

INFORMATION TO USERS

The most advanced technology has been used to photograph and reproduce this manuscript from the microfilm master. UMI films the text directly from the original or copy submitted. Thus, some thesis and dissertation copies are in typewriter face, while others may be from any type of computer printer.

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleedthrough, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send UMI a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

Oversize materials (e.g., maps, drawings, charts) are reproduced by sectioning the original, beginning at the upper left-hand corner and continuing from left to right in equal sections with small overlaps. Each original is also photographed in one exposure and is included in reduced form at the back of the book. These are also available as one exposure on a standard 35mm slide or as a 17" x 23" black and white photographic print for an additional charge.

Photographs included in the original manuscript have been reproduced xerographically in this copy. Higher quality 6" x 9" black and white photographic prints are available for any photographs or illustrations appearing in this copy for an additional charge. Contact UMI directly to order.

U·M·I

University Microfilms International
A Bell & Howell Information Company
300 North Zeeb Road, Ann Arbor, MI 48106-1346 USA
313/761-4700 800/521-0600

Order Number 9008322

An evaluation of the role of irrational cognitions in depression

Herbert, James Dalton, Ph.D.

The University of North Carolina at Greensboro, 1989

U·M·I
300 N. Zeeb Rd.
Ann Arbor, MI 48106

AN EVALUATION OF THE ROLE OF IRRATIONAL
COGNITIONS IN DEPRESSION

by

James D. Herbert

A Dissertation Submitted to
the Faculty of the Graduate School at
The University of North Carolina at Greensboro
in Partial Fulfillment
of the requirements for the Degree
Doctor of Philosophy

Greensboro
1989

Approved by

Rosemary O. Nelson-Gray

Rosemary O. Nelson-Gray, Ph.D.

APPROVAL PAGE

This dissertation has been approved by the following committee of the Faculty of the Graduate School at the University of North Carolina at Greensboro.

Dissertation Advisor Rosemary O. Nelson-Gray

Committee Members Ernest A. Sumner
Paul C. Stolt
Ph. Dull
Jacquelyn White

6-5-89
Date of Acceptance by Committee

6-5-89
Date of Final Oral Examination

HERBERT, JAMES DALTON, Ph.D. An Evaluation of the Role of Irrational Cognitions in Depression. (1989) Directed by Dr. Rosemary O. Nelson-Gray. 298 pp.

Beck's (1979) cognitive theory of depression states that irrational beliefs about the self, the world, and the future are typical characteristics of persons prone to depression. These beliefs are hypothesized to be latent until activated by a stressor, at which point they lead to depression. Prior research has firmly established the presence of such schemas in the actively depressed person. No evidence of depressotypic schemas, however, has been found among depression-prone persons who are currently asymptomatic (e.g., remitted depressives). The apparent absence of such schemas in the latter group might be due to inadequate assessment procedures. Since the schemas are hypothesized to be latent, it follows that they might only be revealed under special assessment conditions.

In order to assess the presence of depressotypic schemas in depression-prone persons, three methodologies were used with the same group of 30 subjects. The subjects consisted of 10 actively depressed persons, 10 remitted depressives, and 10 subjects with no history of depression. In Method I, subjects were exposed to tachistoscopic presentations of both rational and irrational versions of depressotypic statements under subliminal and supraliminal conditions. The dependent measures included a sensitive measure of dysphoric mood and

agreement ratings with each stimulus. In Method II, subjects were administered four cards from the Thematic Apperception Test. Response latencies and total response times were recorded. Transcribed responses were also evaluated by 10 expert clinicians blind to subject group. In Method III, subjects completed the Dysfunctional Attitudes Scale, both under standard instructions, and under modified instructions to rate the beliefs of another person. The results of all three methodologies consistently found the actively depressed group to differ in the predicted direction from the normal group, with no differences between the normal and remitted groups. The results are consonant with those of prior investigations, and provide no evidence of depressotypic schemas in nondepressed, depression-prone persons. Although the present results do not rule out the possibility of depressotypic schemas in persons predisposed to depression, the most parsimonious explanation is that such schemas are concomitants, rather than precursors, of depression.

