	3.39	3.90	2.91
DEPRESSED													
	Mean minimum aspiration	5.10	.92	4.96	.98	4.50	1.84	3.54	1.12	3.44	1.28	3.58	1.25
	Mean maximum aspiration	9.15	.94	9.25	.89	7.82	1.44	7.79	1.85	6.45	1.91	7.58	2.46
	Mean changes in maximum aspiration	2.00	2.05	1.14	1.71	2.81	2.40	2.81	2.99	2.00	2.65	3.19	4.02

Note. Each cell contains 21 subjects. S_R = success rewarded; S_N = success, neutral feedback; S_P = success with failures punished; F_R = failure with reward for successes; F_N = failure, neutral feedback; F_P = failure punished.

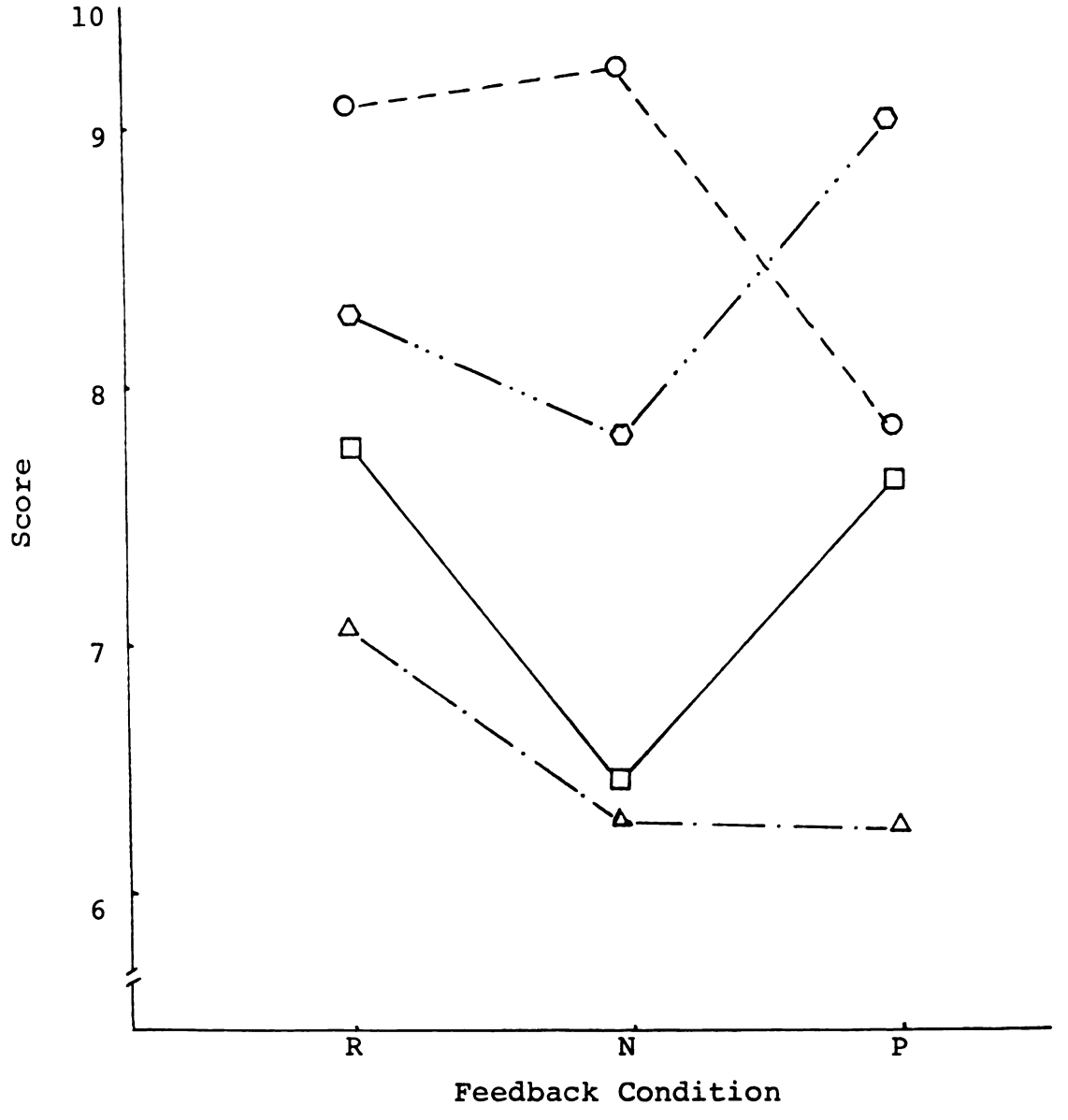


Figure 15. Mean Maximum Aspiration Scores by Treatment Condition.

Note: R = Reward; N = Neutral; P = Punishment

⬡—···—⬡ = nondepressed success

△—·—△ = nondepressed failure

○------○ = depressed success

□————□ = depressed failure

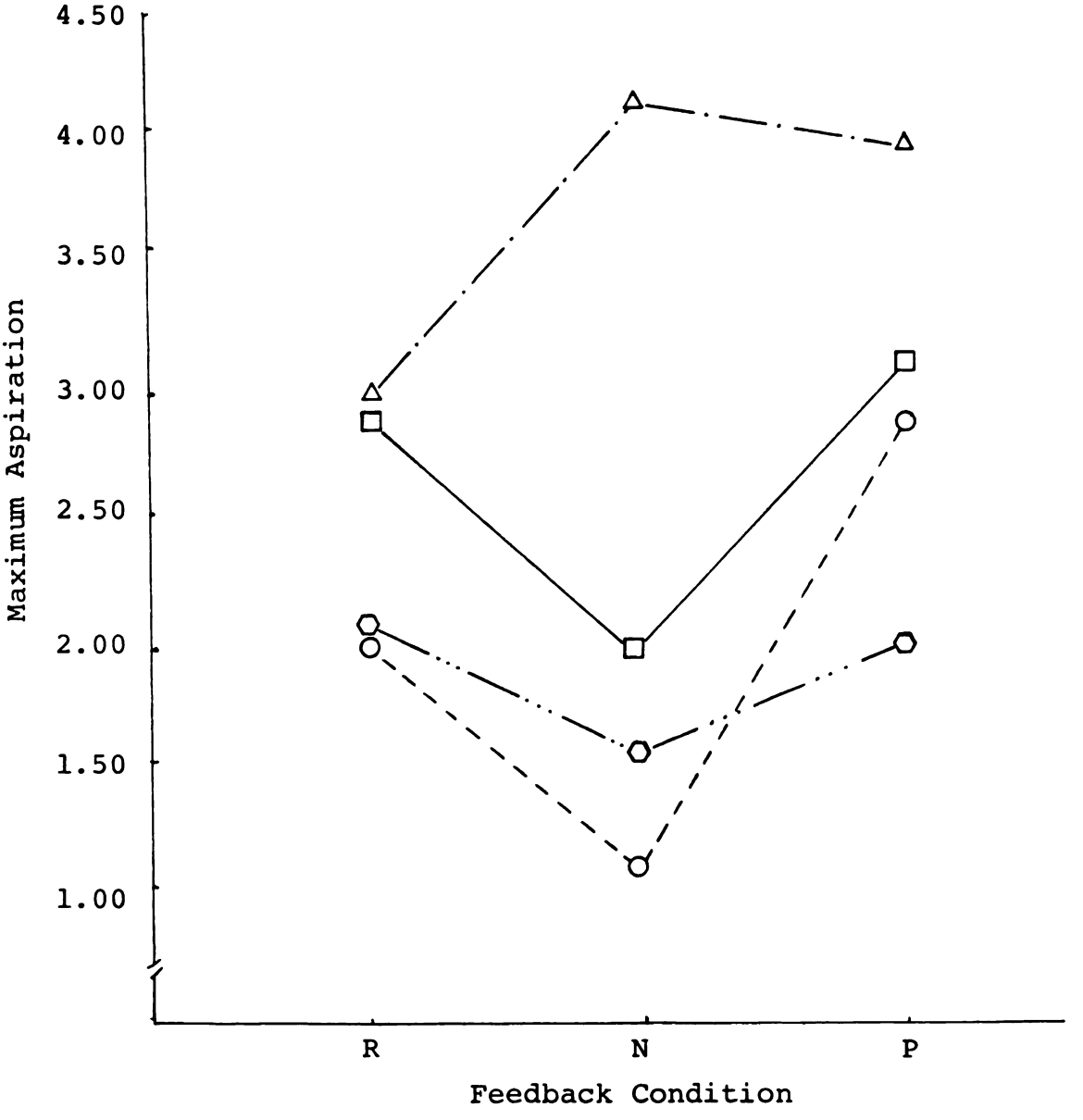


Figure 16. Mean Changes in Maximum Aspiration by Treatment Condition.

Note: R = Reward; N = Neutral; P = Punishment

⬡——···——⬡ = nondepressed success

△——·——△ = nondepressed failure

⊙— — — —⊙ = depressed success

□————□ = depressed failure

of neutral feedback condition subjects (Tukey $p<.05$). Mean maximum aspirations of neutral and punishment feedback subjects did not significantly differ ($p>.10$).

As suggested by the main effect of outcome reported above, higher aspiration levels were associated with higher subjective self-evaluations for both the minimum measure ($r=.37$, $p<.001$) and the maximum measure ($r=.34$, $p<.001$) contrary to Hypothesis N. Inspection of the data on a factor level basis, however, did reveal that the hypothesized inverse relationship was weakly manifest for subjects who failed ($r=-.12$, $p<.05$), and that this relationship grew to $r=-.16$ for depressed failing subjects and was strongest among depressed subjects who failed and were punished ($r=-.27$, $p<.10$).

