A Test Of The Cognitive Triad In Beck's Cognitive Theory Of Depression

Donna Elaine Giles

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LA THÈSE A ÉTÉ MICROFILMÉE TELLE QUE NOUS L'AVONS RÉCU
A TEST OF THE COGNITIVE TRIAD IN BECK'S
COGNITIVE THEORY OF DEPRESSION

by

Donna Elaine Giles

Department of Psychology

Submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy

Faculty of Graduate Studies
The University of Western Ontario
London, Ontario
June, 1982

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Abstract

Depressed individuals are assumed to distort perceptions of self, world and future systematically and negatively (Beck, 1967; 1974). These distortions are also presumed to be consistent across situations. To date, only single components of the triad have been directly investigated and there have been no comparisons of perceptions between situations. The validity of the cognitive distortion assumption and its generalizability across impersonal and interpersonal tasks were examined in this research.

To test the specificity of the cognitive theory of depression, the negative distortion assumption was studied in groups of depressed female psychiatric inpatients (n=24), nondepressed female psychiatric inpatients (n=24) and normal female medical patients (n=24). Diagnostic criteria (Spitzer, Endicott and Robins, 1975) and Hamilton Rating Scale (HRS-D) scores equal to or greater than 32 were used to select the depressed group. Nondepressed subjects were selected if not diagnostically depressed, if they had no major systemic diseases producing depression-like symptoms, evidenced no formal thought disorder and had HRS-D scores equal to or less than 20. Subjects were matched in age. All subjects were administered the Beck Depression Inventory, the Marlowe-Crowne Social Desirability Scale and the WAIS-Clarke Vocabulary Test as descriptive measures.
As hypothesized, depressed subjects made negative evaluations of self, world and future when compared to both nondepressed psychiatric and normal medical controls. Moreover, these negative evaluations represented distortions. That is, depressed subjects estimated their performance to be less adequate than it actually was. Actual performance in each of the impersonal and interpersonal tasks did not discriminate among the groups. There was also no effect of task on perceptions of performance. The success/failure strategy used in this research revealed that, although depressives endorse lower estimates overall, estimates of depressed and nondepressed subjects are affected equivalently by success or failure.

Beck's theory was generally supported in that the assumption of negatively distorted views of self, world and future specific to depression was confirmed. It is warranted to generalize these negative distortions across impersonal and interpersonal situations. It should be noted, however, that variability within the depressed group's responses suggest that depression is not a cognitively unified phenomenon and that cognitive variables may not be primary for all depressed women.
ACKNOWLEDGEMENTS

I take this opportunity to express publicly my gratitude to those who have made formative contributions to my efforts at becoming a scientist. First, I would like to thank my advisor, Dr. Brian F. Shaw, for his perseverance and unfailing encouragement. I would like to express my appreciation for the advice and concern given by my committee members, Drs. Kuiper, Evans, Siess, Scheid, Stone and Highlen. Special thanks to Dr. Bill Krane for his considerable advice concerning design and statistical issues, and for his continued interest in my progress. Dr. Dwight German merits special praise for the role his technical rigor and unswerving insistence on logic played in the development of this research. Kathleen Mooney deserves credit for her patient tolerance in typing the multiple drafts of this piece of research. And thank you, Dr. John Rush, for the financial support and for believing in me.

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Analysis of Probability of Success and Level of Aspiration Estimates
INTRODUCTION

The term "depression" has been used to describe a number of different conditions. It has been used to describe a transient mood, a symptom appended to psychiatric and medical conditions and a syndrome manifesting psychological, biochemical and physiological correlates. Spitzer, Endicott and Robins (1975) have provided a commonly accepted definition of depression. An individual is considered to meet criteria for primary depression if the following symptoms are present: 1) dysphoric mood and 2) at least five of eight symptoms including sleep disturbance, weight change and/or appetite disturbance, increased fatigability, decreased interest in activities and/or sex, agitation/retardation, guilt feelings, difficulty concentrating and/or making decisions, suicidal ideation. There must be no evidence of formal thought disorder inconsistent with depressive symptoms (e.g., thought broadcasting, insertion). Unlike primary depression, secondary depression is defined as a episode of depressive disorder preceded by a major psychiatric disorder (e.g., Schizophrenia, Alcoholism, Antisocial Personality) or by a major medical disorder (e.g., Organic Brain Syndrome, Hypothyroidism).

Within the last fifteen years, a number of psychological theories have addressed the problem of depression. Three models in particular have received attention: Lewinsohn's (1974) social skills model, Seligman's (1975; Abramson, Seligman and Teasdale, 1978) learned
helplessness model and Beck's (1967; 1976) cognitive model (see Blaney (1977) for a review). This dissertation is concerned with the theory proposed by Beck.

**BECK'S COGNITIVE THEORY OF DEPRESSION**

Beck (1967; 1974; 1976) identifies three major elements of psychological function as central to his model: cognitions (mental activity with verbal or image content), schemas (silent assumptions and attitudes) and logical errors in thinking (e.g., selective attention, personalization). These elements are theorized to be interrelated. For example, cognitions are assumed to proceed from schemas that, in turn, are developed through complex interactions of past and present internal and external events.

Beck delineated two critical factors for research into psychological components of depression. First, a specific psychological construct must be isolated which meaningfully differentiated depression from other psychopathological groups. Second, referents of this construct must be identifiable in a clinical population. Beck focused on idiosyncratic characteristics of the depressed person's information processing style. Specifically, the theory emphasized the negative and distorted bias in depressive thinking when these individuals were considering personally relevant information. Clinical data indicated that depressed persons interpret particular events in terms of failure, deprivation or rejection independent of disconfirmatory information. In 1961, Beck and colleagues (Ward, Mendelson, Mock and Erbaugh) developed a self-report test, the Beck Depression Inventory,
designed to measure severity of depression, particularly as it related to the psychological constructs of interest. This test has subsequently become a standard in assessing presence of depression.

In 1967, Beck outlined the cognitive theory of depression. Depression was stated to be primarily a disturbance in three major areas of psychological function (the cognitive triad). Views of self, world and future were systematically and negatively distorted such that events were construed to represent loss and deprivation. According to Beck, depression could not be meaningfully typified as a primary disturbance of mood. Although multiple psychological and physiological symptoms of depression were recognized, Beck proposed a causal link between cognition and affective, motivational, behavioral and physiological disturbances (Shaw and Beck, 1978). Affective symptoms (feelings of sadness, irritability, boredom) were due to misinterpretation of events to reflect personal rejection and deprivation. Motivational changes (escape, avoidance wishes, suicidal ideas and/or attempts, increased dependence, indecision) occurred in response to distorted perceptions of the future, where any undertaking appeared doomed. Increased dependence resulted from a belief system that concurrently overestimated the difficulty of normal tasks, underestimated personal performance, and expected negative or failure consequences. Depressed people seek assistance and reassurance from those surrounding them who, by contrast, are considered competent. Finally, negative cognitive patterns were seen to account for physical correlates of depression. The person, sensing defeat and loss, takes
a protective posture, which includes increased muscle tension, sleep
disturbance, appetite loss and psychomotor inhibition.

The validity of Beck’s theory rests on the assumption that
depressives, as a group, have a negatively distorted view of self,
world and future. Moreover, by his own criteria these negative
cognitive distortions must be specific to depression such that other
psychiatric disorders as well as normals do not manifest similar
distortions.

IMPERSONAL AND INTERPERSONAL ISSUES

Beck (1967) states that "the depressed patient is peculiarly
sensitive to any impediments to his goal-directed activity" (p. 256)
and "in achievement-oriented situations the depressed patients are
particularly prone to react with a sense of failure" (p. 257).
Either of these statements can be applied to impersonal or to inter-
personal situations. Beck, however, does not directly address the
relative roles of impersonal and interpersonal issues and their
impact on the cognitions of depressed individuals.

In the next section, literature relevant to Beck’s concept of
self, world and future in depression will be reviewed relative to
validity of the concepts and as they relate to impersonal and inter-
personal problem solving cognitions and performance.

CONCEPT OF SELF

Beck describes "concept of self" in depression as centering
around the depressed person’s self-attributions of inadequacy,
unworthiness, deficiency and presumed defect in mental, moral or physical character. The presumed defect is causally related to the individual's judgment of personal unworthiness. These cognitions develop through complex interactions of past learning and present events. The pattern of devaluing self is precipitated either by a specific stress to which the individual was sensitized, or by a series of nonspecific stressors impinging on specific vulnerabilities. Beck's major thrust is that the individual "must be peculiarly sensitive to the situation and must have a predepressive constellation to react with clinical depression" (Beck, 1967, p. 279).

Evidence is available indicating that depressed people endorse negative self-concept and that this concept is related to depressed mood. These data typically have been gathered through paper and pencil self-ratings. Self-concept measures taken during and after a depressive episode (Beck, 1967), and comparing depressed and paranoid inpatients (Laxer, 1964) showed the specific negative self-concept of depressives. Furthermore, an inverse relationship was found between severity of depression and positive self-concept (Beck and Stein, 1960). In a Focused Fantasy Test, depressives were found to identify with a protagonist who was hurt or disabled whereas nondepressed patients identified with the uninjured hero (Beck, 1961). Finally, in examining the role of cognitions in depressed mood, a series of studies found that negative self-references lead to depressed mood (defined by an adjective checklist) among college populations (Velten, 1968; Strickland, Hale and Anderson, 1975; Coleman, 1975; Hale and Strickland, 1976) and among psychiatric outpatients (Teasdale and
Bancroft, 1977). Although the causal relationship of cognition to mood has been challenged recently (Polivy and Doyle, 1980), mood induced by reading relevant statements seems "to be genuine" (Polivy and Doyle, 1980, p. 290).

**IMPERSONAL PROBLEM SOLVING:** Impersonal task is defined as a goal-striving situation where the stimulus is nonsocial and where the consequences of performance directly involve only the performing individual. Studies investigating concept of self in impersonal problem solving situations have used such tasks as card sorting (e.g., Loeb, Beck, Diggory, and Tuthill, 1967; Loeb, Beck and Diggory, 1971), finding concealed figures (e.g., Wortman, Panciera, Shusterman and Hibsch, 1975), puzzle solving (e.g., Flippo and Lewinsohn, 1971) and word and digit tasks (e.g., Loeb, Feshbach, Beck and Wolf, 1964; Lobitz and Post, 1979). In these tasks, experimenter controlled success and failure feedback procedures (i.e., success/failure strategy) have been utilized (Loeb et al., 1964; Loeb et al., 1967; Loeb et al., 1971; Wortman et al., 1975; Flippo and Lewinsohn, 1971). This strategy has shown that, after failure, depressed subjects have lowered success expectations (Loeb, et al., 1964; Loeb et al., 1967; Loeb et al., 1971) and self-esteem (Flippo and Lewinsohn, 1971) when compared to nondepressed controls. After success feedback, depressed subjects tend to show increased success expectations (Loeb et al., 1964; Beck, 1974) and self-concept (Beck, 1974) although success feedback has also been shown to have no effect on expectations (Loeb et al., 1971). Depressed subjects were less reinforcing to themselves
and more reinforcing to others compared to nondepressed subjects (Lobitz and Post, 1979). Actual performance measures show that clinically depressed subjects perform as well as nondepressed subjects, however (Loeb et al., 1967; Loeb et al., 1971; Lobitz and Post, 1979).

Thus depressed subjects tended to respond directly to performance feedback since their expectations varied directly with success/failure. This finding was more robust with failure in that there were consistent differences between depressed and nondepressed subjects under this condition. In addition, clinically depressed subjects tended to perform as well as nondepressed on the tasks but perceived their likelihood of success to be lower. Self-esteem and mood were both influenced by success/failure although mood was less affected (Loeb et al., 1964).

INTERPERSONAL PROBLEM SOLVING: Interpersonal task is defined as a goal-striving situation where the stimulus is social and where consequences of performance directly involve the individual and at least one other person. Concept of self in interpersonal situations has been investigated by using specific responses to routine college problems (e.g. Steiner, 1975), multiple choice responses to short stories (e.g. Hammen and Krantz, 1976; Krantz and Hammen, 1979) and self and observer ratings of a group interaction (Lewinsohn, Mischel, Chaplin and Barton, 1980). Depressed subjects selected responses defined as depressed and distorted (Hammen and Krantz, 1976; Krantz and Hammen, 1979) and endorsed negative self-evaluations (Steiner,
1975; Lewinsohn et al., 1980). Their interpersonal performance and solutions to interpersonal problems were observed to be less socially competent (Steiner, 1975; Lewinsohn et al., 1980). When given negative personal feedback (informed that they would make poor therapists), depressed subjects judged themselves more harshly than non-depressed controls, who were relatively unaffected (Hammen and Krantz, 1976).

These studies indicate that depressed subjects believed themselves to be less competent interpersonally and actually demonstrated limited competence. Negative personal information appeared to be incorporated more readily with depressed than with nondepressed subjects. These findings are somewhat discrepant with those found using impersonal problem solving tasks. It is important to note that actual performance is comparable for depressed and nondepressed subjects in impersonal tasks while depressed subjects do more poorly in interpersonal tasks. Self-ratings of depressed subjects may be influenced by "failure" in both types of tasks. A direct success/failure strategy has not been employed in interpersonal tasks, however.

CONCEPT OF WORLD

Beck (1967; 1976) maintains that those animate and inanimate objects which are part of the individual's "personal domain" are most important in concept of world. That is, perceived variation in those objects construed to be personally significant provide a major stimulus for depressed cognitions. According to Beck, the depressed
person perceives interaction with the world to be inordinately demanding or obstructive. Experiences with the world are construed as evidence for defeat and loss. This evidence leads to perceptions of personal rejection, deprivation and increased dependence. In comparison to others, the depressive is particularly inadequate; success experiences are minimized and failure experiences are overemphasized. As Beck (1967) states: "[The depressed person] is prone to hold himself responsible for any difficulties or problems that he encounters" (p. 21). Moreover, "when he looks at his past and present life, he sees his failure as outstanding and his successes as faint by comparison" (p. 22).

Research to examine depressives' concept of world has revealed inconsistencies. One line of evidence demonstrated that depression is not improved simply by increasing the frequency of previously rewarding behaviors (Hammen and Glass, 1975). That is, depression may not be due simply to the external contingencies applied to the individual. Depressives' world perceptions do not appear to be artifacts of depressed mood (Lunghi, 1977). Other studies show that depressives' dream reports indicate they see their world as obstructive and depriving (Beck and Hurvich, 1959; Beck and Ward, 1961; Hauri, 1976). Yet controversy occurs concerning overemphasized failure experiences. The hypothesized reactions to failure have led to use of internal/external locus of control measures. Depressives were expected to attribute success to external factors and failure to internal factors. In self-report ratings, depression has been associated with external locus of control with men (Calhoun, Cheney and
Dawes, 1974; Naditch, Gargan and Michael, 1975) while results with women showed inconsistencies in locus of control (Calhoun et al., 1974). To summarize, depressives' concept of world as interpreted by Beck has not been clearly supported. Depressives tend to perceive the world negatively yet they do not reliably respond to failure and success as predicted.

IMPERSOINAL PROBLEM SOLVING: Strategies to investigate concept of world in impersonal tasks have typically included recall with word association tasks (e.g. Lishman, 1972; Lloyd and Lishman, 1975; Buchwald, 1977; Kuiper, 1978), differential reinforcement rates for response selection (e.g., Wener and Rehm, 1975; deMonbreun and Craighead, 1977; Nelson and Craighead, 1977; McNitt and Thornton, 1978), number guessing (e.g., Rizley, 1978) and letter substitution and anagram tasks (e.g. Teasdale, 1978). In general, depressed subjects recalled more negative personal events, more punishment and fewer rewards (Lishman, 1972; Lloyd and Lishman, 1975; Wener and Rehm, 1975; Nelson and Craighead, 1977). Recalling success had little impact on future anagram performance (Teasdale; 1978).

Depressed responding in impersonal problem solving tasks appears complex. Some depressed subjects perceived reinforcement accurately when it was low, although high rates produced the expected negative distortion (deMonbreun and Craighead, 1977). Alternatively, work to examine the subjective representation of objective events has shown that depressed college students evaluate at least some situations more realistically than do their nondepressed counterparts (Alloy and
Abramson, 1979). While depressed subjects made internal attributions for failure (Kuiper, 1978; Rizley, 1978), success attributions showed variability. Kuiper (1978) found depressed females attributed success internally while Rizley (1978) found success attributions to be external in a sample of males and females. In a chance task much like Rizley's (1978), depressed subjects actually had higher expectations of success than did normal controls (McNitt and Thornton, 1978). In addition, there are data to suggest that distorted recall of negative events may be more true for women (Buchwald, 1977).

With impersonal tasks, depressed subjects generally tend to perceive and recall fewer positive events and more negative occurrences. This is not a unanimous finding, since it appears that the nature of the task, skill or chance, the degree of reinforcement and sex of the subjects may influence the quality of their world perceptions.

