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The Influence of Cognitive Processing Style
on Cognitive Distortions in Clinical Depression

by

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A Thesis Submitted to the
Faculty of Graduate Studies and Research
in partial fulfillment of the requirements

for the degree of
Doctor of Philosophy

School of Psychology
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1988



Richard G. MacGillivray, Ottawa, Canada, 1988.

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Abstract

The theory of depression of Beck and his colleagues (Beck et al., 1979; Sacco and Beck, 1985; Beck, 1987) proposes some distinction in the manner in which information is processed, between depressed and nondepressed people. This hypothetical distinction depends on the activation of depressogenic schemata or beliefs which direct the cognitive processing of the depressed person to selectively process information consistent with the underlying beliefs or schemata. This model does not take into account in any systematic way the pre-depressed cognitive processing styles of people. Witkin and his colleagues (Witkin and Goodenough, 1981) have proposed a model of intraindividually consistent cognitive styles, in which a range of attentional, selection, recall and problem-solving strategies are used in characteristic ways by people of particular cognitive processing styles. It was hypothesized that the use of specific cognitive errors by clinically depressed women would reflect their stable ongoing cognitive style, as well as their current depressive state. More specifically, it was hypothesized that field dependent (FD) women would use more errors of personalization, overgeneralization and catastrophizing than field independent (FI) women, who would in turn use

more errors of selective abstraction than their FD counterparts. It was also predicted that the error of selective abstraction would be least frequently endorsed of all errors among FD women, but most frequently endorsed among FI women. Lastly, it was predicted that people with different cognitive styles would be sensitive to different depression-evoking events, and would make tend to make cognitive errors in different situations. Thirty depressed women were assessed using a diagnostic self-report inventory for depression, a cognitive style test, a depression severity inventory, two cognitive error questionnaires, a screening device for intelligence, and a scale of life events. Results suggest partial confirmation of hypotheses: depressed FD women made more errors generally than FI women, and the patterns within each cognitive style group were more homogeneous than predicted. Similar results were found when the effects of intelligence, negative life events, and depression severity were statistically controlled. Hypotheses about the relationship of cognitive style to perceived depression-causing events and situation-specificity of errors were not confirmed. It is concluded that the stable cognitive styles of women have a predictable relationship to the cognitive errors they use while depressed.

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Cognitive Styles and Distortions v.

Table of Contents

| | |
|---|-----|
| Abstract | 11 |
| Acknowledgements | iv |
| Table of Contents | v |
| List of Tables and Figures | vi |
| Introduction | 1 |
| Chapter One: Literature Review, Rationale and Hypotheses | 7 |
| Chapter Two: Method | 135 |
| Subjects | 136 |
| Materials | 138 |
| Procedure | 149 |
| Design | 152 |
| Chapter Three: Results | 157 |
| Chapter Four: Discussion | 203 |
| References | 222 |
| Appendix A: Raw Data | 259 |
| Appendix B: The Cognitive Error Questionnaire and scoring key | 263 |
| Appendix C: The Cognitive Bias Questionnaire and scoring key | 272 |
| Appendix D: The Inventory to Diagnose Depression and diagnostic criteria | 281 |
| Appendix E: The Life Experiences Survey | 291 |

| | |
|---|-----|
| Appendix F: Follow-Up Question (Part Two) to The Life Experiences Survey | 295 |
| Appendix G: The Beck Depression Inventory | 297 |
| Appendix H: Instruction Manual | 299 |
| Appendix I: Instructions to Independent Raters for Rating Patients' Causal Attributions for the Onset of their Depressive Episode | 305 |
| Appendix J: Informed Consent Form for Patients of the Royal Ottawa Hospital | 308 |
| Appendix K: Informed Consent Form for Patients of the Ottawa General Hospital | 311 |
| Appendix L: Approval of the Ethics Committee of the Royal Ottawa Hospital to Test Patients | 313 |
| Appendix M: Approval of the Ethics Committee of the Ottawa General Hospital to Test Patients | 315 |
| Appendix N: Correlation Matrix for All Dependent Measures and Covariates | 317 |

List of Tables and Figures

| | |
|---|-----|
| Table 1: Mean subject scores on nondependent measures for separate and combined cognitive style groups | 159 |
| Table 2: Cell means and standard deviations for CEQ error scale scores for separate and combined cognitive style groups | 162 |
| Table 3: Univariate F-tests for individual line segments on CEQ profile | 164 |
| Table 4: Univariate F values and significance levels for differences of FD and FI groups on the CEQ | 167 |
| Table 5: Tests of homogeneity of variance (Bartlett Box F) for univariate ANOVAs for FD-FI differences on the CEQ | 168 |
| Table 6: Bonferroni t values for planned comparisons between CEQ scaled scores, for the FI group | 172 |
| Table 7: Observed and adjusted CEQ means by cognitive style group and scale, with -LES as a covariate | 175 |
| Table 8: Univariate F-tests for individual line segments on CEQ profile, with -LES as a covariate | 181 |
| Table 9: Observed and adjusted CEQ means by cognitive style group and scale, with BDI as a covariate | 184 |
| Table 10: Univariate F-tests for individual line segments on CEQ profile, with BDI as a covariate | 188 |
| Table 11: Mean, standard deviation and standard error | |

Cognitive Styles and Distortions viii

| | |
|---|-----|
| values for SI and AC stories on the CBQ, for each cognitive style | 190 |
| Table 12: Observed and adjusted CEQ means by cognitive style group and scale, with PPVT(R)-L as a covariate | 194 |
| Table 13: Univariate F-tests for individual line segments on CEQ profile, with PRFT(R)-L standard scores as a covariate | 197 |
| Figure 1: Mean CEQ Scores for FD and FI groups | 163 |
| Figure 2: Adjusted Mean CEQ Scores for FD and FI groups, with -LES as Covariate | 177 |
| Figure 3: Adjusted Mean CEQ Scores for FD and FI groups, with BDI as Covariate | 185 |
| Figure 4: Adjusted Mean CEQ Scores for FD and FI groups, with PPVT(R)-L as Covariate | 195 |

Introduction

The theory of depression of Beck and his colleagues (Beck, Rush, Shaw and Emery, 1979; Sacco and Beck, 1985) presupposes some distinction in the manner with which information is processed, between depressed and non-depressed people. It has been argued by cognitive theory adherents that such processing differences are related specifically to underlying depressogenic belief structures (eg. Segal and Shaw, 1986; Guidano, 1984; Derry and Kuiper, 1981; Dobson, 1986). Some commentators have suggested that the formal cognitive processing strategies of depressed people are in fact no different than the typical biasing and/or distorting processing strategies of non-depressed individuals (Turk and Speers, 1983; Williams, 1985). Others argue that depressed people may not distort information to any remarkable degree. Proponents of the latter view typically suggest that depressed people may in fact distort information less than nondepressed people (Alloy and Abramson, 1979; Beidel and Turner, 1986; Coyne and Gotlib, 1983, 1986; Lewinsohn, Mischel, Chaplin and Barton, 1980; Nelson and Craighead, 1977; Wilkinson and Blackburn, 1981). Of course, such criticisms as the latter do not contradict the basic premise of a distinction in processing as such, between

depressed and nondepressed people.

Few of these views take into account the long-standing, typical manner- or cognitive style, as it will be referred to henceforth- in which people process information, regardless of whether or not they are depressed. Witkin and his colleagues (eg. Witkin and Goodenough, 1981) have assembled a large body of information to suggest that cognitive style- specifically, degree of field dependence- represents a robust, measurable phenomenon across not only perceptual, cognitive and personality domains, but also across situations and over time. The omission of cognitive style influences in the cognitive depression literature is surprising in light of recent research by Kingsland and others (e. g. Kingsland and Greene, 1984), which suggests at least a prima facie link between the field dependent cognitive style and depression. It is the more surprising in light of comments by Sundberg (1981) about the historical importance of the field dependence literature in assessment of inferential cognitive processing variables, and those by Williams (1984) about the relative lack of application of information processing research to the problem of cognition in depression.

One implication of the cognitive style concept for

cognitive distortion in depression lies in the potential influence of longstanding stylistic preferences, arising from the particular learning histories of different people, on the quality of information processing of depressed people. Such an interaction suggests the possibility that long term styles of information-processing affect the types of inferential and selection strategies used by depressed people while they are depressed, in ways which affect the cognitive experience of depression inherent in cognitive theories. If cognition is indeed a precursor to behavior and affect, as suggested by Beck and others (Sacco and Beck, 1985), then cognitive style variables like field dependence-independence may play an important role in the phenomenology and symptomatology of this clinical syndrome.

It is the goal of this thesis to examine the influence of cognitive style on the cognitive processing errors which have already demonstrated to bear some relationship to depression (Lefebvre, 1981; Krantz and Hammen, 1979; Beck et al., 1979). Specifically it will be hypothesized that the preexisting cognitive style of depressed individuals influences the kind and extent of errors made in dealing with new information. Such a view will be examined for its implications for Beck's cognitive

theory of depression. These implications include expanding the cognitive influences on depressogenic processing beyond Beck's (1987) notion of schema-driven, top-down control of depressive processing. A second implication of the cognitive style literature is that particular kinds of information may be more likely to activate the cognitive components of depression because of a processing preference (developed in light of the personality dimensions hypothesized for field dependent and field independent people (eg., Witkin, 1979)). While Beck (1987) has suggested a dichotomy of likely precipitating events for depression based on personality dimensions (that is, the sociotropic versus autonomous personality types), very little supportive data has been reported for this personality dimension, in contrast to the large supportive literature for personality differences correlated to cognitive style (Witkin and Goodenough, 1977).

The undertaking of these tasks implies no position on the relative depressogenesis of one cognitive style over another: only a truly longitudinal study of immense scale could render such a finding. By comparing depressed samples with both field dependent and field independent cognitive styles, and looking at specific processing errors, we may examine the hypothesis that there are

formal distinctions in information-processing, among depressed individuals. By examining a stable variable like field dependence, we attempt to substitute in an ex post facto sense a reliable inference of a longitudinally stable processing variable, through a testing procedure designed to minimize effects of depression severity, antidepressant medication, and diagnostic unreliability. To a limited extent, statistical analyses will be provided to assess the role of one potential confounder- depression severity- in addition to the methodological safeguards cited.

A few words are in order concerning the organization of the thesis. In the first chapter, a theoretical and empirical rationale for the study will be established. This rationale will cover several stages. First, the disorder in question will be reviewed, in terms of its diagnostic characteristics. Second, Beck's theory of depression will be described in general, followed by a specific and detailed review of literature pertaining to the role of cognitive processing distortions within this theory. The status of such research will be criticized, most strongly on the grounds that depressogenic processing has been assumed to be entirely influenced by active depressogenic schemata. Third, the Witkin theory of field

dependence- independence will be reviewed, with emphasis on the qualitative aspects of informational selection and processing, and associated personality variables. The hypothetical relationship of depression and cognitive style, and supportive data, will be reviewed. A hypothetical model for the relationship of cognitive style to cognitive distortions in depression will be presented, with arguments based upon the preceding review. Finally, this model will be cast into formal, testable hypotheses.

In the second chapter, a research design will be presented to test the hypotheses, with a review of proposed measures, along with details of the methodology.

Chapter three will present experimental results and analyses.

In chapter four, the results will be discussed in light of theoretical and empirical considerations mentioned earlier. Directions for future research will be proposed.

A reference section will follow next.

Finally, appendices including raw data, permission forms, ethics committee approval letters, copies of dependent and independent measures, and a copy of the instruction manual.

Cognitive Styles and Distortions 7

Chapter One

Literature Review, Rationale and Hypotheses

Major Depression: the Disorder of Interest

Major Depression: Diagnostic Issues

Research on the cognitive theories of depression has long been plagued by diagnostic confusion, problems in generalizability of research findings based on subclinical samples, and questionable instrument use. In the latter case, Coyne and Gotlib (1983) have criticized the use of the Beck Depression Inventory (BDI) (Beck, 1978), as a diagnostic measure to confirm the presence or absence of depression. The BDI is designed as a measure of severity of depressive symptoms, not a diagnostic test of the presence or absence of major depressive disorder.

Given these problems, one is seriously constrained about generalizations to clinical syndromes like depression, which have specific diagnostic criteria and present with distinctive clinical characteristics. Segal and Shaw (1986a), despite supporting the cognitive theory of Beck, essentially concurred with Coyne and Gotlib. These theorists have recommended use of diagnostic criteria from the Diagnostic and Statistical Manual of Mental Disorders, then in its third revision (DSM-III) (American Psychiatric Association (APA), 1980), for the purpose of diagnosis of research subjects.

In a similar vein, Shaw (1985) has suggested that

disorders incorporating depressive symptoms be clearly distinguished from depression, such that the label "depression" itself be used synonymously with the diagnostic category of major depressive disorder, as defined in the APA manual.

From a different vantage point, Williams (1984) has discussed the empirical support for cognitive theories of depression with attention to cognition-mood relationships. In particular, he cautioned against generalizing from the results of mood-induction procedures, in which subclinical samples are induced to experience dysphoria through manipulations of cognitive content, in support of cognitive theories concerning clinically depressed people. Such procedures have relevance to precipitation theories of depression, but have little consequence for major cognitive theories of depression. In contrast, Beck's theory (Beck et al., 1979) is explicitly a "vulnerability" theory- that is, one which proposes that a pre-existing cognitive component increases the likelihood that a given individual will develop the clinical syndrome. Supportive data from mood-induction procedures (eg. Velten, 1968; Brewer, Doughtie and Lubin, 1980; Teasdale and Fogarty, 1979) are questionably applied to such a theory, again because the transient dysphoria produced by mood-induction

procedures can hardly be equated with the full-fledged clinical syndrome of depression. Like Coyne and Gotlib (1983), and Segal and Shaw (1986a), Williams reached a similar conclusion: it is essential to distinguish subclinical dysphoria from major depression, to avoid diagnostic confusion and limited generalizability.

In keeping with this conclusion, and to maximize the clarity, generalizability and utility of data produced, the present study is concerned with a single affective disorder as defined by the DSM-III: major depression (single or recurrent episodes).¹ Specifically excluded are bipolar affective disorders and affective disorders complicated by psychosis. The selection of this disorder is consistent with a notion of depression as a unidimensional phenomenon (Rush and Giles, 1982), one which falls within the domain of the cognitive theory and therapy of depression (Beck et al., 1979). This theory assumes, if not unitary influences on the manifestation of depressive

¹ Because this study was undertaken prior to publication of the most recent revision of the Diagnostic and Statistical Manual (DSM-III(R)) (American Psychiatric Association), terminology from the prior system has been retained, including the use of the term "affective" disorder (as opposed to the more recent appellation "mood" disorder). However, the syndromic characteristics of major depressive episode remain virtually identical, and hence no constraints upon generalizability, clarity, or utility are suggested as a result of the recent revision. These characteristics are reported in the text.

symptomatology, at least a single etiological source for depression (Craighead et al., 1984). The exclusion of bipolar disorders is undertaken with the recognition that no definitive qualitative distinction between the depressive syndromes of unipolar and bipolar disorders can be justified as yet (Smith and Winokur, 1984), despite sex-ratio (Hirschfeld and Cross, 1982), genetic (Mendlewicz, 1985) and morbidity-risk (Smith and Winokur, 1984) differences in the incidence of unipolar and bipolar disorders. The distinction and resulting emphasis on major depression is maintained in the present study in part because the cognitive theory of depression deals primarily with unipolar depression, but more importantly because the issue of bipolar disorders is, for purposes of this study, beside the point.

The same rationale applies to psychosis in depression. Given the explicitly cognitive nature of both the Beck theory and Witkin's cognitive style theory, the inclusion of formal thought disorders or cognitive distortions of delusional severity would incur both methodological and theoretical confounders of little practical value. This exclusionary strategy is consistent with the contraindication of therapy based on cognitive theory for individuals suffering from psychotic depressive

conditions (Rush, 1982).

This study is concerned with a syndrome of which the defining characteristic is a degree of disturbance of mood, the predominant features of which include dysphoria, apathy and anhedonia (American Psychiatric Association, 1980, 1987). Essential features include several of the following: loss of appetite, sleep disorders, atypical levels of psychomotor activity, decreased sexual interest, loss of concentration, and cognitions of self-reproach, worthlessness, guilt, and suicidal intent.

Several of the symptoms listed are suggestive of subclassifications of major depressive disorders, most notably melancholia² and endogenous depression. Given the inconsistent empirical (Braddock, 1986; Zimmerman et al., 1986a) construct (Abou-Saleh et al. 1986; American Psychiatric Association, 1980; Braddock, 1986; Carroll et al., 1981), morbidity-risk (Zimmerman et al., 1986a) and treatment-outcome (Rush, 1982) bases for the endogenous subclassification, and the still unclear nature of the roles of biochemical theories (Braddock, 1986; McNeal and Cimboric, 1986) and diagnostic criteria (Carroll et al.,

² Note that the subclassification of melancholia has been revised to a degree in the most recent Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 1987).

1982; Braddock, 1986) specific to the melancholia distinction, it is not the intent of the present proposal to consider these subclassifications as distinct entities. For the purposes of this study, unipolar depression will be considered a homogeneous clinical entity.

The Beck Theory of Depression

Beck's theory of depression has been described as one of the two major cognitive models of depression, one which has been implicated in the spread of the "cognitive revolution" (p.472) to the study of psychopathology (Coyne and Gotlib, 1983). The importance of this theory, and its impact upon the evolution of cognitive conceptualizations of depression, is evident in the growing empirical support for components of the theory (eg., Dobson and Shaw, 1986), and its central rôle in the evolving notion of cognitive diathesis stress in depression (Alloy, Clements and Kolden, 1985). Perhaps most importantly, for the purposes of the present study, is the Beck theory's explicit use of a structural metaphor for cognition (Coyne and Gotlib, 1983; Beck et al., 1979; Beck, 1987). This model allows empirical investigation of components of the model with some degree of specificity. As it will be seen, empirical support for some aspects and components of the theory is stronger and more complete than for others.

The general focus of the Beck theory of depression (Beck, 1969; Beck, 1976; Beck et al., 1979; Sacco and Beck, 1985; Beck, 1987) has been on the role of thought and mental activity in the cause, precipitation and maintenance of depression. Beck et al., (1979) specified three components to the cognitive model of depression: the depressogenic underlying schema(ta) of the depressed person, the resulting, covert self-statements or cognitive products; and the distorted cognitive processes which provide a mediational link between the two. The depressed person is hypothesized to have unreasonable, extreme or erroneous beliefs about him or herself. These beliefs or assumptions are specific to depression, and characteristically include conditions of self-worth, happiness, and fulfillment. These conditions, if unmet, are proposed to activate the relevant schema(ta), which then become(s) hypervalent in the overall information processing of the depressed individual (Beck, 1987). These schemata or beliefs represent the sum of prior relevant learning, as evident from the structure of knowledge in memory (Dobson and Shaw, 1987; Williams, 1985). The specificity of such beliefs and assumptions to depression, their relationship to the structure of knowledge in memory, and the explicit role of these assumptions in the larger structure of

cognition distinguishes these from the similar though more general role of beliefs in psychopathology, suggested by Ellis (eg, 1987).

These beliefs or assumptions lead to faulty inferences about environmental stimuli (Merluzzi, Rudy and Glass, 1981), which lead to negative, ruminative thoughts about the self (Beck et al., 1979). What distinguishes these thoughts from the typical ongoing "stream of consciousness" (Beck, Brown, Steer, Edelson, and Riskind, 1987, p.179) of nondepressed individuals is their concern with themes of deprivation, defeat, and deficiency (Beck, 1976). This preoccupation is proposed to conform to what the authors have called the "cognitive triad": (Beck et al., 1979, p. 11) a descriptive interrelationship between derogatory thoughts about one's self, reflections on the aversiveness of one's interactions with other people and situations, and pessimistic predictions about the future.

Because of the importance of Beck's theory to this study, each component of this theoretical model will now be considered in some detail, with supportive data: cognitive products, schemata and cognitive processes. The choice of this order of presentation differs from that of some other authors (eg., Segal and Shaw, 1986a); however,

because of the focus on process issues, and structural correlates in the ensuing study, this order of presentation is adopted for convenience (and, incidentally, parallels that of Beck et al., 1979). The separation of these components may have more heuristic than empirical value, as might become apparent from the ensuing discussion.

Cognitive products

According to the Beck theory and its adherents, the affective, behavioral, and motivational symptoms of depression are manifestations of the stream of consciousness or "automatic thoughts" of the depressed individual (Beck et al., 1979; Hollon and Kriss, 1984). These automatic thoughts are perhaps most accurately known as cognitive products, since these are the products of the interplay between hypothetical cognitive processes and structures. These automatic thoughts are proposed to encompass the phenomenology of depression for the depressed person, and they follow the hypothetical patterns suggested by the cognitive triad (Beck et al., 1979). The cognitive triad describes typical thinking patterns of depressed people. The first component refers to a negative view of oneself, a view which incorporates notions of personal defectiveness, inadequacy, or deprivation. The

second component refers to a view of one's life experience as aversive, overwhelming, or uncontrollable. The third component refers to the view of one's situation as hopeless, unlikely to change or improve. In combination, these thinking patterns produce a preoccupation with themes of deprivation and loss, which lead to the emotion of depression. Combined with this depressive emotion are pessimism and subjective self-statements of helplessness which, by robbing one of motivation, lead to decrements in one's repertoire of behaviors likely to lead to pleasure, fulfillment, or other non-depressive results.

There is considerable evidence for differences between the self-statements of depressed people and those of nondepressed individuals. Dobson and Shaw (1986), for example, compared the frequency of depressive self-statements for individuals during and following a depressive episode, as well as comparing both to a normal control sample. They used the Automatic Thoughts Questionnaire (ATQ) (Hollon and Kendall 1980), a measure of frequency and degree of belief of negative self-statements, as the dependent measure for frequency of depressive automatic thoughts. As predicted, they found that people's scores on the ATQ were significantly higher when they were depressed than they were following re-

mission; moreover, ATQ scores for depressed patients in remission resembled those of normal controls. Similarly, Eaves and Rush (1984) found that the ATQ distinguished depressed patients from nondepressed controls. The same authors also found that ATQ scores dropped significantly—indeed, to normal-like levels—between mid-depressive episode and two weeks post remission, for a clinically depressed sample. Hollon, Kendall and Lumry (1986) also reported the same phenomenon with remitted clinically depressed patients: a drop of ATQ scores to levels similar to those of nondepressed people. In a study of comparative efficacy of group cognitive-behavioral treatments for depression, Jarrett and Nelson (1987) found significant decreases in ATQ scores concurrent with clinical improvement, as measured by decreases in BDI scores.

Rush, Weissenburger and Eaves (1986) examined patterns of scores on a variety of cognitive measures for recurrently depressed individuals. They found that ATQ scores reported by people while remitted showed no significant correlation with symptom severity once a person became depressed again. Similarly, Rholes, Riskind and Neville (1985) found that patients' reported cognitions of loss at a given time were not likely to predict depressive symptoms at a later time. Nor are elevations in

the ATQ themselves predictive of likelihood of therapeutic success (Jarrett and Nelson, 1987). These results suggest that negative automatic thoughts, while elevated during depression, are transient, state-dependent phenomena which occur when one is depressed but which tend to fluctuate with mood and clinical state. Such negative thoughts would seem to be present only when one is depressed, and absent when one is not.

Consistent with these results, Missel and Sommer (1983), in a study comparing depressed inpatients to nondepressed controls utilizing success and failure manipulations, found significant correlations between number of negative self-statements and level of depression. Dobson and Shaw (1987) found that depressed people rate depressed words more frequently than nondepressed words as self referent, using a self-referent encoding task, and that they rated more depressive words than did nondepressed people. In a general review of the literature, Segal and Shaw (1986a) cited ten studies (Friedman, 1964; Loeb, Beck and Diggory (1971); Lunghi (1977); Abramson, Garber, Edwards and Seligman (1978); Lobitz and Post (1979); Golin, Terell, Weitz and Drost (1979); Lewinsohn, Mischel, Chaplin and Barton (1980); Space and Cromwell (1980); Norman, Miller and Klee (1983);

and Giles and Shaw (1983)) in which depressed people were found to show more negative performance expectations and self evaluations than normal or psychiatric controls. Wilkinson and Blackburn (1983) reported significant differences between currently-depressed and remitted-depressed patients on three cognitive product tests, including the Hopelessness Scale (HS) (Beck and Weissman, 1974) a test explicitly related to the pessimistic quality of the cognitive triad.

It is not enough that the empirical evidence indicates that depressed people have different thoughts than nondepressed people. A crucial assumption of cognitive theories, especially that of Beck, is that particular types of cognitive products are specific to depression, as opposed to other emotional disorders (Beck et al., 1987). Kuiper (1985) and Beck (1987) have suggested that the qualitative distinction between depressive cognitive products and anxiety-provoking cognitive products rests in the emphasis of depressive thinking on loss as a definite or already-existing condition, versus the emphasis of anxiety-concurrent thinking on the threat or probability of loss.

Beck et al. (1987) provided evidence in favor of this position, in a comparison of depressed and anxious

psychiatric patients' scores on the Cognitions Checklist (Anxiety and Depression Scales). The anxiety scale items measure future-oriented, uncertain cognitive products, whereas the depression scale items measure certain, past-orientated cognitive products. Anxious patients were found to score higher on the anxiety scale items than depressed scale items; the reverse was true for depressed patients. Dobson (1985) found that anticipatory situations were related to anxiety for anxious female university students, whereas perceived social loss was more related to depression: this result is also consistent with the specificity hypothesis.

Rholes, Riskind and Neville (1985) reported evidence for a relationship between perceived loss and depression, but not for a relationship between threat of loss and depression, for depressed subjects. They did not, however, find as clear a delineation for anxiety and loss, for anxious subjects, since loss cognitions are not uncommon in anxiety along with threat of loss cognitions. However, the number of loss cognitions was not significantly correlated with anxiety, again in support of the specificity hypothesis.

Clark (1986) reported on two studies with similar implications to those of Rholes. He devised the

Distressing Thoughts Questionnaire (DTQ) to test several parameters (including frequency, worry, disapproval, et cetera) of anxious and depressive thoughts and images among a student sample. Partial correlation analyses showed a small but significant partial correlation between DTQ(A) scores and scores on the BDI, with DTQ(D) scores partialled out ($r=.18$, $p<.033$). A larger and highly significant partial correlation between DTQ(D) and the BDI, with DTQ(A) partialled out ($r=.39$, $p<.0002$) suggests a stronger relationship between depressed automatic thoughts and depression severity, than between anxious thoughts and depression severity. Using a multivariate step-down analysis, frequency of depressive thoughts and depressive-disapproval thoughts were found to be the only significant predictors of depressive mood (although anxious disapproval approached significance). In a second study, Clark reported stronger correlations between DTQ(A) scores and a measure of anxious emotion, than between DTQ(D) and the same measure. DTQ(D) scores were found to correlate more strongly with the measure of depressed emotion than to the measure of anxious emotion, although both correlations were significant. These results were presented as tentative support for the specificity hypothesis, although this interpretation must be tempered in

the context of this study's reliance on a subclinical, university-student sample.

It should be noted that in all of the above cases, the issue of specificity has been addressed in the context of anxiety disorders. The issue of specificity is not, of course, settled by demonstrating a distinction between depressive cognitive products and those of a single, alternative disorder, ignoring the scores of other psychiatric diagnoses possible besides anxiety disorder.

Of relevance to the more general case is Dobson and Shaw's (1986) comparison of depressed patients with normal and general psychiatric controls. These authors found distinctions on both cognitive product and schematic measures between depressed and other psychiatric patients. Depressed people showed significantly higher scores on the ATQ, as well as on a measure of depressogenic attitudes (the Dysfunctional Attitudes Scale (Weissman and Beck, 1978)). These results provides further evidence for specificity of depressive cognitive products to depressed patients, although the authors provided little description of the characteristics of the psychiatric control group.

In sum, the data reviewed are reasonably consistent: not only do depressed people seem to generate different cognitive products than nondepressed individuals, but they

also generate cognitive products which are specific to depression. Such results are supportive of the product component of the cognitive model of depression presented by Beck and his colleagues. Obviously, further study is necessary to investigate the issue of specificity in the broader context of psychiatric disorders in general.

As noted earlier, the disorder of depression should not be confused with transient changes in mood produced by mood-induction procedures (Williams, 1985). However, the results of such procedures are not irrelevant to cognitive theories of depression. For instance, Velten (1968) found that subjects who were asked to reiterate a series of negative self statements (including statements of discouragement, self-criticism, and unhappiness) reported change in self-reported mood towards dysphoria, and showed differences in demeanour following mood induction, according to independent raters. Teasdale and Fogarty (1979) used a similar mood induction procedure, following which they asked normal university students to associate pleasant and unpleasant autobiographical memories to stimulus words. Subjects showed not only shifts in mood towards dysphoria, but increases in latency time for pleasant memories, compared to unpleasant memories, following the mood induction. The authors suggested that

mood and cognition showed a reciprocal pattern of interaction, once the mood induction procedure had taken place. Brewer (1980) used a procedure whereby nondepressed subjects were asked to recall unhappy memories from their own past; again, a mean shift in mood towards dysphoria was noted (as measured by self-report inventories).

These findings provide some evidence of face validity for the relationship between negative thought content and mood at a subclinical level. If short of clinical significance, a directional link between negative cognitive products and subclinical depressive affect suggests a degree of plausibility to the cognitive thesis, in general.

The cognitive product data cited seem to indicate that, consistent with the Beck model, there is some difference between what depressed people think, compared to what nondepressed people think, at least while the former are actively depressed. Beyond the mood-induction data, there is little to indicate causality in the relationship between thinking and mood. Beck et al. (1979) make a logical case for the relationship of automatic thoughts and behavior, based on the role of pessimism in reducing rates of previously reinforced behaviors. Beck (1976) also makes a logical case for the relationship of

automatic thoughts and mood, based on the notion that the loss-content of such thoughts evoke the typical emotion of loss. Because of the hypothetical concurrence of depressotypic automatic thoughts and the emotions and behaviors which they evoke, there is little to establish whether depressed cognitions are causal, symptomatic, or epiphenomenal in the depressive response. Little empirical progress has been made in the solution of this problem, beyond the use of mood-induction procedures. Causality has been more thoroughly studied within the realm of hypothetical knowledge structures, or schemata. It is to that level of the cognitive model that this discussion will now turn.

Schemata

Definitional issues. Schemata have been described and defined by numerous theorists. An appropriate starting place in this discussion would seem to be the achievement of some definitional consensus, to avoid confusion in what can be a confusing issue.

Surprisingly, Beck (for example, Beck et al., 1979; Sacco and Beck, 1985) is generally not very elaborate in defining schemata. In a manner reminiscent of Ellis (for example, Ellis, 1987), Beck et al. (1979) treat schemata as functionally equivalent to beliefs, which seem to take

the form of pervasive, underlying verbal propositions which give conceptual coherence to cognitive experience. Typically these beliefs take a "contractual" form (Olinger, Kuiper and Shaw, 1987, p. 26); in the case of depression, these are often conditions of self-worth which, if met, tend not to lead to depression. If events fail to fulfill a condition of self-worth, however, the implications for the individual is that self worth has been lost or otherwise diminished. In the sense of presenting a condition of worth which may or may not be met, these beliefs are contractual. The conditionality, moreover, seems to relate to a core belief that one is, in some essential respect, lacking in self-worth (Beck, 1987).

Williams (1984) has elaborated Beck's view, using the structure-as-processing-guide approach: one seeks, or is more likely to process, information consistent with stored informational structures, in order to allow meaningful interpretation and integration of new information. Williams's view seems reflective of several of Beck's colleagues and co-authors (for example, Segal and Shaw, 1986a; 1986b; Dobson and Shaw, 1987).

This view of schemata is generally consistent with the notions of schemata proposed by others in experimental

and applied psychology. Most theorists seem to agree that schemata in general, and depressive schemata specifically, have something to do with knowledge in memory. As early as 1932, Bartlett had coined the term "schema" to describe an organization of all of one's past experiences in memory. More recently, Turk and Speers (1983) defined schemata as a set of constructs which include all of one's knowledge at a given time. Derry and Kuiper (1981) defined a schema as a heuristically-organized body of information in long-term memory which (functionally speaking) interacts with new information in short term memory to organize and facilitate storage of new information. In like manner, Merluzzi, Rudy and Glass (1981) stressed the organizational set structure of information, and the functional role of such sets to guide new processing. Crane and Markus (1982) define the schema as a central unit in the information-processing system, which represents both past knowledge and processing, and which facilitates the processing of new stimuli consistent with that unit. Ingram (1984) defined schemata as a network of memories which (again functionally speaking) are activated by information relevant to that network. The subsequent likelihood of processing a given subset of new information is determined, in Ingram's view, by the level of activ-

ation of that network: a level influenced by the salience of the new information.

Several theorists, while maintaining the memory component of such views, have emphasized the role of schemata for their hypothetical formal processing characteristics. For instance, Leventhal and Nerenz (1983) defined the schema as a template: given the interaction of prior and new knowledge, the role of schema is to ensure consistency of conceptual and perceptual thought. This approach recalls George Kelly (1955), whose construct theory of personality was built on the assumption that the role of constructs (a term conceptually interchangeable with schemata) is to ensure predictability of new information. According to Kelly, constructs serve to organize and classify incoming information according to a hierarchy of dichotomous descriptors. The hierarchy itself logically diverges from more central predictive schemata to more peripheral ones. In the process, subordination of past experience into the system is implicit; the resulting hierarchical system ideally allows for both categorical simplicity in informational storage, and efficiency of prediction. Safran, Vallis, Segal and Shaw (1986) emphasized the importance of the hierarchical organization of core processes in their approach, and variation of

processing along the continuum from centrality to peripherality. Such a view recalls Mahoney (1974) and others, as well as Kelly, in specifying an executive role for higher cognitive processes relative to lower processes. The direction of such control reflects the centrality of certain structures in one's organization of the self. In this respect the views of both Safran and colleagues, as well as Mahoney, resemble those of Guidano and Liotti (1983). While structural knowledge acts as a processing guide in such views, the functional organization of such knowledge is preeminent. Processing characteristics, as much or more than informational characteristics, are fundamental to such conceptualizations.

Mahoney (1974) and MacDonald and Kuiper (1985) have stressed the range of impact of schemata, at the pre-recognition level (in the former case) and pre-attentional level (in the latter). Williams (1984) discussed the role of schemata at higher, more complex cognitive levels, in particular in the area of decision-making.

Schemata, then, are generally seen as incorporating previously acquired information in structural form, and/or typical patterns of acquisition or transformation of information. These structures and patterns fulfill a general role of enhancing (if not creating) consistency in

the ontogeny of individual knowledge, across the range of cognitive processes available to the individual.

Assuming that schemata exist, theorists have addressed the question: why? Assuming that cognitive structures and processes follow the same theoretical rules of selection as other behavioral and biophysiological characteristics of organisms (cf. Darwin, 1859; Skinner, 1984; Beck, 1987), there must be some reason(s) why such structuring of information might be selected by environmental contingencies.

Ironically, one of the most concise arguments for why a schema might develop comes from Skinner (1974). Skinner has not discussed the concept of schema as schema; however, his concept of rules in part overlaps in function with that of schema, to the extent that covert verbal rules direct the person to aspects of stimulus display and enhance the probability of occurrence of subsets of overt behavior subsequent to self-directed exposure to relevant contingencies. Rules make behavior more efficient; hence the rules persist. The same argument might easily be applied to schemata.

Still on the issue of why schema might exist, Kelly (1955) has argued that constructs are necessary for the individual to make sense out of the hopelessly undiffer-

entiated multiplicity of stimuli impinging on an individual from birth. One must attend to a subset of reality; constructs allow prediction, and prediction allows survival in a complex world. Guidano and Liotti (1983) have suggested that schematic or core processes are essential to the cognitive organization of the individual, an organization that is in itself essential over and above the content of the organization. Again the emphasis is on the necessity of making sense of the world, and the implicit danger in not being able to do so. Schemata not only make behavior more efficient, as in the Skinnerian sense, but they enhance the likelihood of survival. Beck (1987) has suggested that the depressive response, with its hypothetically schematic base, is likely to have survived because of its evolutionary enhancement of the survival of the human species, in situations of defeat or futile depletion of energy. Species members that do not cease activities which endanger them or seriously deplete their resources are less likely to produce offspring, nor to ensure the survival of such futile behaviors. Depressive schemata may have evolved to enhance the behavior of disengagement from futile or dangerous activities, in Beck's view.

In most cognitive theories, including Beck's, the

point at which structure stops and process starts is rather vague. This state of affairs should not be surprising, since schemata are virtually always inferred from patterns of processing. In the discussion to follow, a distinction is made between schemata as strictly structures, or organizations of knowledge in memory, and the processing characteristics which define them. This distinction is undertaken mainly for the sake of clarity, as well as convenience. In the section to follow, the processes which define schemata, as well as those which are hypothesized to be subordinate to them, will be discussed. (This approach may have the effect of contaminating the discussion of processes with that of schemata; such an approach seems more appropriate than the converse, since the topic of study is the role of processes and their implications for schematic theory.)