Hypothesis O, that nondepressed subjects would alter aspiration levels as a function of outcome and feedback, while depressed subjects would not, was examined by performing two-way analyses of variance on mean aspiration change scores, computed by summing the absolute values of changes in problem-to-problem aspiration scores, for both depressed and nondepressed subjects, using outcome and feedback condition as between subjects factors. As predicted, nondepressed subjects altered their aspirations as a function of task outcome ($F(1,120)=14.25$, $p<.001$), with failing subjects exhibiting significantly larger amounts of change than successful subjects, resulting in a Pearson correlation of $r=.32$, $p<.001$. Contrary to expectation, however,

nondepressed subjects' aspiration changes did not vary systematically with feedback ($F(1,120)=.28$, $p>.50$). Surprisingly, depressed subjects produced an opposite pattern of results, with changes in aspiration unrelated to outcome ($F(1,120)=1.96$, $p>.10$), but significantly associated with feedback mode ($F(1,120)=2.89$, $p<.05$). Furthermore, post hoc analysis showed that the neutral feedback depressed subjects made significantly ($p<.05$) smaller changes in aspiration than did the punishment feedback subjects. These results suggest that nondepressed subjects primarily modify their aspirations in response to task outcomes, while depressed individuals may be relatively insensitive to outcomes but react to the evaluations, especially punishing ones, made by others about those outcomes, in terms of their subsequent aspirations. It would of course seem to be of much greater practical utility to respond to actual outcomes, as did the nondepressed subjects, then evaluative responses regarding one's outcome.

In order to aid the reader in integrating the large amount of data presented, a summary of the major findings is provided in Table 9. Table 9 notes significant differences between treatment groups which accrue from both main effects and interaction effects. While not providing comprehensive coverage of the results of this study, it will hopefully be useful as an "at a glance" reference during reading of the following discussion section.

Table 9.--Summary of Major Findings

Outcome	Depression Level	Feedback Condition		
		Reward	Neutral	Punishment
Success:	Nondepressed:			
Less sadness Less depression Less anger Less nervousness	Best performance Most internal Most stable Rel. controllable Best moods Rel. more asp. change	Best perf.		Rel. more angry
	Depressed:			
	Poor performance Rel. external Rel. unstable Rel. uncontrollable Rel. higher aspirations	Least "D" sadness & DACL scores Less angry & nervous	Rel. less exp. shift & rel. less asp. change	Underestimated performance
Failure:	Nondepressed:			
More sadness More depression More anger More nervousness	Poor performance Most external Rel. unstable Most uncontrollable Rel. less asp. change		Rel. stable	Most external Most angry

Table 9 (cont'd.)

Outcome	Depression Level	Feedback Condition		
		Reward	Neutral	Punishment
	Depressed:			
	Poor performance Rel. internal Rel. stable Rel. uncontrollable Rel. higher aspirations	Good perf. Less angry & nervous	Rel. more exp. shift & rel. less asp. change	Poorest perf.

Note. Rel = relative to relevant comparison groups; Asp = aspiration; Exp = expectancy

DISCUSSION

As stated in the introduction to this research, this study provided for replication of earlier research associated with the learned helplessness experimental paradigm, and provided the first known systematic study of the differential effects of both task outcome and environmental response factors on cognitive and behavioral variables associated with the helplessness phenomenon. This research project was thus intended not for the purpose of producing a superordinate cognitive behavioral theory in this area of study, but rather as a vehicle for critically examining the veracity of a number of preexisting theoretical systems and their interrelationships as suggested by the empirical data, and to generate questions which would support further, more specific research efforts. With these goals in mind, the data relevant to each specific area of research covered will first be discussed with regard to its relationship to previous findings and theory. Relationships between the diverse behavioral, cognitive, and emotional perspectives will be discussed as suggested by relevant theoretical notions and the current data.

Performance Deficits

The behavioral performance measures in this study support the notion that nondepressed and depressed individuals respond differentially to task outcomes and feedback about outcomes. Although the finding of optimal performance associated with success and reward is rather mundane, the overall relationship between feedback, outcome and performance appears to be surprisingly complex. Nondepressed successful subjects who were rewarded did not differ in their performance from their counterparts who were punished, but a curious drop in performance was exhibited on most measures for the successful nondepressed neutral feedback group. These results suggest that nondepressed successful individuals may be oriented to achievement in that if a mechanism for external evaluation is not operating, they tend to slack off or give up on the task at hand. If this effect is not specific to this particular experimental paradigm, it has implications for achievement behavior in nearly all educational and vocational settings. Consideration of these unexpected results in terms of intrinsic versus extrinsic motivation or other motivational constructs is beyond the scope of the present study.

With regard to nondepressed failing subjects, similar performance deficits were induced by the perceptual discrimination induction procedure across all feedback modes. Depressed subjects who succeeded on the treatment task also showed a uniformity of poor performance that was unaffected

by supportive, informative, or punishing feedback. Taken alone, these results would seem to be consistent with the predominant theoretical notions that either noncontingent failure itself or a variable of which failure is an antecedent is the causal factor responsible for the learned helplessness phenomenon, and that depressed individuals not only exhibit chronic performance deficits, but are also unresponsive to environmental feedback (Seligman, 1975). The performance of the depressed failing subjects, however, refutes such a simple formulation. Depressed subjects who failed were markedly more sensitive to feedback than any other group in terms of their behavioral performance, to the extent that their performance ranged from the worst of any group, when subjected to punishment, to among the best of any group when associated with reward and support in the context of task failure. While no other experimental group exhibited any significant linear relationship between supportive, informative and punishing feedback and performance, the performance of the failing depressed subjects correlated .54 with feedback condition for two dependent measures, while outcome correlated only .20 with performance.

Taken together, the performance results of this study suggest that within this experimental paradigm outcome is the prepotent variable with regard to the performance of nondepressed subjects, while successful depressed subjects exhibit a characteristic performance deficit and unresponsiveness to environmental feedback. Failing depressed

subjects, however, are primarily oriented to interpersonal feedback rather than outcome, and vary their performance as a function of the valence of that feedback. In the absence of subjectively evaluative feedback, their performance does not differ from that of successful, depressed subjects. As Miller and Norman (1979) have pointed out, the development of learned helplessness requires exposure to noncontingent outcomes and perception of events as aversive by the individual. By orienting to feedback rather than outcome, depressed failing subjects were most unlikely to perceive events in the rewarding and supportive feedback condition as aversive.

The above data also provide one additional possible explanation for the inconsistency of the previous research in the area of learned helplessness. Experimenter behavior perceived by depressed subjects as negative or punishing in the context of ambiguous or failing achievement may have led to an enhanced difference in performance between depressed and nondepressed subjects in some studies. Conversely, if experimenter behavior was perceived by depressed, failing subjects as supportive, their resultant performance may have been such that predicted differences between depressed and nondepressed subjects were not obtained. The impact of the experimenter on the subject thus clearly emerges as an important and overlooked variable in this particular experimental paradigm.

The implications of these findings for clinical treatment are important. These data suggest that positive outcomes are likely to be relatively ineffective as reinforcers for depressed individuals, while supportive feedback and generally positive response in spite of failing efforts may be most effective in eliciting effective goal-oriented behavior, at least in the realm of cognitive-behavioral achievement settings. The congruence between this idea and the long-standing notion that emotional warmth and accurate empathy play an indispensable role in effective therapy (Truax, 1963) should not be missed. This factor could possibly be the common element among various forms of therapy of depression which do not differ in their treatment efficacy (Fleming & Thornton, 1980).

In the current statistical analysis, the dependent measures of digit symbol time to completion and total errors generally failed to differentiate between groups. This may be due to the fact that these measures represent a task which is cognitively simple, relative to the cognitively complex anagrams task, and thus not susceptible to the methodology employed in this research for the induction of interference effects. An alternative explanation is suggested by the fact that the digit symbol errors measure, as well as the anagram related measure of trials to criterion, suffered from a severely attenuated range of scores. Few digit symbol errors were made by subjects regardless of experimental condition (Grand Mean = .07, SD = .02). Similarly, the failure

to differentiate between groups with the anagram trials to criteria measure may be due, in part, to the stringent standard set for criterion (five consecutive solutions in under 10 seconds each with no faulty errors), since the results indicated that all groups took nearly the entire 20 trials to reach criterion (Grand Mean = 16.99, SD = 4.78).

Causal Attributions

The results of this research provide clarification of the attributional patterns of nondepressed, nondepressed "helpless," and depressed individuals. Successful nondepressed subjects, consistently attributed their outcome to internal, stable, and controllable causes regardless of the feedback mode associated with the process of succeeding, thereby demonstrating a "self-serving bias" of taking credit for success and expecting this success to continue. Successful depressed subjects, on the other hand, made external, unstable, and controllable attributions for their success, reflecting a "self-defeating bias" of not taking responsibility for their success and not expecting this success to continue. These results are congruent with the theoretical notions and previously reported empirical findings of Litman-Adizes (1976, 1980). The control attributions made by these depressed subjects are not provided for in Litman-Adizes' (1978) model of depression, however. The combination of attribution for outcome to external but controllable factors is logically inconsistent and therefore not possible in her

rational model. This irrational pattern, however, may at once illustrate the efficacy of the internal-external versus controllability distinction employed by her system, and demonstrate by example a part of the irrational cognitive process said by Beck (1976) to characterize depressed individuals. The successful depressed subjects appear to have discounted their outcome, not taking credit for it, while implying attributionally that they could or perhaps "should" have been able to control their outcome. The emergent statement is, thus, that one can or should be able to control unstable factors which are external to oneself, but for which credit for successful outcomes cannot be taken. This illogical position provides for no self-reinforcement for positive outcomes and no positive future expectancies, encouraging a negative view of both present events and the future.

The failing depressed subjects in this study made internal, stable and relative uncontrollable attributions for their outcome, thereby demonstrating the predicted "uncontrollable internality" that Litman-Adizes (1978) calls the hallmark of depressive functioning. The failing non-depressed or "helpless" subjects, on the other hand, made external, unstable, and uncontrollable attributions, relative to their successful counterparts, in effect endorsing the position of "it's not my fault, I can't change it, but I think that it won't last." These results suggest the operation of either or both of two cognitive phenomena.