INTERPERSONAL PROBLEM SOLVING: Data gathered on depressed subjects' interpersonal relationships have entailed examining telephone conversations with real or role-played depressed persons (Coyne, 1976; Hammen and Peters, 1978) and self and other ratings of social relationships or preferences (Rehm and Plakos, 1975; Lunghi, 1977; Howes and Hokanson, 1979; Lewinsohn, Mischel, Chaplin and Barton, 1980). Depressed subjects have also been examined for the degree of responsibility they take for other people's performance (Rizley, 1978).

Depressed subjects report a greater number of negative social relationships and activities (Hammen and Glass, 1975; Lunghi, 1977;
Lewinsohn et al., 1980), engender more negative social experiences (Coyne, 1976; Hammen and Peters, 1978; Howes and Hokanson, 1979), prefer nonsocial rewards for their activities (Rehm and Plakosh, 1975) and find themselves responsible for other's behavior, whether the outcome is success or failure (Rizley, 1978).

In a study specifically comparing impersonal and interpersonal task performance (although not perceptions of performance) (Gotlib and Asarnow, 1979), depressed subjects were comparable to nondepressed in the impersonal task. In the interpersonal task, however, depressed subjects performed more poorly. Moreover, as severity of depression increased, interpersonal performance decreased.

Depressed persons' concept of world appears to be negative when examined in interpersonal situations. Further, this negative perception may not represent a distortion.

CONCEPT OF FUTURE

Beck states that a depressive's perception of future represents an extension of present negative experiences. Concept of future is most salient in depressives' motivational paralysis where it appears futile to work to change or to hope for improvement when current suffering is due to personal deficiencies. Avoidance, suicidal ideas and suicidal attempts are also taken as evidence for negative concept of future. This negativism extends to the immediate future as well as to more long term perceptions of the future. "Not only are long range forecasts of a negative nature, but short term predictions are similarly negative" (Beck, 1967, p. 260).

IMPERSONAL AND INTERPERSONAL PROBLEM SOLVING: None of the research currently available assesses perception of future through problem solving task measures.

RESEARCH CRITIQUE

The Beck Depression Inventory (BDI) has been used as the selection instrument in many of the cited studies. This instrument has been found to correlate 0.56 with pessimism or negative view of the future (Loeb et al., 1967), 0.70 with negative self-concept (Vatz et al., 1969) and -0.66 with positive self-concept (Beck, 1967). This inventory was developed explicitly to measure the constructs of the theory. Subject selection based on a test related to constructs under investigation artificially enhances the probability of significant outcome. Thus, use of this instrument to sort groups is not consistent with a clear test of the theory. It is advisable to use criteria that are independent of the constructs in question.
Much of the experimental research to date, particularly as it relates to the cognitive component, view of self, has been conducted with college student populations. Of the 51 studies cited, less than half (23) examined clinically depressed subjects. Much of the information concerning depression is based on a group of mildly dysphoric people, aged 19 to 25, of above average intelligence. Statements concerning the phenomenon of depression are necessarily limited. Comparability of a college population with a clinical population must be determined empirically.

Of the 23 studies examining clinically depressed subjects, seven (Loeb et al., 1964; Loeb et al., 1966; Loeb et al., 1971; Lishman, 1972; Lloyd and Lishman, 1975; deMonbreun and Craighead, 1977; Lobitz and Post, 1979) investigated depression through impersonal task assessment, one (Krantz and Hammen, 1979) used an interpersonal task alone, and one (Gotlib and Asarnow, 1979) used both impersonal and interpersonal tasks. The interpersonal task assessment (Krantz and Hammen, 1979) was conducted largely as a validation study for an instrument developed to assess cognitive biases. Of the 576 subjects in the Krantz and Hammen sample, 104 were considered depressed. Only 38% (39 subjects) were psychiatric depressed subjects. The study examining both impersonal and interpersonal tasks (Gotlib and Asarnow, 1979) was conducted with 40 classroom college students and 18 college student counselees, a group that may or may not be representative of a clinically depressed population. Both Krantz and Hammen (1979) and Gotlib and Asarnow (1979) used the BDI to select subjects. Because the proportion of subjects likely to meet clinical criteria for the
Depressive syndrome is very low (e.g. in Krantz and Hammen's (1979) sample, 29-36 subjects met criteria set forth by Spitzer et al. (1975)), these studies are of questionable value in elucidating clinical depression.

The remaining studies used an impersonal task for cognitive assessment of depression. Only four of the studies used a success/failure strategy or high and low reinforcement conditions (Loeb et al., 1964; Loeb et al., 1966; Loeb et al., 1971; deMonbreun and Craighead, 1977) and all four studies selected subjects on the basis of BDI scores.

In order to test Beck's tenet of the negative cognitive distortion in depression, representative measures of self, world and future should be examined in the same sample. In this way the individual validity as well as the interrelationship of the concepts can be examined. While the Hammen and Krantz (1976) study included the triad in a single experimental procedure, there was no attempt to discriminate among the components and to assess their relationship. Thus, it is theoretically important to employ an assessment incorporating the triad. Moreover, examination of the major tenet of Beck's theory, that depressed people systematically and negatively distort views of self, world and future, is short-circuited without specific measures of self, world and future.

In addition to examining the element of negative bias, it is necessary to evaluate the issue of distortion among depressives. Distortion is defined as subject perception compared to objective performance. Do depressives distort information concerning self,
world and future compared to normals? The majority of research has been directed at ascertaining the negative bias. Relatively few have directly examined the element of distortion. Of the studies reviewed, only one investigation (Loeb et al., 1971) used a success/failure procedure where objective performance could be measured.

Loeb et al.'s (1971) study is not an adequate test of Beck's theory for methodological reasons. First, Loeb et al. (1971) used the BDI to select subjects. As pointed out previously, using the BDI as the major criterion for subject inclusion biases findings. A second problem lies in the choice of subject population. Choice of male subjects limits generalization to a minority of the depressed population. The ratio of males to females presenting with the complaint of depression varies from center to center but is approximately 1:3 (Weissman and Paykel, 1974). This figure holds for both outpatient and acute inpatient services. As depression is prevalent in females, it is more meaningful to study depression either in a group of females or in a design where the variable of sex can be examined.

As a corollary to the relevance of sex as a variable for consideration, the achievement literature suggests that performance generally discriminates between men and women when a success/failure strategy is used (Weiner, Freize, Kukla, Reed, Rest and Rosenbaum, 1971). As reported by Weiner et al. (1971) "the relationship between achievement motivation and locus of control for successful events is undetermined (nonexistent?) for females" (p. 12). Use of a success/failure strategy is important to examine the element of distortion.
It appears, however, that females and males must be examined separately, at least in the early investigation.

RATIONALE AND OBJECTIVES

Beck's cognitive theory of depression has contributed to understanding depression through formulation of testable constructs. Beck (1967; 1976) has stated that negative cognitive distortions lead to the syndrome of depression and not simply to a transient mood disturbance. This assumption has not been rigorously tested 1) in a clearly defined, clinically depressed population; 2) in a female population; 3) with comparison to a relevant psychiatrically disturbed population and to a population of normal females.

Further, the three components of the cognitive triad, concepts of self, world and future, have not been investigated simultaneously in the same sample of depressives to facilitate understanding the interrelationship of the components. Moreover, the notion of generalizability of cognitive distortions from impersonal to interpersonal situations is implicit in the theory but has not been adequately tested in a group of clinically depressed subjects.

This study was proposed to examine the question of whether depressed females have negative and distorted concepts of self, world and future compared to nondepressed, nonpsychotic psychiatric female inpatients and to psychometrically normal females. A nondepressed psychiatric control group was proposed to examine the specificity of the assumption. A hospitalized normal group was proposed to control for the effects of the general stress of hospitalization and the
"blues" that frequently are concurrent with living in a restricting environment, one unfamiliar to the subject. The second purpose of this study was to examine whether the views of self, world and future are differentially affected by impersonal or interpersonal demands of a situation. Although Beck assumes comparability of cognitions across situations, previously cited research suggests that negative cognitions in interpersonal situations may not, in fact, represent distortions. Depressives have been shown to be less adept socially. Moreover, the valence of interpersonal performance appears to be highlighted repeatedly in clinical cases of depression. Interpersonal situations are often the focus of depressives' complaints. Therefore, it was determined to examine both the validity of the cognitive triad and the generalizability of this concept across representative situations by assessing the cognitive triad in impersonal and interpersonal tasks.

Beck does not explicitly define concepts of self, world and future but working definitions can be inferred. Much of Beck's early work to test the triad was done in collaboration with James Diggory (e.g., Loeb, Beck, Diggory and Tuthill, 1966; Loeb, Beck and Diggory, 1971). Diggory (1966) defined concept of self operationally as probability of success estimates made by subjects in ongoing performance of a particular task (see Diggory, 1966 for a complete review). The logic of his approach was that if one assumes that an individual can make observations and evaluations relative to itself and report these with precision, then it is meaningful to study concept of self empirically. "In other words, the sources of knowledge of ourselves are the same as our knowledge about anything" (Diggory, 1966, p. 91).
Diggory (1966) has amassed considerable data to indicate that probability of success estimates (PS) are related to direct statements of self-evaluation (see Diggory, 1966, pp. 195-203) and that PS is an index of the subject's evaluation of self "as an instrument for doing whatever he [sic] is trying to do" (p. 203).

Concurrently, Diggory (1966) evaluated a measure termed "level of aspiration" (LA). This variable was intended to measure goal aspirations in ongoing performance of a task and therefore to reflect self-esteem. Higher aspirations were expected to be related to higher self-esteem. The LA measure, however, was found to be more weakly related to concept of self and showed greater variability. Subsequent research with depressives has also shown this variability. In some research, LA has discriminated between depressives and other subjects (e.g., Loeb et al., 1966) while other research has not supported this distinction (e.g., Loeb et al., 1971).

The line of reasoning initiated and operationalized by Diggory (1966) has been followed in this research. Concept of self was measured in this study using both probability of success estimates and a measure of level of aspiration.

Concept of world at the level of theory can be defined as an individual's self referenced cognitive perceptions of animate and inanimate objects beyond the self. Specifically, concept of world has been operationalized as the estimates made by the individual of her achievement compared with that of other subjects performing a given task. This measure, level of achievement compared to others (LA0), was developed explicitly to examine subjects' evaluations of
themselves as instrumental in meeting a given goal in comparison with their assessment of others' abilities to meet similar goals.

Concept of future is defined as an individual's cognitive perceptions of a time period which has not yet occurred. Two components of future perceptions are implicit in the theory. One component is that perception of the future reflects an immediate extension of present negative experiences (Beck, 1961). A second component entails the long range expectation of negative consequences reflected by hopelessness in depression. Operationally, one would expect immediate negative predictions for the future as well as negative expectations in the face of some ambiguous future task.

Two sets of measures were employed to operationalize the concept of future. A probability of future success estimate (PFS) was developed to test immediate negative predictions for the future. This measure would follow task performance immediately. Two other measures were designed to examine a more global pessimistic set. One measure (F3) required the subject to choose between probable success or failure in a task with uncertain outcome. The second measure (F4) required the subject to rate her global expectation of success/failure in response to ambiguous feedback.

A final measure was introduced as a control measure. Since the essence of the cognitive triad is negative distortion, it was necessary to determine whether a subject's perception of her performance in a particular task was believed by her to be typical of her performance. For example, if a depressed subject made low estimates of success and reported worse performance than others but believed that
current performance was below her standard performance, then these negative estimates could reflect perhaps only temporary cognitions. Therefore, an estimate of perceived personal achievement was developed to examine the representativeness of present performance. This measure was termed "level of perceived personal achievement" (LPA).

Both impersonal and interpersonal tasks were used in this dissertation research. A card sorting task (Diggory, 1966) was selected as the impersonal task to investigate subjects' evaluations of their performance in a nonsocial situation. The Means-Ends Problem Solving Task (MEPS) (Platt and Spivack, 1975) was used to assess interpersonal problem solving.

An experimenter controlled success/failure strategy was used in each of the tasks to examine the element of distortion in depressed subjects' cognitions.

Following are the hypotheses that were tested:

**MAJOR HYPOTHESES**

1) Depressed subjects will make lower probability of success estimates (PS) compared to nondepressed psychiatric and normal medical subjects.

2) Depressed subjects will estimate their achievement to be lower than others (LAO) when compared to nondepressed psychiatric and normal medical subjects.

3) Probability of future success estimates (PFS) and LAO estimates made by depressed subjects will be less affected by success
or failure feedback compared to estimates made by nondepressed psychiatric and normal medical subjects.

4) Depressed subjects will make lower estimates of future success (PFS) compared to nondepressed psychiatric and normal medical subjects.

5) Depressed subjects will make more failure choices (F3) and will have global expectations of failure when confronted with uncertain tasks outcome (F4) compared to nondepressed psychiatric and normal medical subjects.

6) Depressed subjects will have lower PS, LAO and PFS, F3 and F4 estimates when performing the MEFS procedure than when performing the card sorting task when compared to nondepressed psychiatric and normal medical subjects.

MINOR HYPOTHESES

1) There will be no differences between the depressed subjects and the nondepressed psychiatric and normal medical subjects in their level of aspiration (LA).

2) There will be no differences between the depressed subjects and the nondepressed psychiatric and normal medical subjects in their estimates of their level of perceived achievement (LPA).
METHOD

Subjects

Female subjects were drawn from three populations: depressed psychiatric inpatients, nondepressed psychiatric inpatients, and normal medical inpatients. Two general hospitals with operating capacities of 391 and 861 beds, respectively, were used to gain access to subjects. Psychiatric units in the two hospitals accommodated 20 and 41 inpatients respectively. Normal medical inpatients were solicited from orthopaedic, gynaecology, chest diseases and E.N.T. units.

Subjects were classified as depressed or nondepressed and suitable for the study according to the following criteria:

(a) psychiatric or medical diagnosis for appropriate group membership;

(b) diagnosis of primary depressive disorder according to Spitzer et al. (1975) for depressed group (Appendix A);

(c) Hamilton Rating Scale Depression (HRS-D) (Hamilton, 1960) combined score equal to or greater than 32 (depressed) or equal to or less than 20 (nondepressed) (Appendix B);

(d) no major organic disorder with secondary psychiatric features;

(e) signed informed consent (Appendix C).
Psychiatric diagnoses were determined by the International Classification of Diseases (8th Revision) routinely used in Canadian hospitals. A staff psychiatrist assigned a psychiatric diagnosis to each subject in the two psychiatric groups independent of study involvement. Psychiatric subjects included in the study were neither diagnosed nor considered by the staff psychiatrist nor by the experimenter to be psychotic, schizophrenic, drug or alcohol abusive or to have an Antisocial Personality Disorder nor Organic Brain Syndrome.

Subjects selected for the nondepressed psychiatric group did not meet criteria for primary or secondary depression nor were they diagnosed as depressed by the attending psychiatrist. Subjects in this group were diagnosed as Immature Personality Disorder, Obsessive-Compulsive Personality Disorder, Borderline Personality Disorder, Hysterical Personality Disorder, Acute Situational Crisis, Anorexia Nervosa or Anxiety Reaction.

Subjects in the normal control group were nonpsychiatric inpatients who presented with no major systemic or central nervous system diseases nor with diseases considered to occur prior to or simultaneously with depressive disorder. Diagnoses for subjects in this group were Chronic Mastoiditis, Deviated Nasal Septum, Chronic Suppurative Otitis Media, Tuberculosis, Bronchitis, Menorrhagia, Uterine Fibroids, Spastic Colon, Fractured Femur, and Asthma.

Medical records of all subjects were reviewed to determine presence or absence of depressed symptomatology as defined by Spitzer et al. (1975). Permission was secured from the attending physician to approach appropriate subjects. The purpose of the study was
The probability of future success estimate (PFS) (Appendix N) measured subjects' expectations for success after success/failure feedback. This was also expressed as a percentage score. The PFS was obtained after completion of five trials as follows:

I would now like you to tell me what you feel your chances are of making the goal of sorting 20 cards if you were to attempt this task on another occasion. You can again think of your chances in percentages. In other words, what percent chance do you have of making the goal if you tried this task again?

The level of perceived personal achievement measure (LPA) (Appendix O) provided a subjective estimate of how the subject perceived her performance. This was rated on a scale from 0 to 100.

The LPA estimate was obtained after feedback from of the five trials:

I would like to know how well you think you did on this task compared to how well you think you should do. On a scale of zero to 100 where zero represents the poorest performance and 100 represents the very best you could do and 50 represents average, where would you place your performance?

The measure level of achievement relative to others (LAO) (Appendix P) was used to provide a direct subjective comparison of the subject's own performance to that of other individuals who had attempted the task. Subjects again rated their performance on a 100-point qualitatively anchored scale after feedback. LAO was obtained as follows:

Now, how well do you think you did on this task compared to others who have taken this test? On the same sort of scale, that is, on a scale from zero to 100, where zero represents the poorest performance of anyone, where 100 represents the best performance of anyone and 50 represents the average person's performance, where would you place your performance?