In virtually all of the cognitive formulations of depression, there is a clear assumption that the structure of knowledge in memory somehow encompasses themes or patterns which are conducive to depression (Beck et al., 1979; Beck, 1987; Alloy, Clements and Kolden, 1985; Williams, 1985; Ingram, 1984; Coyne and Gotlib, 1983, 1986; Segal and Shaw, 1986; Eaves and Rush, 1984; Dobson and Shaw, 1986). In a few cognitive formulations, the

enduring nature of these cognitive structures has been questioned (for instance, Lewinsohn, Hoberman, Teri and Hautzinger, 1985; Hoberman and Lewinsohn, 1985). Lewinsohn and his colleagues have argued that the organization of knowledge, and the processes which betray this organization, undergo a metamorphosis in depression. In this metamorphosis, customary information-processing strategies are shifted to encompass self-defeating thinking, away from a typically self-enhancing orientation.

Lewinsohn's position (Lewinsohn, et al. 1985; Hoberman and Lewinsohn, 1985) is not typical of cognitive models, however. In the other formulations noted, it is assumed that the structural organization of depression-related knowledge in memory exists as a permanent part of the cognitive organization of the individual. While the person is not depressed, this organization is conceived of as latent, or inactive. When the right kind of information occurs- that which matches the content of the particular structure (Ingram, 1984), or which fails to fit the contractual conditions of the schema(ta) (Ollinger et al., 1987; Beck et al., 1979), or which confirms the predictive function of depressogenic beliefs about the self (Shustack and West, 1985)- the particular structure becomes activated. When this structure becomes activated, it in turn

acts upon the subsequent information-processing strategies of the individual in a way which leads to depression. How it acts upon information-processing will be discussed in the following section. That it does so, if it does, suggests that something about the cognitive organization of the would-be depressed individual makes him or her vulnerable to depression, given the right kind of environmental stressor. For Beck's theory, then, like other cognitive diathesis-stress models (Alloy et al., 1985), depressogenic schemata are relatively permanent unless something specific happens to change them. For Lewinsohn and colleagues, depressive schemata are transitory structures, formed in response to changing events and behaviors, and discarded in the same flux of environmental and personal variables.

The empirical status of schemata in depression. There have been numerous efforts to empirically confirm the presence of depressogenic cognitive structures. Many of these have had disappointing results, from the cognitive perspective. Lewinsohn et al. (1981), for example, found no predictive relationship whatsoever between several cognitive measures (although primarily product measures) and subsequent depression, for a very large sample of never-depressed subjects, over a one-year interval. As

Segal and Shaw (1986) have pointed out, Lewinsohn's failure to include a measure of life events robs the study of much of its potential impact, since many subjects with a predisposition to depression but no eliciting event may have been included in the nondepressed comparison group.

The Dysfunctional Attitude Scale, or DAS (Weissman and Beck, 1978), has been used in a number of studies to test the relationship of hypothetical schemata and depressive cognitive products and depressive symptoms. The DAS is composed of a series of attitude statements which the test-taker endorses on a 7-point scale. These attitudes are hypothesized by the authors to reflect the presence of dysfunctional beliefs which give thematic coherence to depressive cognitive products. The authors specified a clear theoretical relationship between dysfunctional attitudes and schemata: indeed, they stated that such attitudes "act as schemas by which the individual's world is construed... The beliefs are unspoken, abstract regulations..." (p.8) In its conception, the DAS was literally seen as an instrument for measuring schemata.

Studies using the DAS have not provided the kind of empirical support for the Beck model presumably envisaged by the authors. Dobson and Shaw (1986), cited earlier,

measured DAS scores in a group of patients both during and following a depressive episode, and contrasted these to scores produced by normal controls. In fact, these authors found that DAS scores did not drop significantly from episode to remission, consistent with the Beck model. However, the residual dysphoria of remitted depressed patients could have accounted for the above-normal DAS scores of the remitted group (although the still-mild elevation of BDI scores did not prevent ATQ scores from dropping significantly from episode to remission, also consistent with the Beck theory).

Hamilton and Abramson (1983) also examined the effects of depression and subsequent remission on DAS scores, in a study comparing depressed patients, psychiatric controls and normal controls. They found a significant drop in DAS scores from depression to remission for depressed patients, so much so that remitted depressed patients resembled never-depressed controls on this measure. These results seem to contradict the assumption that DAS scores represent stable aspects of cognitive organization; alternatively, the same results might indicate that the DAS does not get at such structures, assuming they do exist. Moreover, Hamilton and Abramson found that approximately half of the depressed patients

recorded "normal" (that is, nondepressed-like) elevations on the DAS while depressed. This finding suggests that either some depressed patients do not have depressive schemata, contrary to the Beck theory, or else that the DAS is not exhaustive of possible depressogenic assumptions.

Simons, Garfield and Murphy (1984) also found that DAS scores fell to normal levels at remission, for clinically depressed individuals. Particularly remarkable about their study was the apparent improvement on hypothetically stable cognitive indices of depression vulnerability, following pharmacological treatment alone.

Hollon, Kendall and Lumry (1986) found a similar result with a clinically depressed sample: a drop in DAS scores from depressed state to remission, with a remission level similar to that of normal controls. Hollon and his colleagues also found that scores on the DAS, unlike those on the ATQ, did not distinguish a clinically depressed sample from bipolar, substance abuse, and general psychiatric controls. The latter finding casts some doubt on the specificity of the DAS, as well as its stability.

Hamilton and Abramson (1983) also examined changes in Attributional Styles Questionnaire (Peterson, Semmel, Von Baeyer, Abramson, Metalsky, and Seligman, 1982) responses

for the same groups. The ASQ measures self-statements (cognitive products) which are hypothetically derived through biases in attribution-processes. The study of attributional bias is based on a related cognitive model of depression, the revised learned helplessness model (see Alloy, 1985). Because of explicit overlap with cognitive triad issues like self-blame and inferred processing consistency, this model is often associated with the Beck model (see Williams, 1985). Since attributional style reflects hypothetically stable underlying causal theories of the individual, it has been studied closely in the context of schematic issues.

Hamilton and Abramson (1983) found essentially the same results for the ASQ as the DAS: a return to normal levels at remission, contrary to the predictions related to the Beck theory.

Rush, Weissenburger, and Eaves (1986) found that ASQ scores at remission were not significantly related to subsequent depressive symptomatology, for formerly clinically-depressed patients.

Hargreaves (1982), however, compared ASQ scores for a currently depressed sample to those for a group of normal controls, and found no difference. This result casts some doubt on the ASQ itself, if not the parent theory, and may

temper the critical nature of the findings of Hamilton and Abramson's (1983) and Rush et al. (1986), for Beck's theory.

Not all of the data based upon the DAS has failed to support the hypothetically stable role of dysfunctional beliefs in depression. Eaves and Rush (1984), cited earlier, found that while ATQ scores fell significantly from depressive episode to remission, DAS scores did not, for a sample of clinically depressed individuals. Weissman and Beck (1978) presented data supporting a role for dysfunctional attitudes in predicting depression, using a subclinical sample. Using a cross-lagged design, they compared the degree to which depressive symptom level (measured by the BDI (Beck, 1978)) predicted DAS scores after an interval of eight weeks, to the degree to which DAS scores predicted symptom level, using the same interval. They found that DAS scores predicted BDI scores better than vice versa, although the difference only approached significance at the $p < .05$ level.

Rush et al. (1986) examined the predictive role of DAS and ATQ scores (along with ASQ scores, cited above) in predicting subsequent levels of depressive symptomatology, for remitted clinically depressed people. They found that only DAS scores bore a near-significant predictive

relationship of this kind ($r=.32$, $p=.08$), and that no other cognitive measure added to the predictive power of the DAS. Similarly, Norman, Miller, and Kleitner (1987) found that increased elevations on the DAS were predictive of more severe (and melancholia-like) depression, as well as higher frequency of readmission, among a sample of hypothetically endogenous and reactive depressed psychiatric patients.

Ollinger et al. (1987) criticized many of the DAS-related studies on the basis of the failure of these to take into account the specific nature of life events necessary to activate a given person's depressive schema. Depressive symptoms only result when people who are vulnerable in a certain way, cognitively, encounter information specific to that vulnerability, according to the Beck theory.

To investigate this hypothesis, Ollinger and her colleagues (Ollinger et al., 1987) devised the DAS-CC, or Contractual Condition scale. The DAS-CC measures whether or not individuals have encountered life events which fulfill the contractual condition of the DAS: that is, life events which somehow fail to live up to the conditions or prescriptions for happiness and self acceptance encompassed by the DAS. They predicted that only indivi-

duals who scored high on the contractual condition scale would have an increased probability of depression, and that people with low DAS scores would be unlikely to become depressed even if confronted with environmental conditions which lead to depression among their high-DAS counterparts. In a multiple regression analysis, they found both DAS and DAS-CC scores significantly predictive of subsequent depressive symptoms, and a moderating effect due to the interaction of DAS and DAS-CC. In addition, they found that stressful life events made little impact on depressive symptomatology for low DAS scorers, and considerably more impact on higher DAS scorers. These results support the notion that the DAS provides an index of vulnerability, and that the relationship between life events and dysfunctional cognitions may be more specific than that suggested by studies which examine only cognitive structures or only negative life events. (Similar results were found in a second study using the Life Experiences Survey (Sarason, Johnson and Siegal, 1978), instead of the DAS-CC). This study did not involve a clinically depressed sample, however, so generalizability to clinically depressed individuals is severely limited.

Not all of the studies involving the ASQ have failed to support the schematic model, either. Using a method-

ology similar to Weissman and Beck (1978), Golin (1981) found that a depressive attributional style predicted depressive symptoms following an interval, but that the reverse did not happen. These data provide some tenuous support for the pre-existent schema view, from the revised learned helplessness view.

Several studies have investigated issues related to stability of hypothetical depressive schemata, using other strategies besides monitoring of questionnaire results. Gotlib and his colleagues (Gotlib and McCann, 1984; Gotlib and Cane, 1987) used a variation on the Stroop task to investigate the relative impact of depression on response latencies to depressive-type words versus neutral words. The nature of the Stroop task involved asking depressive college students (Gotlib and McCann, 1984) and depressed psychiatric patients (Gotlib and Cane, 1987) to respond by stating the ink color of each of a series of words presented tachistoscopically. It was surmised that depressed individuals would respond more slowly only when the presented word was relevant to depressive schematic content. In both studies, this hypothesis was confirmed.

Gotlib and Cane (1987) also retested depressed psychiatric patients at remission and found that group differences (depressed versus nondepressed) had vanished.

The authors reasoned that if this task indeed measures the effect of depressive schemata, then the evidence suggests that schema-driven cognitive functioning is only operative during depression. This conclusion casts further doubt on the existence of depressogenic cognitive structures, between depressive episodes.

A similar pattern was reported by Dobson and Shaw (1987), using a self-referent encoding task. Depressed psychiatric patients reliably endorsed more negative self-referent adjectives than nondepressed controls; this difference vanished when the same patients remitted. Recall and reaction time measures also failed to distinguish control and psychiatric groups. Dobson and Shaw concluded (based in particular on the recall and reaction time data) that the task was perhaps more likely to blame than the theory. They suggested that self-reference endorsements probably reflected cognitive products than schematic content.

The last three studies may be questioned on a basis not considered by the authors. Clinical depression is a serious psychological disorder, with potentially catastrophic impact on all aspects of a person's life. One may question whether a list of adjectives on a machine in a psychology laboratory can be legitimately construed as

somehow tapping into the network of potentially self-denigrating, hopeless, helpless beliefs of a vulnerable person, while that person is not depressed. Researchers are constrained from more convincing efforts to assess latent schemata, if they do exist, by obvious ethical issues, as well as methodological ones. Working within these constraints, one must be cautious about the conclusions one draws about depressogenic thinking, given laboratory assessments.

Ross, Mueller and de la Torre (1986) examined the hypothesis that negative content in the self-schema is specific and personal. They asked depressive and nondepressive university students to rate a series of depressive and nondepressive adjectives according to self and other-descriptiveness. Dysphoric students rated more adjectives as referent to self-only than did nondysphoric ones, and in particular rated more negative adjectives as self-referent (as opposed to characteristic of people in general). Dysphoric students also rated other people more positively than nondysphoric students, a tendency which could help maintain a negative self-image. However, dysphoric students did not differ from others in the number of positive self-referent adjectives they endorsed, or on recall for adjectives in any category. These results

seem to confirm the hypothesis of a specific, personal negative view of the self among dysphoric people. Generalization is limited because of the subclinical nature of the sample, and the lack of any estimate of stability over time.

Pietromonaco (1985), also using a subclinically depressed student sample, found that dysphoric subjects tended to select and categorize self-descriptive adjectives around primarily affective themes, as opposed to other, more behaviorally-oriented ones. Pietromonaco interpreted this apparent sensitivity of depressive people as an indication that such people use affect as a central organizing factor in the structure of information about the self.

Earlier, it was noted that negative mood-induction procedures tend to result in greater dysphoria among research subjects, in indirect support of the cognitive product aspect of Beck's theory. Madigan and Bollenbach (1986) used a list of somatic Velten statements (Frost, Graf and Becker, 1979) to manipulate the mood of university students in the direction of depression or elation (along with a neutral manipulation). Using a true-false test of common irrational beliefs (Newmark and Ziff, 1977) as a dependent measure, Madigan and Bollenbach found that

depressive mood induction procedures produced significantly higher scores on the irrational beliefs test than either the elation or neutral manipulations. The authors argued that these results show a pattern of reciprocal effects of mood and cognition, similar to the cognitive loop hypothesis suggested by Isen, Shalke, Clark and Karp (1978). Given that hypothetically stable, global, abstract beliefs were subject to change based on mood change would seem to cast doubt on the cognitive hypothesis that these beliefs are precursors which render the individual vulnerable to depression in the first place. Again, Madigan and Bollenbach's sample consisted of subclinically depressed university students, and generalizability is limited.

In summary, studies which have attempted to demonstrate the existence of a stable structural organization of knowledge in memory conducive to depression have been largely unsuccessful in doing so, so far. There is a general consensus that dysfunctional attitudes and self-referent thinking exists while people are clinically depressed, although the data of Hargreaves (1983) and Hamilton and Abramson (1983) cast some doubt on this conclusion. The existence of such structures as a stable cognitive entity across clinical states is unproven, and

the present status of the research would suggest that dysfunctional attitudes appear to be influenced (at the very least) by state variables like mood and clinical status.

These efforts to define the content of schemata by content represent, as noted earlier, only a portion of schema-relevant research in clinical depression. An additional body of research has accumulated around the issue of depressive cognitive processing. This discussion will now turn to the topic of processing, with two emphases: a discussion of the hypothetical cognitive processing distortions outlined by Beck along with directly relevant empirical data, and a review of the status of processing research in general, with its implications for the theory of distorted or biased processing as well as for inferring cognitive organization in depression.

Cognitive Processes

Beck's model (Beck et al., 1979) suggests that the source of depression lies within the schemata, which (as described) take the form of enduring and typically irrational depressogenic beliefs. Once these beliefs have been activated by relevant environmental information, the depressed person employs cognitive processes in ways which

bias or distort the selection, recall, and retrieval of information. As a result of these biased selection, storage and retrieval processes, the depressed person experiences negative automatic thoughts which lead to the affective, behavioral and motivational manifestations of clinical depression (Beck et al., 1979; Hollon and Kriss, 1984).

Of crucial concern is the issue of cognitive process distortions: the way in which depressed people process information which, among other effects, serves to confirm their underlying beliefs.

Beck et al. (1979) specified six systematic errors in thinking, typically made by depressed people. These errors were hypothesized to lead to the distortion of information processed from the environment, to support negative beliefs about the self, world and future of the depressed person. These errors in thinking allow the depressed person to maintain negative assumptions in the face of contradictory or nonsupportive information:

The errors are:

Selective abstraction: the tendency to take features of the environment out of context and emphasize them, while ignoring other, more salient environmental features;

Arbitrary inference: the process of drawing conclusions in

the absence of supporting or in the presence of contradictory information;

Overgeneralization: the practice of drawing a general rule or conclusion based on a few isolated events in an individual's life, and applying it to other, objectively unrelated events.

Magnification-minimization: the tendency to make gross errors in evaluating the significance or importance of an event;

Personalization: the propensity to relate external events to one's self in the absence of objective evidence of self-reference; and

Absolutistic, dichotomous thinking: the categorization of experience according to one of two opposite poles (eg. "saint" or "sinner"). (This error has since been relabelled "all or nothing thinking" (Sacco and Beck, 1985)).

Overall, Beck and his colleagues have characterized the thinking of depressed people as primitive. Depressed people hypothetically make global, undifferentiated evaluations of experience and absolutistic, moralistic judgements about people and events which are applied in an invariant, across-the-board way. Self-judgements are harsh; the depressed person considers them irreversible.

These descriptions characterize a qualitative difference in how depressed people process information, compared to nondepressed people.

Lefebvre (1981) provided some evidence for several of the distorted processes mentioned. Based on raters' inability to distinguish the first two errors listed above, Lefebvre combined arbitrary inference and selective abstraction and omitted both absolutistic thinking and minimization in deriving the Cognitive Error Questionnaire (CEQ). The errors measured by the CEQ are selective abstraction, catastrophizing (magnification), personalization and overgeneralization. In a study involving clinically depressed lower-back-pain and no-back-pain patients, and non-depressed pain and no-pain controls, Lefebvre found a significant positive correlation between CEQ scores and the Beck Depression Inventory (BDI) (Beck, 1978) ($r=.61$; $p<.001$). Because of the artificial separation of depressed and nondepressed samples on the basis of BDI scores, Lefebvre cautioned that this correlation may have been inflated. Separate correlations for depressed and non-depressed samples, while restricting the range, yielded significant but lower correlation values for the CEQ-BDI relationship: for depressed groups, $r=.39$; $p<.01$, for non-depressed groups, $r=.37$; $p<.003$. Analysis of

covariance results, using socio-economic status as a covariate, yielded a significant depression effect for all groups ($F(1,73) = 24.86; p < .001$): depressed groups recorded significantly higher CEQ scores than non-depressed groups. Several analyses involving lower-back-pain (LBP) patients and a derived LBP-CEQ suggested that pain was not an influential factor in degree of cognitive distortion. Pairwise comparisons revealed nonsignificant differences among specific cognitive error scores for the depressed-no pain group.

In summary, Lefebvre's (1981) study indicated that depressed people are more likely to use cognitive distortions, as defined by Beck et al. (1979), than are non-depressed people. Keeping in mind the statistical cautions cited earlier, one may also infer that the degree of cognitive distortion is related in some way to degree of depression.

In a series of studies involving depressed and non-depressed students, non-depressed role players who acted depressed, and two psychiatric patient samples, Krantz and Hammen (1979) found that the results of a cognitive bias questionnaire (CBQ) reliably differentiated between depressed and non-depressed groups. The cognitive errors included in the test instrument were explicitly based on

those of the Beck model, although no differentiation of error-type was attempted. The results indicated that degree of cognitive error was positively related to degree of depression. Results also indicated that reductions in cognitive error scores, achieved through naturalistic variation or therapeutic intervention, were reliably associated with reductions in degree of depression.

Krantz and Hammen (1979) cautioned that mood and cognitive errors may have had a reciprocal effect in their study. As a result, they did not assign a causal role to either factor. Krantz and Liu (1987) investigated this possibility further using a revised version of the CBQ, in which background information is differentially valenced for emotional content. As with the earlier studies, mildly depressed people again endorsed more depressive cognitions, and more of these when the information presented was negatively valenced than when it was of a neutral or positive character. However, mood status did not influence information processing: mildly depressed people did not distort neutral stories negatively, as indicated by frequency of depressed-distortion scores for such stories. Mood did have an influence on the interpretation of neutral stories for depressed people: they selected more depressed but not distorted options for such stories than

did nondysphoric controls.

Norman, Miller and Klee (1983) used the CBQ, along with several measures of symptomatology, and found that depressed psychiatric inpatients endorsed significantly more depressed distortions than did psychiatric controls. Among depressed subjects, those who endorsed higher levels of depressed distortion also endorsed higher levels of depressive symptoms.

Hammen and Krantz (1985) have pointed out that the CBQ is not a measure of cognitive processes, but one of content. The same comment might be applied to Lefebvre's (1981) CEQ: both measure cognitive content, given a hypothetical situation. This content is based upon the systematic processing errors hypothesized by Beck (Beck et al., 1979), reviewed above. However, the responses one gives to these measures is not intended to represent the real cognitive content of an individual at a given time (in the way that responses to the ATQ do, for example). While it is true that the responses are then technically content in nature, their hypothetical nature, the availability of qualitatively (Krantz and Hammen, 1979; Krantz and Liu, 1987) or quantitatively (Lefebvre, 1981) different alternatives, and the explicit link between type of error and type of content would seem to provide a legiti-

mate basis on which to infer cognitive processes.

A number of studies have investigated processing biases in depression on a more generic basis, as opposed to examining the specific processing characteristics described above. These studies are important to the Beck model since they specifically examine the ways in which depressed people act on and use information while depressed, a crucial element of that model. These processing characteristics will be considered separately by specific processes: that is, according to the implications of particular studies for perceptual, attentional, and recall processes.

Perceptual bias. A number of studies have investigated perceptual bias in depression. Dykman and Volpicelli (1983) used a dot-estimation task with three feedback conditions ("good", "average" and "poor") and two self-importance conditions, in order to contrast perceptual processes among subclinically depressed and nondepressed university students. Over time, longer response latencies were found for dysphoric students given unfavorable self-referent information.

Kingsland (1981) and Kingsland and Greene (1984) compared the perceptual/cognitive styles of clinically depressed women versus nondepressed controls. The cogni-

tive style variable they used was field dependence-independence, based on the work of Herman Witkin (e.g. Witkin and Goodenough, 1981). Field dependence refers to the relative tendency to rely on perceptual and social context in problems involving ambiguous perceptual or social information, in order to structure new information. Kingsland and his colleague found depressed women to be significantly more field dependent than nondepressed women, based on scores on the Embedded Figures Test (Witkin, Oltman, Raskin and Karp, 1971). These studies, and the concept of field dependence-independence, will be reviewed in detail below.

Two studies reviewed earlier (Gotlib and McCann, 1984; Gotlib and Crane, 1987) investigated the interference of task-irrelevant depressive material (written words) on a Stroop color-naming task (Stroop, 1935). For both subclinically depressed university students and depressed psychiatric patients, depression was associated with longer response latencies to color stimuli, only when the irrelevant material was negative in content. These results have implications for attentional as well as perceptual processes in depression.

Kuiper and MacDonald (1982) investigated the hypothesis that depressed people have enhanced efficiency for

perception of pathological (that is, depression-related) self-referent information. They asked clinically depressed patients and nondepressed controls to rate a list of adjectives according to perceived self-reference. They found that depressed subjects recorded longer reaction times for positive self-referent adjectives, compared to nondepressed subjects.

MacDonald and Kuiper (1985) extended their earlier study to further investigate the role of automatic processing versus controlled processing in depression. Automatic processing is hypothesized to occur independently of attention or memory load, and to encompass (in the case of depression) efficient parallel perceptual processing of negative self-referent information. Effortful processing is hypothesized to occur in a serial manner, dependent on current memory load and attention. These modes of processing were derived from Schiffrin and Schneider's (1977) conceptualization of fundamental information processing nodes.

Again, MacDonald and Kuiper (1985) utilized an adjective rating task, which included depressed-content and nondepressed content words. For half of the rating trials, a six-digit recall task was combined with the rating task, to determine whether or not memory load would

interfere with rating time. The authors found that depressed patients rated depressed content adjectives as self-referent more quickly than nondepressed ones, depressed content adjectives as non-self-referent more slowly than nondepressed content adjectives, and depressed content adjectives as non-self-referent more slowly than either psychiatric or normal controls. These results suggest efficient perceptual processing of negative self-referent information by clinically depressed people. Moreover, the lack of any significant interaction with memory load supports the notion that such perceptual processing is automatic, rather than effortful. This result suggests that depressive-schema-consistent perceptual processing takes place independent of memory load and attention.

In contrast to the studies which have shown a facilitation of depression-consistent perceptual processing, McLeod, Tata and Mathews (1987) recently found no such effect on a lexical decision-making task. McLeod and colleagues compared reaction time latencies for identification of words which were selected for positive, neutral or negative valence. Subjects- in this case, psychiatrically depressed individuals and controls- were asked to decide whether a visual display of letters

represented a real word or not. Half of the display sequences were nonwords, and the other half was comprised of the valenced words. Latencies were fastest for positively valenced words, and slowest for negatively valenced words, for depressed and nondepressed subjects uniformly.

Attentional bias. Several studies have investigated attentional biases in depression. Ingram and Smith (1984), for instance, reported on two studies in which the amount of self-focused attention was measured for subclinically depressed university students, compared to nondysphoric controls. Their results indicated that not only did dysphoric students show a greater degree of self-focused attention (in replication of a similar study by Smith and Greenberg (1981)), but they also showed a greater degree of negative self-focused attention, based on responses to Exner's (1973) Self Focus Sentence Completion Scale (SFSC).

More recently, Ingram, Lumry, Cruet and Sieber (1987) used the SFSC scale with a clinically depressed sample and normal controls. Statistically controlling for anxiety, they found that clinically depressed individuals had only modestly (though significantly) higher levels of self-focused attention, than nondepressed controls. Depressed people also had higher self-focused attention, compared to

other-focused attention. Closer examination of these results, taking into account the quality of self-focused attention, Ingram and colleagues found that depressed people resembled nondepressed people on the amount of nonnegative self-focused attention. Comparison of levels of negative self-focused attention showed a much different picture, with depressed people showing almost twice the amount of negative self-focused attention. Ingram and colleagues concluded that it may not be self-focused attention per se, but the favorability of such attention, that distinguishes depressed from nondepressed individuals.

Two studies of attributional processes revealed results consistent with an attentional-bias interpretation. Peterson (1983) found negative self-attributions for positive events, among subclinically depressed female university students, using the ASQ. Peterson argued that the results obtained reflected selective attention to undesirable aspects of life experiences (in a manner consistent with Beck's (Beck et al., 1979) selective abstraction error). Sharp and Tenner (1983) reported similar results: subclinically depressed university students ignored obvious attributional cues in the "attribution of responsibility" (p. 328) stage of a

puzzle-solving task.

Indirect support for the attentional bias in depression was reported by Brockner (1979) and Brockner and Hutton (1978). These authors reported alleviation of task deficits for low-self-esteem students following alteration of self-focused attentional patterns.

McLeod, Mathews and Tata (1986) investigated the issue of specificity in attentional bias, comparing clinically anxious and depressed individuals. They found evidence of attentional shifts towards threat-related words, as well as decreased detection latencies (of relevance to the earlier discussion of perceptual bias), for anxious but not for depressed people. The authors suggested, based on this preliminary data, that there is some indication of specificity in processing bias.

Lastly, Brand and Jolles (1987) investigated cognitive processing dysfunctions for unipolar, bipolar and anxious patients. Unlike the MacDonald and Kuiper (1985) study cited earlier, Brand and Jolles examined primarily controlled rather than automatic processing. They found a variety of weaknesses in controlled processing, with slower responses to target digits and letters with and without scanning, and slower recall speed for target digits and letters for unipolar depressed than other

groups. These results have implications for several aspects of cognitive processing; however, the independence of these results from hypothetical schematic content make them rather difficult to interpret in light of the other data reviewed. Perhaps, as Beck (1987) has suggested, differences in controlled processing as a result of neurochemical dysfunctions may reduce the likelihood of using normal, nondepressive cognitive structures by depressed people, suggestive of a neurochemical-cognitive loop.

Recall bias. Several studies have investigated the role of recall bias in depression. Nelson and Craighead (1977) found that subclinically depressed university students recalled less positive and more negative feedback following an ambiguous stimulus matching task, than nondepressed students. No memory bias could be inferred from these results, however, since the dysphoric students recorded a more accurate estimate of feedback than their nondysphoric counterparts. In a similar study involving depressed psychiatric patients, nondepressed psychiatric controls, and nonpsychiatric controls, DeMonbreun and Craighead (1977) found that depressed patients recalled less positive feedback than both control groups (on the second 40 trials; on the first 40, both psychiatric groups

were found to be similar). Contrary to the previous study, this study revealed a significant underestimation of amount of positive feedback by depressed patients: a finding which more closely conforms to the notion of recall bias in depression.

A follow-up study involving depressed-anxious, nondepressed-anxious and nondepressed nonanxious students revealed no differences in recall when the information presented was of a neutral character (Craighead, Hickey and DeMonbreun, 1979).

Derry and Kuiper (1981) reported recall differences between depressed psychiatric patients and both psychiatric and nonpsychiatric controls. All subjects were asked to rate a series of adjectives according to semantic, structural and self-referent properties, and then to recall them. Both control groups showed enhanced recall for nondepressed-content adjectives compared to the depressed group; the depressed group showed superior recall for depressed-content compared to nondepressed-content adjectives, and superior recall for depressed-content adjectives than either control group. Derry and Kuiper concluded that their results indicate a greater accessibility of negative self-referent adjectives in memory, for depressed individuals.

Zuroff, Colussy and Wielgus (1983) asked depressed, formerly-depressed and nondepressed female university students to rate lists of adjectives for self-descriptiveness. The ten most positive and ten most negative adjectives were used for subsequent recall and recognition tasks. Subjects were asked to recall the lists of self-referent words on three occasions, and on the last of these, a recognition task was administered which included both the selected adjectives and several positive and negative distractor adjectives.

Depressed and formerly depressed women recalled significantly more negative adjectives than nondepressed women, consistent with the hypothesis of recall bias in depression. Depressed women also selected more negative distractor words on the recognition task, a finding which suggests response bias, in addition to recall bias, on the part of depressed individuals.

Two studies by Ian Gotlib provide further support for the role of recall bias in depression. In the first (Gotlib, 1981), Gotlib compared clinically depressed patients, psychiatric controls and normal controls on a combined self-reinforcement and recall task. Gotlib found that depressed patients resembled psychiatric controls in the degree of self-reinforcement administered; both groups

self-reinforced significantly less often than normal controls. Asked later to recall the amount of self-reinforcement and self-punishment administered, depressed patients recalled significantly fewer reinforcements than either control group. Depressed patients underestimated the number of reinforcements and overestimated the number of punishments administered.

In the second study, Gotlib (1983) again compared depressed psychiatric patients with psychiatric and normal control groups. In this study, participants were evaluated by observers following dyadic interpersonal interactions. Even though all participants received exactly the same ambiguous evaluation, the depressed group rated the evaluation as less favorable than the other two groups, and when asked to recall the evaluation later, recalled it to have been more negative than was actually the case (unlike both control groups).

In both of these studies, Gotlib found evidence not only of recall differences between clinically depressed people and others, but of a negative bias in recall for depressed people, given the objective qualities of the information to be remembered.

Loewenstein and Hokanson (1986) failed to find evidence of depressotypic recall biases in social situ-

ations, in a study comparing mildly depressed, moderately depressed, transiently depressed and nondepressed female university students. Moderately depressive women were found to recall less negative information about themselves than did nondysphoric students. The authors suggested that this unexpected result may have reflected the lack of an explicit self-evaluative component to this study. It might also be noted that group classification was undertaken only on the basis of BDI scores on two occasions, with liberal inclusionary criteria for the moderately depressed group (that is BDI \geq 9 at time one; BDI \geq 14 at time two).

Roy-Byrne, Weingartner, Bierer, Thompson and Post (1986) examined recall differences between depressed psychiatric patients and controls on two types of recall tasks: effortful and automatic. The two effortful tasks involved free recall of words, the first from a paired associate recall task, and the second, from a serial-learning task. The automatic tasks involved recalling judgements made about each word pair during initial learning trials (for example, which noun of each pair was heavier, larger, more valuable, et cetera), and recall for words from the original serial list on a recognition-memory task. Roy-Byrne and his colleagues found no differences between depressed and nondepressed groups on

automatic tasks. On effortful tasks, the depressed group recalled significantly fewer nouns, both times. These data should be interpreted with caution, since the depressed group (N=10) included three bipolar patients.

The results of Roy-Byrne et al. (1986) have indirect significance for recall bias hypotheses in depression, since cognitive theories typically do not suggest any memory dysfunction per se, among depressed people. Cognitive theories suggest that there is a recall bias according to the quality of information processed. Since Roy-Byrne and his colleagues did not compare recall of words for depressed versus nondepressed content, or test for degree of self-reference of presented words, the direct relevance of this study for Beck's theory of depression is reduced. However, the existence of memory dysfunctions in depressed individuals, independent of constructs like content or self-reference, has obvious implications for any cognitive theory. The most important of these implications may be that depressed people do not have a recall bias, but a limited recall capacity. Further research is necessary to resolve this issue.

In summary, there is a mixed collection of data which at face value supports the notion that cognitive processing differs, in some ways, between depressed and

nondepressed people, consistent with the Beck theory. Such differences were found in the case of specific distortions hypothesized by Beck et al., (1979) (Lefebvre, 1981; Krantz and Hammen, 1979), as well as in the cases of generic cognitive processes like attention, recall and perception. Whether the distortion processes are themselves in some way unique to depression, driven solely by depressive schemata, as suggested by Beck (Beck et al. 1979; Beck, 1987), or whether there are other influences on cognitive processing in depression, is rarely if ever addressed in the empirical literature. Nor are individual differences in cognitive processing among depressed people. In these respects, and others to be dealt with in the ensuing section of this study, cognitive processing remains rather a vague component of the Beck theory, both conceptually and empirically.

Present Status of the Beck Theory

The sixty or so studies reviewed above suggest three general conclusions. First, the combined results of virtually all studies of cognitive products provide clear and unequivocal support for the stream-of-consciousness or automatic thoughts component of the Beck (Beck et al., 1979) theory. Depressed people experience different thought content while they are depressed than they do when

they are not, and different thought content than other people who are not depressed. Depressed people have more thoughts of a self-denigrating, loss-related, or pessimistic nature than nondepressed people. Moreover, these thoughts are specific to depression as a nosological and syndromic entity. There is empirical support for the notion that such thoughts can affect mood; however, there is little evidence that this causal sequence is the one which produces the mood alterations and other symptoms of clinical depression.

The second general conclusion based on these studies is that while there is considerable evidence that depressed people endorse higher frequencies of dysfunctional attitudes and beliefs than nondepressed people, there is no convincing reason to conclude that these attitudes persist in latent form when these same people are no longer depressed. Indeed, the observed relationship of state variables like clinical status, mood and induced mood to such self-reports often suggests the opposite conclusion. The reason for this failure to corroborate the schematic component of the Beck theory may in part be due to problems with assessment instruments themselves, including nonspecificity to depression, limited applicability, or methodological failures to fulfill all of the

conditions necessary for schematic inference. Whatever the reason, the latent-schematic component of the Beck theory has not been convincingly validated on the basis of attitudinal research.

Some support for the schematic component of the Beck theory may be inferred from cognitive processing research. The third conclusion justified by the above literature is that depressed people do seem to bias or distort perceptual, attentional and recall processes, and to use the specific errors proposed by Beck et al. (1979) more frequently than do nondepressed people. The use of these biases or distortions would seem to enhance the maintenance of depressive thought content (if not active depressogenic beliefs) in a way reminiscent of the views of theorists like Kelly (1955), Mahoney (1974) and Guidano and Liotti (1983), who have conceptualized schemata in terms of processing consistency.

Despite the generally supportive character of cognitive processing studies for the Beck theory, two aspects of this literature contain potentially contradictory elements for that theory. These two aspects form the conceptual basis for the study to follow.

The first potential contradiction involves the nature of processing bias and distortion. To clarify the nature

of this contradiction, a brief examination of alternative conceptualizations of the relationship of depressogenic schemata and processes is in order.

Theorists like Beck and his colleagues (for example, Beck et al., 1979; Dobson, 1986) have suggested that depressive schemata function through activation by relevant information, in a manner similar to template-matching or distinctive-features models of schema function (Matlin, 1983). Since the schema determines what information will be selected, processed, stored or recalled, depressive information-processing follows a "top-down" pattern: the depressive schema somehow becomes ascendant and thereafter directs the depression response, in particular, the cognitive processing errors and distortions (Beck, 1987). Cognitive processing, then, should be idiosyncratic to the depressive state. Beck (Beck et al., 1979; Beck, 1976; Beck, 1987) has outlined cognitive processes which are specific to depression in a manner consistent with this view.

Alternatively, Williams (1984), while opting for a similar conceptualization of schemata, has suggested that cognitive processing may follow typical, pre-established distortion patterns common to most people. Williams cites Tversky and Kahneman's (1974) research on the role of

heuristics, by which salient if, not representative or relevant information comes to govern decision-making processes. As well, he cites Fischhoff's (1977) hindsight judgements, in which estimates of prior probability are affected by awareness of subsequent outcome, and Loftus and Palmer's (1974) testimony biases, in which sources of information are proposed to exert an influence on the allocation of importance to new information. Williams' view seems to imply that cognitive processing is relatively consistent with regard to its formal properties: that somehow depressed people activate depressive schemata, which are then confirmed in terms of content through the normal informational strategies and distortions that most people use. The errors and distortions used by depressed people, in this view, need not be idiosyncratic to depression.