From the theoretical perspective of Litman-Adizes (1978), the depressed subjects manifested a sense of not being in control of outcomes regardless of their positive or negative valence. An alternative and more parsimonious interpretation is that depressed subjects consider their mood to be a prepotent causal variable relative to effort, as reflected by the specific scale anchor endorsements, and that in this case at least, the theoretical dimension of control is an ethnoscientific concept imposed upon the data. This latter notion is supported by the data produced on the direct (controllable versus outside of my control) attribution measure for controllability. On this scale depressed and nondepressed subjects did not differ in their control attributions for success ($t(124)=.29$, $p>.50$).

Interestingly, the only effects of feedback found on causal attributions were that punishment was associated with increases in both external and uncontrollable attributions, especially for depressed subjects who failed on the treatment task. From a theoretical perspective, these subjects would then be expected to experience the effects of both depression and learned helplessness, which would be manifest in large performance deficits. In fact, failing depressed subjects did exhibit the poorest performance of any group, and their performance on the behavioral measures showed a moderate inverse correlation (r's ranged from .21 to .51) with both internality and controllability attributions. These are post hoc observations, of course, and need to be examined

by legitimate hypothesis testing procedures, but were the only significant relationships between attribution and performance measures.

One further speculation concerns a possible explanation for the failure of the rewarded, successful depressed subjects to perform as well on the behavioral tasks as did the rewarded failing depressed subjects. It seems plausible that the successful depressed subjects, who were externalizing the cause of their outcome, could not then appropriately attend to or mediate praise for their success. This theory would also be consistent with the failing nondepressed subjects' behavioral unresponsiveness to reward feedback, and the fundamental notion that for a stimulus to act as a reinforcer it must be appropriately perceived and internally mediated (Bandura, 1969). It would also account for the loss of reinforcer effectiveness for depressed subjects as reported or suggested by other researchers (Costello, 1978; Lewinsohn, 1974; Rizley, 1978).

Given the data presented in the current study, it is clear the "helpless" subjects report a considerably different pattern of attributional cognitions than do depressed subjects who perform similarly on behavioral performance measures. The nondepressed subjects' performance deficits thus appear to be associated with a sense of what Abramson, Seligman, and Teasdale (1978) call "universal helplessness," characterized by external attributions, while failing depressed subjects exhibit what they refer to as "personal

helplessness." Given these differences between depressed and nondepressed individuals' attributions for both success and failure, it appears not only erroneous but misleading to either posit helplessness as an analog of depression or to expand helplessness theory in an attempt to encompass the empirical findings. Seligman's (1975) notion of perception of response-outcome independence would also seem to be more amenable to empirical test if reframed in terms of internality and controllability, providing at least a theoretically measurable two-dimensional framework with which to examine this variable. Similarly, the internality and controllability dimensions seem to be most highly associated with learned helplessness, based on the current data, as opposed to Abramson's (Abramson, Seligman, & Teasdale, 1978) position that internal-stable attributions are the prime determinant of helplessness. The internal-external construct of Abramson et al. (1978) confounds, as stated earlier, internality with controllability and is inadequate for examination of causal attributions for outcome.

It is necessary, however, to also consider some obvious weaknesses in the attribution measurement methodology. It is quite apparent from the data reported in this study that the form of an attribution endorsement scale affected the resultant response in terms of its placement on its relevant theoretical dimension, as demonstrated by the several reported inconsistencies between the direct and bipolar measures. This problem is beginning to be seriously

addressed in the attribution theory literature (see Oresick, Sokal, & Healy, 1980; Weiner, Neirenberg, & Goldstein, 1976). Perhaps more important for researchers dealing with clinical populations, however, is the possibility of interactions between particular cognitive and perceptual schemata which may predominate for various groups, as suggested by Beck (1976), and the actual attribution scale anchor items. The results of the present study, for example, suggest that depressed individuals in particular, and perhaps persons with affective disorders in general, may be differentially sensitive to mood designated scale anchors. Inattention to this possibility could lead to serious misinterpretation of results. For instance, in the present study "mood" was employed as an "internal-unstable" anchor item, as per general attribution theory research usage. Depressed subjects, however, endorsed "mood" strongly regardless of its polar opposite anchor and inconsistently with the theoretical dimensional bias predicted for them. The "direct" attribution measures did yield results in the predicted dimensional direction, providing a validity check for these results. It may well be that "mood" was also perceived by depressed subjects to be a stable causal attribute for them. Given these possibilities, it is suggested that special care be taken in the construction of attribution scales to be used with clinical populations to avoid this type of confounding factor.

The clinical implications of the attribution related findings are that minimization of punitive experiences for depressed persons would be helpful, but that a major focus of therapeutic efforts might be devoted to cognitive restructuring. This intervention technique would be designed to help the depressed individual mediate successful outcomes positively with appropriate internal controllable attributions, and generate expectancies for continued success which are data and feedback oriented rather than internally cued by negativistic and distorted depressive schemata, said to be characteristic of depressed persons (Beck, 1967, 1976). Theoretically, these changes in attribution for success would be expected to result in a greater sense of personal efficacy on the part of the depressed person (Bandura, 1977), and lead to greater task persistence, positive outcome expectancies, and ultimately more successful instrumental behavior and adaptive mediation of successful outcomes.

Mood Ratings

Although the simple pointer method used for self-report of mood was at best a crude measure of specific affects, the reported correlations between sadness ratings and DACL and BDI scores suggests that this method may be useful and economical as an estimate of subject mood. The similarity of the pattern of the mood ratings results to the pattern of results for other dependent measures also suggests their potential usefulness. As on most of the performance and

attribution measures, nondepressed subjects' mood ratings were unaffected by feedback mode, with the significant exception of anger, which increased when punishing feedback was given. The fact that the task performance of punished nondepressed subjects did not show decrements relative to other nondepressed subjects in the same outcome condition, while punished depressed subjects did not exhibit increased anger but did show performance decrements, suggests that anger may be an adaptive response or an antecedent to adaptive responses to punishment in this type of situation. Furthermore, given the data that punishment was associated with increased external and uncontrollable causal attributions, it appears that nondepressed subjects may have reacted to the punishment by increasing or at least maintaining their efforts to succeed on the behavioral tasks at hand in spite of perceived outside influence, and upon failing, blamed others for this negative outcome. This idea finds some support in the attribution-emotion theory and research reported by Russell (1980). The data also suggest that the depressed subjects had a tendency to "give up" in the presence of punishment. Depressed subjects again appeared to be particularly sensitive to feedback, relative to nondepressed subjects. Reward and supportive feedback were associated with lower scores on all mood ratings for the successful depressed subjects, while less nervousness was reported by the rewarded failing depressed subjects.

These data support the notion that a loss of response contingent positive reinforcement will elicit dysphoria (Lewinsohn, 1974; Rehm, 1977), and depression and anxiety (Seligman, 1975). The general increase in emotionality associated with helplessness induction noted by Gatchel (Gatchel, Paulus, & Maples, 1975) and many others was replicated. Weiner's (1971) early notion that internal attributions maximize affect while external attributions minimize affect found no support in the present data. Russell (1980) however, has proposed a theoretical system in which some moods are said to be outcome-related, while other moods are said to be attribution-related, and this theoretical system is far more sophisticated and complex than Weiner's (1971) earlier formulation. Weiner (1977) has also recently proposed a more complex theory. The mood and causal attribution data of the present study suggest that this would be an interesting and possibly useful avenue of research if unambiguous relationships could be demonstrated between attribution, mood, and overt behavior.

The mood data also suggest that although depression level and outcome are the predominant factors which in this study were associated with differences in behavioral performance and causal attributions, both nondepressed and depressed subjects do in fact attend to and mediate feedback on their outcome, although subsequent behavioral response to feedback was strongly associated with only depressed failing subjects. A possible explanation for this phenomenon is

that failing nondepressed and successful depressed subjects, who made external and unstable causal attributions for their outcome, do not behaviorally respond to feedback even when it results in or is associated with reduced anxiety, since the situation is seen as temporary and not due to oneself. The depressed subjects who failed, on the other hand, made strongly internal attributions, and one effect of the reward feedback may have been not only to reduce nervousness but also in this instance, facilitate task-related cognitions leading to more effective instrumental behavior and reduction of stereotypic responses which are characteristic of depressed individuals. Reduction of anxiety would thus be seen as necessary, but not sufficient to produce improved task performance. In addition, the attribution data suggests that subjects' cognitions must be appropriately oriented to task-related thoughts with the individual as a primary causal agent of outcome, rather than toward externally oriented causal cognitions or self-oriented anxiety-related thoughts, if achievement levels are to improve. Based on the causal attribution and mood data in this study, the failing depressed subjects are the only group which met these conditions. This theoretical construction is not inconsistent with the notions of Wine (1977), Gotlib and Asarnow (1979) and Coyne (Coyne, Metalsky, & Lovelle, 1980), regarding the role of anxiety and attentional redeployment in learned helplessness. As is the case with the entire body of data produced by the current research, however, many

more questions have been generated than answered, and all of the above speculations must be pursued by empirical investigation to establish their credibility.

Expectancy Shifts

The expectancy shift data produced in this study do little to clarify the meaning of such shifts or how they relate to depressive versus nondepressive functioning. Smaller changes in expectancy were found to correlate with internal attributions, but only with nondepressed subjects. Seligman's (Miller & Seligman, 1975) notion that smaller expectancy changes are associated with a sense of uncontrollability was supported, but again only with nondepressed subjects. Weiner's (Weiner, Heckhausen, Meyer, & Cook, 1972) assertion that smaller expectancy changes were due to unstable attributions was not supported, and the data suggested an opposite trend for nondepressed subjects. Indeed, regardless of the often complex theoretical notions outlined earlier regarding relationships between causal attributions and outcome expectancy shifts, there is a compelling simplicity and face validity to this data which suggests that persons shift their expectancies less, regardless of feedback, when they think they are responsible for their outcomes, in control of them, and that this condition is a stable one. The fact that depressed subjects' expectancy changes did not conform to any predicted pattern while demonstrating a distinct difference from the expectancy

changes of nondepressed subjects suggests that expectancy change phenomena are at present not adequately understood. Certainly they are an inappropriate measure for investigations which attempt to interpret differences found in subpopulations such as depressed people, when they are not predictable in the baseline population. The strange and seemingly inexplicable data of the depressed subjects who received neutral informative feedback underlines this issue. The expectancy change pattern for depressed subjects was not systematically related to behavioral, causal attribution, or mood variables. Given the previously discussed irrational pattern of attributions made by depressed subjects who succeeded on the treatment task, it appears even more unlikely that expectancy change data can be meaningfully interpreted. It seems that attribution patterns, by the very nature of their content, would be a more productive area for research than a construct such as expectancy which is purported to be related to attributions but for which there have been few consistent or agreed upon results.