After debriefing, all subjects were administered a form to examine whether they had believed the success or failure feedback,
items of the 24 items are used to calculate the total scores. Interrater reliability on these items was reported at .90 (Hamilton, 1960). The remaining seven items have not been demonstrated to be reliable. For this study, all raters were trained by or with the experimenter. The form and wording of the instrument were followed rigorously. The cut-off scores were 32 or greater for the depressed group and 20 or less for the nondepressed and normal groups. Hamilton (1960) found that a score of 28 or greater represents clinically significant depression. The score '32' was selected to be conservative in generating a depressed group. Scores of 0 to 20 are considered to vary along a continuum of normal to minor nondysfunctional disturbance (Hamilton, 1960).

The Beck Depression Inventory (BDI) (Beck, et al. 1961) is a 21-item self-report test designed to measure severity of depression. A number of validity and reliability studies generally support the BDI as a measure of depression severity (Beck, 1967, pp. 189-207). Pearson biserial correlations between clinical judgments and test scores range between .65 and .67 (Beck, 1976, p. 197). Split-half reliability values range between .86 and .93. Because this measure was designed to measure daily fluctuations and because it is a self-report measure, test-retest and interrater reliabilities are inappropriate. The BDI was used as a self-report measure of the severity of depressive symptoms and to provide comparison with relevant research. The BDI was not used to select subjects.

The Marlowe-Crowne Social Desirability Scale (SDS) (Marlowe and Crowne, 1960) is designed to measure socially desirable response
style independent of pathology. Test items consist of either culturally acceptable and approved behaviors which are relatively unlikely to occur or culturally disapproved behaviors highly likely to occur. The scale was compared with the Edwards SDS (1957, cited in Marlowe and Crowne, 1960) and with the MMPI. The magnitude of the correlations of the new scale with the MMPI were in accord with social desirability defined as need of subjects to respond in culturally sanctioned ways (Crowne and Marlowe, 1960). This scale was used to determine whether there was differential acquiescence to perceived experimental demands or to task requirements between groups.

The WAIS-Clarke Vocabulary Test (Paitich and Crawford, 1971) is a multiple choice vocabulary measure. In studies conducted to examine validity, a correlation of .92 between the WAIS vocabulary and the multiple-choice scores was obtained (Paitich and Crawford, 1971). This test was used as an index of general intellectual functioning.

Procedure

Each subject was randomly assigned to one of two task conditions (Card Sorting, Means End Problem Solving) and one of two feedback conditions (Success, Failure) with two restrictions. The first restriction was that subjects were matched across groups by age. The second restriction was that equal numbers of subjects were assigned to the task and feedback conditions. Thus, there were 24 subjects in each group; 12 subjects per group performed the card sorting task (CS) and 12 subjects performed the interpersonal task (MEPS); within
each task per group, 6 subjects received failure feedback (F) for their performance and 6 subjects received success (S).

Subjects were administered the task perception questionnaire (Appendix H) after completing the task. Subjects filled out the post-experimental questionnaire (Appendix I). The research assistant read each of the items to the subject and referred subjects with questions to the experimenter. Subjects were then debriefed by the experimenter (see Appendix J).

Card Sorting Procedure

Materials for the card sorting task consisted of (1) a board 27" X 16" with ten different pairs of symbols; (2) a deck of 120 cards with twelve cards per symbol; (3) a green score board 27" X 16" set up in graph form; and (4) a stopwatch. The ten symbols on the board were arranged in two rows of five, from left to right, top row; 2 crosses, 2 triangles, 2 rectangles, 2 stars and 2 hexagons; bottom row, 2 oblong circles, 2 T's (one inverted), 2 squares, 2 circles and 2 diamonds. Each pair of symbols was framed by a rectangular box 3" by 5", slightly larger than the size of a card, 2.75" X 4.25." On the score board the number of trials, ranging from one to five, was plotted along the abscissa while the scores, ranging from 1 to 25, were plotted along the ordinate. A heavy line ran across the score of 20, and "goal" was printed beside it.

The board was placed on a table about knee level when the subject was seated and the score board was on the wall directly in front of the subject. The deck of cards and a stopwatch were kept on another
table just behind the subject where the research assistant was situated. (Appendix K has detailed instructions for administration of the card sorting task.) The subject was told that each of the five trials lasted 20 seconds. The goal was defined as sorting 20 cards in 20 seconds on any one of the trials. In fact, the research assistant stopped the stopwatch after a predetermined number of cards was sorted.

Means-Ends Problem Solving Procedure

Subjects in this task condition were presented with the MEPS, developed by Platt and Spivack (1972). This task "is a measure of the ability to conceptualize interpersonal problem situations and to generate appropriate and effective means to reach a specified goal in order to satisfy an aroused need" (Platt and Spivack, 1975, p. 15). The MEPS consists of nine stories where a beginning and an ending are specified. The task is to generate appropriate and adequate means to achieve the end as stated. Five of the nine stories were selected on the basis of their general applicability. Subjects were asked to provide as many appropriate and effective means of reaching a specified goal as they could. A sample story is:

J. noticed that her friends seemed to be avoiding her. J. wanted to have friends and be liked. The story ends when J.'s friends like her again. You begin where she first notices her friends avoiding her.

The five tape recorded stories, each constituting a trial, were played individually to the subject by the research assistant.
The goal specified was to arrive at a satisfactory "means" which was defined for the subject as a score of 20.

The material used in the means-ends problem solving task included two tape recorders, two tapes (one to record the subject's response, the other to present the situations), a green score board in graph form (same score board used in card sorting), a book designed to resemble a scoring manual, and a stopwatch. The subject was seated in a comfortable chair while the research assistant sat at a desk a few feet away. One tape recorder was placed beside the subject and the score board was placed in front of the subject. The second tape recorder and stopwatch were arranged so that the research assistant had easy access while writing the subject's solutions. The tape recorder was turned on beside the subject. The other recorder was switched on at Situation 1. After the subject heard, "You begin the story where,..." the situation tape was turned off, the stopwatch was turned on, and the response latency was noted.

All statements made by the subject were recorded. After she completed her response the recorder beside her was turned off. The research assistant then read over her statements and pretended to score it. (See Appendix L for specific task instructions.) As with the card sorting task, a predetermined score was given to each subject.
Feedback Procedure

Success and failure conditions were used in both tasks. In the success condition, scores which the subjects received were 14, 17, 16, 19, 21. In the failure condition, scores were 14, 17, 16, 19, 19. When the subject "succeeded" after five trials, the research assistant said, "You made the goal." When the subject "failed," the research assistant said, "You didn't make the goal." The research assistant gave no other type of feedback, such as reinforcement (e.g., "Good!").

Debriefing Procedure

All subjects were debriefed (see Appendix J for Debriefing Interview) immediately after completion of the procedure with the exception of one subject. This subject was in the normal medical patient group, HEPD-S condition. Following the experimental procedure, the subject was given medication which produced nausea; debriefing was postponed until the next day.

The completed post-experimental questionnaire (PEQ) (Appendix I) was read with the subject and questions were answered. Subjects were informed of the purpose of the study and of the three experimental groups. Each subject was informed of her own group assignment, of the deception, and its purpose. Subjects were thanked for their participation and an interview was arranged for subjects wishing feedback for the results of their psychometric data.
DEPENDENT VARIABLES

Cognitive Estimates

Probability of success estimates (PS) (Appendix M) were subject predictions for success with the task. Subjects were asked to estimate, in percentages, their chances of achieving the goal on each trial. The scale ranged from 0 to 100% and was anchored with qualitative phrases such as "chances are even that I can or can't." The PS measure was administered before each of the five trials as follows:

I would like you to tell me what you feel your chances are of making the goal of sorting 20 cards in any one of five trials—not necessarily the first, or second, but on any one of the five trials. You can think of these numbers as percentages. In other words, what percent chance do you have of making the goal in one of five trials?

Changes in instructions for subjects in the MEPS group were made as appropriate. Hereafter, only instructions given to those in the card sorting group will be presented, although MEPS group subjects were always given comparable instructions.

The level of aspiration measure (LA) (Appendix M) was used to provide information concerning the goal aspirations of each subject. For the card sorting task, subjects circled the number of cards they would attempt to sort at the beginning of each trial. In the interpersonal task, subjects circled the score they were attempting to achieve, on a 20-point scale. Subjects were told that the goal for satisfactory performance was 20. LA was administered before each of the five trials by asking: "How many cards are you going to try to sort on this trial?"
The probability of future success estimate (PFS) (Appendix N) measured subjects' expectations for success after success/failure feedback. This was also expressed as a percentage score. The PFS was obtained after completion of five trials as follows:

I would now like you to tell me what you feel your chances are of making the goal of sorting 20 cards if you were to attempt this task on another occasion. You can again think of your chances in percentages. In other words, what percent chance do you have of making the goal if you tried this task again?

The level of perceived personal achievement measure (LPA) (Appendix O) provided a subjective estimate of how the subject perceived her performance. This was rated on a scale from 0 to 100. The LPA estimate was obtained after feedback from of the five trials:

I would like to know how well you think you did on this task compared to how well you think you should do. On a scale of zero to 100 where zero represents the poorest performance and 100 represents the very best you could do and 50 represents average, where would you place your performance?

The measure level of achievement relative to others (LAO) (Appendix P) was used to provide a direct subjective comparison of the subject's own performance to that of other individuals who had attempted the task. Subjects again rated their performance on a 100-point qualitatively anchored scale after feedback. LAO was obtained as follows:

Now, how well do you think you did on this task compared to others who have taken this test? On the same sort of scale, that is, on a scale from zero to 100, where zero represents the poorest performance of anyone, where 100 represents the best performance of anyone and 50 represents the average person's performance, where would you place your performance?

After debriefing, all subjects were administered a form to examine whether they had believed the success or failure feedback,
and whether the purpose for deception was clear. Two other responses were also sought (Appendix G). Feedback 3 (F3) was set up as a forced choice and required that each subject state whether she would achieve the goal, given that she could try the task again and that she would not be deceived. The value "1" was assigned a "success" choice and the value "0" was assigned a "failure" choice. Feedback 4 (F4) required that the subject make a post hoc evaluation of her expectations for success or failure. This measure was designed to examine global success/failure expectations and was rated on a scale from 0 to 10. Zero was defined so that performance was "just what [she] expected," 5 was defined as "had no idea what to expect" and 10 was "not at all what I expected." In essence, subjects were asked whether their performance feedback (success or failure) was consistent with their expectations of themselves.

Task Perception Measures

Task perception variables, adapted from Festinger and Carlsmith (1959), were included to examine comparability of task perception across groups and to investigate the credibility of the study and of the deception. Categories were derived from Aronson and Carlsmith (1968). There were four items, rated on an 11-point scale, to assess task interest (TP1), learning afforded by participation (TP2), scientific value (TP3) and interest in participating again (TP4) (Appendix G).

For task interest (TP1), 0 was defined as "extremely dull and boring," 5 was "neutral" and 10 was "extremely interesting and
enjoyable." With the learning provided item (TP2), 0 was defined as "learned nothing," 3 was "learned some," 7 was "learned a fair amount" and 10 was "learned a great deal." In the scientific value item (TP3), 0 was defined as "no scientific value" and 10 was defined as "a great deal of scientific value." For willingness to participate again (TP4), 0 was defined as "definitely dislike to participate again," 5 was "no feeling about it, one way or the other" and 10 was "definitely like to participate again."

Table 1 summarizes the experimental procedure for all subjects.
TABLE 1

SCHEMATIC SUMMARY OF EXPERIMENTAL PROCEDURES

Medical Records
  Physician: Diagnosis Confirmation
  Research Criteria (Spitzer et al., 1975)
  Subject
  Consent Form
  HRS Interview: 2 Raters
  Introduction to Research Assistant
  BDI, SDS, WAIS-Clarke

Card Sorting Task
  Probability of Success (PS) (X 5)
  Level of Aspiration (LA) (X 5)
  Feedback: Success/Failure
  Probability of Future Success (PFS)
  Level of Perceived Achievement (LPA)
  Level of Achievement Compared to Others (LAO)
  Task Performance 1-4 (TP1-TP4)
  Post-Experimental Questionnaire
  Debriefing
  Feedback 3 (F3)
  Feedback 4 (F4)
  Termination

Means-Ends Solving Task
(II) task perception variables (TP 1-4)
(III) actual performance (AP) and goal attainment (GL)
(IV) probability of success estimates (PS), level of aspiration (LA)
(V) probability of future success (PFS), level of perceived achievement (LPA), level of achievement compared to others (LAO)
(VI) debriefing feedback measures (F3, F4).

Analyses of the PS and LA estimates, PFS, LPA and LAO estimates and F3 and F4 variables were conducted separately to complement the differing feedback sets for the subjects. That is, when PS and LA were administered subjects had no specific feedback. When PFS, LPA and LAO estimates were administered subjects had been told that they had either failed or succeeded. Prior to administration of F3 and F4, subjects had been debriefed so that outcome was again uncertain.

I. Subject Data

Subject data are presented in Table 2. The typical subject was in her mid-30's. Depressed subjects were moderately-severe to severely depressed, measured by clinical raters (HRS-D) and by self-report (BDI). Nondepressed psychiatric subjects were not objectively depressed (HRS-D) but endorsed mild to moderate dysphoria (BDI). Normal medical subjects were not depressed by clinical rater nor by self-report. Subjects reported a response style that reflected moderate social desirability and were of average intellectual ability. In addition, of the 8 defined symptoms included in the Spitzer et al. (1975) criteria, depressives endorsed 6.7 (S.D. = .86). Non-depressed psychiatric subjects reported 2.3 (S.D. = 1.00) and normal medical subjects endorsed 1.5 (S.D. = 1.10).

The overall reliability of the HRS-D rating was evaluated by calculating a Pearson product-moment correlation between the ratings of
(II) task perception variables (TP 1-4)
(III) actual performance (AP) and goal attainment (GL)
(IV) probability of success estimates (PS), level of aspiration (LA)
(V) probability of future success (PFS), level of perceived achievement (LPA), level of achievement compared to others (LAO)
(VI) debriefing feedback measures (F3, F4).

Analyses of the PS and LA estimates, PFS, LPA and LAO estimates and F3 and F4 variables were conducted separately to complement the differing feedback sets for the subjects. That is, when PS and LA were administered subjects had no specific feedback. When PFS, LPA and LAO estimates were administered subjects had been told that they had either failed or succeeded. Prior to administration of F3 and F4, subjects had been debriefed so that outcome was again uncertain.

I. Subject Data

Subject data are presented in Table 2. The typical subject was in her mid-30's. Depressed subjects were moderately-severe to severely depressed, measured by clinical raters (HRS-D) and by self-report (BDI). Nondepressed psychiatric subjects were not objectively depressed (HRS-D) but endorsed mild to moderate dysphoria (BDI). Normal medical subjects were not depressed by clinical rater nor by self-report. Subjects reported a response style that reflected moderate social desirability and were of average intellectual ability. In addition, of the 8 defined symptoms included in the Spitzer et al. (1975) criteria, depressives endorsed 6.7 (S.D. = .86). Nondepressed psychiatric subjects reported 2.3 (S.D. = .00) and normal medical subjects endorsed 1.5 (S.D. = 1.10).

The overall reliability of the HRS-D rating was evaluated by calculating a Pearson product-moment correlation between the ratings of
<table>
<thead>
<tr>
<th>Group</th>
<th>Age</th>
<th>HRS-D</th>
<th>BDI</th>
<th>SDS</th>
<th>IQ</th>
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</thead>
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<td>(9.32)</td>
<td>(6.84)</td>
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</tr>
<tr>
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<td>(5.33)</td>
<td>(6.42)</td>
<td>(5.80)</td>
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<tr>
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<td>18.92</td>
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<td>(4.62)</td>
<td>(4.95)</td>
<td>(4.76)</td>
<td>(8.44)</td>
</tr>
</tbody>
</table>
the experimenter and all other raters. The computed value was 0.99 (n=72), reflecting an extremely high level of agreement. Individual correlations between the ratings of the experimenter and the other raters were 0.99 (n=26) and the clinical psychologist, 0.99 (n=17) with the psychology intern, 0.99 (n=16) with the research assistant and 0.98 (n=13) with the medical students.

WAIS-Clarke scores were standardized according to WAIS Vocabulary subtest norms. Analyses were performed using scaled scores. Scaled score means for each of the groups were 11.13 (S.D. = 2.11) for depressed, 10.50 (S.D. = 2.27) for nondepressed and 10.54 (S.D. = 1.77) for normals. WAIS-Clarke scores converted to full score equivalents are presented in Table 2.

WAIS-Clarke scores were not available for two subjects, one subject in the depressed group and one subject in the nondepressed psychiatric group. Both of these subjects lived and functioned within English-speaking communities but had emigrated as adults from Europe. They had lived a minimum of 10 years in Canada and showed no difficulty reading and understanding the psychometric tests and other study-related forms: Both subjects responded with considerable frustration in attempting to complete the WAIS-Clarke test and chose to discontinue this form. IQ scores were estimated from the mental status examination in their medical histories. Both subjects were considered of average intelligence and were assigned a scaled score of 10.00 (converted score of 100).