Similar to Williams' (1985) view is that of Ingram (1984). Ingram has proposed two structural and two processing components in his cognitive model. The structural level includes a network of memories into which prior information is coded propositionally, the elements of which are related associatively. These networks are the functional equivalent of schemata; they are hypothetically potentiated by the summing of the level of activation

already within the system with salient, relevant environmental information. Coexistent with this structure are "primitive emotion nodes" (Bower, 1981): structures representing central nervous system patterns of emotional activation, along with descriptors of evocative events, which are further interconnected within networks, as described. Partial support for Bower's view can be inferred from Pietromonaco (1985), discussed earlier.

At the processing level, Ingram (1984) cites Craik and Lockhart's (1972) concept of depth of processing: the extent of cognitive elaboration increases the likelihood that information will be comprehended. Cognitive elaboration simply refers to the extensiveness of network involvement and activation, relative to a given subset of information to be processed. Information deeply processed—that is, processed at the "meaning" level—will therefore be more likely to be comprehended, stored, and incorporated into the network. Lastly, Ingram notes that cognitive processing capacity is limited. Deep processing requires adequate capacity; if the system is dominated by a particular type of information—for instance, information relevant to the emotion of depression—the new information most likely to be processed is that which will summate with consistent information already activated in

deep processing. Inconsistent information is not likely to be fully processed because of capacity limitations of the cognitive system.


In Ingram's (1984) model, like Williams' (1985), there is an assumption that depressive cognitive processing somehow fits into the regular patterns of information-processing used by the individual. In Williams' case, the distortions themselves are seen as typical of normal processing. Content may be schematically idiosyncratic, but the processes are more generally characteristic of how that individual, and all individuals, deal with information. In Ingram's case, there is no apparent reason to assert that the distortions are typical of depressed functioning. Since depressive schematic functioning summates with coexistent nondepressive schematic functioning, it seems reasonable and consistent to predict that depressive cognitive processing would likely show some summation of the typical cognitive processing characteristics of the individual with the specifically depressive processing characteristics which follow from activation of depressive networks. The importance of this idea for the present study becomes apparent when one considers the inherent contrast to Beck et al., (1979).

On the one hand, Beck and colleagues (1979) suggest that cognitive processes are idiosyncratic to the depressive state, subject to schematic activation. On the other hand, Williams (1984) and Ingram (1984) seem to suggest that, given the activation of depressive schemata, normal biasing and distorting processes serve to increase the probability of processing information consistent with depressive schemata. In order to test these perspectives against each other, there seems to be a need to investigate the role of known cognitive processing characteristics of people before they are depressed. Such a task has been addressed by Lewinsohn, Steinmetz, Larsen and Franklin (1981); however Lewinsohn and colleagues did not measure processes per se, but rather content.

Kingsland and Greene (1984), cited earlier, have also addressed the issue of processing style influences on depressive distortion, using an ex post facto measure of predepressed cognitive style. Kingsland and Green found that the typical cognitive processing style of depressed women is different from that of nondepressed women: specifically, they found that depressed women were more field dependent than nondepressed women. To interpret these findings as supportive of the Beck theory, it would be necessary for cognitive style to change when people

become depressed. The field dependence literature largely supports a contradictory view, that cognitive style is consistent over time (Messick, 1986; McLeod, 1987) and clinical state (Koran and Maxim, 1972). A given cognitive style cannot then be considered indicative of depressogenic cognitive processing, if the same mode of processing is present when people are not depressed, and present in people who never become depressed at all. (It should be noted, however, that Kingsland and Greene used a questionable method to determine the cognitive style of their sample, which casts doubt on the interpretation of their results.)

The first issue for Beck's (Beck et al., 1979) theory, then, is whether or not there is such a thing as depressive cognitive processing, in the formal sense, distinct from normal cognitive processing. The alternative, from a cognitive point of view, is a model wherein depressogenic beliefs shape information-processing through essentially normal biasing and distorting processes through which people generally maximize the efficiency and capacity of their information-processing systems. The issue can be expressed in question form: Does the style of cognitive processing used by people when they are not depressed influence the way they process information when



they are depressed?

Part of the answer to which of these views is correct may come from examining the ways people usually process information, and determining the influence of these nondepressed processing variables upon processing styles when people are depressed. If variation in processing style during depression reflects variation in processing when people are not depressed, there may be some support for Williams' (1985) and Ingram's (1984) views.

The second potential contradiction of the Beck theory involves the implicit homogeneity of information processing among depressed people, as proposed by Beck and colleagues (1979). Although six separate errors are cited in the Beck theory, the authors state that depressive thinking is generally global, primitive or immature. While depressed people may as a group make use of one or more specific errors more or less than one or more others, presumably they all share similar qualities of information processing. Most depressed people would likely resemble most other depressed people in their pattern of errors, given equal severity of depression.

In this sense, cognitive processing in depression may be described as homogeneous, according to the Beck theory. Lefebvre's (1981) results, cited above, are

consistent with this view. He found that not all errors are endorsed with equal frequency by depressed people; personalization was less frequently endorsed than selective abstraction for two depressed samples (one with lower back pain, and one without). However, the patterns of error for depressed-pain and depressed-no-pain groups were similar, and the extent of error endorsement was greater for both groups than both nondepressed control groups: those with and without pain. Taken together, these results support the notion that depressed people have a typical pattern of cognitive errors, which is different from those of nondepressed people.

The assumption of homogeneous processing is made in the context of a fairly vague model of normal cognitive processing, at least in terms of normal biasing or error processes. The style of cognitive processing people use when not depressed is hardly discussed by Beck et al. (1979). Nor, as discussed earlier, is the potential influence of premorbid cognitive processing on depressed cognitive processing considered. The Beck model seems to assume that, even if there are characteristic patterns of cognitive processing before people become depressed, these patterns are discarded with the advent of depressogenic schemata. Once people are depressed, they tend to think in

every similar ways.

This assumption of homogeneity does not reflect the general status of the cognitive style literature. There is a considerable body of literature to suggest a different notion: that people have typical and idiosyncratic patterns of cognitive processing, or styles, which are stable across time and clinical status. This body of literature is provided in the context of the theory of field dependence/independence, conceptualized by the late Herman Witkin (Witkin, 1950, 1965, 1978; Witkin, Lewis, Hertzman, Machover, Meissner, and Wapner, 1954; Witkin and Goodenough, 1981; Witkin, Dyk, Faterson, Goodenough and Karp, 1962; Witkin, Lewis and Weil, 1968; Korchin, 1986; Lewis, 1986; et cetera). More detail about this literature will follow below. Simplistically summarized, the cognitive style literature would suggest that people's customary patterns of cognitive processing influence their information-processing strategies predictably and in a stable fashion. As noted earlier, field dependent people tend to accept visual and social contextual information when structuring ambiguous information, whereas relatively more field independent people tend to structure ambiguous information with reference to bodily or other self-generated referents.

The implications of heterogeneous and stable cognitive styles for Beck's theory may be important. The notion of one particular kind or pattern of depressive bias or error becomes tenuous if the typical, nondepressed way that people process information can influence depressotypic cognitive processing in various patterns among depressed people. This alternative view implies that different depressed people may, indeed have depressive beliefs, but may find or utilize supportive environmental or stored information in very different ways, depending on their cognitive style, in the process of maintaining those beliefs.

A second implication of this alternative view is that variables which influence the development of typical cognitive styles may be important in shaping the form of depressive information-processing.

A third implication, and one with some supportive value for the Beck theory, is that cognitive errors as hypothesized by Beck et al. (1979) may be found to reflect cognitive processing styles, thus enhancing the relationship of such hypothetical processes to valid processing variables.

To summarize the implications of the above two issues for the Beck model, it is suggested that one's typical

cognitive processing style may influence the cognitive processing errors and distortions one uses when one is depressed. The nature of this influence may be such that heterogeneity in normal cognitive processing is functionally related to heterogeneity of depressive cognitive processing. Away from the concept that all depressed people use much the same set of errors and distortions, these speculations suggest that different errors and distortions- different, by degree or type- characterize people of different cognitive styles when they are depressed.

A further aspect of the Beck theory (Beck, 1987) may also have some relationship to cognitive style issues: that of personality influences on depression-evoking events. Beck has suggested that sociotropic people- those who place great importance on social or affiliative relationships- are vulnerable to a different class of depressive-schema-arousing events than are people with an autonomous personality. The latter are hypothesized to be more susceptible to depression following a loss of independence, freedom or autonomy. Beck provided little empirical data for these personality types or their relationship to depression-evoking events beyond clinical observation. As will be seen, the field dependence-

independence literature provides considerable detail about similar personality differences, and some grounds for speculation about depression-evoking events.

In order to explore the issue of heterogeneity and the influence of prior cognitive processing style on depression, several studies directly linking clinical depression to field dependence and independence will be reviewed. First, though, the parent theory of cognitive style, Witkin's theory of field dependence-independence, will be reviewed in detail to provide a conceptual framework for further discussion.

The Theory of Field Dependence-Independence

Theory Development

The study of field dependence-independence had its beginnings in the New Look movement in perception in the late 1940's and early 1950's (Witkin and Goodenough, 1981; Goodenough, 1986). The New Look, drawing on the emerging psychology of individual differences of Cattell and Thurstone (Messick, 1986) placed an unprecedented emphasis on the role of the perceiver in perception, as opposed to the then-prevalent stimulus emphasis in gestalt perceptual theory. The initial studies of Witkin and his colleagues provided evidence for characteristic individual differences on a variety of perception-of-the-upright tasks:

differences which suggested the operation of variables other than stimulus variables in the perceptual process.

The three main tasks used in studies of perception-of-the-upright were the Body Adjustment Test (BAT), in which correct vestibular and misleading visual cues were presented; the Rotating Room Test (RRT), in which correct visual and misleading vestibular, kinesthetic and tactile cues were presented; and the Rod and Frame Test (RFT), in which misleading visual cues were presented while other bodily cues were held constant (Witkin, Lewis, Hertzman, Machover, Meissner and Wapner, 1954).

Witkin and his colleagues (1954) discovered two distinct patterns among the results of these tests, patterns which were remarkably consistent for particular groups of people. For a certain class of individuals, the primacy of cues from the visual field over vestibular or other body-sensational cues was reliably demonstrable. Such individuals tended to draw erroneous conclusions from the misleading visual information of the BAT and RFT; in consequence, they arrived at non-veridical conclusions about the location of the upright. The same individuals tended to ignore the misleading vestibular, tactile and kinesthetic cues of the RRT; on this task, their assessment of verticality was quite accurate. The evident

primacy of visual field data for this group led Witkin and his colleagues to label such people field dependent.

Another class of individuals was relatively impervious to the effects of misleading visual field information on the BAT and RFT (Witkin et al., 1954). Their judgements of verticality, apparently based on reference to bodily cues, tended to be accurate on these tasks. On the RRT, however, they were misled by bodily cues and were hence less accurate in their perception of the upright than their field dependent counterparts. The evident primacy of vestibular, kinesthetic and tactile cues for such people, and the relatively insignificant influence of the visual field, led Witkin and his colleagues to label this class of individuals field independent.

The cluster of studies which established the conclusions summarized in Witkin et al. (1954) served to operationally and conceptually define the original construct of field dependence-independence as a perceptual style. The field dependence-independence construct was, at that point, interpreted as a characteristic but individualized approach to "perceptual resolution of the cue conflict" (Goodenough, 1986, p. 6).

Several developments in the still-early study of

field dependence-independence led to a broadening of the conceptualization of this phenomenon to encompass other elements: in particular, cognitive restructuring ability (or disembedding skill), field articulation, and personality.

A relationship was determined between field dependence-independence and the ability to break up the organization of a visual field in order to locate specific patterns within it (Witkin et al. 1954). Field dependent people were found to accept the organization of the visual field as given; in the absence of explicit direction to the contrary, they were characteristically unlikely to restructure or break up that organization to determine other possible organizations of the same information. Field independent people were found to restructure visual information with comparative ease. The Embedded Figures Test (EFT) (Witkin, 1950) was designed to measure the ability to restructure and disembed specific patterns from a visual display.

In the 1960's, the theoretical components of field dependence-independence, cognitive restructuring, personality, interpersonal differences, and cultural and neuropsychological concepts were incorporated into the parent theory of psychological differentiation. The concept of

differentiation reflected a sense that the characteristics of the concepts in question—perceptual, cognitive, interpersonal and so on—are associated with one another in a definite order during development. This concept also reflects the assumption that these characteristics are formal rather than content properties of a psychological system. Explicit in this concept was the assumption that these characteristics are highly stable over time, and that common to many of the properties is the characteristic of specialized, articulated functioning versus global, diffuse functioning.

Essentially, the theory of psychological differentiation emphasized four aspects of functioning (Witkin and Goodenough, 1981). The first was an articulated field approach, essentially reflecting the initial perceptual phenomena and related cognitive aspects of field dependent-independent functioning. The second aspect of differentiation involved a sense of separate identity, with the recognition of attributes, needs and values as distinctly belonging to oneself. The third aspect involved an articulated body concept, including a sense of body boundaries and the integration of discrete body parts within a structural whole. The fourth aspect of differentiation referred to the availability to the differentiated

individual of specialized controls for dealing with impulses and preserving healthy psychological functioning. With the rise of the superordinate differentiation construct, the construct of field dependence-independence was relegated to a subordinate, specific phenomenon related to cognitive restructuring, subsumed by the differentiation theory.

In the years concurrent with and since the formulation of the theory of psychological differentiation (Witkin, Dyk, Fateron, Goodenough and Karp, 1962), a great deal of research has led to subsequent alterations, in particular with regard to the role of field dependence-independence within the theory (Witkin, 1978; Witkin and Goodenough, 1981). The areas of personality and interpersonal behaviour were responsible for considerable elaboration of the field dependence-independence theory. The emergence of characteristic personality elements which reflect the cognitive and perceptual styles mentioned above suggested a pervasive feature of the field dependence-independence phenomenon not easily accounted for by simple restructuring skill or cue resolution in the narrow, vestibular-versus-visual sense (Goodenough, 1986).

Part of the re-evaluation of field dependence-independence was fueled by new insights into the

mechanisms of cue resolution (Goodenough, 1986), among which was the finding by Hughes (1973) of evidence for visual driving of the vestibular system in the RFT response phenomenon. The degree of countertorsional role, normally found in the eyes of individuals when compensating for body nonverticality in vision, was found to reflect degree of field dependence. Field dependent people showed a greater degree of countertorsional role than field independent people while taking the RFT. In effect, the countertorsional movement of field dependent people's eyes mimicked that for displacement from the vertical, as if the field dependent viewer's body were tilted in the direction of the frame.

Other findings difficult to incorporate into a perceptual disembedding framework included the susceptibility of field dependent people to illusions of movement (Witkin and Goodenough, 1981; Goodenough, 1986). Taken together, the personality and revised cue-conflict findings suggested a more pervasive, superordinate role for field dependence-independence, one closely identified with autonomous functioning across a variety of settings and stimuli.

To follow is a brief summary of the present status of the theory, as it relates to cognitive processing styles.

In keeping with the recommendation of Witkin and Goodenough (1981), the cognitive style prototypes in question will again be referred to as field dependence and field independence. These labels no longer apply strictly to cue-resolution approaches to perception-of-the-upright problems. The present theory reflects an integration of the theory of psychological differentiation with subsequent developments in the conceptualization of the superordinate theory of cognitive styles.

In most of the literature discussed, a dichotomy of stylistic preferences is noted, as if field dependence-independence were a dichotomous, classificatory variable and field dependent and field independent people were prototypes cut from one of two molds. In fact, the nature of the variables in question and their manifestations in real people are continuous (Witkin, 1965). The practice of dichotomizing cognitive styles has had some advantages in terms of clarifying concepts and testing hypotheses. For these reasons, this author has maintained the practice of talking about people's cognitive styles in the prototypic terms. The reader is asked to bear in mind that this approach is taken for convenience, and that cognitive style is a continuously distributed characteristic of human beings.

Present Status of the Theory

As of the most recent theoretical reformulations (Witkin and Goodenough, 1981; Bertini, Pizzamiglio and Wapner, 1986; Goodenough, 1986), field dependence and field independence refer to the extent to which an individual acts upon or accepts as given information in the perceptual field. The notion of field independence includes the concept of autonomy; that is, the propensity to act upon the field. Field independent people are also described as more psychologically differentiated, as having a more articulated concept of self, and the physical, cognitive, interpersonal and emotional components of the self.

In essence, field dependence-independence is described as an information-processing characteristic (Oltman, 1986) which reflects the relative use of different types of information to interpret ambiguous information in the internal and external environments. Without ambiguity, field dependent people should respond to information no differently than field independent people do. Field dependence is thus a formal property of information-processing (Carli, Lancia and Piniccia, 1986), which reflects the manner or mode of cognition (Messick, 1986; Korchin, 1986; Witkin and Goodenough, 1981;

Pizzamiglio and Zoccolotti, 1986).

A related but not synonymous quality of field independent people is the ability to restructure perceptual information. This skill is consistent with the highest level of the field dependence-independence theory: the capacity to act upon the field. However, the concept of restructuring is empirically distinct from the other perceptual aspects of the theory (McKenna, 1983, 1984). This distinction bears further discussion.

McKenna (1983, 1984) reviewed a number of studies which demonstrate stable, significant correlations between the EFT (the principal test of restructuring ability) and several ability measures. These studies contradict the value-neutral, bipolar character typically asserted for cognitive styles, in favor of the unipolar, value-laden construct of intelligence. McLeod, Jackson and Palmer (1986) compared EFT correlations to two spatial abilities measures, and concluded that there is no reason to distinguish the construct of field dependence from that of spatial ability. Crow and Piper (1986) found a significant correlation between EFT performance and performance on a general mental abilities test. Both studies provide more recent supportive data for McKenna's view that the EFT is a test of ability, not of cognitive style.

According to McKenna (1984), the relationship of the EFT to other cognitive style measures is also tenuous, and mediated by general intelligence. He cited two studies in support of this view. The first was that of Vernon (1972), who found that statistically eliminating a general intelligence factor from correlations between the EFT and other cognitive style measures reduced the remaining partial correlations to insignificant amounts (on the order of $r = .07-.09$). The second was that of Arbuthnot (1972), who found that the EFT and RFT loaded on separate factors in a factor analytic study. McKenna concluded that the EFT is not a measure of cognitive style, interchangeable with other such measures.

These findings cast uncertainty on the relationship of perceptual restructuring to the original notion of cue-resolution. McKenna (1983, 1984) has gone beyond his criticism of the EFT to suggest that field dependence-independence is in fact a dimension of ability rather than cognitive style. He presented little evidence for this generalization beyond that derived from studies of the EFT (with the noteworthy exception of Vernon, 1972). More critically, he ignored evidence (like that shown in the RRT studies of Witkin et al. (1954), and the oculogyral illusions of Nilsson, Magnusson, and Vasko, (1972)) for

the superior performance of field dependent in some perceptual contexts, which strongly support the bipolar value-free nature of the field dependence-independence construct. While McKenna's critique of the EFT as a cognitive style measure seems well grounded, his extension to the whole theory in question seems hasty.

Returning to the topic of the present status of the theory, the notion of field dependence includes the concept of perceptual passivity; that is, taking the field as given. Field dependent people are described as less differentiated, and as having a more global, undefined sense of the self and the components of the self. Like the aspects of the perceptual field, the field dependent person views him or herself as indistinguishable from the context in which he or she exists (Witkin and Goodenough, 1981; Carli et al., 1986; Hansson and Rydén, 1987).

The characteristics of field independent and field dependent people carry over into aspects of personality and interpersonal functioning.

Field independent people tend to structure ambiguous situations on their own, with little recourse to the structuring cues provided by others. They tend to be emotionally and physically more distant than field dependent people; not surprisingly, they are often

perceived by others as distant and aloof, and they are less popular than field dependent people (Witkin and Goodenough, 1977). Witkin and Goodenough's review of interpersonal qualities of both cognitive style groups suggests that field independent people are less effective than field dependent people at learning in social situations, resolving interpersonal conflicts, and processing valuable information present in a social-interpersonal context. At the same time, field independent people tend to maintain their principles in conflict situations and make good leaders, provided others choose to follow them.

Field independent people show efficient, flexible information-processing for nonsocial information (Frank, 1983). Comparing performance on three memory tasks for homographic words (free recall, cued recall using the original acquisition cue word, and cued recall using a new cue word related to an alternative meaning of the homograph), Frank found that field dependent and field independent people were equally good at free recall and cued recall under original cue conditions. A change in the semantic relationship of cue and target word produced a significant advantage for field independent people over field dependent ones (although total recall for both groups dropped from the original cue condition). The

ability to recall words was not the distinguishing factor, then; rather, field independent people are more able to be flexible in their use of recall strategies.

Field dependent people learn and function effectively in social-interpersonal situations. They are popular, and show physical and emotional closeness behaviors and resolve interpersonal conflicts effectively (Witkin and Goodenough, 1977). Even as young children, they show different patterns of pronoun usage, favoring the first person plural over the first person singular, in contrast to young field independent children (Dreyer, Dreyer and Davis, 1987). Social and interpersonal information is dealt with efficiently by field dependent people, who show better recall for faces and social aspects of situations, and better free recall of social (as opposed to neutral) words, compared to field independent people (Oltman, 1986). Oltman noted that the interactive aspect of social situations seems crucial to field dependent people; they react much like field independent people to written communication from authority.

McKenna (1983) presented a much different interpretation of the social focus of field dependent people. Noting that people who do poorly on tests of field dependence-independence also do poorly on other tasks,

McKenna suggested that this reliance on social sources of information is in fact an expression of need for help.

McKenna's (1983) view aside, the qualities of field independent and field dependent people suggest that in the appropriate context, either cognitive style is adaptive. For example, Witkin et al., 1954 reported that certain perceptual arrays favor accurate responding from field independent people, whereas other perceptual arrays favor greater accuracy from their field dependent counterparts. In certain social situations, for example those involving leadership, a field independent style is more well suited, whereas in other social situations, like those requiring conflict resolution, a field dependent style is more advantageous. In this sense, the concept of cognitive style can be accurately construed as a value neutral (Witkin and Goodenough, 1981) preference for particular kinds of information in the perceptual array.

Several authors have suggested that field dependence-independence, unlike restructuring ability, is uncontaminated by concepts like intelligence or ability, in which one level is inherently superior or inferior to another (Witkin et al., 1954; Helode and Kulkarni, 1986; Haynes and Miller, 1987; Pizzamiglio and Zoccolotti, 1981). This opinion is not unanimously held, however. Measures of

field dependence have been found to correlate with measures of intelligence (Ozer, 1987; Kaufman, 1979), academic achievement (Kaufman, 1979) and creativity (Chadha, 1985). In the last of these studies, the EFT was used as the measure of cognitive style. In the case of Ozer's study, a spatial abilities test taken during childhood was found to predict verbal IQ at age 18, in a sample of normal students. In neither case, then, was a specific test of field dependence-independence used to establish the relationship of cognitive style and intelligence. In the case of Kaufman's review, the well-known relationship between the RFT and the Block Design, Picture Completion and Picture Arrangement subtests of the Wechsler Intelligence Scale for Children (Revised) (Wechsler, 1974) was cited.

There is a considerable body of research on the development of cognitive styles (Witkin and Goodenough, 1981). There is some empirical support for the notions that neuropsychological, hormonal and genetic influences may indeed play a role in that development. For instance, Van Blerkom (1987) found evidence of greater cerebral lateralization in field independent males than field dependent males (although he did not find the same effect in females). Zoccolotti and Oltman (1978) reported a

similar finding, again with no differences for females. Pizzamiglio and Zoccolotti (1981) found marked evidence of hemifield superiority for letters and faces, indicative of greater lateralization, in field independent males and females. They also found minor indicators of lateralization for field dependent males and females. Pizzamiglio and Zoccolotti (1986) have suggested that the structural differences in brain development seen in lateralized versus ambidextrous individuals may be recapitulated by differences in cognitive style.

Of interest to the present discussion are three areas of research: those which deal with developmental patterns and longitudinal stylistic stability, those which deal with sex differences on cognitive style measures, and those which consider familial influences on cognitive style selection.

Developmental patterns. Differences in cognitive style have been found in children as young as preschool age (Coates, 1975; Coates Lord and Jakabovics, 1975; Dreyer, Dreyer and Nebelkopf, 1971; Dreyer et al., 1987). Children who develop rapidly towards field independence have also been noted to develop rapidly in cognitive restructuring skills (Witkin and Goodenough, 1981). In general, there is an overall developmental trend towards

increased body-reference in perception from early years to the mid-teen years, with little subsequent change (Witkin et al., 1954; Witkin et al., 1962; Witkin, Goodenough and Karp, 1967; Witkin and Goodenough, 1981; McLeod, 1987). A similar developmental trend has been noted for cognitive restructuring skills (Maccoby and Jacklin, 1974; Witkin et al., 1962). Differences in field dependence-independence tend to be quite stable early in life, and post-pubertal cognitive styles can be predicted with reasonable accuracy on the basis of prepubertal measures (Witkin, Goodenough, and Karp, 1967). Witkin et. al. (1977) reported test-retest correlation coefficients from $r=.66$ to $r=.72$, in a study of boys aged 10 and 14.

Sex differences. Sex-related differences in cognitive styles have been reliably demonstrated. Boys tend to be more field independent from an early age and more adept at cognitive restructuring after the age of puberty, than girls (Witkin and Goodenough, 1981; McKenna, 1984). There is some speculation within the hormonal research that the earlier onset of puberty in girls may be responsible for interfering with the development of restructuring skills (Waber, 1976, 1977a, 1977b). In contrast to the case for field dependence-independence, sex-related differences in restructuring ability are typically not evident prior to

puberty, and it has been suggested that late maturers have more well-developed restructuring skills than early maturers (Broverman et al., 1964).

Familial influences on cognitive style. The notion of early onset is consistent with the child-rearing literature, which suggests that differences in parenting techniques as early as the child's infancy may influence his or her cognitive style (Dyk, 1969).

To summarize this literature, we may consider two main topics: the effect on children of parental encouragement towards autonomy, as opposed to parent-reliance, and the effects of family power constellations and specific parental roles on the development of cognitive styles in children. The following summary represents, except where noted, a paraphrase of Witkin and Goodenough's (1981) review of this topic.

Child-rearing practices which encourage autonomous functioning by children are surmised to lead to the adoption of a field independent cognitive style by such children. Child-rearing practices which encourage reliance on parental authority and social conformity by children tend to lead to their adoption of a field dependent cognitive style. The mothers of field dependent children have been found to show several characteristics: they

limit their children's community activities, emphasize conformity, discourage assertive or aggressive behaviors, and discourage the assumption of responsibility by children.

The parents of field dependent children have been noted to use nonspecific and repetitive comforting techniques with their infants, which tended to remain constant across different situations and variable sources of distress. The parents of field independent children, on the other hand, have been noted to use more situation-specific comforting techniques. The parents of field dependent children have been described as more coercive than those of field independent children (Seder, 1957). They have been described as more strict and more dominating of their children than parents of field independent children (Witkin and Goodenough, 1981), and they have been noted to issue more commands to their children (Busse, 1969). Busse also noted a tendency among parents of field dependent children to either insufficiently train their children for specific tasks or else to take over tasks completely. Parents of field independent children tended to give some direction to their children, but not an excessive amount.

In sum, the parenting practices of the parents of

field dependent children discourage separation and individuation by children, perhaps inhibiting their children's own sense of differentiation and reliance on internalized standards. Such parents encourage a global approach to information-processing and problem solving. The parents of field independent children encourage reliance on internal referents and a more differentiated approach to information processing and problem-solving, by adopting more situation-specific comforting behaviors early in life and more task-specific training as their children get older.

Parents of field dependent children have been found to be more dominating of family interactions, while power relations in the families of field independent children have been found to be less structured and more variable from situation to situation (Dreyer, 1975). The influence of paternal and maternal roles has been linked to the development of field dependence and field independence. Given a premise of greater likelihood of field independence among adult males than females, a sex-role modelling hypothesis has been advanced to explain the phenomenon of sex differences in the cognitive styles of children (Lynn, 1962, 1969). Evidence for such a hypothesis has been provided by studies which have shown

differential effects of paternal and maternal influence on cognitive style preferences in girls (MacEachron and Gruenfeld, 1978) and boys (Busse, 1969; Dawson, 1976), and the effect of father-absence on the cognitive style development of children. Most of the latter type of studies suggest that father-absence is associated with a greater tendency to field dependence among their children (Barclay and Cusumano, 1967; Lee, 1974; Louden, 1973; Schooler, 1972; Trent, 1974; and Wohlford and Liberman, 1970). Families with strong paternal involvement tend to produce field independent boys (Busse, 1969). Studies of maternal absence are rare, but lesser identification with mothers has been associated with greater field independence in girls (Nilsson et al., 1973; Bieri, 1960; Constantinople, 1974).

An alternative to the sex-role modelling hypothesis has been advanced, which suggests that the paternal role in fostering field independence may be effected through facilitating the separation of children from their nurturing mothers (Witkin and Goodenough, 1981).

In closing this introduction to the theory of field dependence-independence, one final point must be considered: that is, the concept of mobility and fixity.

Mobility-fixity. Witkin and Goodenough (1981) have

suggested that there may be people who are more variable in their use of cognitive styles than others. Other people are more consistent in their affiliation to either field dependence or independence. The first tendency was labelled mobility and the second fixity by Witkin and Goodenough. There is little data on the incidence of these qualities in the general population (Bertini et al., 1986). Bertini and his colleagues have called for study of the issue, while conceding that the notion of mobility is a striking one, given all of the evidence for consistency in the experimental data. Essentially the same point is made by Korchin (1986).

Two studies have made rather loose interpretations about the general topic of mobility. In a study of creativity, Noppe (1985) functionally equated mobility with achievement on the Stroop color-word task (Stroop, 1935). Hansson, Rydén and Johnsson (1986) have suggested that mobility, as measured by atypical preferences for RFT configurations, is associated with field independence rather than field dependence. In general, the concept of mobility-fixity would seem to reflect a theoretical rather than an empirical construct at present.

Two studies have shown the efficacy of retraining, especially in fostering improved restructuring skills

(Dolecki, 1976; Hurwitz et al., 1975). Witkin and Goodenough (1981) have noted the greater adaptiveness of mobility over fixity, as evident from the retraining studies, and have argued for the use of such retraining to supplement the cognitive style options of individuals.

Having reviewed the background literature on field dependence-independence, it is now possible to integrate this literature into the issue of depression, and to consider the empirical and theoretical links between the two topics. Most importantly, it will also be possible to consider the implications of this relationship for the issues raised earlier for the Beck theory, concerning the influence of premorbid cognitive style on depressive cognitive processing.

Depression and Cognitive Style

As early as the 1950's (Witkin et al., 1954), there was speculation, based largely on research utilizing projective techniques, that the likelihood of developing specific psychiatric disorders was related to the influence of cognitive style. Witkin and his colleagues suggested that psychopathology is an exaggerated but stylistically congruent manifestation of an individual's typical mode of cognitive processing. More specifically, the psychopathological characteristics found in field

independent individuals included expansive, euphoric delusions, with high self-esteem, arrogance, and outward-directed expressions of aggression. Such people were found to show a degree of autonomy of functioning, even in their psychopathological states. In contrast, field dependent people were found to show inadequate impulse control, low self-esteem, and aggression towards the self. Such people were found to display passive, helpless behaviors, such as weeping, and inappropriate dependence on others.

While superficially the characteristics of field dependent individuals as described sound like those of clinically depressed patients, no strong empirical relationship between depression and field dependence or field independence was demonstrated for several years.

Some movement towards establishing such a relationship, at least conceptually, was evident in Witkin's (1965) review of psychological differentiation and forms of pathology. Witkin noted that adequate psychological adjustment was possible at any degree of field dependence or independence, but that cognitive style would likely influence the form and nature of psychopathology. In particular, he specified "dependency"-type (p. 324) problems, such as alcoholism, obesity and asthma, as related to an undifferentiated or field dependent cog-

nitive style. Again, Witkin did not propose a specific relationship between clinical depression and any particular cognitive style. At that point, Witkin's (1965) discussion of depression was symptomatically rather than nosologically or syndromically focused, as evident in comments about depressive symptoms concurrent with a variety of psychiatric disorders. He did note that different cognitive styles were evident across several categories of psychopathology and as such might be useful in clarifying nosological issues.

Evidence for an influence of cognitive style on forms of psychopathology has been provided by several authors. Johnson (1980) found paranoid schizophrenic patients to be more field independent than nonparanoid schizophrenic patients, consistent with Witkin's (1965) hypothesis. Sief and Atkins (1979) found specific phobia patients- those who suffered from a simple phobia- to be more field independent than situational phobic patients (more commonly described as suffering agoraphobic symptoms). Fogliani-Messina, Fogliani and Caruso (1982) found that students who showed hysterical traits on the Rorschach test (Rorschach, 1951) were more field independent than students who showed obsessive traits.

Several authors have suggested that alcoholism is

more likely in field dependent than field independent people (for example, Kalliopuska, 1982; Witkin, 1965). However, as Lafferty and Kahn (1986) point out, there exists considerable evidence that alcohol use affects cognitive style performance measures (for example, Kristofferson, 1968; McWilliams, Brown and Minard, 1975). Lafferty and Kahn (1986) have shown that the EFT performance of alcoholics varies with alcohol use: people score in a more field dependent fashion when they are actively drinking than when they are dry, and the rate of EFT improvement is strikingly fast, once abstinence is achieved (with significant changes in as little as three weeks). These results undermine the traditional view that alcoholism is related to a premorbid field dependent cognitive style.

Parkes (1981) added to this picture of contrasting symptomatic trends among field dependent and field independent people. She asked a group of normal female nurses to fill out a questionnaire indicating situation-specific, subjective experiences of anxiety, irritability and depression. This non-clinical group showed no difference in variance among the emotion-measures. Significant positive correlations between cognitive-symptom measures of anxiety and depression were found for the

field dependent group only. Parkes also compared symptom profiles based on mean per-item scores for field dependent and field independent nurses. There were eleven items per emotion-measure. Field independent subjects showed more (14 out of 22) significant differences between depression and other symptoms than did field dependent subjects (7 out of 22). Parkes cited both of these findings to support a view that field independent subjects achieve a more clear differentiation of symptoms than field dependent ones.

An explicit association of field dependence and depression was noted in Witkin, Lewis and Weil (1968). The authors defined shame as a quality of painful awareness of the self as the object of disapproval, with accompanying "feelings" (p. 195) of worthlessness and inferiority, and behaviors including weeping and professions of weakness. In contrast, guilt was defined as a quality of awareness of having violated one's own standards. Witkin and his colleagues predicted that field dependent psychotherapy patients would show more evidence of shame than guilt in their interactions with psychotherapists, as well as more evidence of self-directed hostility than field independent patients. The authors predicted that field independent patients would show more guilt and other-directed

hostility than field dependent patients. All hypotheses were confirmed.

The results of this study provided some preliminary empirical evidence of a direct relationship between the field dependent cognitive style and the manifestation of depression-like cognitions and behaviors. Witkin et al. (1968) speculated that shame is indeed related to both self-directed hostility and depression. They speculated that depression is a more common symptom for less differentiated, field dependent patients than more differentiated, field independent ones. They did not, however, rule out depression as a symptom for field independent individuals. They suggested a need for further research with depressed patients with varying cognitive styles, to distinguish among patients who arrive at a depressed condition by different routes.

Witkin and Goodenough (1977) reviewed several studies to further support the notion that field dependent patients are more likely to direct hostility towards the self rather than others. The research reviewed also indicated that field independent patients are more likely to direct hostility against others than the self. No difference was noted in the readiness of either cognitive style group to experience hostility or in their willing-

ness to vent it indirectly.

An early attempt to consider field dependence and field independence within a psychopathological diagnostic category was that of Koran and Maxim (1972). The authors noted the similarity between clinical manifestations of manic-phase symptomatology of manic-depressive patients and clinical descriptions of field independent people during a "breakdown" (p. 205). Likewise, they noted the similarity of clinical descriptions of depressed-phase symptomatology of manic-depressive patients and clinical descriptions of field dependent people during a breakdown. Koran and Maxim hypothesized that the degree of field dependence of manic-depressive patients would vary with changes in clinical state, that is, with changes from manic to depressive symptoms and vice-versa. Their hypotheses were not confirmed; nor were any changes in cognitive style evident for such patients when they were symptom-free. The authors concluded that cognitive style has no important relationship to manic-depressive psychosis, and that field dependence has no universal link to the depressive-type symptomatology proposed by Witkin (described above).

Koran and Maxim's (1972) inferences are questionable, for several reasons. On a conceptual level, they failed to

present any integrative model of the clinical disorder under study, in terms of cognitive style. On an empirical level, their proposed generalization from bipolar disorder to depressive states which might occur as part of a unipolar syndrome seems questionable. Koran and Maxim's data, contrary to predictions, indicated the robustness of cognitive styles, despite variation in symptom level.

Another early study of more direct relevance to depression was that of Levenson and Neuringer (1974), who found that suicidal psychiatric patients tended to show a more field dependent pattern of responses to spatial abilities tests than did psychiatric controls. Suicide proneness had been taken as indicative of depressive state (a view supported by Lewis, 1986). While not by itself pathognomic of depression, the inference of depression in suicidal patients makes intuitive sense.