Recall of Reinforcement

The recall of reinforcement data provided support for Beck's (1967) and Rehm's (1977) notions that depressed subjects are particularly sensitive to negative feedback. The failure to replicate Nelson and Craighead's (1977) finding of decrements in estimates of performance with a high rate of positive reinforcement is likely to reflect a critical

difference in methodology between their study and the present research. Nelson and Craighead (1977) employed an ambiguous outcome paradigm, using only reinforcement to provide feedback on results. The present study, however, provided clear and explicit feedback on outcome, and the strong main effect for outcome on performance estimates for both depressed and nondepressed subjects indicates that this information was clearly perceived. In spite of this strong correlation (r=.89) between outcome and performance estimates, however, it appears that punitive feedback had the effect of overriding outcome information in depressed individuals' self-evaluations. The fact that the reward and neutral feedback groups significantly differed on all mood measures but made similar performance estimates, while neutral and punished subjects exhibited similar moods but significantly different performance estimates, suggest that mood was not related to the unique decrement in recall of reinforcement demonstrated by the punished depressed subjects.

These results again illustrate the self-defeating paradox of depressive thinking, in which positive feedback and outcomes are externalized, as demonstrated by the causal attribution data, while negative feedback on even successful outcomes is apparently accepted by the depressed individual and used to negatively evaluate his/her performance. One implication of these data for therapeutic intervention stems from the demonstration that the negative "subjective" outcome reports of depressed individuals' are likely to be

influenced by negativistic cognitions such as those described by Beck (1967), rather than failure to initially correctly perceive outcomes. This fact supports the notion that rationally disputing the distortions of depressed persons and focusing on data based thoughts, or teaching them to engage in this process themselves, may be an efficacious technique to disrupt self-punitive depressogenic cognitive process which may supplant covert self-reinforcement and subsequently suppress instrumental behavior.

Aspirations

The aspiration data serve to illustrate how depressed subjects may "set themselves up" for continued subjectively negative experiences. They desired higher achievement levels than the nondepressed subjects, which in view of the well-demonstrated performance deficits of depressed individuals seem at once to be a self-defeating strategy in which they do not use past outcomes to modify future expectancies. The fact that minimum expectancies, the minimum level of achievement that subjects would be satisfied with, did not differ between nondepressed and depressed subjects appears to reflect a more adaptive outlook toward achievement, but the fact that depressed subjects subsequently rated their performance more poorly than did nondepressed subjects suggests that in fact depressed subjects do actually process and evaluate performance feedback in terms of excessively high and rigid self-standards regardless of their pretask statements which imply aspiration flexibility.

Nondepressed subjects' particular attention to task outcomes as a guide to making changes in their aspiration level, suggests an internal orientation to goal-setting behavior which seems likely to be relatively consistent and data based, whereas the depressed subjects did not employ task outcome as data for use in the process of goal setting. The weak but significant association of aspiration changes with feedback for depressed subjects further illustrates the relative rigidity of the depressed subjects' aspirations, and their tendency to orient toward evaluative feedback rather than actual outcome data. From a clinical perspective, this approach to goal setting seems likely to produce an unending subjective experience of failure and frustration, which might in fact be exacerbated by well-meant supportive feedback from others. Once again, helpful intervention with the depressed subject would include assistance in developing realistic and attainable goal-setting skills and outcome-evaluation skills.

CONCLUSION

In brief, the nondepressed person appeared to be reasonably adept at cognitive-behavioral tasks, worked best when subjectively evaluative feedback was given, and was clearly oriented toward outcome information which she/he employed to improve task performance, generate accurate self-evaluation of performance, and set attainable and reasonable goals. He/she exhibited a self-serving bias in cognitive processing of task-related outcomes, ascribing positive outcomes to internal, stable and controllable attributes, while disavowing responsibility for, or control of, negative events, which were typically viewed as temporary. The nondepressed person made "helpless" by exposure to non-contingent failure appeared to be very similar to his/her successful counterpart, but exhibited a large and general increase in emotion, and became angry when punished. The helpless persons' task performance was poor and the external and uncontrollable attributions for this performance engendered an attitude of helplessness which probably did not result in either shame or loss of self-esteem.

The depressed subject, on the other hand, appeared to be radically different from the nondepressed subject. The

depressed person's cognitive and motor performance was impaired, and when outcomes were successful he/she appeared to discount any personal responsibility for the outcome by attributing the outcome to external but controllable factors, revealing an irrational system for viewing responsibility and control. He/she also did not respond behaviorally to subjectively evaluative performance feedback and was markedly sad, angry, and nervous, although supportive and rewarding feedback was associated with mood levels indistinguishable from those of nondepressed subjects. When failing, the depressed subject took personal responsibility for that outcome, attributed the outcome to relatively stable and uncontrollable causes, but in fact was responsive behaviorally to subjectively evaluative feedback. Given broadly supportive and positively reinforcing feedback for small successes in the midst of overall treatment task failure, subsequent performance was indistinguishable from that of nondepressed subjects, as was self-reported sadness, anger, and anxiety. Overall, the depressed subject did not use task-outcome data to guide task performance or set goals, and was particularly sensitive to punishing feedback, which was associated with decreased performance and more negative self-evaluation as well as increased nervousness.

From the thumbnail sketches above, it becomes quite clear that learned helplessness is likely to be minimally useful as an analog of mild reactive depression. Most of the other theoretical approaches discussed in the course

of this research are similarly inadequate to comprehensively account for the results of this study, although they do not represent as radical or probably as misleading a position as learned helplessness theory. Indeed, the answer to the question of "who's right?" among the theorists and researchers discussed in the course of this investigation may be, in an important sense, "all of them." Through the use of Litman-Adizes' (1978) attributional model of depression, we confirmed her hypothesized pattern of causal attributions for depressed, failing individuals, as well as discovering an unexpected attributional pattern for outcome of depressed, successful subjects. This latter pattern was one that Litman-Adizes (1978) did not consider a possibility, due to its inherently irrational structure. This discovery, however, enabled illumination of the fact that both Beck (1967) and Seligman (1975) may be correct in their views of depressive functioning, although they often have seemed to be in conflict. It appears that it was as a result of depressed subjects' unwillingness to take personal responsibility for their successful outcomes, that they may not attend to and/or mediate feedback appropriately, and hence appeared insensitive and unaware of environmental contingencies for reinforcement, as Seligman (1975) has described them. For these subjects it also appeared that there had been a loss of reinforcer effectiveness, as posited by Costello (1978). Both of these interpretations are true, when viewed from their own particular perspective. On the other hand,

depressed subjects under conditions of task failure took personal responsibility for failure and exhibited self-blame, paralogical cognitions, and particular responsiveness to both negative subjective feedback, as previously noted by Rehm (1977), as well as supportive, rewarding feedback and neutral informative feedback, thus behaving in a manner which is broadly predicted by Beck's (1967) notions that depressed persons are especially sensitive to evaluative feedback.

Most importantly, the current study provides strong support for the general notion that depressive behavior cannot be fully understood simply in terms of its overt topography, and that systematic and potentially measurable cognitive processes play important attentional, mediational, and executive roles in the production of overt behavior. All of these variables must be examined empirically in an integrated fashion if depressive functioning is to be better understood. In terms of laboratory research issues, it is apparent that previously unrecognized but important variables, such as perceived impact of experimenter on the depressed subject and interpersonal versus impersonal situational parameters (Gotlib, 1980), may have operated in earlier research on depression and produced misinterpreted or artifactual results. Conceptually based variables such as locus of control and expectancy changes have often been adopted uncritically or hastily from other areas of investigation with inadequate consideration of their applicability.

Similarly, causal attribution assessment techniques appear to be promising tools for cognitive-behavioral inquiries, but the impact of their form and content on subject responses is not well understood. A renewed emphasis on gathering sound basic data rather than building theory would appear to represent a major step toward the development of a useful and integrated body of knowledge in the area of depression research and treatment.

APPENDICES

APPENDIX A

DEBRIEFING LETTER

APPENDIX A

DEBRIEFING LETTER

Thank you once again for your participation this term in the mood and concept formation research. We would like to tell you more about the experiment. As you may recall, we were studying relationships between how people did on a task and how that affected their feelings, thoughts about themselves and why what happened came about, and how they did on some subsequent tasks. More specifically, we wanted to see how depressed and nondepressed people systematically differ in their responses to success and failure, and reinforcement.

Some of you were given money for succeeding, while others were not. Likewise, some of you lost money for failing. Moreover, half of you were given concept formation problems that had no solution; that is, the feedback given to you had no relation to your response (this is called noncontingent feedback). The rest of you received correct (contingent) feedback to solvable problems. You all then received some solvable anagram and digit symbol problems. We wanted to compare the ease and rapidity of solving the anagrams between the first group given solvable problems and the second group given unsolvable problems. We expected that those given initially solvable problems with contingent feedback would be better and quicker at solving anagrams.

We were also testing a number of other hypotheses, including the notions that: (a) depressed persons react more strongly to failure and negative consequences than to success and positive consequences, and that this pattern is reversed for nondepressed persons; (b) nondepressed persons tend to "take all the credit" for successes, but blame failures on factors outside of themselves (this is called a self-serving bias), while depressed folks do just the opposite (a self-defeating bias); and (c) depressed persons tend to set higher and more rigid demands for themselves and their performance, while nondepressed persons are more flexible and change their expectations so as to be more "in tune" with ongoing feedback from the environment.

By the way, in case you're wondering, I spoke in person immediately following the experiment with those people whom we found to be particularly "down" or depressed.

Better understanding of how depressed people view and experience aspects of living differently from nondepressed persons will allow us to develop more effective methods of treatment for depression. Your participaton has made an important contribution to this work. Thank you.