Univariate analyses of variance of age, HRS-D, BDI, SDS and IQ revealed no between-group differences in age ($F_{2,69} = .08, p < .93$), SDS ($F_{2,69} = 1.78, p < .18$) and IQ ($F_{2,69} = .63, p < .53$). Both HRS-D and BDI scores differentiated the groups (HRS-D $F_{2,69} = 310.85, p < .01$;
BDI $F_{2,69}=80.05$, $p<.01$). Duncan's multiple range test performed on the HRS-D and BDI measures (df=69) revealed that the depressed psychiatric group had significantly higher scores than both the nondepressed psychiatric group ($p<.05$ for both measures) and the normal group ($p<.01$ for both measures). The HRS-D and BDI scores for the non-depressed psychiatric group were significantly higher than the normals as well ($p<.05$ for both measures).

**Summary.** Depressed subjects were significantly more depressed than both nondepressed and normal groups as measured by the HRS-D and BDI. Nondepressed psychiatric subjects evidenced higher dysphoria, as measured by HRS-D and BDI, than normal subjects. Groups were comparable in age, social desirability response style and intellectual functioning.

II. Task Perception

Task perception data are presented in Appendix R. The subjects in general found the tasks interesting and enjoyable (TP1), learned only moderately (TP2), indicated that the project had considerable scientific value (TP3) and were willing to participate again (TP4). Reviewing item means by Task shows that subjects found both tasks interesting and enjoyable (TP1), learned moderately (TP2) and reported both tasks had scientific value (TP3). The means for the TP4 measure by Task suggests that although subjects were willing to participate in either task again, there was some preference for the card sorting task (CS mean = 8.19±1.19; MEPS mean = 6.64±1.09). Task perception Feedback condition indicates that subjects found that the tasks were
interesting (TP1), afforded moderate learning (TP2), had scientific value (TP3) and subjects were willing to participate again (TP4) independent of feedback.

Multivariate analysis of variance showed that Group (depressed vs. nondepressed psychiatric and normals, p<.41; nondepressed vs. normals, p<.34), Task (p<.12) and Feedback (p<.58) were nonsignificant factors in task perception. All interactions were nonsignificant.

Summary. Task perception measures of "interest in the task," "amount learned," "scientific value" and "willingness to participate again" were analyzed by means of multivariate analysis of variance. Task perception was nonsignificant for all factors and interactions. Groups were comparable in their task perceptions; card sorting and interpersonal problem solving tasks were viewed similarly although there was some suggestion that subjects preferred card sorting, at least if they were to do the task again. Task perceptions were not influenced by success or failure feedback.

III. Actual Performance (AP) and Goal Attainment (GL)

Actual performance for the card sorting task was calculated in two ways. Actual time required for sorting the predetermined number of cards was recorded and calculated as cards/seconds. For example, a subject who sorted 14 cards in 16 seconds received an actual performance score of 14/16 or .88 cards/second. In addition, "goal", scored as "1" or "no goal", scored as "0", was assigned to each trial. The "goal" was defined as a minimum of 1.0 card/second.
Actual performance scores for the MEPS task were determined independently by two raters, the research assistant and a senior psychology graduate student, according to the criteria set forth by Platt and Spivack (1973). Subjects were scored on the basis of the number of relevant means generated to achieve the end stated. The raters were trained through use of data collected on subjects who failed to meet study inclusion criteria. Interrater reliability was computed by Pearson product-moment correlations. Correlations for the five stories were 0.95, 0.97, 0.97, 0.95 and 0.93, respectively. The overall correlation coefficient for interrater reliability was 0.98. Subjects were assigned "goal" (1) in the MEPS condition if they provided a minimum of one relevant means for a story. Otherwise, subjects were assigned "no goal" (0) for the story.

Actual performance scores (AP) were examined within Task by two repeated measures analyses of variance. Table 3 and Figure 1 display the results of AP analysis in the card sorting task. No effects of Group or Feedback were detected although the effect of Trials was significant. Actual performance improved across trials. All interactions were nonsignificant.

AP scores for the MEPS task are displayed in Figure 2. Table 3 reveals that only the Trials factor was significant. As indicated in the Figure, all groups showed a marked decrease in Trial 2 with general increase across Trials 3, 4 and 5. All interactions were nonsignificant.
### Table 3.

Repeated Measures Analysis of Variance on Actual Performance (AP) Scores within Each Task

#### Card Sorting Task

<table>
<thead>
<tr>
<th>Source</th>
<th>Mean Square</th>
<th>df</th>
<th>F</th>
<th>p&lt;</th>
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<td>Group (G)</td>
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<td>Feedback (F)</td>
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<tr>
<td>Error</td>
<td>13</td>
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<td>15.02</td>
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<tr>
<td>Error</td>
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#### MEPS Task

<table>
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<th>F</th>
<th>p&lt;</th>
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<td>.58</td>
<td>.57</td>
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<tr>
<td>Feedback (F)</td>
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<td>.97</td>
<td>.33</td>
</tr>
<tr>
<td>G x F</td>
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<td>2</td>
<td>.36</td>
<td>.70</td>
</tr>
<tr>
<td>Error</td>
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<td>R x G</td>
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<td>.99</td>
<td>.45</td>
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<td>R x F</td>
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<td>.70</td>
<td>.59</td>
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<tr>
<td>R x G x F</td>
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<td>8</td>
<td>1.50</td>
<td>.16</td>
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<tr>
<td>Error</td>
<td>.71</td>
<td>120</td>
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</table>
Fig. 1  Actual performance (AP) scores by Group and Trial in the Card Sorting Task

Fig. 2  Actual performance (AP) scores by Group and Trial in the Means Ends Problem Solving Task
A repeated measures analysis of variance was also conducted to compare goal attainment across tasks using the "goal"-"no goal" variable. Table 4 indicates that there were significant effects of Task and Trial and that the Task by Trial interaction was significant. Figure 3 shows that subjects in the MEPS condition were more likely to achieve the goal across Trials. There was no effect of Group and all other interactions were nonsignificant.

Summary. Actual performance, computed both as actual scores and as goal attainment, did not differentiate the Group or Feedback conditions. Subjects in both tasks improved their scores across trials. Subjects assigned to the card sorting task were less likely to attain their goal than were subjects assigned to MEPS.

IV. Probability of Success Estimates (PS) and Level of Aspiration (LA)

The probability of success estimate (PS) across trials was averaged to obtain a measure of concept of self (see Appendix S for analyses of trials). The PS measure was used to examine the hypothesis that depressed subjects estimate lower likelihood of success compared to nondepressed and normal subjects. The hypothesis that the depressed group estimates would be lower for the interpersonal than impersonal task was also tested. Level of aspiration estimates (LA) were also averaged over trials (see Appendix S for analyses of trials) to examine the goals subjects set for themselves. These two dependent variables were examined within a multivariate analysis because these measures were administered before subjects had been
### TABLE 4
Repeated Measures Analysis of Variance for Goal (GL) Scores Between Tasks

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<th>Source</th>
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<td>.48</td>
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<tr>
<td>Task (T)</td>
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<tr>
<td>Feedback (F)</td>
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<td>.43</td>
<td>.52</td>
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<td>G x T</td>
<td>.01</td>
<td>2</td>
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<td>G x F</td>
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<tr>
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<td>R x G</td>
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<td>.48</td>
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<tr>
<td>R x T</td>
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<td>R x F</td>
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<td>Error</td>
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Fig. 3 Goal scores (GL) across Trial by Task
given success/ failure feedback. Because IQ was weakly, but significantly, related to these variables, it was included as a covariate (See Table 5).

As shown in Figures 4 and 5, the depressed group made significantly lower PS and LA estimates than either nondepressed or normal groups. PS and LA estimates did not differentiate, nondepressed and normal groups. Results of the multivariate analysis are presented in Table 6. The multivariate F for Group (G), that is depressed (D) vs. nondepressed psychiatric (P) and normal medical (N) groups, was significant. Both univariate F's for PS and LA were significant. The multivariate F for the nondepressed psychiatric versus the normal group was not significant. The multivariate F ratios associated with other factors and their interactions were all nonsignificant (Task (T), p<.18; Feedback (F), p<.71; G X T, p<.99; G X F, p<.30; T X F, p<.68; G X T X F, p<.28).

Summary. Depressed subjects made significantly lower PS and LA estimates than either nondepressed psychiatric or normal medical subjects. In terms of the qualitative anchors assigned to the scale, depressed subjects considered their likelihood of success to be less than chance or about average. Both nondepressed and normal subjects estimated their probability of success to be greater than chance. Nondepressed psychiatric and normal medical subjects made equivalent estimates.

PS and LA were not different across Task nor were there pre-Feedback differences. All interactions were nonsignificant.
TABLE 5

Effect of IQ on Probability of Success Estimates and Level of Aspiration

<table>
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<tr>
<th>Variable</th>
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<th>Square Mult. $R$</th>
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<td>PS</td>
<td>.29</td>
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<tr>
<td>LA</td>
<td>.26</td>
<td>.07</td>
<td>4.12</td>
<td>.04</td>
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</tbody>
</table>

Overall $F(2,58) = 3.8$, $p < .03$. 
Fig. 4  Probability of success estimates (adjusted) for depressed, nondepressed psychiatric and normal groups.

Fig. 5  Level of aspiration (adjusted) for depressed, nondepressed psychiatric and normal groups.
TABLE 6

Probability of Success Estimates (PS) and Level of Aspiration (LA)

Depressed vs. Nondepressed and Normal Group

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean Square</th>
<th>Univariate F</th>
<th>p less than</th>
</tr>
</thead>
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<td>PS</td>
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<td>.01</td>
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<tr>
<td>LA</td>
<td>68.04</td>
<td>8.79</td>
<td>.01</td>
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</tbody>
</table>

Overall $F(2,58) = 6.54$, $p < .01$.

Nondepressed vs. Normal Group

<table>
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<th>p less than</th>
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<tr>
<td>LA</td>
<td>5.50</td>
<td>.71</td>
<td>.40</td>
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</tbody>
</table>

Overall $F(2,58) = .45$, $p < .64$. 
V. Probability of Future Success (PFS), Level of Perceived Achievement (LPA) and Level of Achievement Compared to Others (LAO)

The following hypotheses were addressed in this analysis:
1) depressed subjects make lower estimates of future success (PFS) compared to nondepressed psychiatric and normal medical subjects,
2) depressed subjects judge their performance to be worse than others (LAO),
3) depressed subjects estimate lower probability of future success in the interpersonal task and estimate their performance to be worse than others in the interpersonal task, and
4) estimates (PFS, LAO) made by depressed subjects are less affected by success or failure feedback, compared to estimates made by the two nondepressed groups. The variables PFS, LPA and LAO were analyzed together in a multivariate analysis of variance because all subjects had been given performance feedback when completing these estimates.

PFS, LPA and LAO data are illustrated in Figures 6, 7, and 8. Results of the multivariate analysis are presented in Table 7. The multivariate F for D vs. P and N was significant. Both PFS and LAO measures significantly differentiated D from P and N. LPA did not significantly differentiate groups. When nondepressed psychiatric controls were compared to normals (P vs. N) the multivariate F ratio was nonsignificant as were all of the univariate tests.

The multivariate F for the Task factor was nonsignificant (p<.01).

Results of the multivariate analysis of feedback condition are presented in Table 8. For all groups, PFS estimates were significantly affected by feedback. Figure 9 presents the means by success
Fig. 6  Probability of future success in depressed, nondepressed psychiatric and normal groups.

Fig. 7  Level of perceived achievement in depressed, nondepressed and normal groups.
Fig. 8  Level of achievement compared to others in depressed, nondepressed psychiatric and normal groups.

Fig. 9  Probability of future success estimates in success and failure feedback conditions.
TABLE 7

Probability of Future Success (PFS), Level of Personal Achievement (LPA) and Level of Achievement Compared to Others (LAO).

Depressed vs. Nondepressed and Normal Groups

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean Square</th>
<th>Univariate F</th>
<th>p less than</th>
</tr>
</thead>
<tbody>
<tr>
<td>PFS</td>
<td>3354.34</td>
<td>7.93</td>
<td>.01</td>
</tr>
<tr>
<td>LPA</td>
<td>.84</td>
<td>.01</td>
<td>.96</td>
</tr>
<tr>
<td>LAO</td>
<td>1156.00</td>
<td>7.10</td>
<td>.01</td>
</tr>
</tbody>
</table>

Overall $F_{(1,60)} = 3.35; p < .03.$

Nondepressed vs. Normal Group

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean Square</th>
<th>Univariate F</th>
<th>p less than</th>
</tr>
</thead>
<tbody>
<tr>
<td>PFS</td>
<td>638.02</td>
<td>1.51</td>
<td>.22</td>
</tr>
<tr>
<td>LPA</td>
<td>25.52</td>
<td>.10</td>
<td>.76</td>
</tr>
<tr>
<td>LAO</td>
<td>300.00</td>
<td>1.84</td>
<td>.18</td>
</tr>
</tbody>
</table>

Overall $F_{(1,60)} = .72; p < .55.$
TABLE 8
Feedback (Success vs. Failure)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean Square</th>
<th>Univariate F</th>
<th>p less than</th>
</tr>
</thead>
<tbody>
<tr>
<td>PFS</td>
<td>3297.01</td>
<td>7.72</td>
<td>.01</td>
</tr>
<tr>
<td>LPA</td>
<td>917.24</td>
<td>3.51</td>
<td>.07</td>
</tr>
<tr>
<td>LAO</td>
<td>2.72</td>
<td>.02</td>
<td>.90</td>
</tr>
</tbody>
</table>

Overall $F(1,60) = 3.84, p < .04$. 
and failure conditions of the PFS measure. Probability of future success estimates were higher in the success condition. Neither LPA nor LAO differentiated the feedback conditions.

The Group X Task interaction was nonsignificant (p<.63). Depressed subjects did not make lower PFS estimates in the interpersonal task, did not perceive their personal performance to be decreased, nor did they rate their performance as significantly worse than others in the interpersonal task.

The hypothesis that depressed subjects' estimates would be less affected by success feedback, compared to control subjects, predicts a significant Group X Feedback interaction, which was not found (p<.68). It was expected that depressed subjects' PFS estimates would not change significantly with success in particular and that LAO estimates would be equivalent for success and failure. All three groups had higher expectations of future success when their experience had been to succeed (Figures 10 and 11). Similarly, all groups had lower PFS estimates when told they had failed. Success/failure feedback had no significant impact (p<.90) on the LAO measure.

The remaining interactions were also nonsignificant (T x F, p<.48; G X T X F, p<.59).

Summary. Subjects considered their performance in the task to reflect their typical performance. Depressed subjects, however, predicted future success at a perceived chance level while the two nondepressed groups estimated success at better than chance (61-69%). In comparing their performance to others, nondepressed psychiatric and normal medical subjects considered themselves to perform at about average
Fig. 10  Probability of future success in depressed (D), nondepressed (P) and normal (N) groups in two feedback conditions.

Fig. 11  Level of achievement compared to others in depressed (D), nondepressed (P) and normal (N) groups in two feedback conditions.
level while depressed subjects perceived their performance to be less than average.

Feedback had a significant impact on probability of future success estimates across groups, but not on perceptions of personal performance or performance compared to others. All groups reduced their probability of future success estimates when feedback indicated they had failed. When comparing self to others, normal subjects considered their performance to be superior to others independent of feedback, nondepressed psychiatric subjects regarded their performance to be average and depressed subjects reported their performance to be below average, whether they failed or succeeded. Neither Task nor Feedback had a specific effect on depressed subjects.

VI. Debriefing Feedback Measures (F3, F4)

This analysis addressed the hypothesis that depressed subjects make more failure choices (F3) and have global expectations of failure when confronted with uncertain task outcome (F4) compared to non-depressed psychiatric and normal medical subjects. The differential effect of an impersonal vs interpersonal task is also tested here.

The data for F3 are presented in Figure 12 and Table 9. The multivariate F for D vs. P and N was significant. The multivariate F for P vs. N was nonsignificant. The perceived likelihood of success or failure when outcome was uncertain (F3), was significantly higher for depressed than for nondepressed psychiatric and normal medical subjects. Nondepressed and normals were not significantly different.
Fig. 12 - Expectation of failure (F3) in depressed, nondepressed psychiatric and normal groups.
### TABLE 9

Feedback 3 (F3) and Feedback 4 (F4)

#### Depressed vs. Nondepressed and Normal Groups

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean Square</th>
<th>Univariate F</th>
<th>p less than</th>
</tr>
</thead>
<tbody>
<tr>
<td>F3</td>
<td>3.06</td>
<td>16.96</td>
<td>.01</td>
</tr>
<tr>
<td>F4</td>
<td>35.01</td>
<td>3.82</td>
<td>.06</td>
</tr>
</tbody>
</table>

Overall $F_{(1,60)} = 8.87$, $p < .01$.