More recently, O'Connor, Colter and Shaw (198) reported that a group of clinically depressed psychiatric patients showed more extreme elevations on a revised form of the RFT than a control group, indicative of greater field dependence among the depressed patients. It is not clear from this study whether the control subjects were other psychiatric patients or nonpatients.

Similar results were provided by Kingsland (1981) and

Kingsland and Greene (1984). In the first study, depressed female outpatients at a community clinic were compared on the basis of characteristics of dependency versus self-evaluation and cognitive style. They were also compared on a variety of measures to non-depressed controls. Kingsland hypothesized that dependent depressed women would be more field dependent than self-evaluative depressed women; results indicated the converse. More importantly, depressed women were found to be significantly more field dependent than non-depressed women. The Kingsland and Greene (1984) study essentially replicated the latter results. The authors noted the methodological drawbacks of this study, in particular the absence of a clinical control group (of presumably non-depressed psychiatric outpatients).

In summary, the preceding studies suggest that clinical depression may be associated with the undifferentiated cognitive style of field dependent people. While none of the studies reviewed provides evidence that field independent people are invulnerable to depression, indications are that the field dependent cognitive style may be conducive to depression, as suggested by Witkin in 1965.

The conclusion that field dependence is related to

depression must be taken cautiously, however, because of methodological issues as well as conceptual ones. Considering the methodological ones first, it is essential to determine to what, if any, extent the apparent field dependence of depressed people is due to an independent effect of depression on cognitive style measures. As noted earlier, this issue is well exemplified in the literature on alcoholism (Lafferty and Kahn, 1986).

Koran and Maxim (1972), as noted, found that changes in clinical status involving manic and depressive symptomatology produced no changes in RFT performance for the same people. Whatever the cognitive style of their subjects to begin with, it appears that it was impervious to changes brought on by depression onset and remission.

Silverman (1979) reported a similar conclusion in a study involving depressed women. Although there is some lack of clarity about the composition of Silverman's subject group according to cognitive style preferences, it is notable that the authors found that improvements in depression following electroconvulsive therapy did not lead to improvements in Rod and Frame Test (RFT) scores (in the direction of field independence).

O'Connor et al. (1984) reported inconsistent evidence with regard to the effect of depression on RFT scores.

They found initial improvements in some RFT indices coincident with reduction in depressive symptoms following electroconvulsive (ECT) and antidepressant-drug therapies for field dependent and independent depressed patients. In the case of bilateral ECT, these improvements were transitory and RFT performance returned to pretreatment levels within three months, despite enduring improvement in depressive status. These results, like those of Silverman (1979) and Koran and Maxim (1972), suggest that depressive status may not influence RFT scores much (the transitory improvements immediately post-ECT presumably being due to real but short-lived neurological effects of ECT). Data from unilateral ECT are not so clear cut, and show interactions of cognitive style and type of ECT stimulation. Field independent patients who received unilateral ECT showed few changes over the course of treatment and follow-up. Field dependent patients who received unilateral ECT showed a linear pattern of improvement on some RFT indices, but a fall-back to a near-pretreatment level at follow-up on others, including the mean error as determined by Witkin's (1954) approach. Antidepressant medication seemed to produce a more longstanding change in RFT scores, although it was not clear if patients in the study were still taking medi-

cation at three-month follow-up. As with bilateral ECT, unilateral ECT and pharmacological interventions all produced enduring improvements in depressive symptomatology.

The three studies reviewed all made use of the RFT as a measure of cognitive style; all provide evidence that RFT scores are relatively stable over fluctuations in clinical status in depression. This inference makes intuitive sense conceptually, as well. Depressive symptoms frequently affect motivation and motor speed, factors which might influence a timed test. The RFT requires no motor involvement and is untimed, and so should avoid the obvious confounds presented by depressive symptoms.

The same comments cannot be applied to EFT performance, or performance on spatial abilities tests like those used by Levenson and Neuringer (1974). These tests are all timed, and all involve motor speed. Results like those of Kingsland (1981) and Kingsland and Green (1984) must be interpreted with caution, because of the unquantifiable influence of depressive symptoms on timed tests.

The above studies, along with much of the literature reviewed earlier, suggest that cognitive style is a relatively stable intrapersonal phenomenon. If cognitive style exerts an effect upon the manifestation of psycho-

pathological symptoms, there is little evidence that it has any etiological role, since presumably most field dependent people do not eventually become depressed. Given some other condition or situation which brings about deviance from the normal, well-adjusted function of which both field dependent and field independent people are capable, it may be more likely that field dependent people develop depressive symptoms.

Wise, Hall and Wong (1978) presented evidence pertinent to this view. In a study involving thirty-seven post-cholecystectomy patients with no diagnosable psychiatric illness, the authors found that field dependent patients were more susceptible to anxiety and depression in the anticipation and experience of pain. Such patients did not, however, make greater demands for medication. Instead they drew on available social supports to allay their distress. These results suggest that, given an objective environmental stressor, field dependent patients reacted in a characteristically different manner than field independent patients. That reaction was one conducive to anxiety and depression. Yet in the absence of this stressor, both field dependent and field independent groups functioned adequately.

Further evidence for the depression-proneness of

field dependent people was provided by Newman and Hirt (1983). The authors exposed a sample of field dependent and field independent undergraduate students to a two-part experimental manipulation. During the first part, subjects were asked to listen to two tape-recorded passages each of which described a child's reaction to it's mother's death. One recording described a depressive-type reaction by the child; the other, an angry, aggressive reaction. During the second part of the experiment, subjects were exposed to tachistoscopically-presented stimulus words of either an aggressive (eg. "kill") or a neutral (eg. "swim") type. Subjects were then asked to rate themselves on a scale of depressed emotion. Physiological measures of skin conductance were also taken for all subjects.

Consistent with a psychoanalytic explanation of depression as the result of introjected hostility, Newman and Hirt (1983) had predicted that field dependent subjects would show more depressed feelings following exposure to aggressive stimulus words than neutral words. In fact, the tachistoscopic cue words made no difference. Cognitive style was the only significant variable. Field dependent subjects reacted to all manipulations with a consistently greater degree of depressive affect than

field independent subjects. Field dependent subjects also showed highly significant increases in skin conductance, compared to field independent subjects. The authors concluded that the presence of aggressive stimuli did not account for depressive reactions among field dependent subjects. It would appear that the preliminary exposure to the tape describing a sad event (the mother's death) was enough to arouse depressive feelings in the field dependent subjects.

The picture that emerges from the latter two studies is that of normally-functioning field dependent people who react, in response to environmental stressors, in ways which are characteristically different than field independent people. Both studies are consistent with the notion advanced by Witkin and his colleagues (Witkin, 1965; Witkin et al., 1968; Witkin and Goodenough, 1981) that, given conditions conducive to psychopathology, field dependent people will react in different ways than field independent people.

None of these positions implies that a field dependent cognitive style is necessary for the development of depressive symptoms. It is important to recall the proposition of Witkin et al. (1968) that depression may occur in a person regardless of the degree to which he or

she is field dependent or field independent. Given this provision, however, the above data seem to suggest that, given a combination of events or conditions likely to produce psychopathology, the field dependent person is more likely to display symptoms of depression than the field independent person.

In summary, the above studies suggest the pertinence of the construct of cognitive style for the study of depression in a general sense. It remains to consider the implications of this construct for the Beck theory, and in particular for issues relevant to the relationship of typical modes of cognitive processing to hypothetically depressotypic cognitive processing, as proposed by the Beck theory. In that cognitive style refers to the formal cognitive processing characteristics of people, which seem to exert a stable influence on information processing over time and variation in clinical status, the direct relevance (if not potential contradiction) of this construct for a theory which presupposes changes in cognitive processing due to variation in clinical status seems clear. Moreover, the personality correlates of the field dependence-independence literature, based on the different degree of need for contextual information of people with different cognitive styles, have implications for the

nature of depression-evoking events, again relevant for the Beck theory (as articulated by Beck, 1987).

Problem Statement and Rationale

Earlier, two major theoretical and empirical issues were delineated for the Beck theory of depression. The first of these concerned the apparent uncertainty of the theory, and contradiction between advocates of cognitive theories, about the role of premorbid modes of information-processing on cognitive processing errors and distortions when people are depressed. With reference to Williams (1985) and Ingram (1984), it was pointed out that there are views which stress the influence of normal cognitive processing on cognitive errors in depression. These views are different from those of Beck et al. (1979), who describe depressive cognitive errors as distinct from normal information-processing. In the Beck view, depressive processing errors are seen as schema-driven, by depressive schemata. In this context, depressive cognitive errors should reflect little about the general premorbid processing style of now-depressed people. The two positions are different ways of viewing cognitive processing errors in depression. For convenience, this issue will be referred to as the "premorbid style" issue, in discussions to follow.

The second major issue mentioned is related to the first. The Beck model (Beck et al., 1979) has suggested that depressive cognitive processing is homogeneous, given formal characteristics of globality, primitiveness and immaturity. The specific processing errors outlined in the model would seem to apply more or less equally to most depressed people. Again, this view is based on the implicit assumption that depressive cognitive processing is entirely the product of depressive schematic activation, rather than an interaction between schematic arousal and the predominant modes of information-processing followed by people before they are depressed. Research findings like those of Hamilton and Abramson (1983) have called into question the notion of homogeneous information processing among depressed people, on a general level; there is little specific evidence with regard to heterogeneity of processing errors, to the knowledge of this author. For convenience, this issue will be referred to as the "error style" issue.

The theory of field dependence-independence and the literature concerning the relationship of cognitive style to depression have been reviewed, in order to provide a conceptual framework upon which to suggest some answers to the two issues raised. This review is offered to as

evidence that people do have characteristic, stable modes of information-processing which follow predictable developmental trends and which tend to resist change in the absence of specific retraining or biophysical intervention. While the research is far from complete as yet, indications are that cognitive processing in depression, along with some other psychiatric disorders, is consistent with premorbid cognitive style, rather than distinct and unique to the depressive state.

These characteristic modes represent a heterogeneity of cognitive processing style of the kind likely to influence depressive information-processing, if theorists like Williams (1985) and Ingram (1984) are correct. The potential importance of the influence is emphasized by a few recent studies which suggest that cognitive style has a possible influence on the form of depressive pathology, or the likelihood of its development (Kingsland and Greene, 1984; Wise et al., 1978; Newman and Hirt, 1983).

Of particular interest for the premorbid style and error style issues is the comparative shape or form of cognitive processing in depression, for people who show different (presumably premorbid) cognitive styles. A finding that patterns or modes of processing in depression are consistent with patterns or modes of processing while

not depressed would provide evidence for the view that normal information processing does influence depressive cognitive processing errors, relevant to the premorbid styles issues. It would also provide evidence that patterns of depressive cognitive processing errors are heterogeneous and predictable given the customary style of cognitive processing of people, of relevance to the error style issue.

To the knowledge of this author, no study has examined the relationship of cognitive style to cognitive theories of depression (perhaps in part because of the traditional link of field dependence-independence to the ego analytic perspective (Messick, 1986)). It would seem that an investigation of this relationship is in order, to help resolve the two issues raised.

Analysis of the processing component of the Beck theory (Beck et al., 1979) in the context of the cognitive style literature permits a more specific delineation of the relationship, in hypothetical form. Witkin and Goodenough's (1981) prototypical field dependent person processes information in a global, undifferentiated manner; depends on others for structuring cues in situations in which information lacks inherent structure; fails to adequately segment aspects of his or her psychological

functioning; and prefers to respond to rather than act upon the perceptual field. Such a person characteristically values highly the acceptance of others. His or her information-processing strategies include selective attention to social information and selective inattention to both non-social information and own-body sensory cues.

All of these processing characteristics, given a depressive psychopathology, suggest the particular cognitive processing distortions of the Beck theory of depression; in particular, overgeneralization, magnification (or catastrophizing), and personalization. All of these errors imply perceptual passivity and a global, undifferentiated style of processing objectively discrete information. One can hypothesize that field dependent people overgeneralize as they draw conclusions from minor and perhaps even irrelevant situations and apply them to other situations in an undifferentiated way. The tendency of field dependent people to use external (and often social) structural cues to interpret ambiguous information, especially personally-relevant information, will likely lead to the perception of all events as relevant to oneself in one's social milieu: that is, personalization. This social dependence will likely also lead to the accordance of undue importance to events of objectively

limited significance to the person, based on their structural and social implications: that is, magnification or catastrophizing (since the field dependent person lacks internal structural capacities to counterbalance unfavorable information from external sources). More generally, based on the personality correlates of the field dependent cognitive style, one might also expect that the precipitating event of a depressive episode for a field dependent person would be social or interpersonal in nature. Moreover, one might expect that the cognitive distortions of field dependent people would be situation-specific, with an emphasis on social or interpersonal themes.

Despite the general trend towards an empirical relationship between field dependence and depression, there is no reason to assume that field independent people are invulnerable to depression. On the contrary, the characteristic profile of the field independent person suggests that depressive-type distortions may well be potentially operative for them. The prototypical field independent person processes information in a highly differentiated manner, depends on him/herself to the exclusion of others for structuring information, clearly segments aspects of his/her psychological functioning, and prefers to act upon the perceptual field. Information-

processing strategies of field independent people include selective inattention to social information and idiosyncratic cognitive structuring.

Given a depressive psychopathology, these processing characteristics suggest the stimulus set cognitive processing distortion of selective abstraction and imply arbitrary inference. Both of these distortions are indicative of a discrete approach to structuring information, and the definitively field independent predilection of acting upon the perceptual field. Field independent people bring their own structures to new situations and either select information which fits those structures or impose those structures on available information. Given the personality characteristics of field independent people, one might also expect that the precipitating event of a depressive episode for a field independent person would be non-social or non-interpersonal; most likely related to achievement, competence or self-reliance. Moreover, one might expect that the cognitive distortions of field independent people would be situation-specific, again with an emphasis on achievement, competence, or self-reliance situations.

Before presenting specific hypotheses about cognitive styles and distortions, it is necessary to consider the

roles played by three relevant and potentially rival hypotheses. The first concerns the role of life events. Brown and Harris (1978) and Hammen and Mayol (1982) have noted the effects of different life events on the incidence of depression. In the first case, the authors argued that depressed people are indeed faced with depressing life situations. In the second case, the authors reported classes of typical life events in the histories of depressed people. Neither of the studies cited suggested that depressive-type life events are homogeneous; yet neither suggests any systematic role for individual differences in such life events. Thus in a broad sense, both studies may be construed as having a quantitative view of the role of life events in depression. The quantitative view might be described as the hypothesis that more bad things happen to depressed people than people who do not get depressed. There is a need to demonstrate the independence of cognitive styles and quantity of negative life events, to minimize the potential impact of this rival hypothesis.

The role of life events does have a role in the present study, but that role is qualitative, not quantitative. There is no apparent reason to expect field dependent depressed people to have any more or fewer

objectively bad events in their lives than field independent depressed people. One might expect a qualitatively different kind of event to bring about a depressive episode and to be the object of cognitive distortions for people with different cognitive styles, given the different predilections for situational information and different relative values regarding sources of information, of the two cognitive style groups. According to Witkin and Goodenough (1977), field dependent people value social contact and use social information to structure their views of the world. Field independent people value their own standards and achievements in relating to the world. One might hypothesize that the kind of events seen as depressogenic would be different for the two groups: that perceived social traumas would lead field dependent people to depression, while perceived damage to competence or achievement would more likely lead to depression for field independent people. In both cases, it is hypothesized that it is not the event per se, but the qualitative interpretation of the event which is truly depressogenic.

This distinction of depression-evoking events is reminiscent of Beck's (1987) distinction between potentially depression-evoking events for people of different

personalities. For Beck, people with a sociotropic personality, who highly value interpersonal affection and affiliation, are most likely to become depressed as a result of perceived social loss. Such people sound like field dependent people, in terms of personality characteristics. In contrast, people with an autonomous personality, who highly value independence and freedom of movement, are most likely to become depressed following a perceived loss to their personal autonomy. Autonomous people, as described by Beck, sound very much like prototypical field independent people.

The second rival hypothesis is that of differential intellectual skills between field dependent and field independent individuals. Witkin and Goodenough (1981) cited considerable research to suggest that field dependence-independence is a value-free cognitive style, independent of ability. The relationship between performance on the EFT and performance on some intellectual measures is not consistent with this claim, and there is a general developmental trend towards field independence. Given the potential rival hypothesis that subtle intellectual and developmental variation may play a confounding role in a small sample, it was deemed prudent to take a measure of intelligence for subjects, in order to provide

a gauge of the role of this factor.

The third rival hypothesis concerns the influence of severity of depression on measures of cognitive processing errors. A more severely depressed sample of people would be expected to show a more extreme degree of cognitive processing errors, regardless of whether these errors are causal or epiphenomenal of depression. Part of this problem can be controlled through the use of rigorous inclusionary criteria, (by only taking people who meet DSM-III (American Psychiatric Association, 1980) criteria for a major depressive disorder. As with the intelligence factor, it was deemed prudent to take a measure of depression severity for subjects, in order to provide a gauge of the role of this factor.

Two additional rival hypotheses can be dealt with more simply within the methodology of the study. The first is the influence of sex on cognitive style. To prevent confusion about the nature of obtained differences (since mean scores on field dependence measures tend to differ for men and women, according to Witkin and Goodenough, 1981, Oltman (1968), and others), only women are included in this study. The second is the influence of pharmacological status on scores on measures of cognitive style, as exemplified by O'Connor et al. (1978). To prevent

potential confounding by antidepressant medication status, only women who are experiencing no clinical benefit from psychopharmacological intervention are included in the present study, and when possible assessment measures were taken prior to the initiation of an antidepressant medication regimen.

In summary, there is reason to believe that the cognitive distortions of depressed field dependent people are different from those of depressed field independent people. If so, the cognitive experience of depression will be different for people with different cognitive styles, and different kinds of events will trigger depressive episodes. The following hypotheses were derived to investigate the nature of the relationship between cognitive style and cognitive distortions in depression, as well as the relationship between life events and depression, as a function of cognitive style.

Hypotheses

(1) Field dependent (FD) people will differ from field independent (FI) people in the pattern of specific cognitive distortions they use while depressed.

(2) Hypothesis (1) being confirmed, the following between-groups contrasts are hypothesized:

a) FD people will score higher on a measure of

overgeneralization than FI people;

b) FD people will score higher on a measure of personalization than FI people;

c) FD people will score higher on a measure of magnification (which for the purposes of this study will be referred to as catastrophizing) than FI people;

- d) FI people will score higher on a measure of selective abstraction than FD people.

(3) Hypothesis (1) being confirmed, the following within-group contrasts are hypothesized:

a) FD people will score higher on a measure of overgeneralization than one of selective abstraction;

b) FD people will score higher on a measure of personalization than one of selective abstraction;

c) FD people will score higher on a measure of catastrophizing than one of selective abstraction;

d) FI people will score higher on a measure of selective abstraction than one of overgeneralization;

e) FI people will score higher on a measure of selective abstraction than one of personalization;

f) FI people will score higher on a measure of selective abstraction than one of catastrophizing.

(4) The effects of depression severity and quantitative differences in negative life events do not account for the

relationships described in hypotheses 1, 2 and 3, such that similar analyses with the effects of severity and life events as covariates will result in either no significant change in the results obtained or else a greater degree of contrast in the predicted directions.

(5) Depressed FD people will differ from depressed FI people in the proportion of cognitive distortions they make about social-interpersonal (SI) versus achievement-competence (AC) information, such that:

a) FD people will make a greater proportion of distortions about SI information than AC information; and

b) FI people will make a greater proportion of distortions about AC information than SI information.

(6) Depressed FD people will differ from depressed FI people in the quality of events to which they attribute their depression, such that:

a) FD people will blame SI-type events for causing their depressive episodes; and

b) FI people will blame AC-type events for their depressive episodes.

Chapter Two

Method P

Method

Subjects

Thirty-seven female adult psychiatric patients were interviewed as prospective subjects for this study. Twenty-eight of these were psychiatric inpatients and outpatients at the Royal Ottawa Hospital. The remainder were psychiatric inpatients at the Ottawa General Hospital. Both hospitals are located in Ottawa, Ontario, Canada. Criteria observed for inclusion of persons as subjects in this study included (a) the availability of a provisional diagnosis of major depression uncomplicated by psychosis, as confirmed the psychiatrist in charge of the patient; (b) confirmation of a diagnosis of major depression, according to DSM-III (American Psychiatric Association, 1980) criteria, on the basis of patients' completed Inventory to Diagnosis Depression (Zimmerman, Coryell, Corenthal and Wilson, 1986) forms, and (c) confirmation by the referring psychiatrist that treatment was directed primarily to depression and not some other physical or psychological disorder.

Seven patients (five from the Royal Ottawa Hospital) were excluded from subsequent analyses. Two of these withdrew from testing before completing any appreciable number of tests. One subject was excluded because of

failure to satisfy criteria "a": the psychiatrist in charge changed the diagnosis following the assessment. Two additional subjects were excluded because of failure to satisfy criteria "b": patients did not meet the DSM-III criteria, as measured by the IDD. One patient was excluded because of failure to satisfy criteria "c": after assessment, the psychiatrist in charge revealed that an acute medical condition was the primary focus of treatment (and was, in this patient's opinion, the cause for her depression). A final subject was excluded because visual problems prevented valid assessment of cognitive style.

The thirty remaining subjects were classified into two cognitive style groups, labelled field dependent and field independent, according to performance on the PRFT (Oltman, 1968). A cutoff score of 52.4 degrees was chosen to discriminate between the groups, based on Oltman's research. As a result of this dichotomization, fifteen field dependent female adult psychiatric patients with a primary diagnosis of major depression were selected for inclusion in the study. Of these, six were inpatients and nine outpatients. Fifteen field independent female adult psychiatric patients with a primary diagnosis of major depression were also selected for inclusion in the study. Of these, four were inpatients and eleven outpatients.

The total subject sample ranged in age from 19 to 57 years, with a mean age of 37.0. The field dependent sample ranged in age from 19 to 54 years, with a mean age of 37.4 years. The field independent sample ranged in age from 21 to 57 years, with a mean age of 36.6 years.

Materials:

Inventory to Diagnose Depression (IDD). The IDD (Zimmerman, Coryell, Coryell, and Wilson, 1986) is a multiple-choice-style nosologic and syndromic self-report scale for the evaluation of affective disorders (see appendix D). Patients estimate the incidence and severity of a number of symptoms associated with depression. The IDD was designed to permit diagnosis of major depressive disorder according to the diagnostic criteria of the DSM-III (American Psychiatric Association, 1980). This index was used in this study for the purposes of subject inclusion: all subjects selected were required to meet DSM-III criteria as assessed by this scale.

Zimmerman, Coryell, Coryell, and Wilson (1986) reported impressive psychometric properties for the index: test-retest reliability was .98; split-half reliability was .93; and Cronbach's alpha was .81, for randomly selected subjects (the split-half reliability for depressed patients alone was .83). The IDD correlated

significantly with other scales of depression: with the Hamilton Rating Scale (Hamilton, 1967), $r=.80$, $p<.001$; with the Beck Depression Inventory (Beck, 1978), $r=.87$, $p<.001$; and with the Carroll Rating Scale (Carroll et al., 1981b), $r=.81$; $p<.001$. Level of severity analysis indicated that the IDD discriminated significantly between different levels of depression ($F(5,99)=32.4$, $p<.0001$). IDD sensitivity was 86.1% for patients diagnosed with the SADS (Schedule for Affective Disorders and Schizophrenia) (Spitzer and Endicott, 1978) and 86.4% for chart-diagnosed patients. IDD specificity was 70.2% for SADS-diagnosed patients and 72.3% for chart-diagnosed patients. Zimmerman and colleagues concluded that the IDD is a sound psychometric instrument with a positive predictive value of 84.6% (with a prevalence of major depressive disorder of 62.1%; this value would likely decrease with decreasing prevalence values for major depressive disorder). Zimmerman and Coryell (1987) reported an overall agreement rate with the DIS (Robins, Helzer, Croughan and Ratcliff, 1981) of 97.2%, with a sensitivity estimate of 54.5% and a specificity estimate of 98.5% (based on an inter-test interval of about 10 days).

Portable Rod and Frame Test (PRFT). The PRFT (Oltman, 1968) is a test of cognitive style preference, which was

used to assign subjects to either the field dependent or field independent category.

Subjects are asked to estimate the point at which a tilted rod reaches an upright position, as it is moved in 3-degree steps from a position of 28 degrees tilt either right (R) or left (L) of the true vertical. The rod is moved from its starting place in the direction of the true vertical, to a maximum of 28 degrees beyond the true vertical in the opposite direction. While this task is undertaken, the frame is also tilted 28 degrees, either right or left. There are eight trials. The exact sequence of frame tilts is LLRRLRR; the exact sequence of rod tilts is LRLLRRL. Between each trial the subject's view of the rod and frame is obscured by a curtain. Uniformity of visual display across subjects and trials is ensured by the use of a chin and headrest at a standard height, and adjustment of the base of the apparatus to the true level, prior to every assessment. Each subject derives a score which represents the absolute degree of difference between her estimation of verticality and the true vertical, summed over the eight trials. Oltman's (1968) normative mean of 52.4 degrees of error was used as the cutoff score: in practice, subjects who scored equal to or less than 52 degrees total error were assigned to the field

independent group; subjects who scored equal to or greater than 53 degrees total error were assigned to the field dependent group.

There is adequate empirical and psychometric data to justify using the PRFT for classification purposes. Oltman (1968) reported correlations values of $r=.89$ for women and $r=.90$ for men, between the PRFT and the standard Rod and Frame Test (Witkin, 1948). He also reported a combined-sex-group correlation value of $r=.60$ between the PRFT and the Embedded Figures Test (Witkin et al., 1971). In addition to these concurrent validity data, Oltman reported a Spearman-Brown split-half reliability estimate of $r=.95$, indicative of acceptable internal consistency. The PRFT has been used for measurement of cognitive style during depressive episodes in other studies (for example, Crouppen, 1976; Koran and Maxim, 1972). Because the PRFT is not a test of performance speed or reaction time, there is no obvious reason to suspect performance decrements as a result of depressive symptoms (as illustrated by Weckowicz, Nutter and Cruise, 1972).

Cognitive Error Questionnaire (CEQ). The CEQ (Lefebvre, 1981) is a self-report survey of cognitive processing distortions. (see Appendix B). This survey was used to measure the extent to which subjects use parti-

cular distortions, and functioned as the dependent measure for hypotheses 1, 2, 3 and 4.

The distortions measured are selective abstraction, overgeneralization, personalization and catastrophizing. Individuals are asked to rate the likelihood of a particular distorted cognition following a given anecdote. Twenty-four anecdotes are included and scores are derived for total cognitive distortions and specific types of distortions. Lefebvre reported internal consistency estimates (Cronbach's alpha) ranging from .62 to .94 (all probability values were below $p=.001$), with higher values for overall scores (based on two sample groups). Lefebvre also tested parallel forms reliability in the same administration, thereby deriving a second estimate of internal consistency. Internal consistency estimates of .87 and .88 for the overall test, and values ranging from .57 to .79 for individual scales were so determined (all probability values were below $p=.001$). Lefebvre noted that the inclusion of heterogeneous errors in the scale would be assumed to reduce internal consistency; according to Lefebvre, the reasonably high values obtained suggest that a common factor, probably cognitive distortion, was measured by individual scales. Lefebvre reported a significant correlation of CEQ total scores with the Beck

Depression Inventory (Beck, 1978): $r=.61$, $p<.001$. Since the distribution of BDI scores was artificially rendered noncontinuous through sampling procedures, separate correlations for BDI and CEQ were computed for the depressed and nondepressed groups ($r=.39$, $p<.01$, and $r=.37$, $p<.003$, respectively). Unfortunately, statistical artifact is as apparent in these less impressive estimates as it was in the more favorable estimate preceding. Range restriction of BDI scores would be expected to lower correlation values. Analysis of covariance revealed a significant main effect for severity of depression: nondepressed groups scores significantly lower than depressed groups on the CEQ ($F(1, 73)=24.86$, $p<.001$). Both ANCOVA and Pearson Product-Moment results provide acceptable evidence of construct validity for this instrument.

Cognitive Bias Questionnaire (CBQ). The CBQ (Krantz and Hammen, 1979) is a self report survey of cognitive processing distortions which was used to measure situation-specificity of cognitive distortions (see Appendix C). This questionnaire was used as a dependent measure for hypothesis 6.

Six anecdotes are presented, 3 of which deal primarily with social-interpersonal (SI) situations and 3 of which deal primarily with achievement-competence

situations (AC) (personal communication, C. Hammen, 1986). Each anecdote is followed by 3 to 4 multiple-choice questions, in which alternative cognitions are presented to the respondent. Cognitions presented are classified as depressed-distorted (DD), non-depressed-distorted (NDD), depressed-non-distorted (DND), and non-depressed-non-distorted (NDND). Scores for each type of response are derived. Because the variable of interest for the present study was relative frequency of endorsement of DD options in SA and AC situations, one item was omitted from the AC scale to equalize the number of questions (eleven) per situation. The item selected for exclusion was chosen by an individual not associated with the study, who made the choice without awareness of the nature of the choice and without seeing or being familiar with the content or purpose of the instrument. Krantz and Hammen report moderate estimates of internal consistency (with a KR-20 coefficient of internal consistency of .69), which the authors attributed to the heterogeneous set of cognitive distortions measured. A test-retest reliability estimate of .60 ($p < .001$) was determined, using an 8 week intertest interval. Validity estimates were based on strong evidence for a greater degree of depressed-distorted item-endorsement among depressed than nondepressed individuals (for

example, analysis of one sample, divided according to a cutoff score of 10 on the BDI, revealed a t-value for group differences of $t=3.91$, $p<.001$). This pattern was replicated across every sample reported.

Beck Depression Inventory (BDI). The BDI (Beck, 1978) is a self-report questionnaire of depression severity was used for multivariate covariance analyses of data, relevant to hypothesis 4, and to estimate the severity of subject's depressive symptomatology (Kendall, Hollon, Beck, Hammen and Ingram, 1987).

Twenty-one multiple-choice questions are provided, concerning respondents' affective, cognitive and physiological symptoms of depression (see Appendix G). Shaw, Vallis and McCabe (1985) reviewed reliability data which suggest adequate or better split-half reliability (ranging from .58 to .93), item-total correlations (ranging from .22 to .86, with a mean of .68), and test-retest reliability (ranging from .69 to .90). The same authors review concurrent validity data, with correlations between the BDI and clinicians' rating of depth of depression ranging from .62 to .77, as well as "moderate to good" (p. 384) correlations with the Hamilton Rating Scale for Depression (Hamilton, 1967), the Minnesota Multiphasic Personality Inventory (Depression scale)

(Hathaway and McKinley, 1940), and the Zung Self-Rating Depression Scale (Zung, 1965). These data would attest to the adequate psychometric properties of this instrument.

Peabody Picture Vocabulary Test- Revised (PPVT-R).

The PPVT-R (Dunn and Dunn, 1981) is a test of verbal ability and receptive vocabulary which provides a screening measure of one major and stable facet of intelligence: vocabulary. This test was originally included to match subjects for intelligence, but this procedural step was dropped because of age-range problems and the presence of a number of bilingual (French and English-speaking) patients within the sample. The PPVT-R provides norms for ages 2 years, 6 months to 40 years, 11 months. The upper age limit was much too low for several subjects. In addition, the PPVT-R samples standard American English, and is susceptible to language exposure and other cultural influences, according to the test authors. The presence of several Francophones who spoke English with apparent fluency, but who responded with widely varying degrees of accuracy on the test suggested language sampling and/or cultural influences which cast doubt on the reliability of this measure for bilingual subjects. The test was retained to provide a limited test of the influence of verbal intelligence on dependent

measures, through multivariate covariance analysis.

On the PPVT(R)-L, subjects are asked to indicate which one of four pictures best describes the meaning of a word read to them by the examiner. Salvia and Ysseldyke (1981) reported that the technical characteristics of the PPVT-R "far surpass[ed]" (p. 278) those of other tests of receptive vocabulary. Split-half reliability coefficients ranged from .81 to .85, with a median value of .82, for an adult population using Form L of the test. Immediate test-retest reliabilities ranged from .71 to .79 for standard scores for single-age groups. Validity data is lacking for the PPVT-R. Although this test is a screening test, it is judged adequate for the purposes of estimating verbal intelligence as it avoids the pitfalls of performance and expressive decrements, caused by the depressive condition of subjects, to which more complete assessments of intelligence are susceptible.

⑤ Life Events Survey (LES). The LES (Sarason et al., 1978) is a self-report scale of positive and negative life events, which was used to determine the role of negative external stressors in the relationship between cognitive styles and cognitive distortions, relative to hypothesis 4. The use of the sum of negatively keyed events is consistent with the approach taken by the test authors, as

well as Hammen, Mayol, de Mayo, and Marks, 1986). The LES was also used as to facilitate the determination of qualitative difference in life event types between field dependent and field independent subjects, for hypothesis 5.

The LES version used includes 47 specific events, with three blank spaces left for additional events (see Appendix E). A section designed for a student population was omitted. The LES allows measures of positive and negative events, as defined by the individual, as well as individualized ratings of event impacts. The authors reported moderate test-retest reliabilities for event scores overall, with Pearson product-moment correlations of .19 and .53 ($p < .001$) for changes in positive event scores and .56 and .88 ($p < .001$) for negative event scores, for two separate samples. Significant correlation values are also reported for the negative and combined event scores and measures of trait and state anxiety (.40 and .46, respectively), and between negative scores and scores on discomfort and social nonconformity scales ($r = .25$ and .26) of a screening inventory for personal maladjustment (Lanyon, 1973), suggestive of concurrent validity.

All subjects were asked after completing the LES to state which event on the scale most contributed to their depression, and to briefly explain the nature of that

contribution (see Appendix F). These explanations were rated as to whether they were clearly social-interpersonal or achievement-competence in nature, by three raters blind to the purposes of the study. The ratings were used as the dependent measure for hypothesis 5. The three raters were psychological technicians employed by the Royal Ottawa Hospital, who were instructed in the rating procedure by the author (see appendix I for verbatim instructions to raters).

Procedure

All prospective subjects were referred to the experimenter by the psychiatrist in charge of the particular patient. It had been requested that referral of prospective patients be efficient enough to allow administration of experimental measures within 48 hours of the prescription of any psychopharmacological agent, in order to minimize any confounding effects of such agents. This arrangement was not always practical, and ten subjects were tested after longer intervals from the onset of psychopharmacological treatment. The average post-medication interval for these ten subjects was 6.9 days. In no case did that interval exceed the typical time for clinical effect (of the medication (Reid, 1983) (17 days being the longest interval), and at no time was clinical

improvement due to medication evident, according to the patient's psychiatrist.

Testing was administered in a single session, typically of two to three hours' duration. On arriving for the session, patients were requested to fill in a consent form, designed in accordance with the specifications of each of the hospitals at which testing was undertaken. Permission forms are reproduced in appendices J and K. Prospective subjects were then administered the IDD. All subjects then selected were administered the PRFT and PPVT(R)-L by the experimenter. Before administration of the PRFT(R)-L, subjects were asked whether they spoke English as a first language. After completing the PRFT(R)-L, subjects were given a booklet containing the BDI, CEQ, CDQ, and LES, in that order. Following completion of the LES, all subjects were asked to state which event described by the LES most contributed to their depression. A short break (not less than 15 minutes) was offered to all subjects during the completion of these measures, at approximately the midpoint of the protocol (most declined the break). In the case of subjects asking for discontinuation, no data was used if testing was not complete at least to the point of completing the CEQ. In two cases subjects asked to stop after that point, but gave per-

mission for the use of material collected already. In one of these cases, the patient completed the LES on a second testing occasion, a few days later.

All measures were administered by the author. Verbal instructions were taken verbatim from a test manual, and were based as closely as possible on instructions provided with each test (see appendix H). Written instructions were also provided with the IDD, BDI, CEQ, CBQ, and LES. Once the booklet containing the BDI, CEQ, CBQ and LES was presented and explained, the experimenter typically left the vicinity of the test subject, returning every fifteen minutes or so to check on progress and to deal with inquiries by the subject. This step was undertaken to eliminate any effect of vigilance by the experimenter (for example, hurrying or requesting specific answers).

It had originally been intended to retest patients after remission. This step proved impossible, with almost no referrals for retesting after thirteen months, and with institutional constraints on follow-up. Because of this provision, full debriefing was not possible. The purposes of the testing had not been disguised, however, and the possibility that one testing session would be sufficient was explained to each subject. Occasionally, subjects requested that results be communicated to their psychia-

trist; this request was complied with by the experimenter.

Design

The overall research design is an ex post facto experiment as defined by Campbell and Stanley (1963), in which the inferred experimental variable is clinical depression and in which subjects are distinguished and grouped on an inferred pre-experimental characteristic (cognitive style, or degree of field dependence-independence). This "pre-X attribute" (Campbell and Stanley, p. 70) of field dependence-independence is tested in an ex post facto manner, a course justified by a considerable body of research which indicates that cognitive style is stable over time and variation in clinical status. Similarly, several measures are taken to confirm the inferred experimental variable. Dependent variables and covariates are taken subsequent to this inferred experimental variable, with comparisons provided between field dependent and field independent groups.