Leonard VanderJagt

5 Olds Hall

APPENDIX B

EXPERIMENTER INSTRUCTIONS:

SUBJECT ORIENTATION

APPENDIX B

EXPERIMENTER INSTRUCTIONS-- SUBJECT ORIENTATION

Hello, I'm _____. Are you here for the mood and concept-formation study? (If yes, ask the person to take a seat at the table.)

Please read this consent form. Before you sign it, I will give you a brief overview of the experiment. In this experiment I will be asking you to solve a series of perceptual discrimination problems, to solve some word puzzles, do a symbol-digit substitution task, and to report your feelings and attitudes at several points.

The perceptual-discrimination problems are a series of cards with two patterns on them. Your task will be to discover the correct dimension within a series of cards. There will also be a series of anagrams (words with the letters scrambled), and you will be asked to unscramble the letters to form a word. At several points I will ask you to indicate on questionnaires, check lists, or rating scales, your feelings and thoughts regarding yourself and the tasks. All of this will take about 60 minutes. Do you have any questions at this point? (Clarify any unclear issues.) At the end of this session, we will be able to tell you about the general area and nature of the experiment, but we won't be able to give you full details until the end of the term. If you will address this envelope to yourself at the end of this session, we will mail you full details during finals week. Do you

have any questions? (Clarify any questions. If the person chooses to sign the consent form, thank him/her and proceed.)

APPENDIX C

ANAGRAM AND DISCRIMINATION TASK SAMPLES

APPENDIX C

ANAGRAM AND DISCRIMINATION TASK SAMPLES

Anagram Task

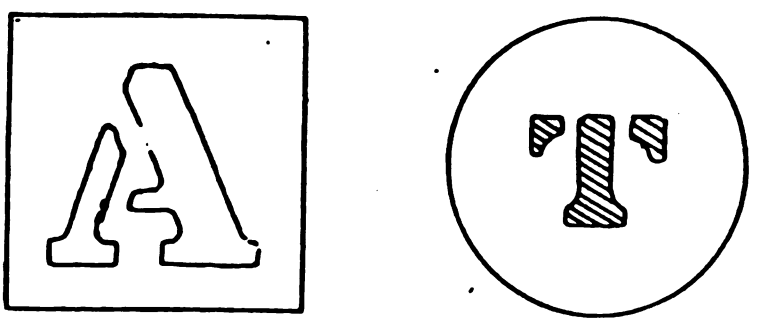
Unscramble these letters to make a word.

1. A L C E S - _____

2. C O A N B - _____

Discrimination Task

You will be looking at cards like this one. Each card has two stimulus patterns on it. They are composed of four dimensions, each with two values, for a total of eight values. One value has been arbitrarily chosen as correct. I want you to choose which side contains this value. I will give you feedback, and in this way you can learn what the correct value is.



APPENDIX D

CAUSAL ATTRIBUTION SCALES

APPENDIX D

CAUSAL ATTRIBUTION SCALES

Form S S number _____

CA1. Did you succeed on this task due to something about you or something due to other people or circumstances? (circle one)

Totally due to me									Totally due to other people or circumstances
0	0	0	0	0	0	0	0	0	0

C1. How certain are you of this rating?

Extremely certain									Extremely uncertain
0	0	0	0	0	0	0	0	0	0

CA2. Did you succeed on this task due to factors which were entirely controllable by you or entirely out of your control?

Entirely controllable									Entirely outside of my control
0	0	0	0	0	0	0	0	0	0

C2. How certain are you of this rating?

Extremely certain									Extremely uncertain
0	0	0	0	0	0	0	0	0	0

CA3. Was your performance on this task typical of you or not at all typical of you?

Extremely typical									Not at all typical
0	0	0	0	0	0	0	0	0	0

C3. How certain are you of this rating?

Extremely certain									Extremely uncertain
0	0	0	0	0	0	0	0	0	0

CA4. Did you succeed on this task because you are always good at these kinds of tasks or because these kinds of tasks are always easy?

Always good									Always easy
0	0	0	0	0	0	0	0	0	0

C4. How certain are you of this rating?

Extremely certain									Extremely uncertain
0	0	0	0	0	0	0	0	0	0

CA5. Did you succeed on this task because you were in a good mood or because you were lucky?

Good mood									Lucky
0	0	0	0	0	0	0	0	0	0

C5. How certain are you of this rating?

Extremely certain									Extremely uncertain
0	0	0	0	0	0	0	0	0	0

CA6. Did you succeed on this task because you are always good at these kinds of tasks or because you were in a good mood?

Always good									Good mood
0	0	0	0	0	0	0	0	0	0

C6. How certain are you of this rating?

Extremely certain									Extremely uncertain
0	0	0	0	0	0	0	0	0	0

CA7. Did you succeed on this task because these kinds of tasks are always easy or because you were lucky?

Always easy									Lucky
0	0	0	0	0	0	0	0	0	0

C7. How certain are you of this rating?

Extremely certain									Extremely uncertain
0	0	0	0	0	0	0	0	0	0

CA8. Did you succeed on this task because you tried especially hard or because you were in a good mood?

Tried hard								Good mood	
0	0	0	0	0	0	0	0	0	0

C8. How certain are you of this rating?

Extremely certain									Extremely uncertain
0	0	0	0	0	0	0	0	0	0

Form F S number _____

CA1. Did you fail on this task due to something about you or something due to other people or circumstances? (circle one)

Totally due to me									Totally due to other people or circumstances
0	0	0	0	0	0	0	0	0	0

C1. How certain are you of this rating?

Extremely certain									Extremely uncertain
0	0	0	0	0	0	0	0	0	0

CA2. Did you fail on this task due to factors which were entirely controllable by you or entirely out of your control?

Entirely controllable									Entirely outside of my control
0	0	0	0	0	0	0	0	0	0

C2. How certain are you of this rating?

Extremely certain									Extremely uncertain
0	0	0	0	0	0	0	0	0	0

CA3. Was your performance on this task typical of you or not at all typical of you?

Extremely typical									Not at all typical
0	0	0	0	0	0	0	0	0	0

C3. How certain are you of this rating?

Extremely certain									Extremely uncertain
0	0	0	0	0	0	0	0	0	0

CA4. Did you fail on this task because you are never good at these kinds of tasks or because these kinds of tasks are always hard?

Never good — Always hard

0 0 0 0 0 0 0 0 0 0

C4. How certain are you of this rating?

Extremely certain — Extremely uncertain

0 0 0 0 0 0 0 0 0 0

CA5. Did you fail on this task because you were in a bad mood or because you were unlucky?

Bad mood — Unlucky

0 0 0 0 0 0 0 0 0 0

C5. How certain are you of this rating?

Extremely certain — Extremely uncertain

0 0 0 0 0 0 0 0 0 0

CA6. Did you fail on this task because you are never good at these kinds of tasks or because you were in a bad mood?

Never good — Bad mood

0 0 0 0 0 0 0 0 0 0

C6. How certain are you of this rating?

Extremely certain — Extremely uncertain

0 0 0 0 0 0 0 0 0 0

CA7. Did you fail on this task because these kinds of tasks are always hard or because you were unlucky?

Always hard — Unlucky

0 0 0 0 0 0 0 0 0 0

C7. How certain are you of this rating?

Extremely certain									Extremely uncertain
0	0	0	0	0	0	0	0	0	0

CA8. Did you fail on this task because you did not try especially hard or because you were in a bad mood?

Did not try hard									Bad mood
0	0	0	0	0	0	0	0	0	0

C8. How certain are you of this rating?

Extremely certain									Extremely uncertain
0	0	0	0	0	0	0	0	0	0

APPENDIX E

EXPERIMENTER'S DEBRIEFING PROCEDURE

APPENDIX E

EXPERIMENTERS DEBRIEFING PROCEDURE

The formal experiment is now over. Please relax for a moment and then I'll ask you to complete just one more form. Now that you have undergone this testing process, you are probably curious about our objective. We would like to share some information with you. This study is examining systematic relationships between mood, attitudes toward oneself and one's accomplishments, task outcomes, and subsequent performance. Some people receive more difficult kinds of problems which make succeeding very difficult, while other people receive problems and tasks of a less difficult nature. (For 'failure' subjects: Your situation in this experiment has been especially difficult. While I cannot give you full information on all aspects of the study at this time, I can let you know that part of this study was designed to learn about the resiliance of people following their experience with difficult tasks. (As an aside): By the way, under the conditions of this experiment, you did very well. We appreciate your participation, and you have made an important contribution to our work.)

Although, as I said, the formal experiment is over, we think it is helpful to get informal feedback on how it was for people to participate in the study, so we can be more sensitive to what makes this kind of experience worthwhile to students. How was it for you, today?

(Use active-listening and empathic-responding skills to assist the person expand on their thoughts and feelings about their participation. Do not rush, and allow the person to speak as fully as she/he wishes. Remember, validation of personal experience is important here. Ask additional questions as would be helpful, such as: What did you like or dislike? Do you have any other feelings? Do you have any suggestions for changes we might make?)

At this point ask the person to please complete the BDI one last time. Score the BDI immediately, out of view of the person, while the subject self-addresses an envelope. If the person's BDI score is less than 12, and has not increased by more than 3 points over the preexperiment score, dismiss the person following the EXIT procedure below. If the person's BDI score is greater than 12 or has increased 3 or more points, continue to use your empathic listening skills and introduce the following:

It seems as if you might be a bit "down" today. Is that a fair guess? (Allow person to respond fully.) I think it would be a good idea for you to talk with Len VanderJagt, who designed this experiment. May I suggest that he give you a call, and let you know more about the study and let him hear your views? If you would like to call him, his number is 5-9564, or you can stop in at his office at Room 5, Olds Hall. (Report

the names of these persons to L. VanderJagt without delay.)

EXIT

As I said, we will mail you details of the experiment at the end of the term. We would appreciate your not discussing particulars of this study with others who might wish to participate in the future. If you have any further questions or concerns at a later time, please feel free to contact us by calling 5-9564 and asking for Len VanderJagt. Thank you again for your help in doing this research.