#### Nondepressed vs. Normal Group

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean Square</th>
<th>Univariate F</th>
<th>p less than</th>
</tr>
</thead>
<tbody>
<tr>
<td>F3</td>
<td>.19</td>
<td>1.04</td>
<td>.31</td>
</tr>
<tr>
<td>F4</td>
<td>2.52</td>
<td>.28</td>
<td>.60</td>
</tr>
</tbody>
</table>

Overall $F_{(1,60)} = .56$, $p < .58$. 
Results of the F4 measure, global expectation of failure were equivocal (Figure 13). The probability level of F4 in D versus P and N was less than .055.

Task (p<.81), Feedback, (p<.29) and all interactions (G X T, p<.49; G X F, p<.58; T X F, p .84; G X T X F, p<.92) were nonsignificant. The nonsignificant Group X Task interaction indicates that the hypothesis that depressed subjects have more negative expectations in the interpersonal vs impersonal task was not supported.

Summary. Depressed subjects more often chose failure as likely when the outcome was unknown than nondepressed psychiatric or normal medical subjects. Differences between the groups concerning their global expectations (i.e., was success/failure what you expected at the outset of your task?) were marginally significant. Depressed subjects tended to respond negatively while nondepressed and normal groups tended to respond positively. There was no effect of task.

Post Hoc Analysis

In order to answer questions arising from the data but not specifically hypothesized, post hoc analyses were performed.

Heterogeneity in the Depressed Group: Because of the consistently greater variability observed in the dependent measures in the depressed group vs the nondepressed groups, data from these subjects were examined to determine the effect of severity of depression on cognitive estimates. Severity was defined in terms of the HRS-D score. The 24 subjects in the depressed group were divided into "high severity depression" (high D) and "low severity depression"
Fig. 13 Global expectation of success (F4) in depressed, nondepressed psychiatric and normal groups.
(low D) on the basis of a median split on the HRS-D measure. The means of the subgroups were 59.92 ± 5.75 for high D and 44.17 ± 3.51 for low D. A t-test for independent means showed that these groups were significantly different \( t(11) = 11.98, p < .01 \) in severity of depression. These two subgroups were also significantly different \( t(11) = 3.11, p < .01 \) on the BDI, another measure of the severity of depression. BDI means for the two groups were 33.58 ± 8.38 for high D and 25.92 ± 7.94 for low D.

Subjects in each of the two subgroups were comparable in age (high D = 36.58 ± 12.33; low D = 34.17 ± 11.07), social desirability response style (high D 14.75 ± 6.69; low D 17.92 ± 6.89), intellectual function (high D = 104.54 ± 8.20; low D = 104 ± 10.84) and number of subjects in the success and failure conditions \( (n=6) \). Five of the 12 subjects in the high D group had been assigned to the MEPS task while 7 were assigned to card sorting.

Means and standard deviations for each of the dependent measures for each subgroup are presented in Table 10. Two-tailed t tests for independent means were significant for PFS \( t(11) = 3.53, p < .01 \), LAO: \( t(11) = 3.15, p < .01 \) and F3 \( t(11) = 2.35, p < .05 \). All other measures were nonsignificant.

Summary. More severely depressed subjects tended to endorse less likelihood of future success, considered their performances to be less adequate than other depressed subjects, and tended to believe they would fail at a task when outcome was uncertain. These differences cannot be accounted for by age, social desirability response style, intellectual ability or experience of failure or success,
## TABLE 10

High and Low Depressed Subgroups: Means and Standard Deviations of Major Dependent Variables

<table>
<thead>
<tr>
<th>Group</th>
<th>PS</th>
<th>LA</th>
<th>PFS</th>
<th>LPA</th>
<th>LAO</th>
<th>F3</th>
<th>F4</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Depressed</td>
<td>40.93</td>
<td>15.45</td>
<td>40.83</td>
<td>51.50</td>
<td>34.67</td>
<td>.25</td>
<td>4.25</td>
</tr>
<tr>
<td></td>
<td>(22.30)</td>
<td>(3.70)</td>
<td>(25.39)</td>
<td>(20.40)</td>
<td>(15.12)</td>
<td>(.45)</td>
<td>(3.65)</td>
</tr>
<tr>
<td>Low Depressed</td>
<td>50.20</td>
<td>16.25</td>
<td>60.00</td>
<td>52.50</td>
<td>52.50</td>
<td>.58</td>
<td>5.42</td>
</tr>
<tr>
<td></td>
<td>(17.97)</td>
<td>(3.16)</td>
<td>(20.45)</td>
<td>(27.01)</td>
<td>(16.03)</td>
<td>(.52)</td>
<td>(4.08)</td>
</tr>
</tbody>
</table>

\(^1p<.01.\)
\(^2p<.05.\)
since these variables were comparable across subgroups. Severity of depression did not affect subjects' probability of success estimates (PS) while engaged in the task, goals set (LA), personal performance estimates (LPA) or global expectation of failure (F4).

**Interrelationship of Major Dependent Variables.** Views of self, world and future comprise the cognitive triad and were operationalized in this study by the variables PS, PFS, LAO, F3 and F4. Pearson product-moment correlations were computed among these measures (Table 11). The major variables PS, PFS, LAO, F3 were significantly related in depressed subjects, but were substantially less related in both nondepressed groups.

The present results indicate an integrity among the elements of the cognitive triad in a group of depressed subjects. In the depressed group, probability of success estimates were directly related to probability of future success estimates and comparison of performance to others and were inversely related to expectation of failure.

Nondepressed psychiatric subjects show a direct relationship between current and future probability of success estimates. Future success estimates are also related to comparisons of performance to others. Other estimates are unrelated.

Normal medical inpatients show only that current success estimates increase with global expectations of success.
**TABLE 11**

Correlation Matrix of Major Dependent Variables

<table>
<thead>
<tr>
<th></th>
<th>PS</th>
<th>PFS</th>
<th>LAO</th>
<th>F3</th>
<th>F4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PFS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>LA0</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>F3</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>F4</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Depressed Group (n=24)**

<table>
<thead>
<tr>
<th></th>
<th>PS</th>
<th>PFS</th>
<th>LA0</th>
<th>F3</th>
<th>F4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PS</strong></td>
<td></td>
<td>.70*</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>PFS</strong></td>
<td>.59*</td>
<td></td>
<td></td>
<td>.56*</td>
<td></td>
</tr>
<tr>
<td><strong>LA0</strong></td>
<td></td>
<td>.64*</td>
<td></td>
<td></td>
<td>.04</td>
</tr>
<tr>
<td><strong>F3</strong></td>
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<td>-.70*</td>
<td></td>
<td></td>
<td>.27</td>
</tr>
<tr>
<td><strong>F4</strong></td>
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<td></td>
<td></td>
<td></td>
<td>.29</td>
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</table>

**Nondepressed Psychiatric Group (n=24)**

<table>
<thead>
<tr>
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<th>LA0</th>
<th>F3</th>
<th>F4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PS</strong></td>
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<td>.67*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PFS</strong></td>
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<td></td>
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</tr>
<tr>
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<td></td>
<td>.23</td>
<td>.10</td>
</tr>
<tr>
<td><strong>F3</strong></td>
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<td></td>
<td>.13</td>
<td></td>
<td>.12</td>
</tr>
<tr>
<td><strong>F4</strong></td>
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<td></td>
<td></td>
<td></td>
<td>.14</td>
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</table>

**Normal Group (n=24)**

<table>
<thead>
<tr>
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<th>PS</th>
<th>PFS</th>
<th>LA0</th>
<th>F3</th>
<th>F4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PS</strong></td>
<td></td>
<td>.25</td>
<td></td>
<td>.05</td>
<td></td>
</tr>
<tr>
<td><strong>PFS</strong></td>
<td>.40</td>
<td></td>
<td></td>
<td>.05</td>
<td>.58*</td>
</tr>
<tr>
<td><strong>LA0</strong></td>
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<td>.40</td>
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<td>.15</td>
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<tr>
<td><strong>F3</strong></td>
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<td><strong>F4</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.41</td>
</tr>
</tbody>
</table>

* p<.01, two-tailed test.
+ p<.05, two-tailed test.
DISCUSSION

Summary of Findings

The present research is a test of a major component in Beck's (1967; 1976) cognitive theory of depression. Previous studies of Beck's theory have defined their samples by BDI scores, have used college students, have not incorporated the three elements of the cognitive triad and/or have not included actual performance measures. This research tested Beck's triad in a more relevant and controlled depressed sample and has examined views of self, world and future in two types of tasks. Direct measurement of actual performance permitted explicit evaluation of the concept of cognitive distortion, the major prediction of cognitive theory.

The first major experimental question was whether depressed women have negatively distorted views when compared to other psychiatric inpatients and to psychometrically normal women. The second major question was whether different types of problems affect their views of self, world and future. These two questions were addressed by requiring subjects to estimate aspects of their performance on problem solving tasks involving impersonal and interpersonal areas of function.

Overall, the estimates depressed women made concerning themselves, their world and their future reflected a decidedly negative bias. They set lower goals for themselves, reported less likelihood
of achieving a given goal, anticipated lower likelihood of future success, considered their performance to be worse than others and expected to fail. These estimates did not reflect actual performance, where depressed subjects were comparable to other subjects. Thus, the major tenet of negative distortions in depression was supported. Moreover, these distortions could not be attributed to psychological distress in general, since nondepressed psychiatric inpatients reported estimates similar to those of normal subjects.

Depressives were expected to demonstrate a reduced response to success and failure feedback compared to normals and nondepressed psychiatric groups. The predicted group-by-feedback interaction was not found. Success and failure affected depressed and nondepressed women similarly. Specifically, subjects in the success condition had higher estimates of future success compared to those in the failure condition.

The final major hypothesis was that the type of task, interpersonal or impersonal, would differentiate the groups. Contrary to that prediction, each group reported similar estimates with both tasks.

In summary, within the parameters of the present research, depressed women were observed to have negative and distorted cognitions compared to others. Moreover, qualitative dimensions (e.g., 50 in a probability scale from 0 to 100 represented "chances are even whether I can or can't make the goal") underline the meaningfulness of these differences. Depressed women made ascriptions to themselves which were different from other women. Not only did they make lower
objective estimates of aspects of their performance but they also aligned themselves with inadequate or "loser" self references.

Refinement of Beck's Cognitive Theory of Depression

Cognition is the label for the moment-to-moment thought patterns in the form of words or images (Beck, 1976) and may be premised on hierarchical organizing principles or schemas (Rush and Beck, 1978). Schemas represent enduring cognitive patterns developed through interaction with the environment. They are based in part on ongoing experience and in part on fundamental events of childhood (Beck, 1967; 1976). Schemas constitute the basis for differentiating and coding stimuli that confront the individual (Rush and Beck, 1978). Through a complex matrix of schemas the individual categorizes and selects incoming data and reduces the information to produce cognitions.

Although Beck (e.g., Beck, 1974; Rush and Beck, 1978) alludes to schemas as involved in production of depressive affect as well as the syndrome, the basis for such involvement is only indirectly discussed (Giles and Rush, 1982). The interrelationship of those variables reflecting the cognitive triad found in this study provides empirical support for pursuing the role of schemas in depression.

Given the present data, the pivotal role of cognition in all depressives is challenged, however. One of the most consistent findings above and in other research on depression has been great variability in the dependent measures (e.g., Hammen and Krantz, 1976; Rush, Giles, Dougherty and Sullivan, 1980). Symptoms were relatively
constant in the depressed group and self-report of presence of dysphoria was quite equivalent. Yet measures of cognition showed great variability. The question then is how to understand and account for this heterogeneity.

Analyses within the depressed group addressed the observation of heterogeneity. Subjects assigned to groups based on more (high HRS-D) or less (low HRS-D) severe depression were not different in age, socially desirable response style or intellectual function. Recent failure or success experience was also comparable across the depressed subgroups. Severity of depression alone distinguished the depressed subgroups. Subjects in each depressed subgroup rated their probability of success comparably, but were different in their estimates of future success, in comparing themselves to others and in their expectation of success given an uncertain outcome. In other words, concept of self was uniformly low in these depressed women but more negative views of the world and future were associated with more severe depression. Thus, severity of depression appears to be associated with the variability found within cognitive function in depression. This finding is partially predicted by Beck's (1967) theory in that negativity and generality of distorted cognitions increase as severity of depression increases. Moreover, the stability of concept of self, independent of severity, introduces the possibility for self as the core concept in the cognitive triad. Negative views of world and future may proceed from the more fundamental distortion in concept of self.
In deference to the variability, however, it appears premature to conclude that cognitive function is causal in depression. Clearly a respectable proportion of depressed subjects (approximately 10-20%), both on objective measures and through clinical observation, demonstrated a positive cognitive set. That these subjects make "non-depressed" responses bears note. The notion of cognitive distortion as generally causative is questioned in this research. A procedure that may have facilitated understanding the variability could be subtyping the depressives into such current classifications as endogenous and non-endogenous (Spitzer et al., 1978).

Beck's (1967) tenet that depressives do not incorporate success yet emphasize failure has not been supported. According to Beck (1976), depressed subjects assume positive experiences are due to factors beyond their control. Failure confirms personal inability and perceived deficits. In fact, all groups were affected by past performance, whether success or failure. The present evidence did not confirm Beck's statement of differential response to success. Due consideration must be given to the limits of the present design in addressing success devaluation, however. The probability of rejecting the null hypothesis when it is false is determined by, among other things, the size of the sample. The number of subjects generated to test the Group-by-Feedback interaction was 12 per cell. Power analyses (set at the conventional 0.80 level (Cohen, 1977)) conducted to examine the adequacy of this sample size revealed that twenty-seven subjects would be required to evaluate the success devaluation hypothesis. Outright rejection of the concept of success
devaluation in depression is therefore unwarranted at this time.
Definitive challenge to this notion must await independent replications of this finding with an adequate sample size.

A criticism put forward in this thesis was that generalization of the cognitive triad was unwarranted given that past research examined this only in an impersonal task. In view of the central nature of interpersonal involvement for most depressed persons (Lewinsohn, 1974; McLean, 1976), explicit examination of this area was necessary. As noted earlier, the hypothesis of differential response to task type was not supported. Generalization of Beck's cognitive triad is warranted within the parameters of this study.

Observation of subjects' task behavior indicated that the tasks generated different affect, however. Generally all subjects were enthusiastic during the card sorting task and showed considerable involvement in goal acquisition. Depressed subjects in the interpersonal task were notable in their remarks such as "I can figure out these for everyone but myself"; "people are always asking me to help them with things like this"; "I get so tired of doing things like this all the time." Clinical impression as well as objective measure (task perception) suggested that the interpersonal task reflected genuine reaction to interpersonal involvement in the person's normal environment. Quantitative measures did not discriminate between the tasks, yet qualitative differences were observed. These differences warrant further investigation, especially in view of other research which has found differences between impersonal and interpersonal task performance (e.g., Gotlib and Asarnow, 1979).
It is critical to note that direct interpersonal involvement was not assessed with the interpersonal procedure used, but only the abstract ability to generate solutions to interpersonal conflicts. Actual exposure to interpersonal involvement may be a more sensitive procedure in isolating cognitive distortions. Moreover, subject perceptions of the task types were not directly measured. That is, card sorting was defined as impersonal and Means Ends Problem Solving was defined as interpersonal by the experimenter. That the subjects themselves perceived the MEPS as interpersonal was assumed, but not directly tested.

Finally, a point not central to Beck’s thesis but one related to his cognitive developmental hypothesis is raised here. Although the focus of this research was to examine the negative bias of depressed subjects, the positive bias of normal subjects was also remarkable. Recent data collected on populations of normal subjects suggest that a positive bias may be typical of "normal thinking" (Alloy and Abramson, 1979; Lewinsohn et al., 1980). Depressed and normal subjects in both an interpersonal situation (Lewinsohn et al., 1980) and in impersonal tasks (Alloy and Abramson, 1979) were asked to rate quality of their interactions or the degree of control that they had. While depressed subjects made fairly accurate assessment of their own positive features or the contingencies involved, normal subjects distorted positively and often assumed greater control than they actually had. "Normals" are presumed to be objective, reality-based assessors of experience. That is, it is expected that they routinely appraise internal and external stimuli realistically—they see what
is there. Data from normal subjects do not support this premise. These subjects, both in the present research and in other studies, clearly biased their personally relevant perceptions in a positive direction. Data such as these suggest that positive yet "unrealistic" self-evaluation may be adaptive.

Findings of this study are generally consistent with much of the literature relevant to Beck's theory and where it differs, is not markedly discrepant. These will be reviewed here.