Hypotheses 1, 2, and 3 are analyzed using a profile analysis procedure described by Morrison (1967), for two groups. Morrison's procedure tests a sequence of hypotheses. First, the null hypothesis that the slopes of the line segments of two (or more) score profiles are parallel is tested by the multivariate Hotelling's T-

squared statistic (henceforth referred to as T^2), performed upon the transformation of individual scale scores into line segment scores. In the present case, the scale scores C, S, P, and O are transformed into new variables CS, SP, and PO. The order of these transformed variables is arbitrary, since in the present case the sequence of tests in the profile has no intrinsic meaning. (Myers (1979) notes that a similar procedure using the Wilks lambda statistic is also appropriate; though also completed for this study, results are not reported since they are of virtually identical significance to those obtained).

When the null hypothesis of parallel profiles is not rejected, Morrison's (1967) procedure calls for two subsequent analyses. The first tests the null hypothesis of equal group levels, by averaging across the component scale scores (since they are parallel) and testing the difference of the averages for each group by univariate ANOVA. The second tests the null hypothesis of flatness, or equal effects across error scales, calls for collapsing across cognitive style groups per scale and testing the null hypothesis through the single-sample T^2 statistic.

When the null hypothesis of parallelism is rejected, the differences between scale values for each cognitive

style group (analogous to the levels test in cases of parallelism) are tested by four separate univariate analyses of variance. Similarly, given nonparallelism, the test of differences across error scale scores is conducted for each cognitive style group separately, using the single-sample repeated-measurements T^2 statistic, with Bonferroni t tests for planned pairwise comparisons, given a significant F value (as advised by Myers, 1979, and Maxwell, 1980).

Hypothesis 1 of this study specifies that the pattern of errors will be different for the two groups. This hypothesis places certain obvious logical constraints upon the shape of a confirmatory analysis. Since the focus of the hypothesis is the difference between two groups, the analysis of flatness is irrelevant to this general, conceptual hypothesis. The analysis of profile and levels are not, since either can logically support the hypothesis: either the groups differ because they use an idiosyncratic mixture of errors, or they differ because one group uniformly uses more errors than the other group. The implications of differences between the profiles and levels become more apparent in the discussion of hypotheses 2 and 3.

Hypothesis 4 essentially reconsiders the first three

hypothesis in light of potential nuisance variables, using the MANCOVA and ANCOVA counterparts to the MANOVA and ANOVA components described above. The variables are the frequency of recent negative life events, as measured by the -LES, and severity of depression, as measured by the BDI. Profiles are reevaluated according to the basic tests of parallelism, levels and flatness. Complicating the issue somewhat are the rather more stringent assumptions of the covariance models and the corresponding loss of power due to loss of degrees of freedom. In one MANCOVA analysis, further complication is introduced by loss of subject data due to one incomplete profile.

Hypotheses 5(a) and 5(b) are tested using two simple t-tests for paired samples, contrasting the total CBQ DD scores obtained on the social-interpersonal stories to those on the achievement-competence stories. A separate test is done for each cognitive style group, since there is no theoretical reason to consider between-groups comparisons on either set of CBQ stories. The error-rate experimentwise is preset at $p < .05$; the error rate per comparison is adjusted by $\alpha/2$ to $p < .025$ to prevent inflation of Type I error for this set of hypotheses.

Hypotheses 6(a) and 6(b) are subject to two sets of statistical procedures. First, the responses of subjects

to the question about which event contributed most to their depression were judged by three independent raters, who were each unaware of the nature and purpose of the experimental hypotheses. This rating was performed for all cases in which subjects did not respond "none" or indicate a causal event more than one year prior to assessment. Since the number of ratable responses was small and the number of unambiguous responses even smaller, the usable data were tested using the binomial test (Siegal, 1956), for each cognitive style group separately.

Chapter Three

Results

Subjects Characteristics

Fifteen field independent and fifteen field dependent women were included in the study. The even split of subjects by cognitive style was not planned.

Subject characteristics on nondependent measures and age are summarized in Table 1.

Because the research design incorporates BDI, VIQ and LES as covariates in subsequent multivariate analyses, and because there is no conceptual reason to include age in a multivariate analysis, only univariate ANOVAs were calculated for group differences as reported here. Examination of table one suggests that the test groups were generally equivalent on all group characteristics except cognitive style, as would be expected.

The PRFT was used solely for classification purposes for this study; however, it should be noted that the mean score is considerably higher than that reported by Oltman (1968). At the same time, the median (55) closely resembles the mean of Oltman's group, and approximates the cutoff score selected on the basis of Oltman's mean.

As noted, stringent exclusionary criteria were employed to eliminate those subjects who might be experiencing a beneficial effect of medication. The mean number of days of psychopharmacological treatment for the field

Table 1

Mean subject scores on nondependent measures for separate and combined cognitive style groups.

| Measures | Cognitive style | | |
|----------|-----------------|--------------|--------------------|
| | FI (n=15) | FD (n=15) | combined (N=30) |
| PRFT | 33.7 | 128.4* | 81.1 |
| IDD | 50.7 | 57.8 | 54.3 |
| BDI | 29.2 | 35.2 | 32.2 |
| -LES(a) | 18.1 | 19.2 | 18.6 |
| VIQ(b) | 105.1 | 102.4 | 104.0 |
| AGE | 37.4 | 36.6 | 37.0 |

Note. FI refers to field independent group; FD to field dependent group.

* $F(1,28) = 44.47$, $p < .0001$, for group difference. All other between group F values: $p > .05$.

(a) $n(\text{FI}) = 15$; $n(\text{FD}) = 14$.

(b) Verbal IQ, estimated by PPVT(R)-L. $n(\text{FI}) = 12$; $n(\text{FD}) = 8$.

independent group was 3.4; the mean for field dependent subjects was 1.53: the difference is nonsignificant ($F(1,28)=1.48, p>.20$). The difference in proportion of subjects per group medicated versus nonmedicated (9/15 field independent subjects and 8/15 field dependent subjects) was also nonsignificant (chi-square (1 df)=.136, $p>.70$). In terms of medication status, the groups were virtually identical.

These preliminary findings establish the basic comparability of the two experimental groups in terms of group composition: age, verbal intelligence, severity of depression (given equivalence of psychiatric diagnosis), negative life events, and lack of contamination by medication effects. A correlation matrix for all dependent measures and covariates is presented in Appendix N (the IDD and PRFT are also reported, although these were used only for dichotomous, classificatory purposes).

Hypothesis 1

It was hypothesized that field dependent women would use a different pattern of specific cognitive distortions than field independent women: that a particular cognitive style group would use either more or fewer errors generally, or an idiosyncratic pattern of specific errors, relative to the other cognitive style group.

The independent variable for this hypothesis is cognitive style classification, using the categorical variables field independence and field dependence. The dependent variable is provided by individual error scale means on Lefebvre's (1981) CEQ, specifically: catastrophizing (C), selective abstraction (S), personalization (P), and overgeneralization (O).

Table 2 summarizes the cell by cell means and standard deviations for each cognitive style group, along with combined group statistics.

Note that all cell means exceed those reported by Lefebvre (1981) for the depressed, no pain comparison group.

Figure 1 illustrates the cell means described in Table 2, for the purposes of clarifying the analyses to follow.

Using Morrison's (1967) profile analysis technique (discussed earlier), the null hypotheses of parallelism was rejected, given $T^2 = .36622$, approximate $F(3, 26) = 3.17387$, $p = .041$. Table 3 displays univariate F-tests for parallelism of the line segments CS, SP, and PO. The hypothesis of parallelism is rejected because the line segment SP of the field dependent group is not parallel with the same line segment for the field independent

Table 2

Cell means and standard deviations for CEQ error scale scores for separate and combined cognitive style groups.

| | Cognitive style | | |
|-----------|-----------------|------------|------------------|
| | FI n=15 | FD n=15 | combined N=30 |
| CEQ scale | | | |
| C: Mean | 9.800 | 14.933 | 12.367 |
| Stan.Dev. | 5.401 | 5.418 | 5.922 |
| S: Mean | 8.333 | 14.600 | 11.467 |
| Stan.Dev. | 5.602 | 6.116 | 6.585 |
| P: Mean | 5.333 | 14.667 | 10.000 |
| Stan.Dev. | 5.972 | 6.477 | 7.746 |
| O: Mean | 8.400 | 15.267 | 11.833 |
| Stan.Dev. | 6.080 | 6.262 | 6.998 |

Note. FI refers to field independent group; FD to field dependent group. C, S, P, and O refer to the errors of Catastrophizing, Selective Abstraction, Personalization, and Overgeneralization, as measured on the CEQ.

Figure 1. Mean CEQ Scale Scores for FD and FI Groups

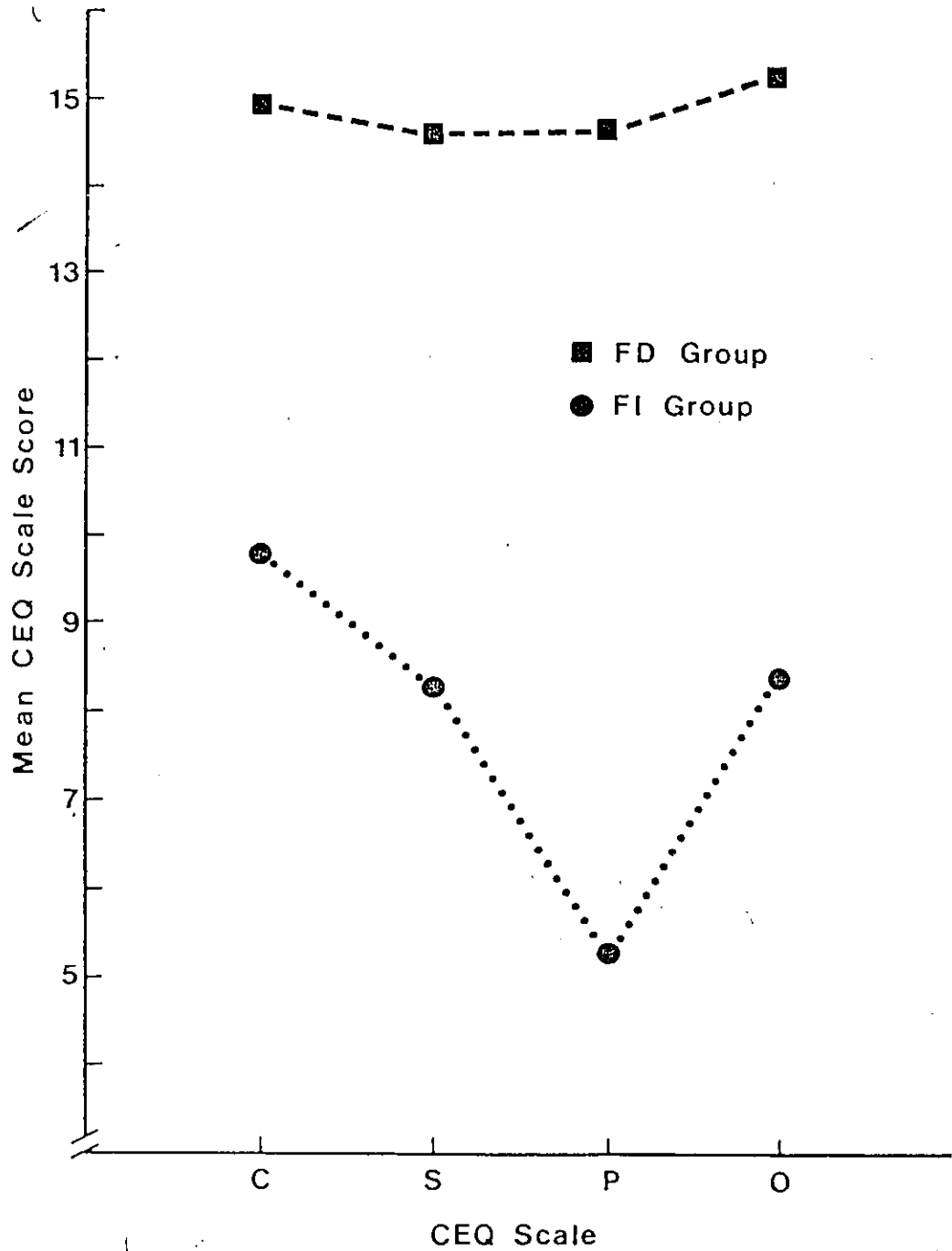


Table 3
Univariate F-tests for individual line segments on CEQ profile.

| | Line Segments | | |
|----------|---------------|------------|-----------|
| | CS | SP | PO |
| Hypo. SS | 9.63333 | 70.53333 | 45.63333 |
| Error SS | 323.06667 | 384.93333 | 730.53333 |
| Hypo. MS | 9.63333 | 70.53333 | 45.63333 |
| Error MS | 11.53810 | 13.74762 | 26.09048 |
| F | 0.83492 | 5.13059(a) | 1.74904 |

Note. C, S, P, and O refer to the errors of Catastrophizing, Selective Abstraction, Personalization, and Overgeneralization, as measured on the CEQ.

(a) $p = .031$. All other F values are nonsignificant ($p > .05$).

group.

Given the rejection of parallelism, neither the tests of levels nor flatness have any meaning. Consistent with earlier points raised, the experimental hypothesis is accepted: clinically depressed field dependent and field independent women use a different pattern of cognitive processing errors, while they are depressed.

Morrison (1967) points out one constraint upon the profile analysis procedure: that the scale scores be commensurable, that is, expressed in comparable units. The CEQ meets this requirement both conceptually and structurally. Otherwise, the analysis is bound by the rather few constraints on the multivariate case, as noted by Myers (1979): that the variance-covariance matrix must be nonsingular, and homogeneity of dispersion matrices is assumed. Both assumptions were tested. Nonsingularity is rather easily checked by examination of the determinant of the pooled variance-covariance matrix, since non-zero determinants are indicative of nonsingularity. Given a determinant value of 40639.61692, one can readily dispense with this concern. Multivariate testing for the homogeneity of dispersion matrices reveals a Box M value of 11.57899, $F(10, 3748df) = .97699$, $p = .461$ (approximately). (Chi-squared approximation with 10 $df = 9.80079$, $p = .458$).

Thus the data fulfill preliminary assumptions for profile analysis.

Hypothesis 2

Several specific hypotheses were presented, concerning the relative extent of endorsement of particular cognitive errors by field dependent women, compared to field independent women.

It was hypothesized that field dependent women would show a greater degree of endorsement of errors of overgeneralization than would field independent women.

The statistical tests of this and the remaining subsections of the second hypothesis are provided by a series of separate univariate ANOVAs for between-groups differences, again consistent with Morrison's (1967) profile analysis procedure. Table 4 summarizes the ANOVA results for between-groups differences, while Table 5 summarizes tests of homogeneity of variance, using the Box F test, for each ANOVA.

The hypothesis that field dependent women would endorse a greater level of overgeneralization errors is accepted, given a predicted direction of difference between group means on the Overgeneralization scale (see Table 2), and a significant ANOVA F ratio: $F(1,28) = 9.2840, p = .0050$. The field dependent group, as predicted,

Table 4

Univariate F values and significance levels for differences of FD and FI groups on the CEQ.

| | df | SS | MS | F-ratio | p |
|-----------|------|----------|----------|---------|----------|
| CEQ scale | | | | | |
| O | 1,28 | 353.6333 | 353.6333 | 9.2840 | .0050 |
| P | 1,28 | 653.3333 | 653.3333 | 16.8344 | .0003 |
| C | 1,28 | 197.6333 | 197.6333 | 6.7539 | .0148 |
| S | 1,28 | 294.5333 | 294.5333 | 8.5644 | .0067(a) |

Note. FI refers to field independent group; FD to field dependent group. C, S, P, and O refer to the errors of Catastrophizing, Selective Abstraction, Personalization, and Overgeneralization, as measured on the CEQ.

(a) Difference opposite to predicted direction; does not indicate rejection of null hypothesis.

Table 5

Tests of homogeneity of variance (Bartlett Box F) for univariate ANOVAs for FD-FI differences on the CEQ.

| | Box F Value | probability |
|-----------|-------------|-------------|
| CEQ scale | | |
| O | .012 | .914 |
| P | .089 | .766 |
| C | .000 | .991 |
| S | .104 | .747 |

Note. FI refers to field independent group; FD to field dependent group. C, S, P, and O refer to the errors of Catastrophizing, Selective Abstraction, Personalization, and Overgeneralization, as measured on the CEQ.

makes significantly greater use of this error on the CEQ.

It was hypothesized that field dependent women would show a greater degree of endorsement of errors of personalization than field independent women. This hypothesis is accepted, given a predicted direction of difference between group means on the Personalization scale (see Table 2), and a significant ANOVA F ratio: $F(1,28) = 16.8344, p = .0003$. The field dependent group, as predicted, makes significantly greater use of this error on the CEQ.

It was hypothesized that field dependent women would show a greater degree of endorsement of catastrophizing errors than field independent women. This hypothesis 2(c) is accepted, given a predicted direction of difference between group means on the Catastrophizing scale (see Table 2), and a significant ANOVA F ratio: $F(1,28) = 6.7539, p = .0148$. The field dependent group, as predicted, makes significantly greater use of this error on the CEQ.

It was hypothesized that field independent women would show a greater degree of endorsement of errors of selective abstraction than field dependent women.

This hypothesis is rejected. The direction of difference between group means on the Selective Abstraction scale was contrary to the direction predicted, and thus the null hypothesis for no group difference

cannot be rejected. An ANOVA was performed on this data for post hoc purposes only, the results of which are reported here for convenience. The analysis produced a significant F ratio: $F(1, 28) = 8.5644, p = .0067$. It would appear from these data that field dependent women may in fact use the error of selective abstraction more than field independent women do.

The results of tests for homogeneity of variance suggest that each ANOVA for Hypothesis (2) fulfills that basic assumption (see Table 5).

Hypothesis 3

Several specific hypotheses were presented concerning the relative extent of endorsement of particular cognitive errors, within each cognitive style group.

Field dependent women were proposed to endorse fewer errors of selective abstraction than any other single type of cognitive error. In other words, their score on the scale of selective abstraction was predicted to be lower than their scores on any of the remaining scales (that is, overgeneralization, personalization or catastrophizing).

Given the rejection of the null hypothesis of parallelism, each cognitive style group is treated as a separate group. The multivariate statistic appropriate for testing such within-group differences is the single-

sample repeated measures T² statistic (Morrison, 1967).

Analysis of error scale scores for the field dependent group revealed a nonsignificant Hotelling's T² value: $T^2 = .07089$, approximate $F(3, 12) = .28356$, $p = .836$. In the absence of a significant overall F value, no planned comparisons were carried out, since the occurrence of any significant within groups differences would have produced a significant T² value. The three within-group hypotheses for the field dependent women are rejected, since the null hypothesis of no significant difference between CEQ scales cannot be rejected.

Still on the subject of within-groups comparisons, it was predicted that field independent women would endorse more errors of selective abstraction than any other single type of cognitive errors, that is, than either overgeneralization, personalization, or catastrophizing.

The single-sample repeated-measures analysis for the field independent group revealed a significant Hotelling's T² value: $T^2 = 1.83546$, approximate $F(3, 12) = 7.34186$, $p = .005$. Given this significant overall F value, planned comparisons were carried out. Table 6 summarizes the Bonferroni t values for the three planned comparisons. Error mean squares for planned comparisons were taken from a subsequent univariate repeated-measures analysis for the

Table 6

Bonferroni *t* values for planned comparisons between CEQ scaled scores, for the FI group.

| | Sign and Magnitude of Difference | <i>t</i> | <i>p</i> value |
|-------------|-------------------------------------|----------|----------------|
| Comparisons | | | |
| S-O | -.067 | .067 | ---(a) |
| S-P | +3.000 | 2.899 | <.0167 |
| S-C | -1.467 | 1.418 | ---(a) |

Note Positive signs indicate direction of difference consistent with hypothesis. Preset significance rate per comparison (based on α/k): $p < .0167$.

Note. FI refers to field independent group. C, S, P, and O refer to the errors of Catastrophizing, Selective Abstraction, Personalization, and Overgeneralization, as measured on the CEQ.

(a) *t* values are meaningless, since direction of difference contrary to 1-tailed rejection region.

field independent group alone, also significant ($F(3,42)=6.61$; $p=.001$).

Two of the proposed hypotheses are rejected immediately, since in the case of comparisons between selective abstraction scores to overgeneralization and catastrophizing, the direction of obtained difference is opposite to the predicted direction. Given the assumption of a one-tailed test, the t values for 3(d) and (f) have virtually no meaning as estimates of probability of absolute difference; the values are tabled to illustrate the small absolute size of obtained mean differences only. Depressed field independent women do not appear to use the cognitive error of selective abstraction more than overgeneralization or catastrophizing. One might speculate, with due caution, that field independent depressed women use selective abstraction about as frequently as the other two errors.

The hypothesis that field independent women score higher on a scale of selective abstraction than on a scale of personalization is accepted. The obtained Bonferroni t value exceeds the critical value (Myers, 1979, Table A-12) for three comparisons, given a preset error rate experimentwise of $p<.05$ (that is, error rate per comparison of $p<.0167$). Depressed field independent do appear

to use the cognitive error of selective abstraction significantly more often than the error of personalization.

Hypothesis 4

The hypotheses tested so far have all been based on actual CEQ scale scores obtained for the field dependent and field independent groups. The fourth hypothesis predicted that the relationships so determined are due to differences in cognitive style, not to differences in depression severity or negatively-toned life events. It was therefore hypothesized that separate analyses of covariance, in which depression severity and negative life events were in turn treated as covariates, would result in no substantial change in the nature of the results obtained.

To test the fourth hypothesis, the profile analysis procedure outlined above is recomputed using a MANCOVA format, with separate analyses for the effect of negative life events (measured by -LES) and depression severity (measured by the BDI).

Consider first the -LES score as covariate. Table 7 provides obtained and adjusted means for the CEQ scale scores. The adjusted scores were computed using a standard MANCOVA analysis, since the profile MANCOVA performs all

Table 7

Observed and adjusted CEQ means by cognitive style group and scale, with -LES as a covariate.

| | Cognitive Style Group | |
|------------------|-----------------------|------------|
| | FI n=15 | FD n=14 |
| CEQ scale | | |
| C: Observed Mean | 9.800 | 15.071 |
| Adjusted Mean | 9.822 | 15.049 |
| S: Observed Mean | 8.333 | 14.286 |
| Adjusted Mean | 8.369 | 14.250 |
| P: Observed Mean | 5.333 | 14.214 |
| Adjusted Mean | 5.379 | 14.169 |
| O: Observed Mean | 8.400 | 15.071 |
| Adjusted Mean | 8.830 | 15.091 |

Note. C, S, P, and O refer to the errors of Catastrophizing, Selective Abstraction, Personalization, and Overgeneralization, as measured on the CEQ. -LES refers the sum of negative life event ratings on the LES.

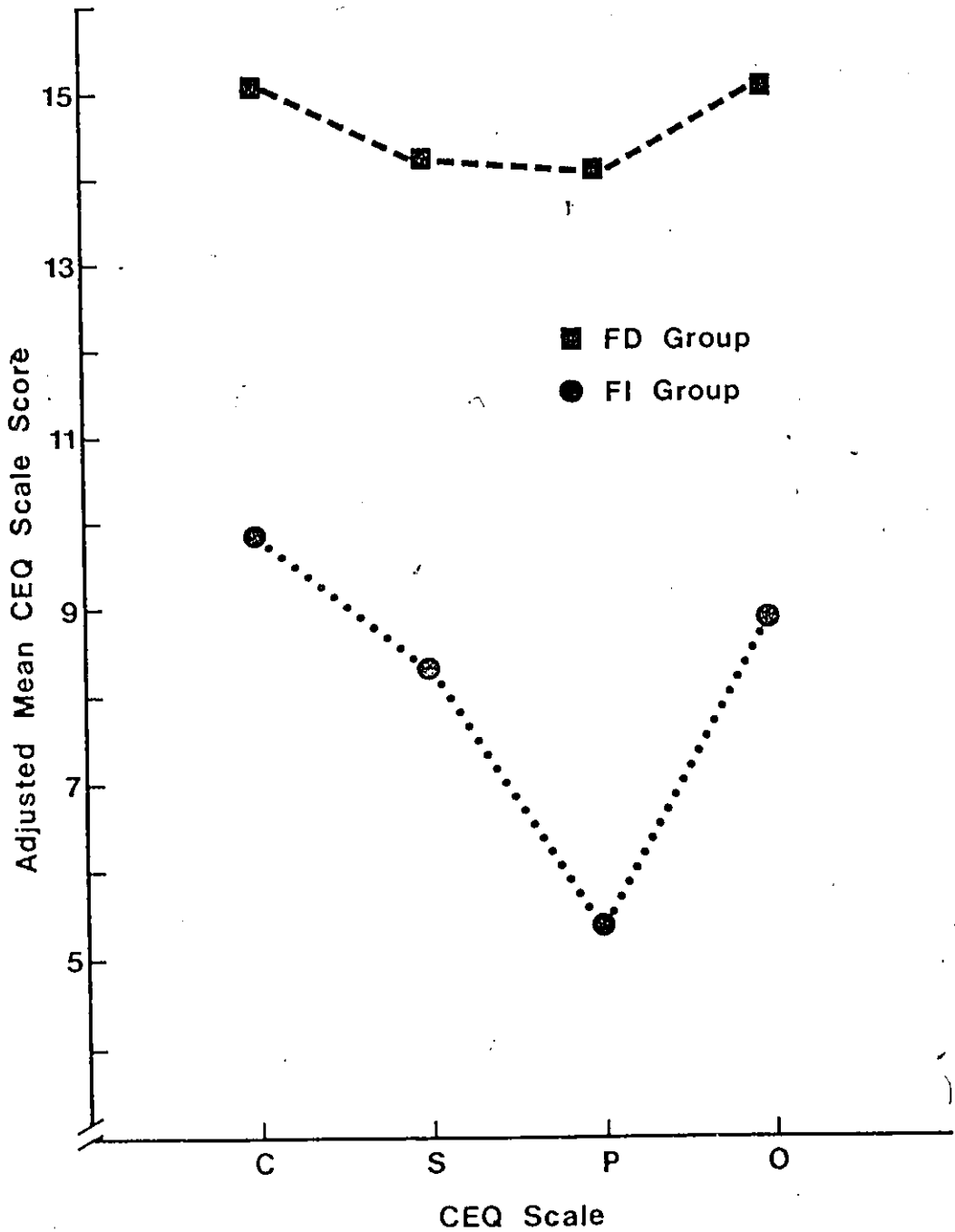
analyses on transformed individual line segment scores.

Casual examination of Table 7 suggests little apparent adjustment of mean values, when the sum of negative life events is considered as a covariate. A slight difference between the observed means for the field dependent group in this table, compared to Table 2, is caused by the loss of one subject's data (the subject failed to complete the LES). Figure 2 illustrates the adjusted means for the -LES, to help clarify the discussions to follow.

Despite the evident similarity between the adjusted profile and the unadjusted profile of Figure 1, the null hypothesis of parallel profiles cannot be rejected, given a multivariate Hotelling's T^2 value of .32368, approximate $F(3,24) = 2.58945$, $p = .076$. Strictly speaking, depressed field dependent women do not seem to use an idiosyncratic pattern of cognitive error scores, compared to depressed field independent women, when the effect of negative life events is covaried out.

Accepting parallelism, the hypothesis that field dependent and field independent groups differ in level of cognitive error is tested by a univariate ANCOVA, using average CEQ scale scores as dependent variables. The null hypothesis of no difference in level of error is rejected,

Figure 2. Adjusted Mean CEQ Scale Scores for FD and FI Groups, with -LES as Covariate



$F(1,26)=10.36, p=.003$. Depressed field dependent women appear to use a significantly and uniformly higher level of cognitive errors than field independent women, with the effect of negative life events controlled.

Given the finding that the groups differ on the levels test, within the profile analysis, the analogous null hypothesis to hypothesis (1)- that is, that the field dependent and field independent groups do not differ in their use of cognitive errors, independent of the influence of negative life events- can be rejected.

The analogous null hypotheses to those accepted under hypothesis 2 (that is, those which predict the direction of between-groups comparisons on catastrophizing, personalization, and overgeneralization) cannot, however, be rejected. One may only conclude that field dependent women use more cognitive errors on the average, than do field independent women, when one controls for the influence of negative life events. No conclusions can be drawn about differences between specific pairs of errors, since the statistical test does not look at the errors individually. In the case of selective abstraction, however, the obtained difference falls in the opposite direction to the predicted direction. One might be justified in rejecting the experimental hypothesis with some confidence in that

particular case, on the basis of common sense. Since the individual scale scores generally differ in the direction predicted, and the level of the profiles does differ significantly, it is tempting to speculate that the original hypothesis concerning differences on the scales of catastrophizing, personalization, and overgeneralization are correct. Strictly speaking, such inferences are no more than that: speculation.

Given parallelism, the analogous analysis to those for hypothesis 3 (that is, those concerning within-groups comparisons of CEQ scale scores for separate cognitive style groups) cannot be directly tested, since the groups are combined for such comparisons. Using Hotelling's single-sample T^2 statistic for combined groups, the null hypothesis of flatness cannot be rejected, given $T^2 = .26558$, approximate $F(3, 24) = 2.12705$, $p = .123$. All hypothesized between-scale differences are rejected, given both flatness and parallelism. Statistically speaking, the best description of the graph of field dependent and field independent patients on the CEQ, controlling for the influence of negative life events, is two flat, parallel lines.

Since the findings of the covariance analysis provide little support for the planned pairwise predictions,

either between or within groups, two post hoc analyses were performed to determine possible reasons for this disappointing result. For convenience, these analyses are presented here.

First, a power analysis (Stevens, 1980) was performed for the initial MANOVA as well as all subsequent MANCOVAs (including those to follow below). In all cases, the extrapolated power estimates fall somewhat below .23. Given such weak power (probably due to small sample size), it is not surprising that parallelism was narrowly rejected in the covariance analysis with -LES as covariate, and so narrowly accepted in the MANOVA case. With a larger sample size, it seems likely that parallelism would have been rejected.

Second, univariate ANCOVAs were performed on the individual line segments CS, SP, and PO. The results are reported in Table 8. The virtual significance ($p=.051$) of the difference between the line segments SP for the field dependent and field independent groups recalls that found in earlier ANOVA procedures. Such a finding does not indicate nonparallelism, in the absence of a nonsignificant multivariate statistic. Its occurrence simply suggests that, with sufficient power (to compensate for that lost by a decreased sample size and a lost degree of

Table 8

Univariate F-tests for individual line segments on CEQ profile, with -LES as a covariate.

| | Line Segments | | |
|----------|---------------|------------|-----------|
| | CS | SP | PO |
| Hypo. SS | 3.08406 | 61.18240 | 31.24451 |
| Error SS | 277.67869 | 379.84120 | 663.17780 |
| Hypo. MS | 3.08406 | 61.18240 | 31.24451 |
| Error MS | 10.67995 | 14.60928 | 25.50684 |
| F | 0.28877 | 4.18791(a) | 1.22495 |

Note. C, S, P, and O refer to the errors of Catastrophizing, Selective Abstraction, Personalization, and Overgeneralization, as measured on the CEQ.

(a) $p = .051$. Other F values are nonsignificant ($p > .05$).

freedom due to the covariance analysis), it is likely that parallelism would be rejected.

Covariance analyses lack the assumptive simplicity of univariate and multivariate analyses of variance. Huitema (1980) lists eight such assumptions. Not all are equally crucial, or indeed amenable to testing, but several were examined relative to the profile analysis with -LES as a covariate.

The assumption of randomization applies most correctly to true experiments (Huitema, 1980), whereas the present study follows a quasi-experimental design (Campbell and Stanley, 1963): However, an effort was made to partially meet the assumption of randomization by avoiding matching on the LES (and both other covariates to be discussed).

The multivariate test for homogeneity of dispersion matrices revealed a Box M value of 21.85106, $F(15, 2901) = 1.16093$, $p = .295$ (and a chi-square approximation, with 15 degrees of freedom, of 17.52689, $p = .288$). Both tests suggest homogeneous variance. Within cells regression analysis produced a Hotelling's T^2 value of .11947, approximate $F(3, 24) = .95573$, $p = .430$, suggestive of homogeneity of within-cells planes.

A similar pattern of analysis was undertaken, to

determine the influence of severity of depressive symptoms on the obtained results. In this case, BDI scores were used in MANCOVA and ANCOVA analyses. Table 9 provides obtained and adjusted means for the CEQ scale scores, with BDI as a covariate. Figure 3 illustrates the same scores in profile form, to clarify the analyses to follow.

Despite the evident similarity between the adjusted profile and the unadjusted profile of Figure 1 (as with the -LES case), the null hypothesis of parallel profiles cannot be rejected, given a multivariate Hotelling's T^2 value of .32834, approximate $F(3,25) = 2.73619$, $p = .065$. Strictly speaking, depressed field dependent women do not use an idiosyncratic pattern of cognitive error scores, compared to depressed field independent women, when the effects of depression severity are ruled out.

The null hypothesis of no difference in level of error is rejected, $F(1,27) = 10.57$, $p = .003$. Depressed field dependent women seem to use a significantly and uniformly higher level of cognitive errors than field independent women, when the effect of depression severity is covaried out.

The analogous null hypothesis to hypothesis (1)- that is, that the field dependent and field independent groups do not differ in their use of cognitive errors,

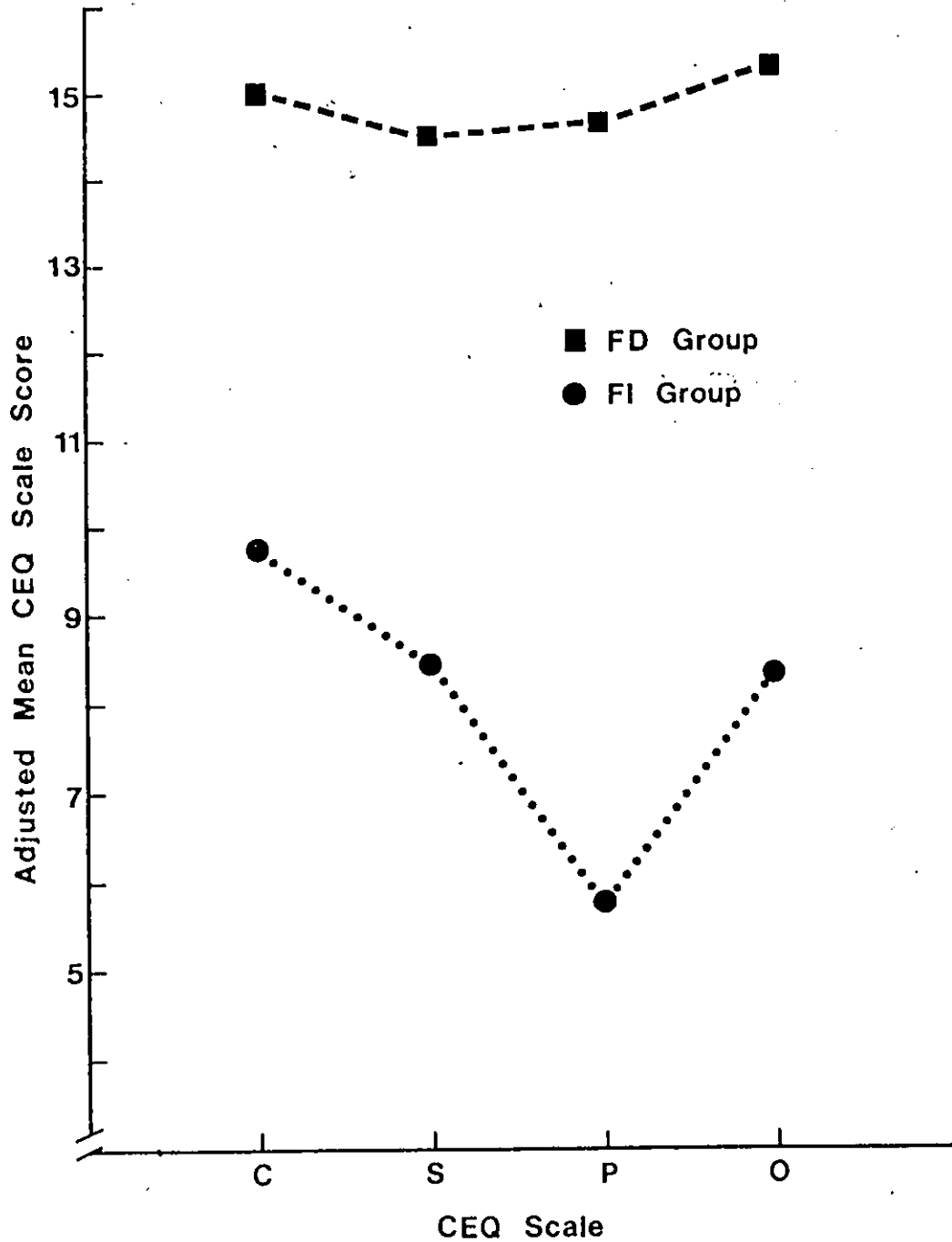
Table 9

Observed and adjusted CEQ means by cognitive style group and scale, with BDI as a covariate.

| | Cognitive Style Group | |
|------------------|-----------------------|------------|
| | FI n=15 | FD n=15 |
| CEQ scale | | |
| C: Observed Mean | 9.800 | 14.933 |
| Adjusted Mean | 9.733 | 15.000 |
| S: Observed Mean | 8.333 | 14.600 |
| Adjusted Mean | 8.420 | 14.513 |
| P: Observed Mean | 5.333 | 14.667 |
| Adjusted Mean | 5.730 | 14.630 |
| O: Observed Mean | 8.400 | 15.267 |
| Adjusted Mean | 8.352 | 15.314 |

Note. C, S, P, and O refer to the errors of Catastrophizing, Selective Abstraction, Personalization, and Overgeneralization, as measured on the CEQ.