ACKNOWLEDGMENTS

I am extremely grateful to Rosemary Nelson-Gray for her invaluable guidance throughout my graduate training in general, and throughout this dissertation in particular. Thanks are also extended to Ernest Lumsden, Richard Shull, Rita O'Sullivan, and Jacqueline White for their interest in this study and their helpful feedback. I am indebted to Jennifer Harris for her assistance in data collection, and to Richard Farmer for his assistance with data analysis. Realization of this project was made possible through three sources of funding. Appreciation is expressed to the UNCG Graduate School for a summer research stipend, as well as to the American Psychological Association and the Sigma Xi Scientific Society for dissertation grants. Finally, I wish to acknowledge my wife and colleague, Diana L. Herbert, for her theoretical and technical assistance and unwaivering moral support throughout all phases of this project.

TABLE OF CONTENTS

	Page
APPROVAL PAGE	ii
ACKNOWLEDGMENTS	iii
LIST OF TABLES	vii
LIST OF FIGURES	ix
 CHAPTER	
I. INTRODUCTION	1
Depression	1
Theories of Unipolar Depression	5
Cognitive Theories of Depression	6
Research on Beck's Theory	14
Subliminal Perception: History and Overview	26
Basic Research in Subliminal Perception . .	31
Subliminal Psychodynamic Activation	33
Laboratory Studies of Clinical Populations .	35
Laboratory Studies of Nonclinical Populations	40
Therapy and Educational Adjunct Studies. . .	43
Criticisms of Psychodynamic Activation	
Studies	46
Criticisms of Subliminal Perception Research	48
The Thematic Apperception Test	56
The Dysfunctional Attitudes Scale	60
Statement of Purpose	62
Method I: Subliminal Stimulation of	
Depressotypic Statements	64
Method II: The Thematic Apperception Test .	70
Method III: The Dysfunctional Attitudes	
Scale	72
II. METHOD	74
Method I	74
Participants	74
Experimental Design	81
Stimuli and Apparatus	82
Procedure	86
Discrimination Task	91
Dependent Measures	93
Method II	95
Method III	98

CHAPTER	Page
III. RESULTS	101
Method I	101
Check for Subliminality of Stimuli	101
The Effects of the Stimuli on Mood	103
The Effects of the Stimuli on Agreement.	110
Ratings	110
Method II	115
Latency Measures	115
Diagnostic Judgments	115
Method III	117
IV. DISCUSSION	120
The Tachistoscopic Procedure	122
The Thematic Apperception Test	130
The Dysfunctional Attitudes Scale	135
Implications for Beck's Theory of Depression	138
Psychological Diatheses for Depression	141
Directions for Future Research	144
BIBLIOGRAPHY	155
APPENDIX A. AN OVERVIEW OF THEORIES OF UNIPOLAR DEPRESSION	185
APPENDIX B. REVIEW OF BASIC RESEARCH IN SUBLIMINAL PERCEPTION	195
APPENDIX C. DYSFUNCTIONAL ATTITUDES SCALE	213
APPENDIX D. ETHICAL CONSIDERATIONS	218
APPENDIX E. CONSENT FORM FOR SCREENING	223
APPENDIX F. SAMPLE ITEMS FROM THE SCHEDULE FOR AFFECTIVE DISORDERS AND SCHIZOPHRENIA -- LIFE-TIME VERSION	224
APPENDIX G. BECK DEPRESSION INVENTORY	226
APPENDIX H. SADPERSONS SCALE	229
APPENDIX I. THERAPIST CONSENT FORM	230
APPENDIX J. TABLES	231
APPENDIX K. LIST OF REFERRALS	273

CHAPTER	Page
APPENDIX L. OVERVIEW OF SUBLIMINAL STIMULATION STUDY	274
APPENDIX M. CONSENT FORM FOR PARTICIPATION IN STUDY .	275
APPENDIX N. POST-EXPERIMENTAL QUESTIONNAIRE	276
APPENDIX O. AGREEMENT RATING FORM	278
APPENDIX P. MOOD SCALES	279
APPENDIX Q. FIGURES	289
APPENDIX R. TAT STUDY: PSYCHOLOGISTS' DEBRIEFING . .	294
APPENDIX S. PARTICIPANT DEBRIEFING	296