Although the paradigm of Loeb, Beck and Diggory (1971) was its prototype, results from this study are somewhat inconsistent with theirs. While Loeb et al. (1971) found that depressed and non-depressed subjects set similar goals, depressed women in this study set lower goals for themselves. Moreover, depressed subjects in the two studies responded differentially to success. The depressed outpatient males in Loeb et al. (1971) showed little response alteration after success feedback. The depressed inpatient females in the present research, however, responded more directly to success in that their future estimates increased after success. These discrepancies may be due to the different populations studied. The attribution theory for motivation and achievement (Weiner et al., 1971) has indicated that achievement tasks make differential demand on males and females. This prediction may be reflected in different goal-setting as well as in different response to feedback for performance.

Studies by McNitt and Thornton (1978), with college students, and by Loeb et al. (1964) and DeMonbreun and Craighead (1977), with psychiatric patients, found differential reaction to specific
feedback. The depressed college students showed greater reactivity to success while depressed psychiatric patients reacted more to failure. In the present study, depressed subjects tended to expect failure, yet their immediate estimates were consistently related to their experience. One explanation is that although success and failure feedback were salient, the manipulation was not powerful. Non-depressed subjects tended to construe the final failure score, 19, as "almost the goal" or "close enough." Nondepressed subjects appeared to be much more complacent about "less than perfect" performance and made it clear to the experimenter. Depressed subjects were not observed to make these statements and appeared to absorb the failure with less discussion of the relative merits of their performances. One inference is that depressed subjects were simply less apt to overtly discuss performance, although they made similar internal judgments.

Alternatively, an implication is to examine attributions for outcome. Within the parameters set forth by Naditch, Gargan and Michael (1975), locus of control is comprised of "expectation of outcome" and "post hoc responsibility" for the event. Given this framework, one might hypothesize that depressed subjects expect failure, but when it does not occur they assimilate that information and assume the same factors will be operational on other occasions. Following this reasoning, one would hypothesize greater externality among depressives. Only Rizley (1978), Kuiper (1978) and some of the work of Seligman and associates (see Journal of Abnormal Psychology, 1978, Volume 87) have directly investigated the dimension of
attribution in depression. Their data have suggested internal attribution of failure (Rizley, 1978; Kuiper, 1978). Naditch et al. (1975), however, found greater externality as a trait variable. Thus, the question of locus of control in depression remains unresolved.

Steiner (1975) found that depressed college students who rated themselves interpersonally incompetent, when assessed with a narrative interpersonal problem solving task, were less competent. Results from the interpersonal task in this study coincide with Steiner's findings of negatively biased personal assessment, but actual performance scores showed that, in contrast to Steiner (1975), depressed subjects were comparable to other subjects.

Also unlike the findings of this study, Gotlib and Asarnow (1979) found interpersonal problem solving deficits in depressed college students. Gotlib and Asarnow (1979) measured IQ and found no relationship between IQ and interpersonal problem solving. These authors admitted that their range was small (95-131) and skewed towards greater intellectual ability. In the present study, subject IQ's ranged from approximately 70 to 131 with 78% (56 of 72) of the subjects between 90 and 110. It may be that performance deficits are more discriminating when working with an average to superior intellectual group as in college populations.

The performance comparability found in this research raises the issue of cognitive versus behavioral deficit in interpersonal behavior. Other literature (e.g., Coyne, 1976; Hammen and Peters, 1978) testifies to negative interactions fostered by depressed individuals. The suggestion is that for the depressed individual, the deficit in
interpersonal ability is at the level of emitting the appropriate behavior rather than of "knowing" what to do, as Lewinsohn and associates state (Lewinsohn et al., 1980). The present research addressed only the cognitive or "knowing" aspect of performance.

Critique of Study

This study was generated partly to improve upon methodological inadequacies of Loeb et al. (1971). Subject selection for this study constituted a rigorous test of the theory. Subjects were disabled by their depression (they were hospitalized), variability between subjects was designed to be smaller (meeting diagnostic criteria rather than presenting with a mood disturbance) and subjects were more representative of a depressed group who seek treatment (females). This study was designed, therefore, to provide results consistent with the natural occurrence of depression.

Although depression is statistically more frequent in women, men do experience the depressive syndrome. Issues of cognitive function in men have not been examined in this investigation. A critical issue for including men in a study of depression focuses on establishing an appropriate psychiatric control group. The majority of male inpatients have diagnoses of alcoholism or thought disorder. Depression is reported by some (Goodwin and Erickson, 1979) to be important in the genesis of alcoholism. Individuals with formal thought disorder are inappropriate for research into nonpsychotic cognitive function. It follows that generating a nonpsychotic, nondepressed male inpatient control group could meet with limited success.
Independent of the practical problems, the question of negative cognitive distortions in depressed males is worthwhile and has not been answered in this research. To achieve this goal, it may be necessary to study these variables in outpatients.

The contrived nature of the tasks also deserves comment. Although there is empirical justification for generalization of cognitions relative to the tasks used here, situation-by-cognition interaction cannot be determined. Lewinsohn and colleagues (Lewinsohn et al., 1980) used a group format to measure interpersonal interactions between normal, psychiatric nondepressed and depressed subjects. Distortions found in the Lewinsohn et al. study, interestingly, were more a function of positive distortions by the normal subjects. While depressed subjects did make negative self ratings, the most marked discrepancies occurred between observers and controls with the controls perceiving themselves more positively. As Lewinsohn et al. (1980) states, "it is naive to assume that [social] reality is adequately assessed by a single rater." But the trend of negative distortion in depressed subjects and positive distortion in normal subjects was found in the present research as well. Thus there is additional evidence for the validity of the distortion findings in the present study and support for the meaningfulness of these results in naturalistic situations.

Methodologically, this study was descriptive and statements of cause cannot be drawn from the findings. The etiology of depression cannot be clearly documented, although the primacy of cognition in depression can be challenged in view of the great variability in the
individual data. Systematic investigation of the contribution of cognition to depression could be developed more clearly if the degree of cognitive change were measured prior to, during and after depressive experiences.

Finally, attention should be directed to the adequacy of concepts of self, world and future as representative of the way in which information is processed. The approach taken in this research, and in Beck's theory, assumes that the individual has singular and basic concepts of self, world and future as good or bad, demanding or receptive, optimistic or pessimistic, respectively. Moreover, these concepts in unison dictate the individual's definition and categorization of internal and external experiences.

Yet there is disagreement with this position of singular conceptualization. Gergen (1971), for example, challenges this notion. Specific to self concept, Gergen (1971) states that "researchers have tended to think solely in terms of global or fixed levels of self-esteem [and that] such a view is short-sighted. People harbor many different conceptions of self--each which may be weighted differently and may change over time and within situations, depending on a variety of factors" (p. 37). Implied in this criticism is a methodological difficulty inherent in the measurement of self concept. Self concept as measured in research may depend entirely on the content of the variables included by the investigator in the experiment (Gergen, 1971). This argues for multiple observations of a construct (Epstein, 1979). To obtain consistency in the construct, these multiple observations should be averaged across time or situations to gain a reliable
representation of the construct (Epstein, 1979). Epstein (1973) suggested that self concept would be viewed more usefully as a theory, generated by the individual to account for previous behavior, predict future experiences and facilitate fulfillment of needs. The view of self concept as a theory implies a dynamic information processing system, capable of including, excluding and changing input.

To sum, the constructs under investigation have been treated as static entities. Suffice it to say that a number of assumptions concerning the way in which information is organized and processed are required in order for the results of this research to support Beck’s theory of depressive behavior. Interpretation of the data is circumscribed by the assumptive parameters used here.

In summary, generalizability of these results is limited by the sex of subjects studied, by the type of tasks used and by the validity of the underlying assumptions. Given that the constructs measured meaningfully affect behavior, this research provides a well-controlled investigation of a cognitive component of depression in a moderately-severe to severely depressed female population. While the tasks are not actual situations confronting subjects in everyday living, affective responses to this assessment underline their meaningfulness.

Future Research Directions

The finding of heterogeneity in depressed women’s responses is intriguing. Although systematic differences between the three groups suggest that some construct underlying their respective responses could be unidimensional, a survey of single group data points toward a more
complex process. Some subjects, independent of group and level of depression, make negative self references. Alternatively, some subjects within the depressed group endorse positive estimates. Depression does not appear to be a cognitively unified process. The heterogeneity may be addressed by the study of schemas. Mahoney encouraged cognitive behavioral scientists, in his 1978 address to the Association for the Advancement of Behavior Therapy, to look again at the "black box," to follow behavior into the "unconscious." Further pursuit of more sophisticated, empirically based analysis of cognitive function offers just such a frontier for the cognitive behavioral scientist.

It is possible to observe systematically the organization of behavior and to infer a belief system which accounts for the behavior (e.g., Paivio, 1975). For example, we tend to maintain a constant grip on a breakable object when transporting it from point A to point B because we believe it will fall if we let go. We invoke (1) a principle of constancy, and (2) belief in the force of gravity. This series of inferences is reasonable by frequent observations of transporting a single object or by observations of multiple types of objects. The analogy is that inferring beliefs, looking into the "black box" may be feasible through multimodal assessments of hypothesized beliefs. If schemas can be defined as organizing principles as they affect behavior, operationalizing these beliefs into experimental manipulations is a reasonable strategy for examining these internal psychological factors.
Another research direction focuses on the role of interpersonal factors in depression. This follows from depressed subjects' reactions to the interpersonal task and their accounts of personal relationships. Note the earlier mentioned preference of depressed subjects to work on card sorting, something which may have been unrelated to the focus of their concerns. One possibility might be to examine the relative role of interpersonal problems and depression with both men and women. A corollary would be to examine job-related functions with depression.

Another study proceeding directly from this project represents a key opportunity for comparison. Many statements made about depression are based on samples of college students who scored relatively high (greater than 10) on the Beck Depression Inventory. Methodological criticism focuses on the population studied. To determine the comparability of clinical and college populations, samples of college students who score high or low on the BDI may be compared to clinical samples using, for example, a task assessment strategy. Are there only quantitative differences between depressed inpatients, depressed outpatients and high BDI college students? Do inpatients simply emit more negative statements? Do they simply have greater portions of their environments implicated? Or are there qualitative differences? While Beck has aligned himself with the position that differences across depressives is a matter of degree only (Rush and Giles, 1982), the variability found in this research casts some doubt. Research into within-group variability presents an interesting direction for future studies.
REFERENCES


Coyne, J. C. Depression and the response of others. Journal of Abnormal Psychology, 1976, 85, 186-193. (a)


Melson, F. T. and Weisz, A. E. The personal future and suicidal ideation. Journal of Nervous and Mental Disease, 1971, 153, 244-250.


APPENDIX A

Diagnostic Criteria*

A. Dysphoric mood, characterized by symptoms such as depressed, sad, blue, hopeless, low, down, irritable, worried. Exclude momentary shifting moods.

B. At least 5 of the following 8 features:

1. Poor appetite or weight loss or increased appetite or weight gain (change of 1 lb./week over several weeks—not dieting).
2. Sleep difficulty (insomnia or hypersomnia).
3. Loss of energy, fatigability or tiredness.
4. Psychomotor agitation or retardation (not simply subjective).
5. Loss of interest in usual activities or decreased sex drive.
6. Feelings of self-reproach or guilt (may be delusional).
7. Diminished ability to think or concentrate.
8. Thoughts of death or suicide or any suicidal behavior.

C. Dysphoric features of illness lasting at least one week.

E. None of the following which suggests Schizophrenia is present:

1. Delusions of control or thought broadcasting, insertion, or withdrawal.
2. Hallucinations of any type throughout the day for several days or intermittently throughout a one-week period unless all of the content is clearly related to depression or elation.
3. Auditory hallucinations in which either a voice keeps up a running commentary on the patient’s behaviors or thoughts as they occur, or two or more voices converse with each other.

4. At some time during the period of illness had delusions or hallucinations for more than one month in the absence of prominent affective (manic or depressive) symptoms (although typical depressive delusions, such as delusions of guilt, sin, poverty, nihilism, of self-deprecation or hallucinations of similar content are permitted).

5. Preoccupation with a delusion or hallucination to the relative exclusion of other symptoms or concerns (other than delusions of guilt, sin, poverty, nihilism, or self-deprecation or hallucinations with similar content).