Figure 3. Adjusted Mean CEQ Scale Scores for FD and FI Groups, with BDI as Covariate



independent of the influence of depression severity- can be rejected. As with the case of the -LES, the several analogous null hypotheses to those subsumed under hypothesis 2 cannot be rejected. Independent of the influence of depression, depressed field dependent women use more cognitive errors on the average than depressed field independent women. However, since in the case of selective abstraction, the obtained difference again falls in the opposite direction to the predicted direction, it seems reasonable to dispense with the experimental hypothesis entirely, for this particular error.

Given parallelism, the analogous analysis to those for hypothesis 3 (that is, those concerning within-groups comparisons of CEQ scale scores for separate cognitive style groups) cannot be directly tested, since the groups are combined for such comparisons. Using Hotelling's single-sample T^2 statistic for combined groups, the null hypothesis of flatness cannot be rejected, given $T^2 = .07748$, approximate $F(3,25) = 0.64564$, $p = .593$. All hypothesized between-scale differences are rejected, given both flatness and parallelism. All hypothesized between-scale differences can be rejected, given both flatness and parallelism.

Power analysis revealed a similar, weak power to that

for the preceding analyses (less than .23), again suggestive that a larger sample size may have produced a significant departure from parallelism, as was the case in the original MANOVA (especially considering the nearly-significant T^* value for the parallelism test).

A similar interpretation is suggested by the results of univariate tests of parallelism of the line segments CS, SP and PO, with BDI as a covariate (see Table 10). Again, the segments SP for the two cognitive style groups significantly depart from parallel, in the univariate case. Such a finding increases confidence that, with adequate power through a larger sample size, parallelism would have been rejected in the multivariate case.

The multivariate test for homogeneity of dispersion matrices revealed a Box M value of 19.00389, $F(15, 3156) = 1.01959$, $p = .431$ (and a chi-square approximation, with 15 degrees of freedom, of 15.38410, $p = .424$). Both tests suggest homogeneous variance. Within cells regression analysis produced a Hotelling's T^* value of .02679, approximate $F(3, 25) = .22325$, $p = .879$, suggestive of homogeneity of within-cells planes.

Hypothesis 5

It was hypothesized that field dependent women would make a greater proportion of depressed-distorted responses

Table 10

Univariate F-tests for individual line segments on CEQ profile, with BDI as a covariate.

| | Line Segments | | |
|----------|---------------|------------|-----------|
| | CS | SP | PO |
| Hypo. SS | 4.68670 | 69.07603 | 36.35294 |
| Error SS | 315.16465 | 384.06944 | 728.18021 |
| Hypo. MS | 4.68670 | 69.07603 | 36.35294 |
| Error MS | 11.67276 | 14.22479 | 26.96964 |
| F | 0.40151 | 4.85603(a) | 1.34792 |

Note. C, S, P, and O refer to the errors of Catastrophizing, Selective Abstraction, Personalization, and Overgeneralization, as measured on the CEQ.

(a) $p = .036$. Other F values are nonsignificant ($p > .05$).

on the CBQ when the information was of a social-interpersonal type, than if it was related to achievement-competence. The opposite pattern was predicted for field independent women.

Table 11 summarizes means, standard deviations and standard errors for t-test comparisons between SI and AC scores, for cognitive style groups.

Given that neither difference conforms to the predicted direction, the null hypothesis is accepted in both cases, without further statistical analysis. For speculative purposes, two-tailed t-tests were performed on the data; neither t value would have been significant, or anywhere near significant, at the .025 level, had more conservative bidirectional hypotheses been proposed (for the FD group, $t(13) = -1.30$, $p = .218$; for the FI group, $t(14) = .783$, $p = .783$). Clearly, it would seem that field dependent women do not tend to make more cognitive errors in social-interpersonal situations than achievement competence ones, as measured by the CBQ. Nor do field independent women seem to make more cognitive errors in achievement-competence situations than social-interpersonal ones, based on the same instrument.

Hypothesis 6

It was predicted that field dependent women would be

Table 11

Mean, standard deviation and standard error values for SI and AC stories on the CBQ, for each cognitive style group.

| | Mean | Stan. Dev. | Stan. Error |
|-----------|--------|------------|-------------|
| FD (n=14) | | | |
| SI | 3.3571 | 2.925 | .782 |
| AC | 3.9286 | 2.645 | .707 |
| FI (n=15) | | | |
| SI | 3.2000 | 2.833 | .732 |
| AC | 3.0000 | 2.777 | .717 |

Note. FI refers to field independent group; FD to field dependent group. SI refers to social-interpersonal stories on the CBQ; AC refers to achievement-competence stories on the CBQ.

more likely to blame social-interpersonal-type events for bringing about their depressive episodes, than achievement-competence-type events.

Fourteen field dependent women completed the question appended at the end of the LES, regarding events which each subject believed contributed to the onset of their depressive symptoms. Of these, eight simply responded with the word "none", and one stated that a causal event occurred over one year prior (that is, beyond the range of the LES). The remaining six responses were judged by three raters. The raters agreed unanimously that four items were clearly related to social-interpersonal factors. There was no consensus on the remaining two explanations. Given the very small number of unambiguous ratings for the variables of interest, a binomial test (Siegal, 1956) was performed on the obtained frequencies of individuals citing social-interpersonal causes and achievement-competence causes (4 and 0, respectively), compared to the expected frequencies, given the null hypothesis (2 and 2, respectively). The probability value obtained was nonsignificant ($p=.0625$); although, given the very small number of subjects, significance at the $p<.05$ level is mathematically impossible in this case. The null hypothesis cannot be rejected in this case.

It was also hypothesized that field independent women would be more likely to blame achievement-competence-type events for bringing about their depressive episodes, than social-interpersonal-type events.

Fifteen field dependent women completed the etiology question appended at the end of the LES. Of these, seven responded with the word "none" Of the remaining eight responses two items were clearly related to social-interpersonal factors, and two to achievement-competence factors. There was no consensus on the remaining four explanations. Again, a binomial test (Siegal, 1956) was performed on the obtained frequencies of individuals citing social-interpersonal causes and achievement-competence causes (2 and 2, respectively), compared to the expected frequencies, given the null hypothesis (2 and 2, respectively). The probability value obtained was non-significant ($p=.375$ for 2 or fewer AC responses). The null hypothesis cannot be rejected in this case.

Supplementary Analyses

The effect of verbal intelligence. Earlier, it was mentioned that verbal intelligence, originally included for matching purposes, had been dropped as a matching factor because of unforeseen difficulties due to English language facility and age-range of subjects. Although

there is little empirical or theoretical reason to suspect an effect for intelligence on cognitive style or depression, it was decided to reperform the profile analysis for those subjects who did provide valid verbal IQ estimates (VIQ) based on the PRFT(R)-L, with VIQ as a covariate. Twelve field independent and eight field dependent subjects were involved in the following analyses.

Table 12 presents observed and adjusted means, for this analysis. Figure 4 illustrates the scale score profiles for each group's adjusted means, to clarify the discussions to follow.

The hypothesis of parallelism cannot be rejected, given this data ($T^2 = .33531$, approx. $F(3,15) = 1.61017$, $p = .229$). The univariate MANOVA for levels, however, reveals a significant difference between groups on the average of the four error scale scores ($F(1, 17) = 10.67$, $p = .005$). The analysis of profile flatness reveals a nonsignificant T^2 value of .33496, approximate $F(3,15) = 1.67481$, $p = .215$. In most respects, this pattern closely follows that of both covariates considered earlier. The finding that cognitive style groups differ on the pattern of errors that they use while depressed- especially on the extent to which they use such errors- appears to be a robust one

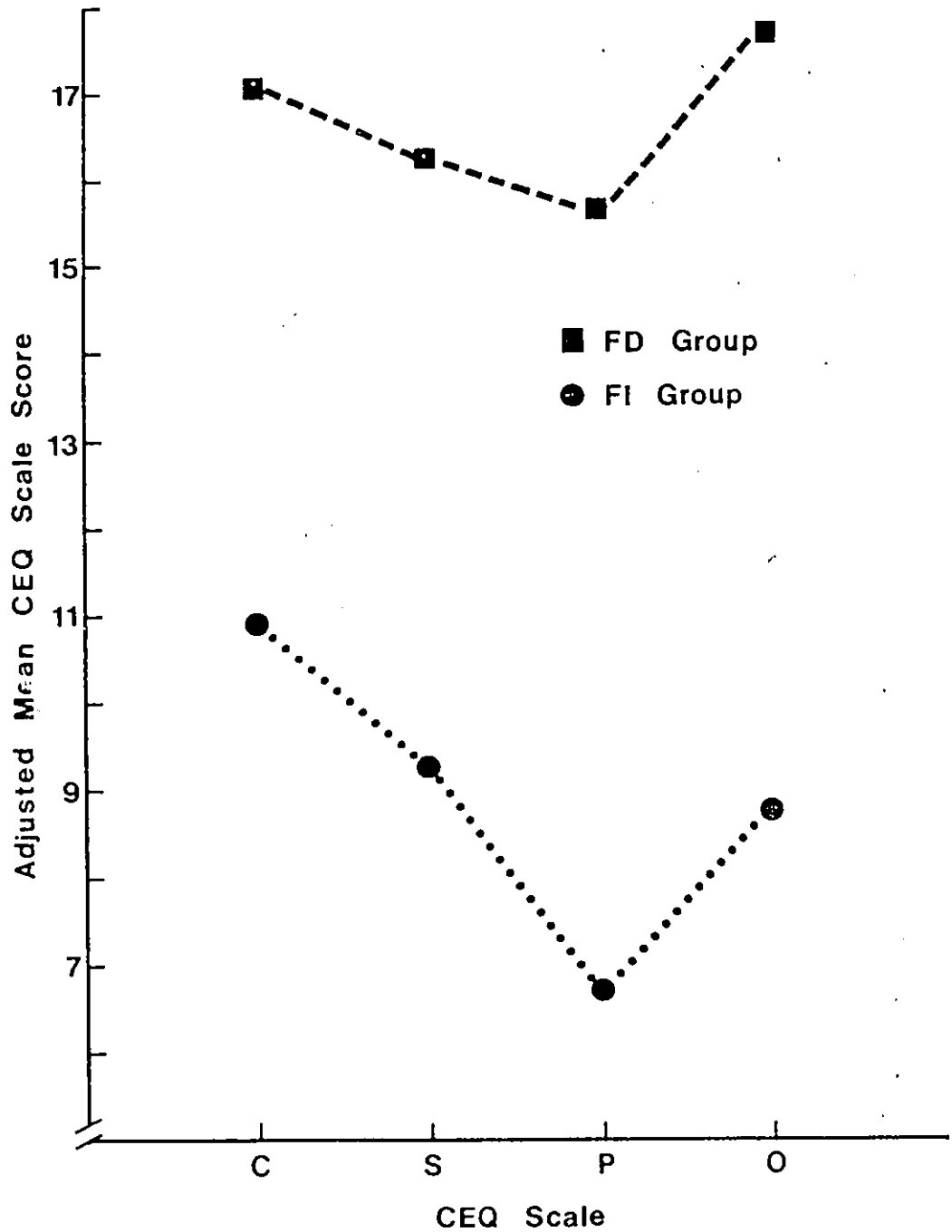
Table 12

Observed and adjusted CEQ means by cognitive style group and scale, with PPVT(R)-L as a covariate.

| | Cognitive Style Group | |
|------------------|-----------------------|-----------|
| | FI n=12 | FD n=8 |
| CEQ scale | | |
| C: Observed Mean | 10.197 | 17.000 |
| Adjusted Mean | 10.888 | 17.028 |
| S: Observed Mean | 9.333 | 16.125 |
| Adjusted Mean | 9.211 | 16.247 |
| P: Observed Mean | 6.500 | 15.750 |
| Adjusted Mean | 6.626 | 15.624 |
| O: Observed Mean | 9.083 | 17.375 |
| Adjusted Mean | 8.785 | 17.674 |

Note. FI refers to field independent group; FD to field dependent group. C, S, P, and O refer to the errors of Catastrophizing, Selective Abstraction, Personalization, and Overgeneralization, measured on the CEQ.

Figure 4. Adjusted Mean CEQ Scale Scores for FD and FI Groups, with PPVT(R)-L as Covariate



through all of the analyses undertaken.

The parallelism test for this analysis is weak, with an extrapolated power estimate below .21. Given the very small sample size, univariate tests of parallelism for individual line segments (reported in Table 13) indicate very little about potential deviations from the parallel, had the sample size been increased. Indeed, casual examination of Figure 4 suggests a much more obviously parallel relationship between the two profile lines, although little can be concluded from such an interpretation, due to sample size.

Two tests of underlying assumptions were performed; the results were favorable for this, as other, analyses of covariance. Tests of homogeneity of dispersion matrices produced a Box M value of 25.07342, $F(15, 893) = 1.11391$, $p = .339$ and a corresponding chi-square approximation with 15 degrees of freedom of 17.12969, $p = .311$. A test for homogeneity of within-cells regression produced a Hotelling's T^2 value of .33531, approximate $F(3, 15) = 1.67657$, $p = .215$. The essential conditions for covariance analysis were again met.

Reliability of the PRFT. Probably the most crucial question in the interpretation of the results for the first four hypotheses is whether or not the PRFT provided

Table 13

Univariate F-tests for individual line segments on CEQ profile, with PRFT(R)-L standard score as a covariate.

| | Line Segments | | |
|----------|---------------|-----------|-----------|
| | CS | SP | PO |
| Hypo. SS | 3.71769 | 17.88921 | 0.05622 |
| Error SS | 160.77212 | 260.52222 | 494.18534 |
| Hypo. MS | 3.71769 | 17.88921 | 0.05622 |
| Error MS | 9.45718 | 15.32484 | 0.00193 |
| F | 0.39416 | 1.16733 | 0.00193 |

Note. C, S, P, and O refer to the errors of Catastrophizing, Selective Abstraction, Personalization, and Overgeneralization, as measured on the CEQ.

Note. All F values are nonsignificant ($p > .05$).

a reliable measure of premorbid cognitive style.

There is some reason to believe, based on recent research (Koran and Maxim, 1972; Silverman, 1977; O'Connor et al., 1984), that RFT scores (as determined by Witkin et al., 1954) are reasonably robust across changes in clinical depression status, from episode onset to remission. These findings provide some empirical justification for confidence in the stability of the portable version of the test, with which the RFT is highly correlated (Oltman, 1968). However, none of these studies provides a definitive test of that stability: a test of cognitive style taken before one's first depressive episode. The finding that RFT scores fail to improve much at remission is taken as the next-best available evidence for the stability of cognitive style across changes in clinical depression status.

Given an adequate justification for using the PRFT based on the published literature, one is left to ponder why the results of the PRFT are positively skewed. The obtained skew is irrelevant to the statistical analyses undertaken, since the test was used only to classify individuals. However, the fact that there is a skew may cause some initial concern about the reliability of the measure. The nature of the skew and possible reasons for

it will now be considered.

Using Oltman's (1968) cognitive style cutoff scores for women, the present sample was bisected, with a median almost exactly equal to the mean of Oltman (either average value would have produced the obtained split). This median analysis increases confidence in the reliability of PRFT results as a measure of premorbid cognitive style, since Oltman's sample was not clinically depressed. Surprisingly, the obtained mean of the present sample was almost thirty points higher than Oltman's mean.

Part of the reason for the higher mean may reflect the higher scatter of field dependent patients' scores than those of field independent patients. The possible range of scores for a field independent woman on the PRFT is 52 points; the possible range for a field dependent woman is 172 points. The higher mean may then be in part artifactual: the range of errors of field dependent women being larger than those of field independent women because it can be larger. This argument is not particularly convincing, since the same possible ranges apply to Oltman's (1968) sample.

A second potential reason for the obtained skew is the possibility that some aspect of the PRFT administration was systematically different from Oltman's (1968),

causing a systematic bias in the results. The problem with this reasoning is that the bias is not systematic, if bias there is. If both median and mean were higher, such an interpretation might make sense. If there is a bias, it would appear to only apply to field dependent people. No source of bias is evident in the methodology. All subjects were tested on the same machine, under the same conditions of horizontal level and height, by the same administrator. It is difficult to find any source of systematic bias which would affect only one cognitive style group.

A third possible explanation is that, contrary to research cited, PRFT performance was affected by the depression severity of individuals. Yet for many of the reasons cited above, this explanation too is unsatisfactory. A univariate ANOVA showed no difference in depression severity, based on the BDI (see Table 1). Given that both groups were roughly equal in depression severity, there is no apparent reason why field independent people should be unaffected by that severity (as evident by the obtained median), while field dependent should be so affected.

Perhaps the most obvious technique for examining the relationship between BDI and PRFT scores would seem to include simple correlational analysis. Since the usual

Pearson product-moment correlation coefficient presents problems in interpretation because of the skewed PRFT distribution (Carroll 1961), points out, a Spearman Rank correlation coefficient was determined (Siegal, 1956). The obtained correlation coefficient of .152 is nonsignificant. Though conservative, this estimate again illustrates the apparent lack of relationship between PRFT performance and depression severity.

Although one may speculate about possible reasons for the skew in the obtained PRFT distribution, a convincing explanation is not readily apparent from the above analyses. Nor is it apparently related to any of the other between-groups differences found in this study, since such differences were found to be negligible (see Table 1). Nor is there extent any literature on the shape of cognitive style distributions in depression, from which to infer possible explanations.

In any case, there is no apparent reason to doubt the reliability of the PRFT measure as a measure of premorbid cognitive style, essential to the interpretation of this study.

Before discussing the implications of the obtained results for the Beck theory of depression, a final comment should be made regarding the interpretation of quantita-

tive data. This point concerns the implicit directionality of the influence of premorbid cognitive style on cognitive errors in depression. While the case for a directional influence of cognitive style on cognitive error makes sense conceptually, for reasons considered earlier, such an inference cannot legitimately be drawn from the data presented because of the nature of the design and the correlational nature of the statistical analysis. One cannot rule out the possibility that cognitive errors may influence cognitive style, however unlikely such an influence may seem, or the more persuasive alternative that some unmeasured third variable is responsible for variation in both variables.

Personality Factors in Anxiety and Depression:
A Preliminary Study

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ABSTRACT

Beck's cognitive theory proposes that broad, underlying superordinate schemas act as general predisposing factors in the development, maintenance, and expression of depression. Sociotropy, characterized by seeking the acceptance and affection of others, and autonomy, indicated by an emphasis on self-determination, mobility and privacy, were identified as possible personality factors in depression. The 60-item Sociotropy-Autonomy Scale (SAS) was developed to assess these characteristics. The present study reports on a series of analyses carried out on the SAS responses of 715 psychiatric outpatients.

Principal component analysis of the SAS suggested a three factor solution; two sociotropy dimensions ("Concern about disapproval/acceptance" and "Attachment/separation") and a single autonomy factor. Subsequent analysis indicated that elevated scores on "Attachment/separation" was associated with increased symptom severity in anxious but not depressed patients. On the other hand, depressives scored significantly higher than anxious patients on "Concern about disapproval". Finally high autonomy depressive patients scored significantly lower than low autonomy subjects on two subscales of the 100-item Dysfunctional Attitudes Scale. These results, then, suggest differences in the way personality influences anxiety and depression.

Introduction

Beck's cognitive theory proposes that certain individuals are cognitively vulnerable to anxiety or depression (Beck, 1987). This vulnerability is characterized by prepotent idiosyncratic schemas which remain relatively inactive until triggered by a congruent or matching stressor (i.e. loss or threat experience). Once activated, these schemas tend to dominate the information processing system in a maladaptive style characteristic of psychological dysfunctional states.

The prepotent schemas consist of specific idiosyncratic beliefs and attitudes as well as more general superordinate schemas. It is these broader schemas or modes that define an individual's personality structure (Beck & Emery, 1985).

Beck (1983) identified two personality modes in depression. The first, labelled sociotropy, characterizes a person who places a high premium on interpersonal relations, acceptance and affection. A highly sociotropic person seeks closeness to others and so fears their rejection and disapproval.

The second personality mode is that of autonomy. The autonomous personality values independence, freedom of action, privacy and self-determination. Autonomous individuals prefer interpersonal distance and so are less influenced by others.

To assess these personality modes or clusters, the Sociotropy-Autonomy Scale (SAS) was developed (Beck, Epstein & Harrison, 1983). Previous psychometric analysis resulted in refinement of the scale to its present 60-item version. The findings reported in the current study are derived from ongoing

validation research on the SAS. In particular, we were interested in determining whether sociotropy and autonomy were meaningful personality factors in depression and anxiety.

Method

The sample consisted of 715 psychiatric outpatients of the Center for Cognitive Therapy, Philadelphia. The mean age was 36.5 years (SD = 11.9), with 311 (44%) males and 398 (56%) females. At intake all subjects received a DSM-III diagnosis by an independent clinician using the Structured Clinical Interview for DSM-III (Spitzer & Williams, 1985). Based on this assessment, 40% (n = 285) of the sample had an Axis I diagnosis of depressive disorder while 41% (n = 295) had anxiety state as their main diagnosis.

Mixed anxious and depressive states are common in unselected clinical samples. Thus in order to investigate personality in anxiety and depression, further refinement of our sample was necessary. Subjects were included in the primary depressive group (n = 160) if they had an Axis I diagnosis of depression and their Revised Hamilton Depression (RHD) score was at least 0.5 standard deviations above their Revised Hamilton Anxiety (RHA) score (based on z scores). The primary anxious group (n = 169) consisted of patients with an Axis I diagnosis of anxiety and a RHA score at least 0.5 standard deviations above their RHD score.

As part of their intake evaluation, all subjects completed a battery of assessment instruments. In addition to the SAS, subjects completed the Beck Depression Inventory (BDI) and Beck Anxiety Inventory (BAI) as self-report measures of mood. Affect intensity also was assessed using the Revised Hamilton Rating Scales for Depression and Anxiety (Riskind, Beck, Brown & Steer, 1987). Finally, the 100-item Dysfunctional Attitudes Scale (DAS)

was completed as a measure of the underlying beliefs and attitudes associated with general psychopathology.

Results and Discussion

Based on the combined sample ($n = 715$), a principal components analysis with varimax rotation suggested a three factor solution for the SAS (31.5% of variance explained). Two sociotropy factors, labelled "Concern about disapproval/acceptance" and "Attachment/separation" emerged from the analysis. Most of the 30 sociotropic items loaded distinctively on one of these factors. A third factor, labelled "Individualism" consisted of autonomy items dealing with individualism, freedom, and mobility.

To investigate personality differences in anxiety and depression, a oneway MANOVA was performed with the three SAS factor scales as the dependent variables and primary depression vs anxiety as the independent factor. Table 1 presents the group means and standard deviations on the three SAS scales. The multivariate F was highly significant ($F(3, 327) = 10.13, p < .0001$). Univariate F tests revealed that the depressive group scored significantly higher than the anxious group on "Concern about disapproval" ($F(1, 327) = 19.67, p < .0001$), while there was a trend for the anxious patients to score higher than the depressive subjects on "Attachment/separation" ($F(1, 327) = 3.04, p < .08$). No significant group differences emerged on autonomy. Thus, a differential pattern of sociotropy was evident in anxiety and depression. For depressives, concerns about the approval and acceptance of others dominated while the anxious patients desired greater closeness to others.

To clarify whether the trend for anxious patients to score

higher on "Attachment/separation" was indeed meaningful, the primary anxiety group was divided at the median into high vs low "Attachment/separation" scorers. Table 2 presents the means of these two anxious groups on the self-report and interview-based mood measures. ANOVAs performed on these four dependent measures showed a trend for high "Attachment/separation" anxious patients to score higher on the BAI ($F(1, 157) = 3.44, p < .066$) and Revised Hamilton Anxiety Rating Scale ($F(1, 166) = 3.42, p < .066$) than the low "Attachment/separation" group. No significant differences emerged on the depression measures. Thus primary anxiety patients who are particularly inclined toward seeking closeness to others to avoid abandonment and loneliness may also experience greater symptomatic anxiety. Interestingly, there was a higher proportion of agoraphobics in the high vs low "Attachment/separation" group (36.4% vs 20.2%, respectively), while the low "Attachment/separation" group had more social phobics than the high group (15.5% vs 5.2%, respectively).

Since cognitive theory postulated an important role for autonomy in depression (Beck, 1983), further analysis was conducted on the primary depressives by dividing the group into high vs low autonomy based on a median split. Table 3 presents the means of these two depressive groups on the six DAS subscales. Previous analysis had suggested that autonomy was primarily associated with differences in cognitive vulnerability as measured by the DAS. A oneway MANOVA with the six DAS subscales as dependent variables was highly significant ($F(6, 135) = 5.09, p < .0001$). Subsequent univariate analyses revealed

significant group differences on "Social Approval" ($F(1, 140) = 10.79, p < .002$) and "Pleasing Others" ($F(1, 140) = 8.29, p < .005$), with low autonomy depressives scoring greater than high autonomy depressives. This suggests, then, that the primary difference between high and low autonomy depressives lies in their attitude toward others. Low autonomy depressives appear particularly concerned about the approval and acceptance of others.

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Table 1. Means and standard deviations of primary depressive and anxious patients on three SAS subscales.

| SAS Subscales | Clinical Groups | | | |
|--------------------------|-------------------|-------|----------------|----------|
| | <u>Depressive</u> | | <u>Anxious</u> | |
| | (n = 160) | | (n = 169) | |
| | \bar{X} | SD | \bar{X} | SD |
| <u>Sociotropy Scales</u> | | | | |
| Approval/acceptance | 42.99 | 10.90 | 37.37 | 11.99 ** |
| Attachment/separation | 33.62 | 9.96 | 35.43 | 8.83 * |
| <u>Autonomy Scale</u> | | | | |
| Individualism | 29.02 | 7.07 | 29.49 | 6.20 |

**Significant group difference; *trend toward group difference.

Table 2. Means and standard deviations on affect measures of primary anxious patients categorized as high or low scorers on the sociotropic separation/attachment subscale of the SAS.

| Affect Measures | Primary Anxiety Patients | | | |
|-------------------------------------|---------------------------|-------|--------------------------|---------|
| | <u>High Scoring Group</u> | | <u>Low Scoring Group</u> | |
| | (n = 73) | | (n = 79) | |
| | \bar{X} | SD | \bar{X} | SD |
| <u>Anxiety Measures</u> | | | | |
| Hamilton Rating Scale of Anxiety | 19.48 | 7.75 | 17.14 | 7.83 * |
| Beck Anxiety Inventory | 26.66 | 12.44 | 23.01 | 11.78 * |
| <u>Depression Measures</u> | | | | |
| Hamilton Rating Scale of Depression | 6.97 | 4.62 | 6.11 | 4.93 |
| Beck Depression Inventory | 16.86 | 9.35 | 14.56 | 9.71 |

*indicates a trend toward significant group differences.

Table 3. Means and standard deviations of high and low autonomy depressed patients on the Dysfunctional Attitudes Scale.

| 100-item DAS Subscales | Primary Depressed Patients | | | |
|---------------------------|----------------------------|-------|---------------------|---------|
| | <u>High Autonomy</u> | | <u>Low Autonomy</u> | |
| | (n = 67) | | (n = 75) | |
| | \bar{X} | SD | \bar{X} | SD |
| Vulnerability | 79.57 | 21.14 | 78.00 | 19.94 |
| Perfectionism | 79.81 | 20.57 | 77.67 | 18.77 |
| Social Approval | 69.37 | 16.07 | 77.65 | 13.97 * |
| Imperatives | 33.81 | 8.98 | 32.04 | 8.33 |
| Pleasing Others | 16.45 | 5.59 | 19.33 | 6.27 * |
| Cognitive Philosophy | 12.66 | 4.76 | 12.43 | 4.33 |

*Significant group differences.

Chapter Four

Discussion

The Beck theory of depression is based, in large part, on the assumption that depressogenic beliefs or schemata exist in the cognitive organization of the depressed individual (Beck et al., 1979; Sacco and Beck, 1985; Beck, 1987). Once activated by specific, schema-relevant environmental events, these schemata alter the cognitive processing characteristics of individuals in predictable ways. These characteristics include systematic errors and distortions in information processing which reflect a global, primitive style of cognitive processing, believed to be characteristic of depressed people in general. The interaction of these deviant processes with ongoing environmental events results in cognitive products of self-worthlessness, pessimism, and helplessness. Through their focus on deprivation, deficiency and loss, these cognitions produce the affective and behavioral manifestations of clinical depression.

The notion of altered processing is an important one, as stated in the Beck theory: presumably if one did not shift from one's typical mode of cognitive processing to one which includes overgeneralization, selective abstraction and other cognitive errors, one could not maintain one's depressive state.

Some authors (Williams, 1985; Ingram, 1984) have

suggested an alternative cognitive processing hypothesis: that depressive cognitive processing may be similar to nondepressed processing, in its formal characteristics (that is, one may overgeneralize, personalize and so on in one's normal, everyday life, but may do so about depressotypic information, once depressogenic structures are activated). In other words, depressotypic cognitive processing may be influenced by the normal, nondepressed cognitive processing characteristics of people. If this view is correct, premorbid style should show some demonstrable effect on the type of cognitive processing errors made by depressed people. Distinctive styles of cognitive processing when people are not depressed should be reflected in a predictable heterogeneity of processing errors while people are depressed. This characteristic heterogeneity has been called error style, for the sake of convenience, for this study.

In this study, the questions of premorbid style influence and error style were addressed using a sample of clinically depressed women, who were tested for their relative standing on a test of field dependence-independence.

Field dependent and field independent women were compared on scales of four specific cognitive errors. It

was predicted that field dependent women would endorse more errors of catastrophizing, personalization, and overgeneralization than selective abstraction, and more of the first three errors than field independent women. The opposite pattern was predicted for field independent women. These predictions were based on the apparent goodness-of-fit between the particular errors and each particular cognitive style. Field dependent women, it was surmised, would be likely to overgeneralize, catastrophize, and personalize when depressed because these characteristics seem to describe the normal processing style of field dependent people. Field independent women were predicted to use the error of selective abstraction because the tendency to structure information according to one's own structural referents is typical of field independent people.

It was also predicted that the tendency to make cognitive errors would tend to be situation-specific and distinctive for each cognitive style group: field dependent women were predicted to make more errors about social-interpersonal information, since they have been found to place more importance on such information (Witkin and Goodenough, 1977). Field independent women were predicted to make more errors about achievement-competence

information, because of the relatively greater importance they seem to place on autonomous functioning, also related to their self-referent thinking style.

Lastly, it was predicted that the self-generated causal theories, by which field dependent and field independent women accounted for the onset of their depressive symptoms, would be consistent with the relative importance of particular types of information to people of particular cognitive styles. Field dependent women were predicted to blame events of a social-interpersonal type, whereas field independent women were predicted to blame events of an achievement-competence type.


The results of the present study provide some clear support for the major hypotheses of the study, concerning the relationship of cognitive style and cognitive errors. When they are depressed, field dependent women use more errors of catastrophizing, personalization and over-generalization than field independent women do. The prediction that field independent women would endorse the error of selective abstraction more often than field dependent women was not supported; on the contrary, it seems that field dependent women use more of this error, too. It also seems that the differences between individual error scores is most striking for the error of personaliz-

ation, which field independent women use significantly less than selective abstraction (and probably less than either overgeneralization or catastrophizing, since the personalization-selective abstraction difference is the smallest of the three).

Even though covariance analyses eliminated much of the error-specificity of the planned comparisons, the general finding of this research is quite robust: field dependent make more cognitive errors, on the average, than field independent women, regardless of the effects of negative life events, depression severity, or verbal intelligence. At least two of the covariance analyses (with the -LES and BDI as covariates) would probably have more closely replicated the original multivariate analysis, with a larger sample size for sufficient power.

Central to this study is the following question: What do these results mean for the Beck theory of depression, most importantly, and for the theory of field dependence-independence, less crucially?

First, it would appear that cognitive style is preserved during clinical depression, consistent with the findings of stylistic stability reported by Witkin and Goodenough (1981). The tendency of people to err in specifically depressive ways appears to follow a pattern



specifically depressive ways appears to follow a pattern which is related to, if not set, by cognitive style.

Second, it would appear that something more than schematic activation is involved in the use of cognitive processing errors in depression. Beck (1987) suggested that people use very few cognitive errors when they are not depressed. Beck also suggested that people use these errors extensively while they are depressed, because depressive schemata are only active when people are depressed.

The data obtained in this study do not support Beck's view. Global, undifferentiated processing is a stable characteristic of certain people (field dependent people), according to Witkin and his colleagues (e.g. Witkin and Goodenough, 1981), and there is no indication from this research that this characteristic changes one way or the other when people are depressed. Such a finding is consistent with the notion of premorbid style, raised earlier.

A second inference follows from the premorbid style discussion, relevant to the Beck theory. There is clearly evidence for the notion of error style: not all depressed people err alike, or with similar frequency. It is probably an error to simply consider all depressive

processing to be global or primitive. Depressive cognitive processing is probably not monolithic, and different people seem to mediate between their depressogenic beliefs (assuming these exist) and the events which happen around them, in very different ways. Even so, the result of this process seems to be a different cognitive content for depressed than nondepressed people.

Given these inferences, one might ask whether or not cognitive processing errors are epiphenomenal, and whether the study of field dependence-independence has any implications for the Beck theory beyond demonstrating this epiphenomenality.

There is no evidence from the present research that cognitive errors are epiphenomenal to depression. Research has been extensively reviewed which indicates that there are differences in cognitive processing between depressed and nondepressed people (and in the present study, even the field independent sample scored at a level of error higher than the normative nondepressed group, reported by Lefebvre, 1981). This study seems to indicate that cognitive processing does not differ in its formal properties between depressive and nondepressive states. There is good reason to speculate that the subject matter to which these processes are directed differs between the

depressed and nondepressed states, and that the processing of negatively-toned information is more efficient when people are depressed than when they are not, as predicted by Beck et al. (1979). The field dependence-independence literature is surely relevant to the study of cognitive errors in the Beck theory, given that the specific form and formal properties of the cognitive error component of the Beck theory may be predicted, and hopefully understood, from the perspective of cognitive styles.

It may be inferred from this study that field dependent women make a lot more errors than field independent women. The finding that they did on this study should be interpreted cautiously. This study was directed to four particular cognitive errors. There is no reason to believe this list of errors is exhaustive, or that there may not be other errors to which field independent women are more prone.

The question may be asked: Is field dependence depressogenic? Despite theoretical claims to the contrary (eg. Witkin et al., 1968), this study does show a higher level of depressive processing errors among field dependent than field independent women. Other studies, reviewed earlier, seem to support the depressogenesis view of field dependence (eg. Kingsland and Greene, 1984;

O'Connor et al., 1984), in that they found depressed people to be relatively more field dependent than controls.

The results of the present study may not, in fact, support such an interpretation. The best empirical argument against the view that field dependence is depressogenic may be taken from the finding that field independent women were just as depressed as field dependent women. Unlike previous studies, this study has compared within a depressed sample for differences in cognitive style, rather than between a depressed group and a nondepressed control. Using this approach, the apparently homogeneous field dependence of depressed groups reported by other authors vanishes. The range of cognitive errors among depressed women seems to parallel a typical range of cognitive styles for the same group of people. Such a finding provides little support for the hypothesis that field dependence is somehow linked to this specific form of psychopathology. This finding provides further support for the earlier claim of Witkin and his colleagues (1968), that field dependence per se is not pathological. It must be said, however, that there are other potential indicators of relevance to the depressogenesis issue, which were not included in this study.

These indicators include the number and length of depressive episodes, and the presence of dysthymic disorder in the history of depressed people. Differences between depressed field dependent and field independent people on these indicators would have to be considered, in order to fully address the issue of depressogenesis of cognitive styles.

Several methodological and interpretive issues should be considered, in order to place the obtained results in context. First, it should be recalled that the measurement of cognitive style was taken after subjects were depressed. This step was unavoidable, but it places some limitation on one's confidence in the estimate of field dependence-independence. A reassessment at remission would strengthen one's confidence, and should be taken in future research.

A second issue is the possibility that cognitive style may influence the response set of women, through the different emphasis on social acceptance by field dependent and field independent people. While there is no evidence of such an effect on symptom measures, it is possible that field dependent women may have endorsed more cognitive errors in compliance to inferred experimenter expectation. Cognitive style may also have influenced error endorsement

by making depressive cognitive content more accessible, rather than through processing differences per se.