LIST OF TABLES

		Page
Table 1	Descriptive Data for Each Subject	232
Table 2	Summary of ANOVA by Subject Group on Base-Line Beck Depression Inventory	233
Table 3	Summary of ANOVA by Subject Group on Base-Line MMPI-Depression Scale	234
Table 4	Summary of ANOVA by Subject Group on Base-Line SADPERSONS	235
Table 5	Summary of ANOVA by Subject Group on Age .	236
Table 6	Outline of Tachistoscopic Procedure . . .	237
Table 7	Summary of ANOVA by Subject Group on Discrimination Task Results	238
Table 8	Summary of ANOVA by Subject Group on Base-Line Mood Measure	239
Table 9	Summary of Factorial ANOVA on Mood Measure Gain Scores	240
Table 10	Tukey Post Hoc Tests on Order by Modality Interaction for Mood Measure Gain Scores .	241
Table 11	Summary of Factorial ANOVA on Unadjusted Mood Measure	243
Table 12	Tukey Post Hoc Tests on Group Main Effect for Unadjusted Mood Measure	244
Table 13	Tukey Post Hoc Tests on Order by Modality Interaction for Unadjusted Mood Measure .	245
Table 14	Post Hoc Tests on Order by Modality Interaction for Unadjusted Mood Measure Using A Method Described by Boik	247
Table 15	Sequence of Orders and Means Broken Down By Order X Modality for Unadjusted Mood Measure	249
Table 16	Pearson Correlation Matrix for Agreement Ratings for Individual Stimuli	250
Table 17	Summary of Factorial ANOVA on Sum of Agreement Ratings	251

LIST OF TABLES (Continued)

		Page
Table 18	Summary of Factorial ANOVA on Individual Agreement Ratings	252
Table 19	Tukey Post Hoc Tests on Group by Valence Interaction for Sum of Agreement Ratings .	254
Table 20	Tukey Post Hoc Tests on Modality by Valence Interaction for Sum of Agreement Ratings .	255
Table 21	Tukey Post Hoc Tests on Group by Modality By Valence Interaction for Sum of Agreement Ratings	256
Table 22	Summary of ANOVA by Subject Group on TAT Latency and Response Time Data	259
Table 23	Summary of ANOVA by Subject Group on Sum Of TAT latency and Response Time DATA . .	263
Table 24	Summary of ANOVA by Subject Group on the Number of Depression Diagnoses Assigned .	264
Table 25	Mean Number of Depression Diagnoses in Relation to the Actual Diagnostic Status .	265
Table 26	Summary of ANOVA by Subject Group on Modified Version of the DAS	266
Table 27	Summary of ANOVA by Subject Group on Original Version of the DAS	267
Table 28	Summary of ANOVA by Subject Group on Difference Between Standard and Modified Versions of the DAS	268
Table 29	Raw Data	269

LIST OF FIGURES

		Page
Figure 1	Thematic Apperception Test: Card 1 . . .	290
Figure 2	Thematic Apperception Test: Card 3BM . .	291
Figure 3	Thematic Apperception Test: Card 10 . . .	292
Figure 4	Thematic Apperception Test: Card 14 . . .	293

INTRODUCTION

Depression

Depression has afflicted humankind since antiquity, to the point of being known as the "common cold of psychopathology" (Seligman, 1973). Despite phenomenal advances over the past 20 years in our understanding of depression, it remains mysterious in many respects. There is no universally accepted etiological theory of the phenomenon; recent treatment interventions, despite their improved efficacy relative to older strategies, remain far from ideal. Even the precise symptoms that constitute the disorder are debated (Glazer, Clarkin, & Hunt, 1981; Greenwood, 1987). Nevertheless, it is generally agreed that a persistent or severe dysphoric mood and/or a loss of interest or pleasure in previously enjoyable activities are central to any conceptualization of the phenomenon (Jacobson, 1981; Rehm, 1981b). For example, the American Psychiatric Association, in the recently revised third edition of its Diagnostic and Statistical Manual of Mental Disorders (DSM-III-R, 1987), lists these two symptoms as the primary defining features of depression. That is, whereas the presence of one or both of these symptoms is not alone sufficient to constitute a depressive episode, the presence of at least one of these

symptoms is a necessary condition to diagnose depression. Other depressive symptoms include significant weight loss or gain, insomnia or hypersomnia, psychomotor retardation or agitation, fatigue or loss of energy, feelings of worthlessness and guilt, diminished ability to think or concentrate, indecisiveness, recurrent thoughts of death, and suicidal ideation (American Psychiatric Association, 1987). The fact that only a subset of these various symptoms need be present in order to define a depressive episode results in substantial heterogeneity of symptoms across individuals diagnosed as depressed.