APPENDIX F

DEPRESSION ADJECTIVE CHECKLISTS

CHECK LIST

DACL FORM B

By Bernard Lubin

Name_____ Age_____ Sex_____

Date_____ Highest grade completed in school_____

DIRECTIONS: Below you will find words which describe different kinds of moods and feelings. Check the words which describe How You Feel Now - - Today. Some of the words may sound alike, but we want you to check all the words that describe your feelings. Work rapidly and check all of the words which describe how you feel today.

1. ☐	Downhearted	17. ☐	Clean
2. ☐	Lively	18. ☐	Dispirited
3. ☐	Unfeeling	19. ☐	Moody
4. ☐	Alone	20. ☐	Pleased
5. ☐	Unhappy	21. ☐	Dead
6. ☐	Alive	22. ☐	Sorrowful
7. ☐	Terrible	23. ☐	Bleak
8. ☐	Poor	24. ☐	Light
9. ☐	Forlorn	25. ☐	Morbid
10. ☐	Alert	26. ☐	Heavy-hearted
11. ☐	Exhausted	27. ☐	Easy-going
12. ☐	Heartsick	28. ☐	Gray
13. ☐	Bright	29. ☐	Melancholy
14. ☐	Glum	30. ☐	Hopeful
15. ☐	Desolate	31. ☐	Mashed
16. ☐	Composed	32. ☐	Unlucky

CHECK LIST

DACL FORM C

By Bernard Lubin

Name_____ Age_____ Sex_____

Date_____ Highest grade completed in school_____

DIRECTIONS: Below you will find words which describe different kinds of moods and feelings. Check the words which describe How You Feel Now - - Today. Some of the words may sound alike, but we want you to check all the words that describe your feelings. Work rapidly and check all of the words which describe how you feel today.

1. ☐	Cheerless	17. ☐	Buoyant
2. ☐	Animated	18. ☐	Tormented
3. ☐	Blue	19. ☐	Weak
4. ☐	Lost	20. ☐	Optimistic
5. ☐	Dejected	21. ☐	Low
6. ☐	Healthy	22. ☐	Deserted
7. ☐	Discouraged	23. ☐	Burdened
8. ☐	Bad	24. ☐	Wonderful
9. ☐	Despondent	25. ☐	Crushed
10. ☐	Free	26. ☐	Somber
11. ☐	Despairing	27. ☐	Interested
12. ☐	Uneasy	28. ☐	Joyless
13. ☐	Peaceful	29. ☐	Crestfallen
14. ☐	Grim	30. ☐	Lucky
15. ☐	Distressed	31. ☐	Chained
16. ☐	Whole	32. ☐	Pessimistic

CHECK LIST

DACL FORM G

By Bernard Lubin

Name_____ Age_____ Sex_____

Date_____ Highest grade completed in school_____

DIRECTIONS: Below you will find words which describe different kinds of moods and feelings. Check the words which describe How You Feel Now - - Today. Some of the words may sound alike, but we want you to check all the words that describe your feelings. Work rapidly and check all of the words which describe how you feel today.

1. ☐	Heartsick	18. ☐	Enthusiastic
2. ☐	Healthy	19. ☐	Bleak
3. ☐	Sad	20. ☐	Griefstricken
4. ☐	Afflicted	21. ☐	Eager
5. ☐	Lonesome	22. ☐	Drained
6. ☐	Fine	23. ☐	Desolate
7. ☐	Alone	24. ☐	Miserable
8. ☐	Gloomy	25. ☐	Merry
9. ☐	Depressed	26. ☐	Dull
10. ☐	Alive	27. ☐	Melancholy
11. ☐	Heavy-hearted	28. ☐	Interested
12. ☐	Failure	29. ☐	Unwanted
13. ☐	Glad	30. ☐	Gruesome
14. ☐	Despondent	31. ☐	Whole
15. ☐	Sunk	32. ☐	Oppressed
16. ☐	Optimistic	33. ☐	Lifeless
17. ☐	Jovial	34. ☐	Elated

APPENDIX G

BECK DEPRESSION INVENTORY

APPENDIX G

BECK DEPRESSION INVENTORY

Instructions: Please read each set of statements completely, then circle the I of the one which most represents how you feel right now. For example, read all of the statments in Category "A", reflect for a minute, then choose one of them and circle it. Then continue to the next set until you have chosen one statement for every letter through "U".

A. I do not feel sad
I feel blue or sad
I am blue or sad all the time and I can't snap out of it
I am so sad or unhappy that it is quite painful
I am so sad or unhappy that I can't stand it

B. I am not particularly pessimistic or discouraged about the future
I feel discouraged about the future
I feel I have nothing to look forward to
I feel that I won't ever get over my troubles
I feel that the future is hopeless and that things cannot improve

C. I do not feel like a failure
I feel I have failed more than the average person
I feel I have accomplished very little that is worthwhile or that means anything
As I look back on my life all I can see is a lot of failures
I feel I am a complete failure as a person (parent, husband, wife)

D. I am not particularly dissatisfied
I feel bored most of the time
I don't enjoy things the way I used to
I don't get satisfaction out of anything anymore
I am dissatisfied with everything

E. I don't feel particularly guilty
I feel bad or unworthy a good part of the time
I feel quite guilty
I feel bad or unworthy practically all the time now
I feel as though I am very bad or worthless

F. I don't feel I am being punished
I have a feeling that something bad may happen to me
I feel I am being punished or will be punished
I feel I deserve to be punished
I want to be punished

G. I don't feel disappointed in myself
I am disappointed in myself
I don't like myself
I am disgusted with myself
I hate myself

H. I don't feel I am any worse than anybody else
I am critical of myself for my weaknesses or mistakes
I blame myself for my faults
I blame myself for everything bad that happens

I. I don't have any thoughts of harming myself
I have thoughts of harming myself but I would not carry them out
I feel I would be better off dead
I feel my family would be better off if I were dead
I have definite plans about committing suicide
I would kill myself if I could

J. I don't cry any more than usual
I cry more now than I used to
I cry all the time now. I can't stop it
I used to be able to cry but now I can't cry at all even though I want to

K. I am no more irritated now than I ever am
I get annoyed or irritated more easily than I used to
I feel irritated all the time
I don't get irritated at all at the things that used to irritate me

L. I have not lost interest in other people
I am less interested in other people now than I used to be
I have lost most of my interest in other people and have little feeling for them
I have lost all my interest in other people and don't care about them at all

M. I make decisions about as well as ever
I try to put off making decisions
I have great difficulty in making decisions
I can't make any decisions at all anymore

N. I don't feel I look any worse than I used to
I am worried that I am looking old or unattractive
I feel that there are permanent changes in my appearance and they make me look unattractive
I feel that I am ugly or repulsive looking

O. I can work about as well as before
It takes extra effort to get started at doing something
I don't work as well as I used to
I have to push myself very hard to do anything
I can't do any work at all

P. I can sleep as well as usual
I wake up more tired in the morning than I used to
I wake up 1-2 hours earlier than usual and find it hard to get back to sleep
I wake up early every day and can't get more than 5 hours sleep

Q. I don't get any more tired than usual
I get tired more easily than I used to
I get tired from doing anything
I get too tired to do anything

R. My appetite is no worse than usual
My appetite is not as good as it used to be
My appetite is much worse now
I have no appetite at all anymore

S. I haven't lost much weight, if any, lately
I have lost more than 5 pounds
I have lost more than 10 pounds
I have lost more than 15 pounds

T. I am no more concerned about my health than usual
I am concerned about aches and pains or upset stomach or constipation
I am so concerned with how I feel or what I feel that it's hard to think of much else
I am completely absorbed in what I feel

U. I have not noticed any recent change in my interest in sex
I am less interested in sex than I used to be
I am much less interested in sex now
I have lost interest in sex completely

From: Beck, A. T. Depression: Causes and Treatment. Philadelphia: University of Pennsylvania Press, 1967.

APPENDIX H

INTERNAL-EXTERNAL SCALE

APPENDIX H

INTERNAL-EXTERNAL SCALE

Social Reaction Inventory

We are interested in the way different people look at things which happen in our society. We have listed below 29 pairs of statements. You will probably agree more with one of the two statements than you will with the other one. Sometimes neither of the two statements will really say what you would like for it to say. If this happens, just choose the one which is closest to what you believe.

There are no right or wrong answers. Just choose the one which is closest to what you really believe, and circle the letter of that statement.

For example, look at item number 1 below. If you agree with statement A, put a circle around the A. If you agree more with statement B, put a circle around the B.

Go ahead and start. Remember to choose the one which is closest to what you really believe.

* * * * * *

1. A. Children get into trouble because their parents punish them too much.

   B. The trouble with most children nowadays is that their parents are too easy with them.

2. A. Many of the unhappy things in people's lives are partly due to bad luck.

   B. People's misfortunes result from the mistakes they make.

3. A. One of the major reasons why we have wars is because people don't take enough interest in politics.

   B. There will always be wars, no matter how hard people try to prevent them.

4. A. In the long run people get the respect they deserve in this world.

   B. Unfortunately, an individual's worth often passes unrecognized no matter how hard he tries

5. A. The idea that teachers are unfair to students is nonsense.

   B. Most students don't realize the extent to which their grades are influenced by accidental happenings.

6. A. Without the right breaks one cannot be an effective leader.

   B. Capable people who fail to become leaders have not taken advantage of their opportunities.

7. A. No matter how hard you try some people just don't like you.

   B. People who can't get others to like them don't understand how to get along with others.

8. A. Heredity plays the major role in determining one's personality.

   B. It is one's experiences in life which determine what they're like.

9. A. I have often found that what is going to happen will happen.

   B. Trusting to fate has never turned out as well for me as making a decision to take a definite course of action.

10. A. In the case of the well-prepared student there is rarely if ever such a thing as an unfair test.

    B. Many times exam questions tend to be so unrelated to course work that studying is really useless.

11. A. Becoming a success is a matter of hard work, luck has little or nothing to do with it.

    B. Getting a good job depends mainly on being in the right place at the right time.

12. A. The average citizen can have an influence in government decisions.

    B. This world is run by the few people in power, and there is not much the little guy can do about it.

13. A. When I make plans, I am almost certain that I can make them work.

    B. It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.

14. A. There are certain people who are just no good.

    B. There is some good in everybody.

15. A. In my case getting what I want has little or nothing to do with luck.

    B. Many times we might just as well decide what to do by flipping a coin.

16. A. Who gets to be the boss often depends on who was lucky enough to be in the right place first.

    B. Getting people to do the right thing depends upon ability, luck has little or nothing to do with it.

17. A. As far as world affairs are concerned, most of us are the victims of forces we can neither understand, nor control.