One potential rival hypothesis which cannot be refuted for this study is that the nature of the obtained group differences may be due to the interaction between formal cognitive impairment related to mood disorders (Roy-Byrne et al., 1986; Otto, Yeo and Dougher, 1987; Taylor and Abrams, 1987) and the different neuropsychological characteristics of field dependent and field independent people (Van Blerkom, 1987; Zoccolotti and Oltman, 1978; Pizzamiglio and Zoccolotti, 1981, 1986). Formal impairment has been related to nondominant hemispheric dysfunction (Taylor and Abrams, 1987; Otto et al., 1987) and deficits in effortful processing (Roy-Byrne et al., 1986). Zoccolotti and colleagues, along with Van Blerkom, have pointed out apparent differences in extent of lateralization for field dependent and field independent people. These differences may conceivably interact with localized dysfunction in different ways, depending on the specific neurological differences which may underlie one's cognitive style. (Beck (1987) has suggested that localized neurochemically-based dysfunctions may represent a vulnerability factor for the development of cognitive correlates of depression). A different methodology would

be necessary to investigate this alternative, one which would have to examine specific subsets of cognitive processing and neuropsychological testing of abilities associated with particular loci of neurological dysfunction.

A second rival hypothesis concerns the CEQ as a measure of individual cognitive errors. Examination of the high, significant intercorrelations between all CEQ scales (see Appendix N) suggests the potential lack of discriminant validity of this test. The CEQ had been chosen because Lefebvre (1981) had successfully derived a scale wherein inter-error comparison was not only hypothetically feasible but demonstrated with the standardization sample. However, given the intercorrelations cited, it may be argued that the CEQ simply measures different manifestations of a single error variable. The implication of this issue for the present study is the possibility that cognitive style influences only amount, not type of error. This rival view does not account well for the inter-scale differences found for the field independent sample, with reference to the personalization scale. Otherwise, the discriminative validity issue is difficult to resolve, and suggests a clear limitation of the CEQ for research of this kind. Future research might better use alternative

means to measure individual cognitive errors, in order to compare between specific error-types. One potential technique for such comparisons may be derived from the thought articulation procedure suggested by Davison, Feldman and Osborn (1984). Trained raters may be able to distinguish particular error types from the spontaneous verbal accounts of cognitive content by depressed people. The use of multiple cognitive assessment techniques might also be advisable, to permit the use of a multitrait-multimethod strategy in order to substantiate the nature and role of processing errors.

It is not readily apparent why field dependent and field independent women did not differ in the types of information about which they make processing errors, or in the types of events to which they attribute their depressive states. In the case of the former hypothesis (5), low absolute DD (depressed-distorted) scores are not unusual even in depressed samples (Krantz and Hammen, 1979). Perhaps dichotomizing the scale rendered it insensitive to group differences because of the very restricted range of DD scores available for each situation. On the other hand, it is possible that social-interpersonal stories may have included elements relevant to achievement-competence, and/or vice versa. Given these

potential confounders, interpretation of the obtained results is difficult, and must be tentative at this point. Further, more elaborate research into the relationship between social settings and cognitive errors would be necessary before any conclusions could be justified about that relationship. Further research in this area, as well as in the area of personal causal theories about why people of different cognitive styles become depressed, might well examine the potential overlap between social and achievement emphases in the cognitive style literature, and the concepts of sociotropy and autonomy. These concepts have been elaborated by Beck and his colleagues (Beck, 1988; Clark, Beck and Stewart, 1988) as schematic characteristics. Sociotropy refers to an emphasis on acceptance and affection, while autonomy emphasizes self-determination. The quality of these characteristics is strongly reminiscent of the personality differences found between field dependent and field independent people. It may be useful to compare these concepts in future research to see if they refer to the same cognitive dimension.

Part of the reason for the failure to find differences in the kinds of situations to which people attributed depression onset is very likely because most women did not attribute the onset of their depression to

any event at all. Approximately 50% of the women tested either endorsed no causal event for their depression; another 20% attributed depression to events not clearly identifiable as social-interpersonal or achievement-competence by blind raters. The very small numbers left virtually precluded any significant results, and none were found. Even combining the groups for a joint estimate of most common causal event produced no significant results, using a binomial test (obtained $p = .141$ for 2 achievement-competence causes, versus 6 social-interpersonal causes).

It would appear that factors other than cognitive style account for the perceived cause of depression. There is no obvious reason to believe that cognitive distortion is situation-specific, either, on the basis of this study.

The results of this study suggest a need for further research on the relationship of cognitive style and cognitive distortion in depression. The most obvious need is for replication, with male as well as female depressed patients, to increase confidence in the obtained results and to allow generalization to the larger population of depressed adults. Replication with adolescents and children would also seem warranted, to enhance the generalizability of findings and to aid in the construction of comprehensive cognitive models of depression.

Other areas of further research are also indicated. Basic research in the cognitive models of depression has tended to be rather dichotomous: evidence for cognitive heterogeneity at times may have been erroneously interpreted as evidence against cognitive models. The results of this study suggest that cognitive distortion and error may be influenced by a variety of factors, one of which may well be field dependence-independence. Measurement of this variable, as well as other potential contributing variables (like qualitative characteristics of distorted information) would seem justified, in future research on cognitive models of depression. In particular, measurement of changes in cognitive error across changes in symptom status as a function of cognitive style, would seem to be an area worthy of investigation, in order to more fully examine the nature of the influence of cognitive style in depression. For the same reason, the relationship of variables like cognitive style to measures of other aspects of depressive information processing, like attitudes and cognitive products, would seem advisable.

The relationship of cognitive style to depression itself would also seem worthy of further investigation, in light of conflict between the obtained results and the findings of other researchers (especially Kingsland and

Greene, 1984), that field dependence is related to depression. Not only does it seem appropriate to use more valid instruments than the EFT to measure cognitive style, but it also seems important to consider the shape of the distribution of cognitive style measures for depressed and nondepressed people. Strictly speaking, the obtained results of this study agree with those of Kingsland and Greene: the obtained mean is higher than that for the normative group (Oltman, 1968). However, the normal median and the obvious skew in the distribution suggest a more complex explanation than the simple finding that depressed people are more field dependent than nondepressed people.

A possible area of applied research is also indicated by the above results. Considering the evidence of the effectiveness of cognitive therapy for depression (Beck et al., 1979), and the hypothesis that cognitive style is amenable to metacognitive training (Witkin and Goodenough, 1981), it may be of clinical interest to investigate whether or not explicitly dealing with cognitive processing issues like field dependence in cognitive therapy would enhance the clinical effect of that intervention.

In summary, it would appear that cognitive processing in depression, and specifically cognitive processing errors, represent the summation of whatever depressive

schematic activation which may occur during the depressive episode with the typical premonitory cognitive style of the depressed individual. Error style should then be an expected rather than a surprising result, in cognitive processing research. Rather than being interpreted as evidence against the validity of cognitive theories of depression, findings of processing heterogeneity should be seen as indicators of the real complexity of cognitive processing in human beings. Similarly, simplistic notions of homogeneous processing errors should probably be revised, to include factors other than simple adherence to irrational beliefs or negatively-toned memories. It would seem that, whatever cognitive changes depression may bring to people, their typical, formal style of cognitive processing is preserved during the depressive state.

2

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Appendix A

Raw Data

Cognitive Styles and Distortions 260

RAW DATA Part One

| SUB# | PRFT | AGE | MD | VIQ | IDD | BDI | C | S | P | O | CEQT |
|------|------|-----|----|-----|-----|-----|----|----|----|----|------|
| 001 | 46 | 37 | 0 | 102 | 45 | 25 | 9 | 5 | 1 | 4 | 19 |
| 002 | 42 | 50 | 14 | 90 | 52 | 12 | 20 | 18 | 20 | 21 | 79 |
| 003 | 21 | 35 | 0 | 117 | 52 | 23 | 11 | 16 | 15 | 8 | 50 |
| 007 | 27 | 44 | 0 | 104 | 27 | 16 | 7 | 2 | 3 | 3 | 15 |
| 008 | 18 | 40 | 3 | --- | 66 | 36 | 8 | 4 | 1 | 4 | 17 |
| 012 | 16 | 29 | 0 | 84 | 53 | 35 | 6 | 6 | 1 | 4 | 17 |
| 014 | 44 | 35 | 0 | 128 | 36 | 22 | 12 | 8 | 3 | 17 | 40 |
| 016 | 14 | 19 | 6 | 112 | 58 | 38 | 14 | 15 | 11 | 9 | 49 |
| 020 | 35 | 39 | 3 | 103 | 53 | 39 | 11 | 5 | 2 | 7 | 25 |
| 021 | 31 | 41 | 17 | 110 | 60 | 45 | 19 | 14 | 9 | 20 | 62 |
| 026 | 44 | 31 | 0 | 106 | 65 | 38 | 0 | 0 | 1 | 3 | 4 |
| 030 | 45 | 31 | 0 | 103 | 49 | 26 | 11 | 12 | 6 | 4 | 33 |
| 061 | 52 | 25 | 0 | 102 | 66 | 43 | 11 | 11 | 6 | 9 | 37 |
| 062 | 22 | 51 | 8 | --- | 29 | 12 | 5 | 3 | 0 | 5 | 13 |
| 063 | 48 | 54 | 0 | --- | 50 | 31 | 3 | 6 | 1 | 8 | 18 |
| 005 | 184 | 38 | 0 | 104 | 40 | 22 | 13 | 11 | 12 | 11 | 47 |
| 006 | 82 | 31 | 0 | 100 | 65 | 43 | 12 | 8 | 12 | 8 | 40 |
| 010 | 187 | 36 | 0 | --- | 42 | 26 | 24 | 20 | 24 | 21 | 89 |
| 011 | 73 | 21 | 1 | 122 | 48 | 30 | 13 | 15 | 8 | 18 | 54 |
| 013 | 213 | 34 | 2 | 101 | 53 | 25 | 20 | 21 | 12 | 21 | 74 |
| 019 | 134 | 31 | 0 | 101 | 69 | 36 | 19 | 16 | 19 | 15 | 69 |
| 023 | 62 | 34 | 3 | 106 | 56 | 41 | 19 | 18 | 18 | 24 | 79 |
| 024 | 68 | 57 | 7 | --- | 55 | 36 | 16 | 12 | 9 | 15 | 52 |
| 027 | 156 | 30 | 0 | 84 | 82 | 44 | 20 | 17 | 24 | 20 | 81 |
| 029 | 143 | 34 | 0 | --- | 65 | 41 | 13 | 19 | 21 | 18 | 71 |
| 039 | 58 | 23 | 3 | 101 | 55 | 30 | 20 | 23 | 21 | 22 | 86 |
| 059 | 111 | 44 | 2 | --- | 67 | 47 | 9 | 13 | 8 | 9 | 39 |
| 060 | 97 | 49 | 0 | --- | 74 | 46 | 14 | 19 | 18 | 17 | 68 |
| 064 | 197 | 56 | 0 | --- | 41 | 20 | 5 | 1 | 3 | 5 | 14 |
| 065 | 161 | 31 | 5 | --- | 55 | 41 | 7 | 6 | 11 | 5 | 29 |

(Continued next page)

Cognitive Styles and Distortions 261

RAW DATA Part Two

| SUB# | SI | AC | -LES | LESC |
|------|----|----|------|------|
| 001 | 7 | 5 | 1 | NONE |
| 002 | 9 | 5 | 21 | NONE |
| 003 | 7 | 4 | 21 | SI |
| 007 | 0 | 0 | 35 | AMB. |
| 008 | 1 | 1 | 18 | AMB. |
| 012 | 0 | 1 | 24 | AMB. |
| 014 | 3 | 2 | 26 | AC |
| 016 | 3 | 3 | 42 | AMB. |
| 020 | 1 | 1 | 9 | AC |
| 021 | 4 | 4 | 23 | NONE |
| 026 | 2 | 6 | 3 | NONE |
| 030 | 3 | 10 | 13 | NONE |
| 061 | 6 | 3 | 17 | NONE |
| 062 | 1 | 0 | 10 | SI |
| 063 | 1 | 0 | 8 | NONE |
| 005 | 3 | 1 | 20 | SI |
| 006 | 1 | 2 | 41 | SI |
| 010 | 3 | 5 | 18 | SI |
| 011 | 1 | 1 | 11 | NONE |
| 013 | 9 | 8 | 8 | NONE |
| 019 | 6 | 5 | 22 | NONE |
| 023 | 7 | 6 | 13 | AMB. |
| 024 | 0 | 3 | 16 | SI |
| 027 | 3 | 5 | 3 | NONE |
| 029 | 2 | 2 | --- | --- |
| 039 | 8 | 9 | 26 | AMB. |
| 059 | 2 | 4 | 41 | NONE |
| 060 | -- | -- | 17 | NONE |
| 064 | 1 | 0 | 3 | NONE |
| 065 | 1 | 4 | 29 | NONE |

Note

SUB# refers to the test kit number assigned to each subject. PRFT refers to scores on the Portable Rod and Frame Test. MD refers to number of days on antidepressant medication. VIQ refers to the standard score obtained on the Peabody Picture Vocabulary Test- Revised, Form L. IDD refers to the score on the Inventory to Diagnose Depression. BDI refers to the score on the Beck Depression Inventory. C, S, P, and O refer to scores on the Catastrophizing, Selective Abstraction, Personalization, and Overgeneralization scales of the Cognitive Error Questionnaire. CEQT refers to the total score of the same questionnaire. SI refers to the depressed-distorted score

on the Cognitive Bias Questionnaire, based on stories which were primarily social-interpersonal in nature. AC refers to the depressed-distorted score on the same scale, for achievement-competence stories. -LES refers to the sum of all negative event ratings on the Life Experiences Survey. LESC refers to the causal attribution about the onset of their depressive episode, made by subjects after completing the same survey. If subjects wrote the word "none", the column contains that word. All other responses were rated by three independent blind raters. If unanimity between raters was not found, the column contains the abbreviation AMB. (ambiguous); if the raters were unanimous, the columns contain either the term SI, for a primarily social-interpersonal cause, or the term AC, for a primarily achievement-competence cause.

Appendix B

The Cognitive Error Questionnaire
and scoring key

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This questionnaire describes a number of situations that might occur in daily life, each followed by a thought in "quotations" that the person in the situation might have. Underneath this is a group of statements that describes how similar the thought is to how you would think in that situation.

Please read each situation and imagine that it is happening to you. Then, read the thought (which is in "quotations") following that situation. Circle the statement underneath each thought that best describes how similar that thought is to how you would think in that situation.

Because you may not have had the experiences described in some of the situations, it is important that you imagine that it is happening to you. Be sure you don't rate the situation, just rate how much the thought (which is in "quotations") is like the way you would think.

As an example, read the following:

- A. You have just come out of the store and notice a dent in your car that wasn't there before you went in. You think to yourself, "Oh no, the car is wrecked."

This thought is:

| | | | | |
|----------------|------------|--------------|--------------|--------------|
| almost exactly | a lot like | somewhat | a little | not at all |
| like I would | I would | like I would | like I would | like I would |
| think | think | think | think | think |

If that thought ("Oh no, the car is wrecked.") was somewhat like the way you would think in that situation, you would circle:

somewhat
 like I would
 think

Please start on the next page and rate every thought.

1. Your boss just told you that because of a general slowdown in the industry, he has to lay off all of the people who do your job including you. You think to yourself, "I must be doing a lousy job or else he wouldn't have laid me off."

This thought is:

| | | | | |
|----------------|------------|--------------|--------------|--------------|
| almost exactly | a lot like | somewhat | a little | not at all |
| like I would | I would | like I would | like I would | like I would |
| think | think | think | think | think |

2. You are a manager in a small business firm. You have to fire one of your employees who has been doing a terrible job. You have been putting off this decision for days and you think to yourself, "I just know that when I fire her, she is going to raise hell and will sue the company."

This thought is:

| | | | | |
|----------------|------------|--------------|--------------|--------------|
| almost exactly | a lot like | somewhat | a little | not at all |
| like I would | I would | like I would | like I would | like I would |
| think | think | think | think | think |

3. Last week you painted the living room and your spouse said it really looked great. When you were cleaning up, you found that you had got paint on the rug and thought, "Boy, this wasn't a very good painting job."

This thought is:

| | | | | |
|----------------|------------|--------------|--------------|--------------|
| almost exactly | a lot like | somewhat | a little | not at all |
| like I would | I would | like I would | like I would | like I would |
| think | think | think | think | think |

4. You noticed recently that a lot of your friends are taking up golf and tennis. You would like to learn, but remember the difficulty you had that time you tried to learn to ski. You think to yourself, "I couldn't learn skiing so I doubt if I can learn to play tennis."

This thought is:

| | | | | |
|----------------|------------|--------------|--------------|--------------|
| almost exactly | a lot like | somewhat | a little | not at all |
| like I would | I would | like I would | like I would | like I would |
| think | think | think | think | think |

5. You and your spouse recently went to an office party at the place where your spouse works. You didn't know anybody there and had a terrible time. When your spouse asks you if you want to go to the neighbours to visit, you think, "I'll have a terrible time just like at that office party."

This thought is:

| | | | | |
|----------------|------------|--------------|--------------|--------------|
| almost exactly | a lot like | somewhat | a little | not at all |
| like I would | I would | like I would | like I would | like I would |
| think | think | think | think | think |

6. You just finished spending three hours cleaning the basement. Your spouse, however, doesn't say anything about it. You think to yourself, "(S)he must think I did a lousy job."

This thought is:

| | | | | |
|----------------|------------|--------------|--------------|--------------|
| almost exactly | a lot like | somewhat | a little | not at all |
| like I would | I would | like I would | like I would | like I would |
| think | think | think | think | think |

7. Last night, your spouse said (s)he thought you should have a serious discussion about sex. You think to yourself, "(S)he hates the way we make love."

This thought is:

| | | | | |
|----------------|------------|--------------|--------------|--------------|
| almost exactly | a lot like | somewhat | a little | not at all |
| like I would | I would | like I would | like I would | like I would |
| think | think | think | think | think |

8. You have been working for six months as a car salesperson. You had never been a salesperson before and were just fired because you had not been meeting your quota. You thought, "Why try to get another job, I'll just get fired."

This thought is:

| | | | | |
|----------------|------------|--------------|--------------|--------------|
| almost exactly | a lot like | somewhat | a little | not at all |
| like I would | I would | like I would | like I would | like I would |
| think | think | think | think | think |

9. Your job requires a lot of travel. You had hoped to drive 400 miles today but you hit bad weather that slowed you down. When you stopped for the night, you thought, "I didn't make that 400 miles; Today was a complete waste."

This thought is:

| | | | | |
|----------------|------------|--------------|--------------|--------------|
| almost exactly | a lot like | somewhat | a little | not at all |
| like I would | I would | like I would | like I would | like I would |
| think | think | think | think | think |

10. You have just finished nine holes of golf. Totaling your score, you recall that although you got par on seven holes, you got two over par on the last two holes. You think to yourself, "Today I really played poorly."

This thought is:

| | | | | |
|----------------|------------|--------------|--------------|--------------|
| almost exactly | a lot like | somewhat | a little | not at all |
| like I would | I would | like I would | like I would | like I would |
| think | think | think | think | think |

11. You went fishing for the first time today with some of your friends who love fishing. Nobody got anything, and the group seemed to be discouraged. You thought to yourself on the way home, "I guess I made too much noise or did something that scared the fish off."

This thought is"

| | | | | |
|----------------|------------|--------------|--------------|--------------|
| almost exactly | a lot like | somewhat | a little | not at all |
| like I would | I would | like I would | like I would | like I would |
| think | think | think | think | think |

12. Your friends are all going out to ride their snowmobiles. Last time you went, you ran out of gas, and you think to yourself, "What if I run out of gas again; I'll freeze to death."

This thought is:

| | | | | |
|----------------|------------|--------------|--------------|--------------|
| almost exactly | a lot like | somewhat | a little | not at all |
| like I would | I would | like I would | like I would | like I would |
| think | think | think | think | think |

13. You have three children who generally do quite well in school. One of your children came home today and told you that he had to stay after school because he got into a fight. You think to yourself, "He wouldn't have gotten that detention if I disciplined him more."

This thought is:

| | | | | |
|----------------|------------|--------------|--------------|--------------|
| almost exactly | a lot like | somewhat | a little | not at all |
| like I would | I would | like I would | like I would | like I would |
| think | think | think | think | think |

14. You are taking your coffee break when your boss stops by and reminds you of some work that has to get done today. You think to yourself, "If I don't start getting back to work earlier, I'm going to lose this job."

This thought is:

| | | | | |
|----------------|------------|--------------|--------------|--------------|
| almost exactly | a lot like | somewhat | a little | not at all |
| like I would | I would | like I would | like I would | like I would |
| think | think | think | think | think |

15. You have noticed that many of your friends have begun playing tennis and are now urging you to play too. You had taken golf lessons with your spouse last year and had difficulty learning to play golf. You think to yourself, "I had so much trouble learning golf, I doubt if I could learn tennis."

This thought is:

| | | | | |
|----------------|------------|--------------|--------------|--------------|
| almost exactly | a lot like | somewhat | a little | not at all |
| like I would | I would | like I would | like I would | like I would |
| think | think | think | think | think |

16. Your seven-year-old son normally does very well in school. Last week, he brought home a paper which he had done incorrectly and was supposed to do over. You think to yourself, "Oh no, now he's having trouble in school. I better make an appointment with his teacher."

This thought is:

| | | | | |
|----------------|------------|--------------|--------------|--------------|
| almost exactly | a lot like | somewhat | a little | not at all |
| like I would | I would | like I would | like I would | like I would |
| think | think | think | think | think |

17. Earlier today, your spouse asked to have a serious talk with you after work about some things that were troublesome at home. You have no idea what's going on and you think, "We don't communicate enough; Our marriage is going to fall apart."

This thought is:

| | | | | |
|----------------|------------|--------------|--------------|--------------|
| almost exactly | a lot like | somewhat | a little | not at all |
| like I would | I would | like I would | like I would | like I would |
| think | think | think | think | think |

18. On your last job, you had not received a raise even though a co-worker with similar experience had. You are now up for a raise in your present job and think, "I didn't get a raise the last time and I probably won't now."

This thought is:

| | | | | |
|----------------|------------|--------------|--------------|--------------|
| almost exactly | a lot like | somewhat | a little | not at all |
| like I would | I would | like I would | like I would | like I would |
| think | think | think | think | think |

19. Your teenage daughter had just asked if two of her friends can stay overnight. You recall that you got very upset when your son had some friends over for pizza several weeks ago and they had made a lot of noise. You think, "If they come over, I'll get upset again."

This thought is:

| | | | | |
|----------------|------------|--------------|--------------|--------------|
| almost exactly | a lot like | somewhat | a little | not at all |
| like I would | I would | like I would | like I would | like I would |
| think | think | think | think | think |

20. You run a day care center. Today, the mother of a child you have been having difficulty with calls and notifies you that she has quit work and will be withdrawing her child from your program. You think, "She probably thinks I wasn't handling him as well as I should."

This thought is:

| | | | | |
|----------------|------------|--------------|--------------|--------------|
| almost exactly | a lot like | somewhat | a little | not at all |
| like I would | I would | like I would | like I would | like I would |
| think | think | think | think | think |

21. You took your children to the neighbourhood pool for the afternoon. Although your kids urged you to swim with them, you were enjoying laying in the sun. Later you look up and see them arguing over a float. You think to yourself, "If I had gone in the water, they probably would be fighting now."

This thought is:

| | | | | |
|----------------|------------|--------------|--------------|--------------|
| almost exactly | a lot like | somewhat | a little | not at all |
| like I would | I would | like I would | like I would | like I would |
| think | think | think | think | think |

22. You went shopping for some new clothes today and were unable to find anything you liked. You think, "What a waste of a day."

This thought is:

| | | | | |
|----------------|------------|--------------|--------------|--------------|
| almost exactly | a lot like | somewhat | a little | not at all |
| like I would | I would | like I would | like I would | like I would |
| think | think | think | think | think |

23. You met with your boss today to discuss how you have been doing on your job. He said that he really thought you were doing a good job, but asked you to try to improve in one small area. You think to yourself, "He really thinks I'm doing a lousy job."

This thought is:

| | | | | |
|----------------|------------|--------------|--------------|--------------|
| almost exactly | a lot like | somewhat | a little | not at all |
| like I would | I would | like I would | like I would | like I would |
| think | think | think | think | think |

24. Last time you went skiing, you took a hard fall and got shook up. You're supposed to go skiing this weekend but think, "I'll probably fall and break my leg and there will be no one to help me."

This thought is:

| | | | | |
|----------------|------------|--------------|--------------|--------------|
| almost exactly | a lot like | somewhat | a little | not at all |
| like I would | I would | like I would | like I would | like I would |
| think | think | think | think | think |

CEQ Scoring Key

Catastrophizing:

Items: 2, 7, 12, 14, 17, 24.

Overgeneralization:

Items: 4, 5, 8, 15, 18, 19.

Personalization:

Items: 1, 6, 11, 13, 20, 21.

Selective Abstraction:

Items: 3, 9, 10, 16, 22, 23.

Scoring is performed as follows:

Values from 0 to 4 are assigned to the response choices such that 0= "Not at all like I would think," 1= "A little like I would think," 4= "Almost exactly like I would think." The scores for an individual cognitive error (eg. catastrophizing) is simply the total of the numerical equivalents of the response choices selected on the items reflecting that cognitive error (possible range of 0-24 for each cognitive error type). The overall score is the total of the numerical equivalents of the response choices for all items (possible range: 0-96).

(Adapted from Lefebvre, personal communication, 6 February, 1986.)

Appendix C

The Cognitive Bias Questionnaire
and scoring key

by Constance Hammen and Susan Krantz

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DIRECTIONS

You are about to read six stories, each followed by a number of questions. For each question, please choose the option that best represents your own response to the situation portrayed in the story, as if you were the central character. Please underline your response to each question. Remember, there is no correct answer, only the answer that is most true for you.

Paul had joined a particular organization a couple of years ago because he was very committed to its goals and practices. He knew most of the members by now, and a few had even become fairly close friends. Paul had never considered himself the "leader" type. Earlier in school he had been fairly active but had never really stood out. Several friends in his current group thought that his ideas were sound and they began to urge him to run for president of the organization in the upcoming election. Paul was very reluctant at first, feeling he was unqualified, but finally he decided to run because he thought he did have energy and ideas to contribute. No ex-patient had ever held the position before, but his friends thought he had a good chance to win. When the elections were held, Paul ran for the presidency but he lost.

Put yourself in Paul's place, trying as vividly as you can to imagine what he probably thought and felt.

1. When you first heard you'd lost, you immediately:
 - a. feel bad and imagine I've lost by a landslide.
 - b. shrug it off as unimportant.
 - c. feel sad and wonder what the total counts were.
 - d. shrug it off, feeling I've tried as hard as I could.

2. After the election, you conclude:
 - a. I feel really depressed about losing, but I'll continue to work for my goals once I get my enthusiasm back.
 - b. It's okay that I lost, since it's a useful illustration of the inevitable prejudice against a former patient.
 - c. I'm not a winner at anything. I never should have let myself be talked into running.
 - d. The campaign was a good experience even though I didn't win.

3. When you compare the winner's "platform" to yours, you think:
 - a. Mine was good for a first attempt, and was vastly better than my opponent's.
 - b. Despite what my friends said, mine wasn't good at all.
 - c. I feel badly that I didn't do a better job on it, but I'll know next time.
 - d. Mine showed some inexperience but was pretty good for a first attempt.

Jason and Lisa have been married for a few years. Tonight at dinner, Lisa seemed to be unhappy despite Jason's attempt to start light-hearted conversations. He asked her if anything was wrong. She replied that she was having some problems at work that she didn't want to talk about, but was grateful for his concern. She seemed a little more cheerful after that.

Put yourself in Jason's place, trying to imagine as vividly as you can what he probably thought and felt.

1. You think about the future of the marriage and you imagine:
 - a. It's a pretty good relationship, and its getting better as time goes on.
 - b. It's a pretty good relationship, and I'm generally satisfied, although I think the marriage has a few problems.
 - c. I would have a hard time finding someone else who would care about me, so I want to make this marriage work out.
 - d. It is not what I really want it to be, and that makes me sad, so I often think about meeting other women and divorcing Lisa.
2. You wonder why Lisa has been so quiet for the last several days.
 - a. I decide I don't really know why and figure I should ask her.
 - b. All I can think of is that she must not care about me.
 - c. I imagine that she thinks so highly of me that she is sometimes afraid of risking rejection or pushing me too hard.
 - d. I feel unhappy about it, but figure that things sometimes do not happen exactly the way one would like.
3. Why do you think her mood changed after you asked her if there was a problem?
 - a. I feel pleased and imagine I can be very therapeutic for her and for most others.
 - b. I don't know why since it may have been due to any number of things, but I am happy that her mood changed.
 - c. I just don't understand her moods, which worries and upsets me, even though I know it's very hard to really understand another person.
 - d. I wish I could believe that I had something to do with it, but I rarely have the ability to cheer anyone up.
4. You wonder why she got in the bad mood, and imagine that:
 - a. I feel badly that I don't understand her, but it's really difficult to understand everything about somebody else.
 - b. Like most people, she has a few problems that bother her.
 - c. It's because she's extremely immature and moody; but I, on the other hand, am calm and happy.
 - d. It's because she's married to the most bleak, plain man in the city.

Carl had started working in the main office last week. It felt like it had taken forever to find this job after he moved to Ottawa. He had grown up in a small town some distance away, and since he moved had met few people. The others who worked in the same office seemed friendly, although most of them were considerably older than he. One woman, Donna, was about his age, sort of good-looking, but she worked down the hall and he saw her only occasionally. Taking his coffee break in the snack bar one afternoon, she came over and sat with him. They talked for awhile. He found her fun and pleasant, and they seemed to enjoy each other. The break ended and he had to get back to his office. He found himself thinking about her that afternoon—fantasizing about going out with her, wondering what she's like. He looked forward to seeing her the next day. At lunch the next afternoon, he sat alone in the snack bar and saw her come in. She saw him, smiled and waved, but she took her lunch to another empty table on the far side of the room.

Put yourself in Carl's place and try to imagine as vividly as you can what he might think and feel.

1. Your first reaction was to think:
 - a. I might consider being a little assertive and pursue her.
 - b. I'm unhappy that she prefers to eat alone this afternoon.
 - c. She dislikes me and wants me to get the message.
 - d. She's playing hard to get.
2. Seeing her makes you think of your romantic prospects in Ottawa, and you imagine:
 - a. I get really discouraged about how hard it is to meet good people, but almost everyone has problems with it, too.
 - b. I feel like I'll never meet anyone who is interested in me.
 - c. I can't expect the first woman to come along to be the Big Romance.
 - d. Women in Ottawa are awfully conceited.
3. Thinking back on your conversation with Donna, your judgement is:
 - a. I know she was really excited by me and I'm mystified about why she's avoiding me.
 - b. I'm afraid it wasn't as interesting as I first thought.
 - c. The conversation was pleasant; that probably had nothing to do with whether she's interested in me or not.
 - d. I must have failed at making a good impression.
4. Reflecting on your life here in Ottawa, you think:
 - a. I'll just have to wait and see what the future will bring; it's too soon to tell.
 - b. I have just about everything I want and I know I'll be a big hit in this town.
 - c. Loneliness is a big problem for me, but then I suppose it's also a big problem for all newcomers.
 - d. No one in Ottawa will ever really care about me, but at least I have a job.

Sam is a worker in a large business. He dislikes the lack of supervisor-worker contact, so he sometimes makes an effort to talk to his supervisor on his breaks. So, after he received merely average evaluation on the annual worker ratings, he went to his supervisor, Mr. Smith, to talk over his evaluation. Mr. Smith pointed out various ways of improving his work. He also gave Sam some helpful tips on health benefits. After about 15 minutes, Mr. Smith said he was quite busy and hoped Sam would excuse him. He then walked Sam to the door and said it was nice talking to him.

Put yourself in Sam's place, trying to imagine as vividly as you can what he probably thought and felt.

1. Are you satisfied with your chat with Mr. Smith?
 - a. Yes, because he was quite pleased with my visit and will probably recommend me for promotion.
 - b. Although it's upsetting for me to realize it, I probably needed that advice on improving my work.
 - c. Yes, he helped me in several ways and was quite pleasant to me.
 - d. No, he probably thinks I'm dumb, which is why he gave me advice on how to do my work.
2. Thinking about the areas you need to improve upon, you decide:
 - a. It's not my fault, they should have told me before.
 - b. Unfortunately, my mediocre evaluation shows I'm just a mediocre worker.
 - c. I feel bad that I didn't get a top rating.
 - d. Now that I've talked to Mr. Smith, I hope I will do better on the next evaluation.
3. You thought Mr. Smith was rather nice to walk you to the door. Your reaction to this was:
 - a. Embarrassment. He was trying to hurry me out.
 - b. Appreciation that he realized that it was worth his time to help me out.
 - c. Appreciation. He seemed interested and concerned.
 - d. Sort of sad and let down that the meeting had to end.
4. How did your meeting with your supervisor change your view of the large, cold organization?
 - a. Mr. Smith helped to make it seem less impersonal.
 - b. I realize that the executives and supervisors are always happy to talk with the workers.
 - c. Although Mr. Smith was willing to talk to me, I still feel lost and a little lonely at the large, impersonal corporation.
 - d. Even though my supervisor was polite, I still felt that he resented my taking up so much of his time, and that made me feel bad.

Jim has been on a psychiatric ward of a large hospital for the last two months. He is friendly, although a bit on the quiet side. He frequently admires people who appear to be more outgoing, although he sees some problems with that personality as well. One of his concerns is making friends. When he first came to the hospital, he was preoccupied with his own problems and did not want to be with the other patients. But now, he has become more aware that he wants to talk with the other patients and make friends with them. He's uncertain how to go about it.

It is now Saturday afternoon and Jim can't deny to himself that he feels lonely. Most of the patients on his ward are on a weekend pass or at the gym. In the dayroom, Jim hears the few remaining men talk about going for a walk.

Put yourself in Jim's place and try to imagine as vividly as you can how he might think and feel.

1. Your first reaction when you hear that they are going out is:
 - a. Unhappiness. They probably would have asked me to come if they liked me more.
 - b. Unhappiness and increased loneliness. Sounds like I'll be practically alone on the ward.
 - c. To wonder if they'd mind if I'd come along.
 - d. Relief. They seem unfriendly for not asking me, so I'm happy since I don't have to bother with them.
2. Being alone on a Saturday afternoon
 - a. doesn't bother me because I figure I'll find friends tomorrow for sure.
 - b. upsets me and makes me feel lonely.
 - c. upsets me and makes me start to imagine endless days and nights by myself.
 - d. I can handle it because one Saturday afternoon alone isn't that important ; probably everybody has spent one afternoon alone.
3. You sit in the dayroom trying to watch TV. Your mind keeps flashing on:
 - a. Pleasant memories of a recent chat I had with my roommate.
 - b. tomorrow's group therapy session in which I suspect everybody will like me.
 - c. I'm lonely and down but everybody is lonely sometimes.
 - d. the feeling that not having a companion today is one of the most painful things I can imagine.
4. People have always told you that you have a nice smile. You're thinking about your looks now and feel:
 - a. it's unimportant what people think about my looks.
 - b. fairly satisfied with my looks.
 - c. really ugly and undesirable. When someone compliments my looks I think they're just being polite.
 - d. unhappy because even though I feel fairly attractive, it didn't seem to be an asset in getting me either men or women friends.

Ed has spent several years in different dead-end, low-paying jobs. He is now in a vocational training program in auto mechanics. He is very happy to be in this training program, because he has always enjoyed and taken pride in his mechanical abilities. If he does well, it is likely that the program will lead to a well-paying, stable job. It would be great to get paid for doing something he enjoys!

One project in this training program is an exercise in making "diagnoses." Each member of the class is given a car with five trouble spots; the student must find them all within a certain time limit while the others watch. When Ed's turn came, he was rather nervous on the inside because he wanted very much to do well, but he seemed relaxed on the outside. He found four of the problems right away, but his time had almost run out before he finally found the last problem. The instructor and the other students watched but did not say anything.

Put yourself in Ed's place and try to imagine as vividly as you can what he probably thought and felt.

1. You try to judge how well you did. You decide:
 - a. I clearly did the best job of anyone.
 - b. According to my own standards, I think it went okay.
 - c. I'm disappointed that no one complimented me.
 - d. I hoped someone would tell me it went well, but since no one said anything, I'm afraid it wasn't very good.
2. When you thought about it afterward, the thing that mostly comes to mind is:
 - a. I feel good; relieved that the whole thing is over.
 - b. I feel disappointed that I didn't get feedback about how I'd done.
 - c. I feel bad about that one problem I couldn't find until the last minute. I think it made me look ridiculous.
 - d. I feel good because now the teacher will see my genius.
3. You're wondering how your performance will affect the recommendation that the instructor will give you:
 - a. I feel that because of that one thing that almost stumped me, he'll conclude that I really don't deserve a top recommendation.
 - b. I saw him nod once or twice, so he was really impressed, and I'll get a high recommendation.
 - c. I'm quite worried about it, but I don't know what he'll do.
 - d. I think I'll get a good recommendation because I clearly did as well as anyone else.
4. With respect to your future career as a mechanic you conclude:
 - a. I'm afraid I won't make it because I know the competition for jobs is stiff.
 - b. I'm optimistic because I've always been lucky.
 - c. Since my project didn't go very well, I feel pretty pessimistic about my chances.
 - d. I'm optimistic since my performance is generally good.