The practical necessity for viable etiological theories and for effective treatment and prevention strategies for depression is obvious. In addition to the toll it takes in human suffering and decreased productivity, depression is associated with a dramatic risk for suicide. Linehan (1981) has found that one-sixth of the mortality for depressives occurs as the result of suicide, compared with only 1% for the general population of Americans. Estimates of the precise rate of depression differ, although it is generally agreed that between 8% and 12% of males and 20% to 26% of females will experience an episode of clinical depression in their lifetime (Boyd & Weissman, 1981). The age of onset of depression varies widely, ranging from early childhood throughout adult life. The duration and course of depressive

episodes are equally variable. At least half of those who experience a single depressive episode will experience at least one further episode at some point in their lifetime. Recurrent episodes may follow one another closely in time, or may be separated by several years of normal functioning.

The multifaceted nature of depression is reflected in the range of proposed dimensions along which to subclassify depressive phenomena. The DSM-III-R divides Mood Disorders into two primary groups: Bipolar Disorders and Depressive Disorders (also known as "unipolar" depressions). Bipolar Disorders are characterized by the presence, either currently or historically, of a manic or hypomanic episode, whereas no such episode has occurred for Depressive Disorders. Bipolar Disorders are further divided into Bipolar Disorder and Cyclothymia, and Depressive Disorders are further divided into Major Depression and Dysthymia. Bipolar Disorder and Major Depression are characterized by very severe symptoms that tend to recur episodically. In contrast, the symptomatology of Cyclothymia and Dysthymia is less severe, but these conditions are by definition chronic and nonepisodic. Major Depression can co-occur with Cyclothymia (a condition sometimes termed "Bipolar II"), and with Dysthymia (termed "Double Depression"). Finally, the DSM-III-R includes residual categories for classifying cases of Bipolar or Depressive

Disorder that cannot be classified into one of the above categories.

Other diagnostic subtypes that have been proposed include a neurotic-psychotic distinction (Paykel, 1979), an endogenous-reactive distinction (Mendels & Cochran, 1968; Seligman, 1975), a primary-secondary distinction (Robins & Guze, 1969; Robins, Munoz, Martin, & Gentry, 1972; Winokur, 1973), a melancholic-nonmelancholic distinction (American Psychiatric Association, 1987), and a seasonal-nonseasonal type (Rosenthal, Sack, Gillin, Lewy, Goodwin, Davenport, Mueller, Newsome, & Wehr, 1984). Of all the proposed dimensions, the unipolar-bipolar subtyping is by far the least controversial, and appears to be quite important in terms of symptomatology (Rehm, 1981), response to pharmacotherapy (Morris & Beck, 1974), etiology (Baldessarini, 1983; Becker, 1977; Cadoret & Tanna, 1977), and degree of heritability (Mendlewicz, 1985). Moreover, psychological theories and interventions have focused almost exclusively on unipolar depression, whereas the study of bipolar or "manic" depression has been dominated by physiological theories and pharmacological interventions. Given this trend, the following discussion focuses only on unipolar depression.

Theories of Unipolar Depression

Theories of unipolar depression can be divided into four broad groups: physiological, psychoanalytic, behavioral, and cognitive. Physiological theories are dominated by neurotransmitter models, which propose that abnormally low levels of brain neuroamines, particularly norepinephrine and serotonin, cause depression. The classic psychoanalytic view of depression holds that the condition is a result of introjected anger toward a lost love object. Ego psychologists emphasize the depressive's discrepancy between the actual and ideal state of the ego. Object relations theorists focus on the infant's failure to discriminate the self from significant objects as resulting in a predisposition toward depression. Several behavioral theories of depression have been proposed. Although they differ considerably in their details, they share the conceptualization of depression as largely an extinction phenomenon resulting from a loss of reinforcement. Aversive, inescapable social situations, sudden environmental changes, deficits in self-control behaviors or social skills, and maladaptive interpersonal environments have been highlighted by various behavioral theorists of depression. Finally, cognitive theories focus on abnormal cognitive content and processes in the etiology of depression.