6. Definite instances of formal thought disorder.
APPENDIX B

Hamilton Rating Scale for Depression (HRS-D)
<table>
<thead>
<tr>
<th>ITEM</th>
<th>CUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. DEPRESSED MOOD</td>
<td>0. Absent</td>
</tr>
<tr>
<td>- Sadness, hopelessness, worthlessness</td>
<td></td>
</tr>
<tr>
<td>2. Feelings of guilt</td>
<td>0. Absent</td>
</tr>
<tr>
<td>- Ideas of guilt or rumination over past errors or sinful deeds</td>
<td></td>
</tr>
<tr>
<td>3. Suicide</td>
<td>0. No difficulty falling asleep</td>
</tr>
<tr>
<td>- Wishes he were dead or any thoughts of possible death to sell</td>
<td></td>
</tr>
<tr>
<td>4. Insomnia early</td>
<td>0. No difficulty</td>
</tr>
<tr>
<td>- Complains of occasional difficulty falling asleep—i.e., more than 1/2 hour</td>
<td></td>
</tr>
<tr>
<td>5. Insomnia middle</td>
<td>0. No difficulty</td>
</tr>
<tr>
<td>- Patient complains of being restless and disturbed during the night</td>
<td></td>
</tr>
<tr>
<td>6. Insomnia late</td>
<td>0. No difficulty</td>
</tr>
<tr>
<td>- Waking in early hours of the morning but goes back to sleep</td>
<td></td>
</tr>
<tr>
<td>7. Work and activities</td>
<td>0. No difficulty</td>
</tr>
<tr>
<td>- Thought and feelings of incapacity, fatigue or weakness related to activity, work or hobbies</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For each item select the "cue" which best characterizes the patient.
<table>
<thead>
<tr>
<th>ITEM</th>
<th>CUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>8. RETARDATION</td>
<td>10: Normal speech and thought</td>
</tr>
<tr>
<td>(Slowness of thought and speech; impaired ability to concentrate; decreased motor activity)</td>
<td>12: Sluggish retardation at interview</td>
</tr>
<tr>
<td></td>
<td>13: Obscure retardation at interview</td>
</tr>
<tr>
<td></td>
<td>14: Interview difficult</td>
</tr>
<tr>
<td></td>
<td>15: Complete stupor</td>
</tr>
<tr>
<td>9. AGITATION</td>
<td>10: None</td>
</tr>
<tr>
<td></td>
<td>12: &quot;Playing with&quot; hands, hair, etc.</td>
</tr>
<tr>
<td></td>
<td>13: Hand-wringing, nail-biting, hair-pulling, biting of lips</td>
</tr>
<tr>
<td>10. ANXIETY PSYCHIC</td>
<td>10: Absent</td>
</tr>
<tr>
<td></td>
<td>Physiological concomitants of anxiety, such as:</td>
</tr>
<tr>
<td></td>
<td>12: Mild</td>
</tr>
<tr>
<td></td>
<td>Gastro-intestinal—dry mouth, wind, indigestion, diarrhoea, cramps, belching</td>
</tr>
<tr>
<td></td>
<td>Cardiac—palpitations, headaches</td>
</tr>
<tr>
<td></td>
<td>13: Moderate</td>
</tr>
<tr>
<td></td>
<td>Respiratory—hyperventilation, sighing</td>
</tr>
<tr>
<td></td>
<td>14: Severe</td>
</tr>
<tr>
<td></td>
<td>Urinary frequency</td>
</tr>
<tr>
<td></td>
<td>15: Incapacitating</td>
</tr>
<tr>
<td>11. ANXIETY SOMATIC</td>
<td>10: None</td>
</tr>
<tr>
<td></td>
<td>10: Loss of appetite but eating without staff encouragement. Heavy feelings in abdomen</td>
</tr>
<tr>
<td></td>
<td>12: Difficulty eating without staff urging. Requests or requires laxatives or medication for bowel or medication for G. I. symptoms.</td>
</tr>
<tr>
<td></td>
<td>13: None</td>
</tr>
<tr>
<td></td>
<td>16: Headaches, backache, muscular aches, loss of energy and fatigue</td>
</tr>
<tr>
<td></td>
<td>12: Any clear-cut symptom rates 2</td>
</tr>
<tr>
<td>12. SOMATIC SYMPTOMS GASTRO-INTESTINAL</td>
<td>10: Absent</td>
</tr>
<tr>
<td></td>
<td>Symptoms such as loss of libido</td>
</tr>
<tr>
<td></td>
<td>12: Mild</td>
</tr>
<tr>
<td></td>
<td>13: Severe</td>
</tr>
<tr>
<td></td>
<td>16: Not ascertained</td>
</tr>
<tr>
<td>13. SOMATIC SYMPTOMS GENERAL</td>
<td>10: Absent</td>
</tr>
<tr>
<td></td>
<td>Symptoms such as loss of libido</td>
</tr>
<tr>
<td></td>
<td>12: Mild</td>
</tr>
<tr>
<td></td>
<td>13: Severe</td>
</tr>
<tr>
<td></td>
<td>16: Not ascertained</td>
</tr>
<tr>
<td>14. GENITAL SYMPTOMS</td>
<td>10: Absent</td>
</tr>
<tr>
<td></td>
<td>12: Mild</td>
</tr>
<tr>
<td></td>
<td>13: Severe</td>
</tr>
<tr>
<td></td>
<td>16: Not ascertained</td>
</tr>
<tr>
<td>15. HYPochondriasis</td>
<td>10: Not present</td>
</tr>
<tr>
<td></td>
<td>19: Self-absorption (bizarre)</td>
</tr>
<tr>
<td></td>
<td>16: Preoccupation with health</td>
</tr>
<tr>
<td></td>
<td>12: Frequent complaints, requests for help, etc.</td>
</tr>
<tr>
<td></td>
<td>Hypochondriacal delusions</td>
</tr>
<tr>
<td>ITEM</td>
<td>CUE</td>
</tr>
<tr>
<td>------</td>
<td>-----</td>
</tr>
<tr>
<td><strong>16. LOSS OF WEIGHT</strong></td>
<td></td>
</tr>
<tr>
<td><strong>A. WHEN RATING BY HISTORY:</strong></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>No weight loss</td>
</tr>
<tr>
<td>2.</td>
<td>Probable weight loss associated with present illness</td>
</tr>
<tr>
<td>3.</td>
<td>Definite (according to patient) weight loss</td>
</tr>
<tr>
<td><strong>B. ON WEEKLY RATINGS BY WARD PSYCHIATRIST, WHEN ACTUAL WEIGHT CHANGES ARE MEASURED:</strong></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Less than 1 lb. weight loss in week</td>
</tr>
<tr>
<td>2.</td>
<td>Greater than 1 lb. weight loss in week</td>
</tr>
<tr>
<td>3.</td>
<td>Greater than 2 lb. weight loss in week</td>
</tr>
<tr>
<td><strong>17. INSIGHT</strong></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Acknowledges being depressed and ill</td>
</tr>
<tr>
<td>2.</td>
<td>Acknowledges illness but attributes cause to bad food, climate, overwork, virus, need for rest, etc.</td>
</tr>
<tr>
<td>3.</td>
<td>Denies being ill at all</td>
</tr>
<tr>
<td><strong>18. DIURNAL VARIATION</strong></td>
<td></td>
</tr>
<tr>
<td><strong>A. M. P. M.</strong></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Absent</td>
</tr>
<tr>
<td>2.</td>
<td>If symptoms are worse in the morning or evening note which it is and rate severity of variation.</td>
</tr>
<tr>
<td>3.</td>
<td>Severe</td>
</tr>
<tr>
<td><strong>19. DEPERSONALIZATION AND DEREALIZATION</strong></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Absent</td>
</tr>
<tr>
<td>2.</td>
<td>Mild</td>
</tr>
<tr>
<td>3.</td>
<td>Such as: Feelings of unreality, Nihilistic ideas</td>
</tr>
<tr>
<td><strong>20. PARANOID SYMPTOMS</strong></td>
<td></td>
</tr>
<tr>
<td>0.</td>
<td>None</td>
</tr>
<tr>
<td>1.</td>
<td>Suspicions</td>
</tr>
<tr>
<td>2.</td>
<td>Ideas of reference</td>
</tr>
<tr>
<td>3.</td>
<td>Delusions of reference and persecution</td>
</tr>
<tr>
<td><strong>21. OBSESSIONAL AND COMPULSIVE SYMPTOMS</strong></td>
<td></td>
</tr>
<tr>
<td>0.</td>
<td>Absent</td>
</tr>
<tr>
<td>1.</td>
<td>Mild</td>
</tr>
<tr>
<td>2.</td>
<td>Severe</td>
</tr>
<tr>
<td>ITEM</td>
<td>CUE</td>
</tr>
<tr>
<td>--------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>22</td>
<td>HELPLESSNESS</td>
</tr>
<tr>
<td></td>
<td>.1. Not present</td>
</tr>
<tr>
<td></td>
<td>.2. Subjective feelings which are elicited only by inquiry</td>
</tr>
<tr>
<td></td>
<td>.3. Requires urging, guidance and reassurance to accomplish ward chores or personal hygiene</td>
</tr>
<tr>
<td></td>
<td>.4. Requires physical assistance for dress, grooming, eating, bedside tasks or personal hygiene</td>
</tr>
<tr>
<td>23</td>
<td>HOPELESSNESS</td>
</tr>
<tr>
<td></td>
<td>.1. Not present</td>
</tr>
<tr>
<td></td>
<td>.2. Intermittently doubts that things will improve but can be reassured</td>
</tr>
<tr>
<td></td>
<td>.3. Consistently feels &quot;hopeless&quot; but accepts reassurances</td>
</tr>
<tr>
<td></td>
<td>.4. Expresses feelings of discouragement, despair, pessimism about future, which cannot be dispelled</td>
</tr>
<tr>
<td></td>
<td>.5. Spontaneously and inappropriately perseverates, &quot;I'll never get well&quot; or its equivalent</td>
</tr>
<tr>
<td>24</td>
<td>WORTHLESSNESS</td>
</tr>
<tr>
<td></td>
<td>.1. Not present</td>
</tr>
<tr>
<td></td>
<td>.2. Indicates feelings of worthlessness (less of self esteem) only on questioning</td>
</tr>
<tr>
<td></td>
<td>.3. Spontaneously indicates feelings of worthlessness (less of self esteem)</td>
</tr>
<tr>
<td></td>
<td>.4. Different from 2 by degree: Patient volunteers that he is &quot;no good,&quot; &quot;inferior,&quot; etc.</td>
</tr>
<tr>
<td></td>
<td>.5. Delusional notions of worthlessness - i.e., &quot;I am a heap of garbage&quot; or its equivalent</td>
</tr>
</tbody>
</table>
APPENDIX C

Name:____________________________________________________

Date of Birth:____________________________________________

Present Treatment:_________________________________________

CONSENT FORM

I hereby agree to participate in a study investigating the relationship between thoughts and feelings. I understand that this involves approximately one hour of my time in order to complete the task to be presented. I understand also that I will be interviewed by two staff members and then I will take four short psychological tests and do a problem solving task. The results of these tests will be kept completely confidential. I have been informed that I will be told about the results of the tests at the termination of my part in the project. I am aware that I may hear information which could be upsetting to me, but that I will have an opportunity to discuss this at length after termination of my part in the project.

The procedure has been explained to me and I understand that the project will not affect my treatment. I understand that I am free to withdraw from the project at any time.

______________________________________  __________________________
Date  Signed

______________________________________
Address

______________________________________
Date  Witnessed

______________________________________
Address
APPENDIX D

General Instructions

Hi, my name is Donna Giles and I'm in Psychology. What I'm doing in Psychology is working on a Ph.D. I don't know whether you know what that involves, but one of the things it requires is that I do a research project. The area that I'm interested in understanding in my research is the relationship between thoughts and feelings. The reason that I wanted to talk to you is that I was wondering whether you'd be interested in participating. If you like I can explain in more detail what your participation would involve for you before you answer.

First I'd want to have an interview with you and another person in psychology where I'd ask you questions about how you've been sleeping and eating, what your mood has been and so on. This would take about 20 minutes. Then I'd want you to do four short psychological tests which give me a more specific idea of how you've been feeling. Finally I'd ask you to do a problem solving task. The task itself is quite simple because I'm not interested so much in your solving the problem as in how you think about yourself while solving the problem. When that is over I would like to talk to you in more detail about the project and get your reactions to the procedure.

On the whole it takes about an hour and a half of your time. If you're uncomfortable with any part of the procedure you have the option to withdraw at any time. This research is not in any way related to your treatment.
APPENDIX E

Marlowe-Crowne Social Desirability Scale (SDS)
PERSONAL REACTION INVENTORY

Listed below are a number of statements concerning personal attitudes and traits. Read each item and decide whether the statement is true or false as it pertains to you personally.

1. Before voting I thoroughly investigate the qualifications of all the candidates.
2. I never hesitate to go out of my way to help someone in trouble.
3. It is sometimes hard for me to go on with my work if I am not encouraged.
4. I have never intensely disliked anyone.
5. On occasion I have had doubts about my ability to succeed in life.
6. I sometimes feel resentful when I don't get my way.
7. I am always careful about my manner of dress.
8. My table manners at home are as good as when I eat out in a restaurant.
9. If I could get into a movie without paying and be sure I was not seen I would probably do it.
10. On a few occasions, I have given up doing something because I thought too little of my ability.
11. I like to gossip at times.
12. There have been times when I felt like rebelling against people in authority even though I knew they were right.
13. No matter who I'm talking to, I'm always a good listener.
14. I can remember "playing sick" to get out of something.
15. There have been occasions when I took advantage of someone.
16. I'm always willing to admit it when I make a mistake.
17. I always try to practice what I preach.
18. I don't find it particularly difficult to get along with loud mouthed, obnoxious people.
19. I sometimes try to get even rather than forgive and forget.
20. When I don't know something I don't at all mind admitting it.
21. I am always courteous, even to people who are disagreeable.
22. At times I have really insisted on having things my own way.
23. There have been occasions when I felt like smashing things.
24. I would never think of letting someone else be punished for my wrong-doings.
25. I never resent being asked to return a favor.
26. I have never been irked when people expressed ideas very different from my own.
27. I never make a long trip without checking the safety of my car.
28. There have been times when I was quite jealous of the good fortune of others.
29. I have almost never felt the urge to tell someone off.
30. I am sometimes irritated by people who ask favors of me.
31. I have never felt that I was punished without cause.
32. I sometimes think when people have a misfortune they only got what they deserved.
33. I have never deliberately said something that hurt someone's feelings.
APPENDIX F

WAIS-Clarke Vocabulary Test
NAME: 

INSTRUCTIONS

On the following pages there is a list of words. The purpose of this test is to find out how many of these words you know. The first word is in capital letters. Look at the word in capital letters and compare it with one of the four words underneath marked A, B, C, or D. Select the word which means the same or almost the same as the word in capital letters and circle the letter in front of it. Choose only one word. If you don't know please guess.

EXAMPLE:

1. CATHEDRAL
   (A) Church
   (B) Heaven
   (C) Building
   (D) Blue

   NOTE:
   In Example 1, Church is the closest in meaning to CATHEDRAL, therefore the correct answer is (A).

2. DOG
   (A) Swim
   (B) Horse
   (C) Animal
   (D) Tail

   Again, in Example 2, the word which is closest in meaning to DOG is Animal, therefore you should have circled (C).
1. BED
   (A) Cot
   (B) Rest
   (C) Seed
   (D) Bury

2. SHIP
   (A) Travel
   (B) Boat
   (C) Carry
   (D) Object

3. PENNY
   (A) Coin
   (B) Girl
   (C) Lane
   (D) Round

4. WINTER
   (A) Climate
   (B) Warm
   (C) Season
   (D) Continent

5. REPAIR
   (A) Replace
   (B) Fix
   (C) Match
   (D) Work

6. BREAKFAST
   (A) Morning
   (B) Table
   (C) Hurry
   (D) Meal

7. FABRIC
   (A) Cloth
   (B) Elastic
   (C) Brick
   (D) Cover

8. SLICE
   (A) Cut
   (B) Golf
   (C) Bread
   (D) Separate

9. ASSEMBLE
   (A) Factory
   (B) Gather
   (C) Pieces
   (D) People

10. CONCEAL
    (A) Animal
    (B) Close
    (C) Stamp
    (D) Hide

11. ENORMOUS
    (A) Big
    (B) Many
    (C) Huge
    (D) Terrific

12. HASTEN
    (A) Slow
    (B) Hurry
    (C) Tidy
    (D) Late

13. SENTENCE
    (A) Statement
    (B) Time
    (C) Phrase
    (D) Line

14. REGULATE
    (A) Command
    (B) Timing
    (C) Coffee
    (D) Control
15. COMMENCE
   (A) Begin
   (B) Speech
   (C) Terminate
   (D) Concur

16. PONDER
   (A) Fret
   (B) Think
   (C) Bear
   (D) Pause

17. CAVERN
   (A) House
   (B) RAVINE
   (C) Cave
   (D) Mouth

18. DESIGNATE
   (A) Ascertain
   (B) Elect
   (C) Assign
   (D) Dessert

19. DOMESTIC
   (A) Animal
   (B) Cultivated
   (C) Couple
   (D) Tame

20. CONSUME
   (A) Buy
   (B) Use Up
   (C) Take
   (D) Destroy

21. TERMINATE
   (A) End
   (B) Decide
   (C) Discard
   (D) Limit

22. OBSTRUCT
   (A) Impair
   (B) Geometry
   (C) Hinder
   (D) Teach

23. REMORSE
   (A) Code
   (B) Sin
   (C) Repentance
   (D) Anger

24. SANCTUARY
   (A) Haven
   (B) Guilt
   (C) Study
   (D) Church

25. MATCHLESS
   (A) Single
   (B) Incomparable
   (C) Different
   (D) Better

26. RELUCTANT
   (A) Hesitant
   (B) Careless
   (C) Unsure
   (D) Shy

27. CALAMITY
   (A) Chaos
   (B) Disaster
   (C) Death
   (D) Surprise

28. TRANQUIL
   (A) Flower
   (B) Lucid
   (C) Sere
   (D) Drug
29. FORTITUDE
   (A) Zeal
   (B) Integrity
   (C) Prepared
   (D) Stamina

30. EDIFICE
    (A) Facade
    (B) Bridge
    (C) Statue
    (D) Building

31. COMPASSION
    (A) Weak
    (B) Pity
    (C) Love
    (D) Dramatic

32. TANGIBLE
    (A) Palpable
    (B) Possible
    (C) Asset
    (D) Intermingle

33. PERIMETER
    (A) Boundary
    (B) Distance
    (C) Geometry
    (D) Ancient

34. AUDACIOUS
    (A) Loud
    (B) Poised
    (C) Unbelievable
    (D) Daring

35. OMINOUS
    (A) Weird
    (B) Serious
    (C) Awesome
    (D) Foreboding

36. TIRADE
    (A) Tantrum
    (B) Harangue
    (C) Uncontrolled
    (D) Bomb

37. ENCUMBER
    (A) Hold
    (B) Burden
    (C) Awkward
    (D) Vegetable

38. PLAGIARIZE
    (A) Copy
    (B) Lie
    (C) Plague
    (D) Annoy

39. IMPALE
    (A) Hurt
    (B) Torture
    (C) Transfix
    (D) Whiten

40. TRAVESTY
    (A) Injustice
    (B) Journey
    (C) Mockery
    (D) Immoral
APPENDIX G
Research Assistant Instructions

Introduction

"Hi, if you'd like to sit down in this chair there will be a few forms to complete.

"The first of the forms is called the Beck Inventory which consists of four statements in each question. What I would like you to do is to read each statement and select the one that is closest to the way you've been feeling in the last three or four days. You then put the number in front of that statement in the bracket on the left and then go on to the next one. If you have any questions don't hesitate to ask me."

(Upon completion of the Beck Depression Inventory, the SCL-90 was placed in front of the subject. The instructions at the top of it were read aloud. The example was explained.)

"Remember to keep in mind that in this form we're interested in the last ten days only. There may be some problems or complaints listed that you may not be able to relate to and these cases can be scored as zero's."

(The next form administered was the SDS and the instructions were read aloud.)

"This form should take only a few minutes to complete since you must put a 'T' down if the statement is true for you and an 'F' if it is false for you."

(The WAIS-Clarke was then administered and the instructions were read aloud and the examples explained.)

"This is a standard vocabulary questionnaire where you have to circle the letter in front of the word that is closest in meaning to the word in capital letters. The words go from fairly easy to quite difficult so if you run into some that you don't know, don't worry, we don't expect you to get them all; just take a guess."

(After this form was completed the four tests were placed in a file and the last phase of the experiment, the task, was begun.)
APPENDIX H

Task Perception Measures (TP1; TP2, TP3, TP4)
1. Was the task interesting and enjoyable?

Rate how you feel about the task on the scale below where -5 means "extremely dull and boring", +5 means "extremely interesting and enjoyable" and 0 means "neutral, neither interesting nor uninteresting".

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5

extremely dull and boring  neutral, neither interesting nor uninteresting  extremely interesting and enjoyable

2. Did the experiment give you an opportunity to learn about your abilities and skills?

Rate how you feel about this on a scale from 0 to 10 where 0 means you learned nothing and 10 means you learned a great deal.

0 1 2 3 4 5 6 7 8 9 10

learned nothing  learned some  learned a fair amount  learned a great deal
3. From what you know about the experiment, and the task involved in it, would you say the experiment was measuring anything important? That is, do you think the results may have scientific value?

Rate your opinion on this matter on a scale from 0 to 10 where 0 means "no scientific value or importance" and 10 means "a great deal of value and importance".