Cognitive Bias Questionnaire

Scoring Key

I. Paul/Peggy*

1. (a) DD (b) NDD (c) DND (d) NDND
2. (a) DND (b) NDD (c) DD (d) NDND
3. (a) NDD (b) DD (c) DND (d) NDND

II. Lisa/Jason**

1. (a) NDD (b) NDND (c) DD (d) DND
2. (a) NDND (b) DD (c) NDD (d) DND
3. (a) NDD (b) NDND (c) DND (d) DD
4. (a) DND (b) NDND (c) NDD (d) DD

III. Carl/Carolyn/Fred**

1. (a) NDND (b) DND (c) DD (d) NDD
2. (a) DND (b) DD (c) NDND (d) NDD
3. (a) NDD (b) DND (c) NDND (d) DD
4. (a) NDND (b) NDD (c) DND (d) DD

IV. John/Janice/Sam*

1. (a) NDD (b) DND (c) NDND (d) DD
2. (a) NDD (b) DD (c) DND (d) NDND
3. (a) DD (b) NDD (c) NDND (d) DND
4. (a) NDND (b) NDD (c) DND (d) DD

V. Steve/Shelly/Lou/Jim**

1. (a) DD (b) DND (c) NDND (d) NDD
2. (a) NDD (b) DND (c) DD (d) NDND
3. (a) NDND (b) NDD (c) DND (d) DND
4. (a) NDD (b) NDND (c) DD (d) DND

VI. Ed/Ellen*

1. (a) NDD (b) NDND (c) DND (d) DD
2. (a) NDND (b) DND (c) DD (d) NDD
3. (a) DD (b) NDD (c) DND (d) NDND
4. (a) DND (b) NDD (c) DD (d) NDND

DD: depressed, distorted; NDD: nondepressed, distorted;
DND: depressed, nondistorted; NDND: nondepressed, nondistorted.

* Social-interpersonal theme. ** Achievement-competence theme.

Appendix D

The Inventory to Diagnose Depression
and diagnostic criteria

by Mark Zimmerman

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1. On this questionnaire are groups of 5 statements.
2. Read each group of statements carefully. Then pick out the one statement that best describes the way you have been feeling the PAST WEEK. Circle the number next to the statement you picked.
3. For every group in which you circled #1, 2, 3 or 4 answer the follow-up question as to whether you have been feeling that way for more or less than 2 weeks.

- 1) 0 I do not feel sad or depressed
- 1 I occasionally feel sad or down
- 2 I feel sad most of the time, but I can snap out of it.
- 3 I feel sad all of the time, and I can't snap out of it.
- 4 I am so sad or unhappy that I can't stand it.

*** If you circled #1, 2, 3, or 4: Have you been feeling sad or down for more or less than 2 weeks? more less

- 2) 0 My energy level is normal
- 2 My energy level is occasionally a little lower than usual.
- 2 I get tired more easily or have less energy than usual.
- 3 I get tired from doing almost nothing.
- 4 I feel tired or exhausted almost all of the time.

*** If you circled #1, 2, 3, or 4: Has your energy level been lower for more or less than 2 weeks? more less

- 3) 0 I have not been feeling more restless and fidgety than usual.
- 1 I feel a little more restless or fidgety than usual.
- 2 I have been very fidgety, and I have some difficulty sitting still in a chair.
- 3 I have been extremely fidgety, and I have been pacing a little bit almost every day.
- 4 I have been pacing more than an hour per day, and I can't sit still.

*** If you circled #1, 2, 3, or 4: Have you felt restless and fidgety for more or less than 2 weeks? more less

- 4) 0 I have not been talking or moving more slowly than usual.
- 1 I am talking a little slower than usual.
 - 2 I am speaking slower than usual, and it takes me longer to respond to questions, but I can still carry on a normal conversation.
 - 3 Normal conversations are difficult because it is hard to start talking.
 - 4 I feel extremely slowed down physically, like I am stuck in mud.

*** If you circled #1, 2, 3, or 4: Have you felt slowed down for more or less than 2 weeks? more less

- 5) 0 I have not lost interest in my usual activities.
- 1 I am a little less interested in 1 or 2 of my usual activities.
 - 2 I am less interested in several of my usual activities.
 - 3 I have lost most of my interest in almost all of my usual activities.
 - 4 I have lost all interest in all of my usual activities.

*** If you circled #1, 2, 3, or 4: Has your interest in your usual activities been low for more or less than 2 weeks? more less

- 6) 0 I get as much pleasure out of my usual activities as usual.
- 1 I get a little less pleasure from 1 or 2 of my usual activities.
 - 2 I get less pleasure from several of my usual activities.
 - 3 I get almost no pleasure from most of the activities which I usually enjoy.
 - 4 I get no pleasure from any of the activities which I usually enjoy.

*** If you circled #1, 2, 3, or 4: Has your enjoyment in your usual activities been low for more or less than 2 weeks? more less

- 7) 0 I have not noticed any recent change in my interest in sex.
1 I am only slightly less interested in sex than usual.
2 There is a noticeable decrease in my interest in sex.
3 I am much less interested in sex now.
4 I have lost all interest in sex.

*** If you circled #1, 2, 3, or 4: Has your interest in sex been low for more or less than 2 weeks? more less

- 8) 0 I have not been feeling guilty.
1 I occasionally feel a little guilty.
2 I often feel guilty.
3 I feel quite guilty most of the time.
4 I feel extremely guilty most of the time.

*** If you circled #1, 2, 3, or 4: Have you had guilt feelings for more or less than 2 weeks? more less

- 9) 0 I do not feel like a failure.
1 My opinion of myself is occasionally a little low.
2 I feel I am inferior to most people.
3 I feel like a failure.
4 I feel I am a totally worthless person.

*** If you circled #1, 2, 3, or 4: Have you been down on yourself for more or less than 2 weeks? more less

- 10) 0 I haven't had any thoughts of death or suicide.
1 I occasionally think life is not worth living.
2 I frequently think of dying in passive ways (such as going to sleep and not waking up), or that I'd be better off dead.
3 I would kill myself if I had the chance.

*** If you circled #1, 2, 3, or 4: Have you been thinking about dying or killing yourself for more or less than 2 weeks? more less

- 11) 0 I can concentrate as well as usual.
1 My ability to concentrate is slightly worse than usual.
2 My attention span is not as good as usual and I am having difficulty collecting my thoughts, but this hasn't caused any problems.
3 My ability to read or to hold a conversation is not as good as it usually is.
4 I cannot read, watch TV, or have a conversation without great difficulty.

*** If you circled #1, 2, 3, or 4: Have you had problems concentrating for more or less than 2 weeks? more less

- 12) 0 I make decisions as well as I usually do.
1 Decision making is slightly more difficult than usual.
2 It is harder and takes longer to make decisions, but I do make them.
3 I am unable to make some decisions.
4 I can't make any decisions at all.

*** If you circled #1, 2, 3, or 4: Have you had problems making decisions for more or less than 2 weeks? more less

- 13) 0 My appetite is not less than normal.
1 My appetite is slightly worse than usual.
2 My appetite is clearly not as good as usual, but I still eat.
3 My appetite is much worse now.
4 I have not appetite at all, and I have to force myself to eat even a little.

*** If you circled #1, 2, 3, or 4: Has your appetite been decreased for more or less than 2 weeks? more less

- 14) 0 I haven't lost any weight.
1 I've lost less than 5 pounds.
2 I've lost between 5-10 pounds.
3 I've lost between 11-25 pounds.
4 I've lost more than 25 pounds.

*** If you circled #1, 2, 3, or 4: Have you been dieting and deliberately trying to lose weight? Y or N

*** If you circled #1, 2, 3, or 4: Have you been losing weight for more or less than 2 weeks? more less

- 15) 0 My appetite is not greater than normal.
1 My appetite is slightly greater than usual.
2 My appetite is clearly greater than usual.
3 My appetite is much greater than usual.
4 I feel hungry all of the time.

*** If you circled #1, 2, 3, or 4: Has your appetite been increased for more or less than 2 weeks? more less

- 16) 0 I haven't gained any weight.
1 I've gained less than 5 pounds.
2 I've gained between 5-10 pounds.
3 I've gained between 11-25 pounds.
4 I've gained more than 25 pounds.

*** If you circled #1, 2, 3, or 4: Have you been gaining weight for more or less than 2 weeks? more less

- 17) 0 I am not sleeping less than normal.
1 I occasionally have slight difficulty sleeping.
2 I clearly don't sleep as well as usual.
3 I sleep about half my normal amount of time.
4 I sleep less than 2 hours per night.

If you circled #1, 2, 3, or 4: Which of these sleep problems have you experienced? (circle all which apply)

- 1 I have difficulty falling asleep
2 My sleep is fitful and restless in the middle of the night.
3 I wake up earlier than usual and cannot fall back to sleep.

*** If you circled #1, 2, 3, or 4: Have you been having sleep problems for more or less than 2 weeks? more less

- 18) 0 I am not sleeping any more than normal.
1 I occasionally sleep more than usual.
2 I frequently sleep more than 1 hour more than usual.
3 I frequently sleep more than 2 hours more than usual.
4 I frequently sleep more than 3 hours more than usual.

*** If you circled #1, 2, 3, or 4: Have you been sleeping extra for more or less than 2 weeks? more less

- 19) 0 I do not feel anxious, nervous or tense.
1 I occasionally feel a little anxious.
2 I often feel anxious.
3 I feel very anxious most of the time.
4 I feel terrified and near panic.

*** If you circled #1, 2, 3, or 4: Have you been feeling anxious, nervous or tense for more or less than 2 weeks? more less

- 20) 0 I do not feel discouraged about the future.
1 I occasionally feel a little discouraged about the future.
2 I often feel discouraged about the future.
3 I feel very discouraged about the future most of the time.
4 I feel that the future is hopeless and that things will never improve.

*** If you circled #1, 2, 3, or 4: Have you been feeling discouraged for more or less than 2 weeks? more less

- 21) 0 I do not feel irritated or annoyed.
1 I occasionally get a little more irritated than usual.
2 I get irritated or annoyed by things that usually don't bother me.
3 I feel irritated or annoyed almost all the time.
4 I feel so depressed that I don't get irritated at all by things that used to bother me.

*** If you circled #1, 2, 3, or 4: Have you been feeling more irritable than usual for more or less than 2 weeks? more less

- 22) 0 I am not worried about my physical health.
1 I am occasionally worried about bodily aches and pains.
2 I am worried about my physical health.
3 I am very worried about my physical health.
4 I am so worried about my physical health that I cannot think about anything else.

*** If you circled #1, 2, 3, or 4: Have you been worried about your physical health for more or less than 2 weeks? more less

- 23) Circle the statement that best describes how your mood varies during the course of the day.

- 0 I clearly feel the most depressed in the morning.
1 I clearly feel the most depressed in the afternoon.
2 I clearly feel the most depressed in the evening.
3 I do not feel consistently more depressed during any particular part of the day.
-

- 24) Do you feel any better when something pleasant happens or someone tries to cheer you up?

- 0 Yes, I feel almost normal for a short time.
1 I feel a little better, but I still feel somewhat depressed.
2 No, I don't feel any better.
-

- 25) How does the feeling of depression or sadness compare with the depression you would feel after someone close to you died? (If the 2 types of depression differ ONLY in severity, circle #0)

- 0 There is no difference between the two types of depression.
1 There is a definite difference between the two.
- C

IDD Scoring Criteria

DSM-III Inclusion Criteria for Major Depressive Episode and Corresponding IDD Items

DSM-III Criteria:

A. Dysphoric mood or loss of interest or pleasure in all or almost all usual activities and pastimes. The dysphoric mood is characterized by symptoms such as the following: depressed, sad, blue, hopeless, low, down in the dumps, irritable. The mood disturbance must be prominent and relatively persistent but not necessarily the most dominant symptom, and does not include momentary shifts from one dysphoric mood to another dysphoric mood, e. g. anxiety to depression to anger, such as are seen in states of acute psychotic turmoil.

IDD Items: 1, 5, 6, 20, 21.

B. At least four of the following symptoms have each been present nearly every day for a period of at least two weeks.

(1) poor appetite or significant weight loss (when not dieting) or increased appetite or significant weight gain. (IDD Items 13, 14, 15, 16)

(2) insomnia or hypersomnia (IDD items 17 and 18)

(3) psychomotor agitation or retardation (but not merely feelings of restlessness or being slowed down) (IDD items 3, 4)

(4) loss of interest or pleasure in usual activities, or decrease in sex drive not limited to a period when delusional or hallucinating (IDD items 5, 6, 7)

(5) loss of energy; fatigue (IDD item 2)

(6) feelings of worthlessness, self-reproach, or excessive or inappropriate guilt (either may be delusional) (IDD items 8, 9)

(7) complaints or evidence of diminished ability to think or concentrate, such as slowed thinking, or indecisiveness not associated with marked loosening of associations or incoherence. (IDD items 11, 12)

(8) recurrent thoughts of death, suicidal ideation, wishes to be dead, or suicide attempt. (IDD item 10).

Part A of DSM-III criteria is met on the IDD if the patients scores 2 or more on either item 1 (low mood) item 20 (hopelessness) or item 21 (irritability), or 3 or more on either item 5 (decreased interest) or item 6 (decreased

pleasure). Part B is met if the patient scores 2, 3, or 4 on at least 1 IDD item in 4 or more of the 8 symptom groups.

Note: Criteria and directions for scoring are quoted verbatim from Zimmerman (1983).

Appendix E

The Life Experiences Survey

by Irwin G. Sarason, James H. Johnson

and Judith M. Siegel

Used by Permission

The Life Experiences Survey

Listed below are a number of events which sometimes bring about change in the lives of those who experience them and which necessitate social readjustment. PLEASE CHECK THOSE EVENTS WHICH YOU HAVE EXPERIENCED IN THE RECENT PAST AND INDICATE THE TIME PERIOD DURING WHICH YOU HAVE EXPERIENCED EACH EVENT. Be sure that all check marks are directly across from the items they correspond to.

Also, for each item checked below, PLEASE INDICATE THE EXTENT TO WHICH YOU VIEWED THE EVENT AS HAVING EITHER A POSITIVE OR NEGATIVE IMPACT ON YOUR LIFE at the time the event occurred. That is, INDICATE THE TYPE AND EXTENT OF IMPACT THAT THE EVENT HAD. A rating of -3 would indicate an extremely negative impact. A rating of 0 suggests no impact either positive or negative. A rating of +3 would indicate an extremely positive impact.

Section One

| | 0 to 6 mo | 7 mo. to 1 yr. | extremely negative | moderately negative | somewhat negative | no impact | slightly positive | moderately positive | extremely positive |
|--|-----------------|----------------------|-----------------------|------------------------|----------------------|-----------|----------------------|------------------------|-----------------------|
| 1. Marriage | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| 2. Detention in jail or comparable institution | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| 3. Death of spouse | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| 4. Major change in sleeping habits (much more or much less sleep) | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| 5. Death of close family member: | | | | | | | | | |
| a. mother | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| b. father | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| c. brother | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| d. sister | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| e. grandmother | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| f. grandfather | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| g. other (specify) | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| 6. Major change in eating habits (much more or much less food intake) | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| 7. Foreclosure on mortgage or loan | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| 8. Death of close friend | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| 9. Outstanding personal achievement | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| 10. Minor law violations (traffic tickets, disturbing the peace, etc.) | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| 11. MALE: Wife/girlfriend's pregnancy | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| 12. FEMALE: pregnancy | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |

| | 0 no 6 mo | 7 to 1 yr. | 8 to 1 yr. | 9 to 1 yr. | extremely negative | moderately negative | somewhat negative | no impact | slightly positive | moderately positive | extremely positive |
|---|-----------------|------------------|------------------|------------------|-----------------------|------------------------|----------------------|-----------|----------------------|------------------------|-----------------------|
| 13. Changed work situation (different work responsibility, major change in working conditions, working hours etc.) | | | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| 14. New job | | | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| 15. Serious illness or injury of close family member | | | | | | | | | | | |
| a. father | | | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| b. mother | | | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| c. sister | | | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| d. brother | | | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| e. grandfather | | | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| f. grandmother | | | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| g. spouse | | | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| h. other (specify) | | | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| 16. Sexual difficulties | | | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| 17. Trouble with employer (in danger of losing job, being suspended, demoted, etc.) | | | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| 18. Trouble with in-laws | | | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| 19. Major change in financial status (a lot better off or a lot worse off) | | | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| 20. Major change in closeness of family members (increased or decreased closeness) | | | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| 21. Gaining a new family member (through birth, adoption, family member moving in etc.) | | | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| 22. Change of residence | | | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| 23. Marital separation from mate (due to conflict) | | | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| 24. Major change in church activ- ities (increased or decreased attendance) | | | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| 25. Marital reconciliation with mate | | | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| 26. Major change in number of ar- guments with mate (a lot more or a lot less arguments) | | | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| 27. MARRIED MALE: change in wife's work outside the home (begin- ning work, ceasing work, chang- to a new job, etc.) | | | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| 28. MARRIED FEMALE: change in hus- band's work (loss of job, beginning new job, retirement etc.) | | | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |

| | 0 to 6 mo | 7 mo to 1 yr | extremely negative | moderately negative | somewhat negative | no impact | slightly positive | moderately positive | extremely positive |
|--|-----------------|--------------------|--------------------------------|---------------------------------|-------------------------------|--------------------|-------------------------------|---------------------------------|--------------------------------|
| 29. Major change in usual type or kind of recreation | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| 30. Borrowing more than \$10,000 (buying home, business, etc.) | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| 31. Borrowing less than \$10,000 (buying car, TV, getting school loan etc) | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| 32. Being fired from job | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| 33. MALE: wife/girlfriend having abortion | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| 34. FEMALE: having abortion | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| 35. Major personal illness or injury | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| 36. Major change in social activities e.g., parties, movies, visiting (increased or decreased participation) | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| 37. Major change in living conditions of family (building new home, remodeling, deterioration of home, neighborhood etc) | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| 38. Divorce | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| 39. Serious injury or illness of close friend | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| 40. Retirement from work | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| 41. Son or daughter leaving home (due to marriage, college etc) | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| 42. Ending of formal schooling | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| 43. Separation from spouse (due to work, travel, etc) | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| 44. Engagement | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| 45. Breaking up with boyfriend/girlfriend | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| 46. Leaving home for the first time | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| 47. Reconciliation with boyfriend/girlfriend | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| OTHER RECENT EXPERIENCES WHICH HAVE HAD AN IMPACT ON YOUR LIFE. LIST AND RATE. | | | | | | | | | |
| 48. _____ | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| 49. _____ | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |
| 50. _____ | | | -3 | -2 | -1 | 0 | +1 | +2 | +3 |

Appendix F

Follow-Up Question (Part Two) to

The Life Experiences Survey

by Richard MacGillivray, MSc

PART TWO

Now that you have finished checking off the life events, please look back over the list of events, including the last three, if you filled them in. Try to decide WHICH EVENT, IF ANY, HAD THE MOST TO DO WITH YOU BECOMING DEPRESSED. This event could have caused your depression, in your opinion, or could have happened around the same time you became depressed and contributed a lot to it. ✓

Please WRITE DOWN THE NUMBER of that item in the space below. The, please BRIEFLY explain what it was about that event which contributed to your depression.

If no event had anything to do with your depression, please write the word "NONE" on the line that says "item number."

ITEM NUMBER: _____

EXPLANATION: _____

Appendix H
Instruction Manual

INSTRUCTION MANUAL

1. CONSENT FORMS:

To begin, I would like to get your written consent to participate in the study. This form (PRESENT FORM) describes the project, the procedures, and tells you your rights. Please read it now. If you have any questions about it, please ask me when you have finished reading it all.

AFTER PATIENT FINISHES READING:

Do you have any questions? Do you wish to be involved in the study? (IF YES) Please sign here and write the date here. The date is _____. I will sign where it says "witness".

On the form you just signed, you agreed to be tested twice. There is a possibility that a second session will not be necessary, depending on how all patients do on the first administration. The decision will not have anything to do with how you yourself do on the tasks. If you are not called in for another session, then, it will be because it is not necessary.

2. PERSONAL INFORMATION:

I will need some information about you in order to get in touch with you for the second testing session. I need your phone number and date of birth.

You will notice that some of the questionnaires you will be given have a space for your name. There may be a number written in the space. Please do not put your name on any of the questionnaires. If you have any questions about the questionnaires as you fill them in, please feel free to ask.

3. IDD:

Please read the instructions at the top of this page and fill in this questionnaire to begin. Notice that for each group of five statements, you are to pick out the one statement that best describes the way you have been feeling for the past week. Circle the number next to the statement. For every group in which you circle #1, 2, 3, or 4, answer the follow up question (INDICATE), as to whether you have been feeling that way for more or less than 2 weeks. If more, circle "more"; if less, circle "less". Any questions?

CHECK RESPONSES IMMEDIATELY. IF MDD NOT JUSTIFIED, DISCONTINUE

[if subject fails to meet criteria: "We will be able to stop now. One of the goals of this research is to test people with certain symptoms of depression, which you do not have. Thank you."]

4. PRFT (see note 1):

The purpose of this test is to see how accurately you can line up a moveable rod with the true vertical; that is, straight up and down. In other words, when the rod is at a right angle to the floor.

Have a seat in front of this apparatus. Inside it is a rod and a square frame that is now behind this screen. You will have 8 trials with the rod and frame tilted in various ways. The screen will be closed between trials. I will be moving the rod from its starting position. When the rod first appears straight up and down to you, say "Now". Please only give me your first impression of when the rod is straight up and down.

Now put your head in the headrest so that you are comfortable. Please keep your head in this position until we are finished. Remember, give me your first impression of when the rod appears upright by saying "Now". Do you have any questions?

DEAL WITH ANY QUESTIONS AND THEN SAY: We will now begin.

(Prior to starting the PRFT(R)-L:

Is English your first language? (If not: Do you understand English and are you able to read it?) IF NOT, DISCONTINUE

5. PPVT(R)-L (see note 2):

I want to find out how large your vocabulary is.

TURN TO TRAINING PLATE D WHILE SPEAKING:

See, there are four pictures on this page. Each of them is numbered.

POINT TO AND NUMBER EACH IN TURN:

1, 2, 3, 4. I will say a word; then I want you to tell me the number of the picture which best tells the meaning of the word. Let's try one. Tell me the number of the picture which best tells the meaning of training plate D initial practice word.

*IF CORRECT: That's fine. Now, what number is training plate E initial practice word.

*IF WRONG: GIVE CORRECT CHOICE, GO ON TO NEXT PLATE. IF NECESSARY, USE AS MANY ADDITIONAL PRACTICE WORDS AS NECESSARY.

WHEN DESIRED RESPONSE ACHIEVED:

Fine! Now I am going to show you some other pictures. Each time I say a word, you say the number of the picture

which best tells the meaning of the word. As we go through the book you may not be sure you know the meaning of some words, but look carefully at all of the pictures anyway and choose the one you think is right. What number is first test plate?

WHEN COMPLETED: You may have noticed that some of the items were more difficult than others or that you weren't sure whether some of your answers were right, especially for some of the words towards the end of the test. That is the way the test is designed, to get harder as it goes, and no one gets all the questions correct. You shouldn't be surprised or concerned, then, if you did find some words hard.

6. BDI/CEQ/CBQ/LES:

THESE TESTS ARE BOUND TOGETHER IN A SINGLE BOOKLET

This booklet contains four questionnaires. Please read the instructions at the beginning of each of them, and fill each one out. When you finish one, go directly on to the next. Before you begin, I'll go over the instructions for each questionnaire with you.

BDI: For the Beck inventory, you see 21 groups of statements. Please read each group carefully. Then pick out the one statement in each group which best describes the way you have been feeling today. Circle the number beside the statement you picked. Be sure to read all the statements in each group before you begin. Any questions?

CEQ: The second questionnaire is labelled "2" It describes a number of situations that might occur in daily life, each followed by a thought in quotations that the person in the situation might have. Underneath each situation is a group of statements that describe how similar the thought is to how you would think in that situation. Please read each situation and imagine that it is happening to you. Then read the thought, which is in quotations, following that situation. Circle the statement underneath each thought that best describes how similar that thought is to how you would think in that situation. Because you may not have had the experiences described in the situations, it is important that you imagine that it is happening to you. Be sure you don't rate the situation; just rate how much the thought, which is in quotations, is like the way you would think. Look at his example. (REVIEW EXAMPLE) Any questions?

CBQ: The third questionnaire is labelled "3". You will read six stories, each followed by a number of

questions. For each question, please choose the option that best describes your own response to the situation portrayed in the story, as if you were the central character. Please underline your response to each question. There is no correct answer, only the answer that is most true for you.

LES: The fourth questionnaire is called the "Life Experiences Survey". It has two parts. For part one, you see a list of a number of events which sometimes bring about change in the lives of those who experience them, and which necessitate social readjustment. Please check off those events which you have experienced in the recent past and indicate the time period here during which you have experienced each event. Be sure that all check marks are directly across from the items they correspond too. Also, for each item you check, please indicate the extent to which you viewed the event as having a positive or negative impact on your life at the time the event occurred. That is, indicate the type and extent of impact that the event had. A rating of -3 would indicate an extremely negative impact. A rating of zero would indicate no impact either positive or negative. A rating of +3 would indicate an extremely positive impact. If an event did not happen to you, just draw a line through it. Any questions? At the end, you will notice here it says other recent experiences which have had an impact on your life; list and rate. There you list any events not described already and rate them the same way. Part Two of this questionnaire asks you to look back over the list of events, including the last three if you filled them in, and decide which event you think had the most to do with your becoming depressed. The event might have caused your depression, in your opinion, or it could have happened around the time you became depressed and had a lot to do with it. If so, please write down the number of that item in the space here. After that, please briefly explain what it was about the event which contributed to your feelings of depression. If you don't think any events had anything to do with your depression, just write the word "none" on the line here. Any questions? (DEAL WITH QUESTIONS) Please begin now with the first questionnaire. As soon as you finish it, go on to number 2, and the same for number three and the life experiences questionnaire. Please don't leave out any questions on any of the questionnaires.

AT THIS POINT EXPERIMENTER WILL LEAVE ROOM, SAY: I will leave you now to work on the questionnaires. I will check back every fifteen minutes or so, to see if you have any questions.

AFTER COMPLETION OF ALL TEST FORMS, THANK SUBJECT AND ANSWER ANY QUESTIONS OR REQUESTS.

Notes

Note 1: Instructions here are derived from Crouppen, G. A. (1976) Field Dependence-Independence in Depressed and "Normal" Males as an Indicator of Relative Proneness to Shame or Guilt and Ego Functioning. Ann Arbor, MI: University Microfilms International.

Note 2: Instructions quoted here verbatim from Dunn, L. M. and Dunn, L. M. (1981) Manual: Peabody Picture Vocabulary Test- Revised Forms L and M. Circle Pines, MN: American Guidance Service.

Appendix I

Instructions to Independent Raters
for Rating Patients' Causal Attributions
for the Onset of Their Depressive Episode

INSTRUCTIONS

On the last page of the questionnaire which you have been given, there is a question which asks what, if any, event had the most to do with the respondent becoming depressed. The respondent is asked to pick an item (indeed some picked more than one) and to explain briefly.

Your task is to rate the type of causal/contributory events by examining their explanation, and referring to the item(s) they have cited. The rating should be done as follows:

You have each a recording sheet, with five columns, with one line each allotted for each respondent's rating.

In the first column, please write the respondent's identification number, which you will find in the top right corner of each questionnaire, on page one. You will then place a checkmark in one of the last four columns for each respondent, according to how you rate her response.

The second column is labelled "social-interpersonal". Place a check mark in this column for a given respondent if in your judgement the cause of their depression is related primarily to a negative impact upon some aspects of the interpersonal and/or social relationships of the person. For example, events with an impact of this type might include those which affect love or friendship relationships with another/others, amount of desired social contact with another/others, amount of time spent in primarily social surroundings, and so on. These examples should not be considered exhaustive or restrictive.

The third column is labelled "achievement-competence". Place a check mark in this column for a given respondent if in your judgement the cause of their depression is related primarily to a negative impact upon some aspects of the nonsocial accomplishment, achievement, or demonstrated competence of the person. For example, events with an impact of this type might include those which affect attainment of important nonsocial goals, professional accomplishment, financial gain, and so on. These examples should not be considered exhaustive or restrictive.

Please remember to rate the respondent's explanation, not your reaction to the events described. Also please only endorse an item as either social-interpersonal or achievement-competence if you are reasonably certain; that is, if the respondent is unambiguous. Rate all responses on your own, without help.

The fourth column is labelled "ambiguous". Please place a check mark in this column if the respondent's

explanation is not clearly and primarily either social-interpersonal or achievement-competence in nature.

Appendix J
Informed Consent Form
for Patients of the Royal Ottawa Hospital

Informed Consent
to Participate in a Research Project

Brief Description of the Project: The purpose of this research project is to determine whether or not the ordinary thinking and problem solving skills of people have any affect on the kinds of thoughts they have while they are depressed. The project is designed to measure certain ways of thinking and solving problems while you are depressed as well as when you are no longer as depressed. This research will be useful in helping to design the most effective psychotherapy for particular depressed people.

Principal Investigator: Richard G. MacGillivray, M.Sc.

Procedures Involved: You will be tested twice. The first time will be shortly after you are either admitted to hospital or start coming to the hospital as an outpatient. The second time will be when your psychiatrist informs the experimenter that you are no longer as depressed. Both times you will be given a battery of tests. Most of these tests are paper-and-pencil questionnaires in which you check off or underline statements that describe your thoughts, experiences or answers to problems. You will also be asked to take two tests in which you tell the experimenter the best answer to a problem. The first testing session will take about three hours; the second will be somewhat shorter. The tests will be the same as those you had done in the first session, but there will be fewer tests. You will be allowed a break in the middle of both testing sessions.

Possible Risks Involved: There are no known risks associated with this testing procedure. No medications, treatments or experimental manipulations are involved in this research. All of the tests you will take are standard psychological tests which have been used successfully in other research projects.

Your Rights: Your privacy will be protected. Scores obtained from your tests will be combined with those of other patients to evaluate the results of this research. Any publications from this projects will be designed so that your identity will not under any circumstances be revealed.

You may decide to withdraw from participating in

this project at any time before or during this project, without any bearing on your treatment at this hospital.

Your legal rights, regarding negligence or the liability of this institution or its agents, are not affected by your decision to participate in this research.

STATEMENT

I, _____, agree to participate in the above described project, the nature and possible complications of which have been explained to me.

I also consent that any data collected as a result of my participation in this project may be used for educational and/or scientific purposes.

I have received assurance that all possible efforts will be made to preserve my anonymity in the use of this material.

I have received assurance that I may withdraw from participation at any time, without any bearing on my treatment.

I further understand that my legal rights, regarding negligence and the liability of this institution or its agent, are not waived.

Date

Signature of Research
Subject

Date

Signature of Witness

Appendix K
Informed Consent Form
for Patients of the Ottawa General Hospital

MENTAL HEALTH RESEARCH PROJECT

Primary Investigator: Richard MacGillivray, MSc
Advisor: Pierre Baron, PhD, C.Psych.

CONSENT FORM

The study in which you are asked to participate is part of the requirement for this researcher's doctoral dissertation. It is a study on the psychological aspects of depression. As part of the study the researcher will need to be informed about the diagnosis that your doctor has established for you. You will be required to fill out five brief questionnaires (along with two optional brief questionnaires) and two short oral tests, which should take no more than three hours of your time. In these you will be asked to provide some information about yourself. Later, you may be asked to complete some of these tests and questionnaires again, when you are no longer depressed.

Your set of questionnaires will be identified by code to insure confidentiality. No names are to be recorded on the sheets so that copies will remain anonymous. All information that pertains to you, be it in the form of the formal diagnosis, questionnaire or test results, will be treated with the utmost care to protect confidentiality. The only people who will handle this information will be the investigator himself and his thesis supervisor, a registered psychologist in the provinces of Ontario and Québec. Your refusal to participate, or withdrawal from participation at any time will not affect your present or future care by the staff of this hospital. Your information and answers will be deleted from the project if you decide to withdraw.

If you decide to participate and would like to know more about the study or to be briefed on the results, please leave your name and phone number with the researcher, who will contact you after all participants have been tested. Should you have any other concerns about the study, either now or later, I would be glad to discuss them with you.

I agree to participate in this study,

Signature of participant _____

Date _____

Appendix L

Approval of the Ethics Committee
of the Royal Ottawa Hospital
to Test Patients



ROYAL OTTAWA HOSPITAL
HÔPITAL ROYAL OTTAWA

A division of the Royal Ottawa Health Care Group / Une division des services de santé Royal Ottawa

February 22, 1988

Mr. Rick McGillivray
Royal Ottawa Hospital

Dear Mr. McGillivray:

RE: Protocol "The Influence of Cognitive Processing Style on Cognitive Distortions in Clinical Depression", by R. McGillivray, under supervision of Dr. R. Trites, Ph.D.

As already notified, this protocol was reviewed by the Research Ethics Committee in October of 1986 and the approval was at that time withheld pending the receipt of documentation from psychiatrists stating that they would be prepared to refer their patients for the study. Such documentation was received from the investigators; however, further approval was not documented and hence was not presented to the Psychiatric Advisory Committee at that time and this appears to have been a slip. This is to state the protocol is approved and I will submit the committee's recommendation to the Psychiatric Advisory Committee and Medical Advisory Committee for further approval.

With best wishes.

Yours truly,

R. Kunjukrishnan, M.D.
Chairman
Research Ethics Committee

Appendix M
Approval of the Ethics Committee
of the Ottawa General Hospital
to Test Patients



JEAN-YVES GOSSELIN, MD. FRCPC
PROFESSEUR TITULAIRE DE PSYCHIATRIE
PROFESSOR OF PSYCHIATRY

February 9, 1988

To whom it may concern:

RE: THE INFLUENCE OF COGNITIVE PROCESSING STYLE
ON COGNITIVE DISTORTIONS IN CLINICAL
DEPRESSION

The study presently conducted by Mr. Richard MacGillivray has been approved by the Ethics Committee of the Ottawa General Hospital.

Yours sincerely,

Jean-Yves Gosselin, M.D.
Director
Hospitalized Patient Unit
Department of Psychiatry

JYG/lmb

Appendix N
Correlation Matrix for
Dependent and Independent Measures and Covariates

Correlation Matrix for Dependent and Independent Measures
and Covariates (Part One)

| | IDD | VIQ | BDI | CBQ:SI | CBQ:AC |
|--------|------|-------|---------|--------|---------|
| PRFT | .127 | -.307 | .149 | .142 | .231 |
| IDD | ---- | -.426 | .826(d) | .141 | .312 |
| VIQ | ---- | ---- | -.145 | -.069 | -.174 |
| BDI | ---- | ---- | ---- | -.170 | .111 |
| CBQ:SI | ---- | ---- | ---- | ---- | .660(c) |

(Part Two continued on following page.)

Correlation Matrix for Dependent and Independent Measures
and Covariates (Part Two)

| | CEQ:C | CEQ:S | CEQ:P | CEQ:O | -LES |
|--------|---------|---------|---------|---------|-------|
| PRFT | .342 | .625(c) | .516(b) | .424(b) | -.209 |
| IDD | .233 | .361 | .411(a) | .233 | .046 |
| VIQ | -.137 | -.048 | -.259 | .043 | .156 |
| BDI | .090 | .182 | .191 | .121 | .192 |
| CBQ:SI | .566(b) | .622(c) | .481(b) | .517(b) | -.083 |
| CBQ:AC | .493(b) | .571(b) | .465(b) | .382(a) | -.094 |
| CEQ:C | ---- | .859(c) | .807(d) | .866(d) | .099 |
| CEQ:S | ---- | ---- | .859(d) | .844(d) | .139 |
| CEQ:P | ---- | ---- | ---- | .758(d) | .154 |
| CEQ:O | ---- | ---- | ---- | ---- | -.037 |

Note: PRFT refers to the Portable Rod and Frame Test; IDD to the Inventory to Diagnose Depression; VIQ to the standard score derived from the Peabody Picture Vocabulary Test (Revised)- Form L; BDI to the Beck Depression Inventory; CBQ:SI and CBQ:AC to the social-interpersonal and achievement-competence scores (respectively) of the Cognitive Bias Questionnaire; -LES to the sum of negative ratings on the Life Experiences Survey, and CEQ: C, S, P and O to the Catastrophizing, Selective Abstraction, Personalization and Overgeneralization scales of the Cognitive Error Questionnaire. All instruments are cited in the text.

Note: All correlation values given for the PRFT with any other instrument are Spearman rank (ρ) coefficients, to compensate for the nonnormal distribution of PRFT scores; all other correlation values are Pearson Product-Moment correlation coefficients.

(a) $p < .05$; (b) $p < .01$; (c) $p < .001$; (d) $p < .0001$