    B. By taking an active part in political and social affairs the people can control world events.

18. A. Most people don't realize the extent to which their lives are controlled by accidental happenings.

    B. There really is no such thing as "luck."

19. A. One should always be willing to admit mistakes.

    B. It is usually best to cover up one's mistakes.

20. A. It is hard to know whether or not a person really likes you.

    B. How many friends you have depends upon how nice a person you are.

21. A. In the long run the bad things that happen to us are balanced by the good ones.

    B. Most misfortunes are the result of lack of ability, ignorance, laziness, or all three.

22. A. With enough effort we can wipe out political corruption.

    B. It is difficult for people to have much control over the things politicians do in office.

23. A. Sometimes I can't understand how teachers arrive at the grades they give.

    B. There is a direct connection between how hard I study and the grades I get.

24. A. A good leader expects people to decide for themselves what they should do.

    B. A good leader makes it clear to everybody what their jobs are.

25. A. Many times I feel that I have little influence over the things that happen to me.

    B. It is impossible for me to believe that chance or luck plays an important role in my life.

26. A. People are lonely because they don't try to be friendly.

    B. There's not much use in trying too hard to please people, if they like you, they like you.

27. A. There is too much emphasis on athletics in high school.

    B. Team sports are an excellent way to build character.

28. A. What happens to me is my own doing.

    B. Sometimes I feel that I don't have enough control over the direction my life is taking.

29. A. Most of the time I can't understand why politicians behave the way they do.

    B. In the long run the people are responsible for bad government on a national as well as on a local level.

APPENDIX I

ANAGRAMS RECORD FORM

APPENDIX I

ANAGRAMS RECORD FORM

Date _____ S number _____

E number _____

Experience Rating _____

	Anagram	Response	Latency	"Check" if Correct	
1.	O T L H C	_____	_____	CLOTH	_____
2.	I R L T F	_____	_____	FLIRT	_____
3.	I N A T P	_____	_____	PAINT	_____
4.	G A U R S	_____	_____	SUGAR	_____
5.	I C O E V	_____	_____	VOICE	_____
6.	B L O E N	_____	_____	NOBLE	_____
7.	T I A O P	_____	_____	PATIO	_____
8.	E R L K C	_____	_____	CLERK	_____
9.	B I A T H	_____	_____	HABIT	_____
10.	I M L B C	_____	_____	CLIMB	_____
11.	O P D T A	_____	_____	ADOPT	_____
12.	L U A E V	_____	_____	VALUE	_____
13.	A R U D G	_____	_____	GUARD	_____
14.	A L C E S	_____	_____	SCALE	_____
15.	C L N E U	_____	_____	UNCLE	_____
16.	R T I H B	_____	_____	BIRTH	_____
17.	O U L R F	_____	_____	FLOUR	_____
18.	C O A N B	_____	_____	BACON	_____
19.	N T O H M	_____	_____	MONTH	_____
20.	R T A Y P	_____	_____	PARTY	_____

Pattern Solved? _____ (ask)

Number of Correct Responses _____ Mean Latency ___

Trials to Criterion _____

APPENDIX J

PROTOCOL RECORD SHEET

APPENDIX J

PROTOCOL RECORD SHEET

Experimenter number _____

Checked by _____

Pre-BDI _____ BDI _____ Post BDI _____

Pre-IE _____ IE _____

Sadness I _____ Anger I _____ Nervousness I _____

DACL-B _____

(Go to Treatment Record Form)

Sadness II_____ Anger II_____ Nervousness II_____

DACL-C _____

(Give Performance Rating Sheet)

Objective Estimate _____ Subjective Rating _____

(Give Causal Attribution Scales)

(Go to Anagram or Digit Symbol Sheet)

Sadness III_____ Anger III_____ Nervousness III_____

DACL-G _____

Task Performance Rating (TPR) _____

Future Performance Est. (FPE) _____

TPR-FPE = _____

(Interview) Valid Protocol?_____

Mood Change Scores (Use absolute values)

Sad I - Sad II = _____ Anger I - Anger II = _____

Nervous I - Nervous II = _____

Causal Attribution - Sums

CA4 + CA5 = _____ CA6 + CA7 = _____

APPENDIX K

TREATMENT RECORD FORM

APPENDIX K

TREATMENT RECORD FORM

Form S

S number _____

E number _____

Code: R=right, L=left, + = correct, - = incorrect

Initial Expectancy _____

SERIES I		SERIES II		SERIES III		SERIES IV	
Max. Asp. ____		Max. Asp. ____		Max. Asp. ____		Max. Asp. ____	
Min. Asp. ____		Min. Asp. ____		Min. Asp. ____		Min. Asp. ____	
Ser. Exp. ____		Ser. Exp. ____		Ser. Exp. ____		Ser. Exp. ____	
S-Resp	E-Resp	S-Resp	E-Resp	S-Resp	E-Resp	S-Resp	E-Resp
1. ____	L-( )	____	L-( )	____	R-( )	____	L-( )
2. ____	R-( )	____	R-( )	____	R-( )	____	R-( )
3. ____	R-( )	____	L-( )	____	L-( )	____	L-( )
4. ____	R-( )	____	L-( )	____	R-( )	____	L-( )
5. ____	L-( )	____	R-( )	____	L-( )	____	R-( )
6. ____	L-( )	____	R-( )	____	L-( )	____	R-( )
7. ____	L-( )	____	L-( )	____	R-( )	____	L-( )
8. ____	R-( )	____	L-( )	____	R-( )	____	R-( )
9. ____	R-( )	____	L-( )	____	L-( )	____	L-( )
10. ____	R-( )	____	R-( )	____	R-( )	____	R-( )
Hyp ____	Lg-( )	____	Un-( )	____	A-( )	____	Sg-( )

Final Max. Asp. _____ Final Min. Asp. _____ Final Ser. Exp. _____

SERIES EXPECTANCY CHANGES	I - II	II - III	III - IV	IV - Final	Total
	____	____	____	____	_____
Max. Asp. CHANGES	I - II	II - III	III - IV	IV - Final	Total
	____	____	____	_____	_____
Min. Asp. CHANGES	I - II	II - III	III - IV	IV - Final	Total
	____	____	____	_____	_____

Mean Max. Asp. _____ Mean Min. Asp. _____

APPENDIX L

DIGIT SYMBOL FORM

APPENDIX L

DIGIT SYMBOL FORM

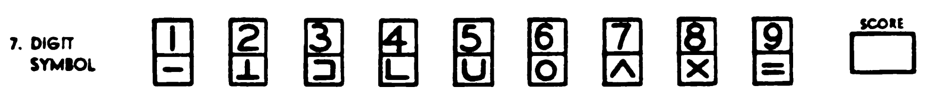
DIGIT SYMBOL

S number ________ E number ________

Digit Symbol Order ________ (1=first; 2=second)

Time to Completion ________ (in seconds)

Total Errors ________



SAMPLES

2	1	3	7	2	4	8	1	5	4	2	1	3	2	1	4	2	3	5	2	3	1	4	6	3

1	5	4	2	7	6	3	5	7	2	8	5	4	6	3	7	2	8	1	9	5	8	4	7	3

6	2	5	1	9	2	8	3	7	4	6	5	9	4	8	3	7	2	6	1	5	4	6	3	7

9	2	8	1	7	9	4	6	8	5	9	7	1	8	5	2	9	4	8	6	3	7	9	8	6

APPENDIX M

MEANS AND STANDARD DEVIATIONS OF PERFORMANCE MEASURES

APPENDIX M

Table A.--Means and Standard Deviations of Performance Measures

Depression Level	Measures	Treatment Condition											
		S_R		S_N		S_P		F_R		F_N		F_P	
		M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
NONDEPRESSED													
	Latency	11.38	10.44	30.88	22.71	17.18	10.91	30.61	18.99	36.49	22.74	33.71	13.92
	Number correct	17.95	2.94	15.62	3.72	17.62	2.09	15.71	4.14	14.76	4.56	16.14	3.00
	Criterion	12.95	6.45	16.76	5.26	15.24	5.68	16.95	5.10	16.76	6.35	19.29	1.38
	Solution	1.24	.44	1.43	.51	1.24	.44	1.52	.51	1.52	.51	1.52	.51
	Digit symbol time	113.57	12.25	128.14	15.72	116.71	13.21	125.00	13.09	124.14	16.49	123.57	18.85
	Digit symbol errors	0.00	0.00	.24	.89	.05	.22	.05	.22	.14	.65	.05	.22
DEPRESSED													
	Latency	34.56	18.43	25.82	11.30	31.56	15.90	18.18	11.25	31.60	18.17	45.09	20.63
	Number correct	14.90	3.53	15.76	2.55	15.14	2.87	16.86	2.43	14.43	3.06	11.52	4.66
	Criterion	17.52	3.40	18.00	3.11	17.29	4.79	16.48	4.35	16.71	4.04	19.95	.22
	Solution	1.57	.51	1.52	.51	1.57	.51	1.24	.44	1.76	.44	1.81	.40
	Digit Symbol Time	123.33	17.21	126.29	10.05	128.57	13.50	119.52	15.32	132.20	16.90	132.95	21.63
	Digit Symbol Errors	.14	.36	0.00	0.00	0.00	0.00	.14	.36	0.00	0.00	.05	.22

Note. Each cell contains 21 subjects. S_R = success rewarded; S_N = success, neutral feedback; S_P = success with failures punished; F_R = failure with reward for successes; F_N = failure, neutral feedback; F_P = failure punished.