0 1 2 3 4 5 6 7 8 9 10
no scientific value or importance

a great deal of value and importance

4. Would you have any desire to participate in another similar task?

Rate your desire to participate in a similar experiment again on a scale from -5 to +5, where -5 means "definitely dislike participating again", +5 means "definitely like participating again" and 0 means "no particular feeling about it, one way or another".

-5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5
definitely dislike participating again
no feeling about it, one way or another
definitely like participating again
APPENDIX I

Post-Experimental Questionnaire

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POST-EXPERIMENTAL QUESTIONNAIRE

1. What, in your words, is the purpose of this study?

2. Do you have any questions? Please specify.

3. Was the entire experiment perfectly clear to you -- the purpose as well as each aspect?

4. People react to things in different ways. It would be helpful to us if you would comment on your reactions to the experiment. Why did you respond as you did? How did you feel during the experiment?

5. Was there any part of the procedure which was odd, confusing or disturbing to you?

6. Do you think that the experiment had any other goals besides those stated?

   What were they?

7. How much would you say that these other goals influenced your responses?

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<td>not at all</td>
<td>very little</td>
<td>sometimes one way</td>
<td>sometimes</td>
<td>quite</td>
<td>totally another</td>
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</table>
APPENDIX J

Debriefing Interview

"Hi, how are you doing? . . . What are your reactions to being in the project? . . . What did you think of your performance in the task? . . ."

"To begin, I'd like to go over the last form you filled out with you . . ."

"As I said, I'm interested in understanding the relationship between thoughts and feelings. You may have figured it out already, but what I am interested in studying specifically is the relationship between thinking and depression.

"There's a theory in psychology which says that people who are depressed systematically and consistently take in information which has a negative bias. For instance, when a person who's depressed has a failure experience or something negative happens, she says things to herself (I'm just interested in studying women right now) like, 'That's just like me--nothing ever works out. I don't seem to be able to do anything well.' When she has a success experience or something positive happens, she says things to herself like, 'That was easy. Anybody could do that.'

"What this means is that when she's thinking about herself or looking inside she has this whole mass of negative things to deal with and not much room anymore for good things.

"Now this is just a theory right now; we don't know whether depressed women really think like this, whether anybody thinks like this, or whether everybody thinks like this, so this is why I'm doing the study.

"Does this make sense to you so far? . . .

"I have three groups of women that I am studying: a group of women who are in psychiatry and who are experiencing a lot of stress and pain and who are responding to it with depression; another group of women who are also in psychiatry and who are experiencing stress or pain, but who are not responding to it with depression; and another group of women who are in the hospital, who are experiencing physical stress or pain, but who are feeling emotionally okay. It seems to me that you're in the group; does that seem right to you? . . .

"Now in terms of the problem solving task you did, I want to explain in more detail why I used that task. In science, it is very
very important that everything be very well controlled so that the only thing that is different in the set-up is the person, you, and for my purposes, how you think about yourself.

"One of the things that was required in order to fulfill this necessity was that the scores be fixed. That means that the scores you received on the board there are not necessarily how you've actually done. Right now, we don't know whether you made the goal or whether you didn't make the goal. As I said, the reason I had to do this was to keep everything as similar as possible for all subjects involved in the study. What I really want to know is how you think about yourself. It's possible that the women I'm comparing you with would do better or worse at this task than you do. If that happened, then I'd have two things different in the experiment: how you think about yourself and how you actually do. Does this make sense to you? . . .

"I have one last form for you fill out to indicate that you understand the purpose of the experiment."

(At this point, the items were read aloud.)
APPENDIX K

Taped Card Sorting Instructions

"In a minute or so, you are going to take this card sorting test. First I thought you might like to know a little more about it. We've found from past experiences that it can be useful in performing the task.

"It consists of sorting cards correctly and quickly from a deck onto this board. This is not as simple as it may seem. It involves several abilities: the ability to recognize forms as they appear, the ability to remember where they go and the ability to handle cards. Most of all, it means coordinating these abilities in order to do a good job.

"Now let me explain exactly what you are to do. You're to sort these cards so that they match the ones here. You will have 20 seconds, and I want to see whether you can sort 20 or more cards correctly in this time. This is not as easy as it may seem.

"You will have five tries, or trials, with 20 seconds each try. I want to see if on one of the five trials, any one of them, you can make the goal of sorting 20 or more cards.

"You'll see here (point to graph board) the number of cards and here (pointing) the number of trials. And this is the goal. After each trial, I'll put a mark on the board and that way, you'll be able to tell just how you are doing as far as the goal goes."

At this point, the research assistant further explained:

"Basically what I'm going to do is hand you a pile of cards and tell you when to start. I want to see if you can sort out 20 cards in 20 seconds on just one of your five trials so 20 is the goal. The best way to approach this task is to put your energy into sorting the cards rather than worrying about the time limit. Any questions before we start?"

About 30 cards were given to the subject and the subject was told to begin: "You may start now." Timing with the stopwatch was begun coinciding with instructions to begin.

---

Loeb, et al., 1971, p. 108
CARD SORTING SCORING SHEET

TRIAL 1
RESPONSE LATENCY _____
LENGTH _____
AFFECT: FLAT HAPPY ENTHUSIASTIC
SAD ANGRY ANNOYED
NO. OF CARDS SORTED _____

TRIAL 2
RESPONSE LATENCY _____
LENGTH _____
AFFECT: FLAT HAPPY ENTHUSIASTIC
SAD ANGRY ANNOYED
NO. OF CARDS SORTED _____

TRIAL 3
RESPONSE LATENCY _____
LENGTH _____
AFFECT: FLAT HAPPY ENTHUSIASTIC
SAD ANGRY ANNOYED
NO. OF CARDS SORTED _____

TRIAL 4
RESPONSE LATENCY _____
LENGTH _____
AFFECT: FLAT HAPPY ENTHUSIASTIC
SAD ANGRY ANNOYED
NO. OF CARDS SORTED _____

TRIAL 5
RESPONSE LATENCY _____
LENGTH _____
AFFECT: FLAT HAPPY ENTHUSIASTIC
SAD ANGRY ANNOYED
NO. OF CARDS SORTED _____
APPENDIX L

Means-End Problem Solving Procedure

**Taped MEPS Instructions**

"In a minute or so you are going to hear some problems which can occur in relationships with people. First I thought you'd like to know a little more about the purpose of these problem solving situations. We have found from past experience that knowing about the task can be useful in solving the problems.

"What I want you to do in each of the situations is think about and say aloud all the ways you can think of for the person in the story to solve her problem.

"I will tell you the beginning of a story; for instance:

One day Ann saw a handsome man she had never seen before while eating in a restaurant. She was immediately attracted to him.

Then I will tell you the end of the story.

The story ends when they get married.

What I want you to do is tell me the best ways you can think of for Ann to end up marrying this man.

"After you have answered the problems, I will mark on this board here (pointing) the appropriate category to indicate how satisfactory your solutions are. By my marking it on the board, you'll always be able to tell how well you're doing."

At the end of the tape the research assistant continued to explain:

"I'll give you five different situations to complete. The goal is 20 and what I'm looking for is to see whether you can get a score of 20 on one out of the five situations.

"Basically what you'll be doing is filling in the middle of the story. You'll hear the beginning and the end of the story on tape and you just have to fill in the middle the best way you can.

"Because I'll be writing down what you're saying, I'd like to also tape you so that if I miss something while writing I can check it with the tape. I'll listen to it only if I make a mistake in writing and it would be Donna or myself that would hear. Is that all right with you? Any questions?"
MEPS STORIES SCORING SHEET

SUBJECT:

1. J's friends avoiding her.

RESPONSE
LATENCY
LENGTH

AFFECT: FLAT HAPPY
SAD ENTHUSIASTIC
ANGRY ANNOYED

STORY:

MEANS: RELEVANT

IRRELEVANT

NO MEANS.
MEPS STORIES SCORING SHEET

2. G. Nasty.

RESPONSE
LATENCY
LENGTH
AFFECT: FLAT HAPPY
SAD ENTHUSIASTIC
ANGRY ANNOYED

STORY:

MEANS: RELEVANT

IRRELEVANT

NO MEANS

SUBJECT: 122
3. Miss C. in neighbourhood.

RESPONSE
LATENCY
LENGTH
AFFECT: FLAT HAPPY
SAD ENTHUSIASTIC
ANGRY ANNOYED

MEANS: RELEVANT

IRRELEVANT

NO MEANS
4. Mrs. P. and watch.

RESPONSE
LATENCY
LENGTH
AFFECT: FLAT HAPPY SAD ENTHUSIASTIC ANGRY ANNOYED

STORY:

MEANS: RELEVANT

IRRELEVANT

NO MEANS
MEPS STORIES SCORING SHEET

5. H. and boyfriend.

RESPONSE
LATENCY
LENGTH
AFFECT: FLAT HAPPY
SAD ENTHUSIASTIC
ANGRY ANNOYED

STORY:

MEANS: RELEVANT

IRRELEVANT

NO MEANS
APPENDIX M

Probability of Success (PS)

Level of Aspiration (LA):

Tasks 1 and 2
1. WHAT DO YOU THINK ARE YOUR CHANCES OF SORTING 20 CARDS CORRECTLY IN 20 SECONDS ON AT LEAST ONE OF THE REMAINING TRIALS? MARK THE SCALE ANYWHERE TO SHOW YOUR ESTIMATE AS A PERCENTAGE.

0 10 20 30 40 50 60 70 80 90 100
CAN'T POSSIBLY LESS THAN EVEN CHANCES CHANCES ARE EVEN THAT I CAN OR CAN'T MORE THAN EVEN CHANCE I CAN DO IT WITH CERTAINTY CAN DO IT

2. WHAT SCORE ARE YOU GOING TO TRY TO MAKE ON THE NEXT TRIAL?
(CIRCLE ONE)

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
APPENDIX N

Probability of Future Success (PFS)

Tasks 1 and 2
WHAT DO YOU THINK YOUR CHANCES OF SORTING 20 CARDS CORRECTLY IN 20 SECONDS ON A SIMILAR TASK WOULD BE? MARK THE SCALE ANYWHERE TO SHOW YOUR ESTIMATE AS A PERCENTAGE.
APPENDIX O

Level of Perceived Achievement (LPA)

Tasks 1 and 2
HOW WELL DID YOU DO ON THIS TASK COMPARED TO HOW WELL YOU THINK YOU SHOULD DO?
MARK THE SCALE ANYWHERE TO SHOW YOUR ESTIMATE OF YOUR PERFORMANCE.

POOREST PERFORMANCE
POSSIBLE

AVERAGE PERFORMANCE
FOR ME

BEST I COULD
EVER DO
APPENDIX P

Level of Achievement Compared to Others (LAO)

Tasks 1 and 2
HOW WELL DID YOU DO ON THIS TASK COMPARED TO HOW WELL YOU THINK OTHERS HAVE DONE?
MARK THE SCALE ANYWHERE TO SHOW YOUR ESTIMATE OF YOUR PERFORMANCE COMPARED TO OTHERS.
APPENDIX Q

Feedback Measures ($F_3, F_4$)
FEEDBACK

1. Did you believe that information about your performance that you were given during the experimental session?

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<tr>
<td>Yes, I was unsure</td>
<td>No, I thought I was being misled</td>
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<tr>
<td>it did not occur</td>
<td>to me to question it</td>
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2. Now that the procedure has been explained to you, do you understand why incorrect information was given to you?

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<tr>
<td>Yes it is perfectly clear</td>
<td>I feel confused about the purpose</td>
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<td>No, it makes absolutely no sense</td>
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</table>

3. If you had to do this task again and you knew you would be given accurate information, how do you think you would do?

- I think I would reach the goal
- I don't think I would reach the goal

4. As you know, you were given misleading information about your performance. Nevertheless, how close did this information come to how you expected to do?

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<tr>
<td>It was just what I had no idea what all what expected to expect</td>
<td>Not at I expected</td>
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APPENDIX R

Task Perception Summary Statistics

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<th>Card Sorting</th>
<th>MEPS</th>
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<tr>
<td></td>
<td>TP1 = 7.00 (2.10)</td>
<td>TP1 = 7.00 (1.90)</td>
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<tr>
<td>Success</td>
<td>TP2 = 4.67 (1.51)</td>
<td>TP2 = 4.00 (3.52)</td>
</tr>
<tr>
<td></td>
<td>TP3 = 7.33 (1.03)</td>
<td>TP3 = 5.83 (2.86)</td>
</tr>
<tr>
<td></td>
<td>TP4 = -8.33 (1.63)</td>
<td>TP4 = 6.83 (1.94)</td>
</tr>
<tr>
<td>DEPRESSED</td>
<td>TP1 = 8.33 (1.86)</td>
<td>TP1 = 7.17 (2.32)</td>
</tr>
<tr>
<td>Failure</td>
<td>TP2 = 5.83 (2.23)</td>
<td>TP2 = 3.92 (4.84)</td>
</tr>
<tr>
<td></td>
<td>TP3 = 7.00 (2.68)</td>
<td>TP3 = 5.88 (3.73)</td>
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<tr>
<td></td>
<td>TP4 = 8.50 (2.35)</td>
<td>TP4 = 4.67 (3.98)</td>
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<tr>
<td>NONDEPRESSED</td>
<td>TP1 = 9.67 (0.52)</td>
<td>TP1 = 8.00 (2.28)</td>
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<td>Success</td>
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<td>TP2 = 5.33 (3.39)</td>
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<td>TP3 = 8.67 (2.16)</td>
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<tr>
<td></td>
<td>TP4 = 8.17 (3.25)</td>
<td>TP4 = 7.00 (2.28)</td>
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<td>NORMAL</td>
<td>TP1 = 7.83 (2.14)</td>
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<td>Failure</td>
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<td>TP2 = 5.25 (3.31)</td>
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<td>TP3 = 7.83 (2.04)</td>
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<td>TP1 = 7.67 (1.63)</td>
<td>TP1 = 8.50 (1.38)</td>
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<tr>
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<td>TP2 = 4.67 (2.88)</td>
<td>TP2 = 4.50 (2.51)</td>
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<td>TP3 = 8.33 (1.21)</td>
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<tr>
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<td>TP1 = 8.33 (1.86)</td>
<td>TP2 = 8.00 (1.26)</td>
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<tr>
<td>Failure</td>
<td>TP2 = 5.17 (1.83)</td>
<td>TP2 = 4.33 (3.39)</td>
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<td>TP3 = 6.33 (3.14)</td>
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<tr>
<td></td>
<td>TP4 = 8.00 (2.37)</td>
<td>TP4 = 6.83 (1.94)</td>
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APPENDIX S

Analysis of Probability of Success and Level of Aspiration Estimates By Trial

The repeated measures analysis of variance for the PS measure is presented in Table 12. This analysis revealed no effect of Group, Task or Feedback, although the probability value associated with Group differences was .06. There was a main effect of the Trial factor, indicating that, as shown in Figure 14, PS estimates tended to increase across trials. All interactions were nonsignificant.

The repeated measures analysis of variance for the LA measure is presented in Table 13. Both Group and Trial factors were significant. The interaction of Group, Task and Trial factors was also significant. The relationship between these variables was examined graphically in Figures 15 and 16. Visual inspection of the figures reveals that LA estimates increase across trials and that for the card sorting task, the LA values appear to have a steeper negative slope. Furthermore, in the normal group (N), the slopes for both tasks were attenuated most likely because of a ceiling effect in this measure. With respect to the major hypothesis of group differences, it is notable that the depressed group (D) had consistently lower LA mean scores per trial than either the nondepressed psychiatric (P) or normal (N) groups.
### TABLE 12
Probability of Success (PS) Repeated Measures Analysis of Variance

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<thead>
<tr>
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<th>Mean Square</th>
<th>df</th>
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<th>p&lt;</th>
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<td>.58</td>
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<td>.38</td>
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<tr>
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Fig. 14 Probability of success (PS) estimates across Trials by Group
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<tr>
<td>Error</td>
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Fig. 15 Level of aspiration in card sorting task in depressed (D), nondepressed (P) and normal (N) groups.

Fig. 16 Level of aspiration in means-end problem solving task in depressed (D), nondepressed (P) and normal (N) groups.
**Interpretation:** Other research using the PS and LA variables (e.g., Diggory, 1966) typically has taken an average score across a number of trials to examine group differences. The repeated measure analyses of variance presented here were conducted to investigate the justifiability of following that precedent. As has been stated, the effect of Trials is consistent; both PS and LA estimates generally increase across trials. Although the effect of Group for both PS and LA was not as striking, it is clear from the Figures that the depressed, nondepressed psychiatric and normal medical groups conformed to a pattern within each trial. Depressed subjects consistently made the lowest estimates, whether PS or LA. Nondepressed psychiatric subjects tended to make intermediate estimates and normal medical subjects tended to make the highest estimates. The nondepressed psychiatric and normal medical groups showed some tendency to interchange their relative positions on trials while the depressed group was consistently lowest in any given trial. It was determined that averaging across the five trials to derive a single score for each subject did not violate the relationship among these subject groups for either the PS or LA estimates.