APPENDIX N

ANALYSES OF COVARIANCE OF TASK PERFORMANCE MEASURES

APPENDIX N

ANALYSES OF COVARIANCE OF TASK PERFORMANCE MEASURES

Table B.--Mean Anagram Response Latency

Source	df	MS	F	p
Anagram experience (Covar)	1	442.63	1.55	
Depression classification (A)	1	1069.27	3.75	.05
Task outcome (B)	1	3142.86	11.01	.001
Feedback condition (C)	2	1785.72	6.25	.01
A x B	1	2606.01	9.13	.01
A x C	2	1655.92	5.80	.01
B x C	2	1044.40	3.66	.05
A x B x C	2	2037.91	7.14	.001
Residual	239	68249.67		

Table C.--Number of Correctly Solved Anagrams

Source	df	MS	F	p
Anagram experience (Covar)	1	43.99	3.83	.05
Depression classification (A)	1	128.10	11.16	.001
Task outcome (B)	1	86.00	7.49	.01
Feedback condition (C)	2	45.25	3.94	.05
A x B	1	4.57	.40	
A x C	2	66.76	5.82	.01
B x C	2	32.55	2.84	
A x B x C	2	56.75	4.94	.01
Residual	239	11.48		

Table D.--Number of Anagram Trials to Reach Criterion

Source	df	MS	F	p
Anagram experience (Covar)	1	47.13	2.72	
Depression classification (A)	1	91.46	4.41	.05
Task outcome (B)	1	102.88	4.96	.05
Feedback condition (C)	2	88.34	4.26	.01
A x B	1	105.67	5.09	.05
A x C	2	9.78	<1	
B x C	2	85.03	4.10	.05
A x B x C	2	23.37	1.13	
Residual	239	20.74		

Table E.--Number of Correct Anagram Pattern Solutions

Source	df	MS	F	p
Anagram experience (Covar)	1	.11	<1	
Depression classification (A)	1	1.70	7.40	.01
Task outcome (B)	1	1.12	4.87	.05
Feedback condition (C)	2	.68	2.96	.05
A x B	1	.48	2.10	
A x C	2	.43	1.87	
B x C	2	.45	1.95	
A x B x C	2	.82	3.58	.05
Residual	239	.23		

Table F.--Analysis of Variance of Digit Symbol Completion Time

Source	df	MS	F	p
Depression classification (A)	1	1760.14	7.19	.01
Task outcome (B)	1	754.35	3.08	
Feedback condition (C)	2	1186.48	4.85	.01
A x B	1	106.73	<1	
A x C	2	452.76	1.85	
B x C	2	116.25	<1	
A x B x C	2	829.78	3.40	.05
Residual	240	244.76		

APPENDIX O

ANALYSES OF VARIANCE OF INTERNAL VERSUS EXTERNAL CAUSAL ATTRIBUTION MEASURES

APPENDIX P

ANALYSES OF VARIANCE OF STABLE VERSUS UNSTABLE CAUSAL ATTRIBUTION MEASURES

Table K.--Direct Stable Versus Unstable Attribution Measure

Source	df	MS	F	p
Depression classification (A)	1	1.15	<1	
Task outcome (B)	1	792.89	189.93	.001
Feedback condition (C)	2	8.41	2.01	
A x B	1	17.81	4.27	.05
A x C	2	13.86	3.32	.05
B x C	2	5.08	1.22	
A x B x C	2	8.22	1.97	
Residual	240	4.18		

Table L.--Bi-Polar Stable Versus Unstable Attribution Measure--Internal, Uncontrollable Anchors

Source	df	MS	F	p
Depression classification (A)	1	75.57	21.11	.001
Task outcome (B)	1	.78	<1	
Feedback condition (C)	2	.51	<1	
A x B	1	7.68	2.15	
A x C	2	4.01	1.12	
B x C	2	6.69	1.87	
A x B x C	2	7.91	2.21	
Residual	240	3.58		

Table M.--Bi-Polar Stable Versus Unstable Attribution Measures--External, Uncontrollable Anchors

Source	df	MS	F	p
Depression classification (A)	1	47.15	13.24	.001
Task outcome (B)	1	8.77	2.46	
Feedback condition (C)	2	24.77	6.95	.001
A x B	1	60.04	16.86	.001
A x C	2	2.50	<1	
B x C	2	.41	<1	
A x B x C	2	3.08	<1	
Residual	240	3.56		

Table N.--Combined Bi-Polar Stable Versus Unstable Attribution Measure

Source	df	MS	F	p
Depression classification (A)	1	242.10	31.17	.001
Task outcome (B)	1	14.77	1.90	
Feedback condition (C)	2	18.30	2.36	
A x B	1	110.67	14.25	.001
A x C	2	5.78	<1	
B x C	2	5.44	1.09	
A x B x C	2	16.97	2.18	
Residual	240	7.78		

APPENDIX P

ANALYSES OF VARIANCE OF STABLE VERSUS UNSTABLE CAUSAL ATTRIBUTION MEASURES

APPENDIX Q

ANALYSES OF VARIANCE OF CONTROLLABLE VERSUS UNCONTROLLABLE CAUSAL ATTRIBUTION MEASURES

APPENDIX Q

ANALYSES OF VARIANCE OF CONTROLLABLE VERSUS UNCONTROLLABLE CAUSAL ATTRIBUTION MEASURES

Table O.--Direct Controllable Versus Uncontrollable Attribution Measure

Source	df	MS	F	p
Depression classification (A)	1	11.57	2.18	
Task outcome (B)	1	155.57	29.36	.001
Feedback condition (C)	2	29.29	5.53	.01
A x B	1	18.35	3.46	
A x C	2	.77	<1	
B x C	2	3.23	<1	
A x B x C	2	1.93	<1	
Residual	240			

Table P.--Bi-Polar Controllable Versus Uncontrollable Attribution Measure

Source	df	MS	F	p
Depression classification (A)	1	56.19	17.82	.001
Task outcome (B)	1	6.67	2.11	
Feedback condition (C)	2	4.11	1.30	
A x B	1	1.15	<1	
A x C	2	2.35	<1	
B x C	2	4.87	1.55	
A x B x C	2	2.73	<1	
Residual	240	3.15		

APPENDIX R

ANALYSES OF VARIANCE OF POST-TREATMENT MOOD SCORES

APPENDIX R

ANALYSES OF VARIANCE OF POST-TREATMENT MOOD SCORES

Table Q.--Self-Rated Post-Treatment Sadness Scores

Source	df	MS	F	p
Depression classification (A)	1	104.14	92.11	.001
Task outcome (B)	1	16.25	14.38	.001
Feedback condition (C)	2	5.36	4.74	.01
A x B	1	.06	<1	
A x C	2	.94	<1	
B x C	2	3.05	2.70	
A x B x C	2	2.89	2.55	
Residual	240	1.13		

Table R.--Post-Treatment DACL Scores

Source	df	MS	F	p
Depression classification (A)	1	1540.19	127.94	.001
Task outcome (B)	1	730.22	60.69	.001
Feedback condition (C)	2	71.60	5.95	.01
A x B	1	12.89	1.07	
A x C	2	7.98	<1	
B x C	2	48.44	4.02	.05
A x B x C	2	69.44	5.77	.01
Residual	240	243.48		

Table S.--Self-Rated Post-Treatment Anger Scores

Source	df	MS	F	p
Depression classification (A)	1	140.25	95.58	.001
Task outcome (B)	1	84.59	57.64	.001
Feedback condition (C)	2	20.48	13.96	.001
A x B	1	.40	<1	
A x C	2	3.24	2.21	
B x C	2	.19	<1	
A x B x C	2	3.53	2.40	
Residual	240	1.47		

Table T.--Self-Rated Post-Treatment Nervousness Scores

Source	df	MS	F	p
Depression classification (A)	1	54.32	34.46	.001
Task outcome (B)	1	52.48	33.29	.001
Feedback condition (C)	2	29.71	18.85	.001
A x B	1	.89	<1	
A x C	2	9.33	5.92	.01
B x C	2	1.25	<1	
A x B x C	2	1.29	<1	
Residual	240	1.57		

APPENDIX S

ANALYSES OF VARIANCE OF RECALL OF PERFORMANCE SCORES

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ANALYSES OF VARIANCE OF RECALL
OF PERFORMANCE SCORES

Table U.--Objective Recall of Performance

Source	df	MS	F	p
Depression classification (A)	1	374.00	22.13	.001
Task outcome (B)	1	20,250.32	1198.19	.001
Feedback condition (C)	2	107.15	6.34	.01
A x B	1	7.34	<1	
A x C	2	74.36	4.40	.01
B x C	2	3.30	<1	
A x B x C	2	173.39	10.26	.001
Residual	240	16.90		

Table V.--Subjective Recall of Performance Scores

Source	df	MS	F	p
Depression classification (A)	1	66.04	30.11	.001
Task outcome (B)	1	1231.15	561.44	.001
Feedback condition (C)	2	9.79	4.47	.01
A x B	1	.67	<1	
A x C	2	27.08	12.35	.001
B x C	2	5.36	2.45	
A x B x C	2	12.62	5.76	.01
Residual	240	2.19		

APPENDIX T

ANALYSES OF VARIANCE OF MAXIMUM ASPIRATION MEASURES

APPENDIX T

ANALYSES OF VARIANCE OF MAXIMUM ASPIRATION MEASURES

Table W.--Initial Maximum Aspiration Ratings

Source	df	MS	F	p
Depression classification (A)	1	14.77	4.60	.05
Task outcome (B)	1	6.04	1.88	
Feedback condition (C)	2	7.34	2.29	
A x B	1	.48	<1	
A x C	2	4.08	1.27	
B x C	2	2.18	<1	
A x B x C	2	18.60	5.80	.01
Residual	240	3.21		

Table X.--Mean Maximum Aspiration Ratings

Source	df	MS	F	p
Depression classification (A)	1	21.26	7.51	.01
Task outcome (B)	1	172.34	60.86	.001
Feedback condition (C)	2	9.11	3.22	.05
A x B	1	2.21	<1	
A x C	2	3.80	1.34	
B x C	2	4.37	1.54	
A x B x C	2	22.03	7.78	.001
Residual	240	2.83		

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