A great deal of research has been conducted from each of the perspectives described above. Although some support has been obtained for the theories within each school, no single theory has been universally accepted. The cognitive theories have attracted a great deal of attention during the past several years, and are described in greater detail below. For a more thorough review of the various physiological, psychoanalytic, and behavioral theories of depression, the interested reader is referred to Appendix A.

Cognitive Theories of Depression

Over the course of the past decade, a growing amount of attention has been given to cognitive theories of depression. Although differing in details, these theories share the hypothesis that specific abnormalities in the processing of information produces depression. Treatment interventions therefore target the depressive's problematic cognitive processes (or verbal behavior) under the assumption that correcting these processes will ameliorate the individual's depression. Two cognitive theories have dominated the psychological literature in depression over the last ten years; these include the reformulated learned helplessness theory (Abramson et al., 1978) developed by Martin Seligman and his colleagues, and the cognitive theory developed by

Aaron Beck and his colleagues (Beck, 1967, 1976; Beck, Epstein, & Harrison, 1983; Beck, Rush, Shaw, & Emery, 1979; Sacco & Beck, 1985).

The reformulated learned helplessness theory. The original learned helplessness theory held that noncontingency between behavior and environmental events (especially inescapable aversive stimulation) led to depression (Seligman, 1973, 1974). The theory was developed following the observation by animal learning researchers that dogs given inescapable electrical shocks developed behavioral patterns topographically similar to many of the symptoms of human depression (Overmier & Seligman, 1967; Seligman & Maier, 1967). A history of inescapable aversive stimulation was thought to lead to an expectation of uncontrollability of future events, which then resulted in depression (Seligman, 1972, 1974, 1975). The original learned helplessness theory has been criticized on both empirical and theoretical grounds (e.g., Buchwald, Coyne, & Cole, 1978; Costello, 1978). For example, one of the major symptoms of depression, self-blame, is inconsistent with the theory (Abramson & Sackeim, 1977; Peterson, 1979; Peterson & Seligman, 1985). That is, if one sees him or herself as helpless to control negative events in the environment, why would one blame oneself for these events?

The theory was reformulated in 1978 to take into account more fully the depressive's perception of the relationship between his or her behavior and subsequent environmental outcomes. In brief, the revised theory holds that the evaluation of the nature of the causal relationship between one's behavior and apparently uncontrollable events determines how one will react to these events. Three attributional dimensions are hypothesized to be relevant: the internal-external dimension, the stable-unstable dimension, and the global-specific dimension. Depressed persons are thought to perceive bad events as due to something about themselves rather than about the situation (internal), which will be persistent across time rather than transient (stable), and which will likely affect outcomes in other situations as well (global). In contrast, positive outcomes are perceived by depressives caused by external, unstable, specific factors (e.g., luck rather than ability or effort). The depressive's internal-stable-global "explanatory style" is held to be an enduring trait-like quality of the individual. This style is not itself sufficient to produce depression. Depression results when this explanatory style, in the context of stressful life events, affects the expectation of the uncontrollability of future events (Peterson & Seligman, 1985). The reformulated learned helplessness theory limits itself to attributions about causality, and does not address the perception of other dimensions such as the perceived

consequences or moral aspects of events (Power & Champion, 1986). Although existing cognitive and behavioral treatments for depression are interpretable within the reformulated theory (Seligman, 1981), the theory has not led to new interventions for depression or to substantial modifications of existing treatments.

The empirical support for the reformulated learned helplessness theory of depression is mixed. In general, most cross-sectional studies of depressives support the notion of a relationship between the internal-stable-global explanatory style and depression (see Peterson & Seligman, 1984, and Peterson & Villanova, 1984 for comprehensive reviews of this literature), although the empirical support for depressives' attributions of negative events to internal factors is stronger than the support for the global and stable dimensions (Willner, 1984). Such data do not address, however, the critical hypothesis that such an explanatory style precedes the onset or persists beyond the remission of a depressive episode. This issue has been addressed by cross-sectional studies comparing currently depressed individuals to remitted depressives and individuals who have never been depressed, as well as by longitudinal studies which track depressed persons over time. Although a few such studies have found some indications of the depressive attributional style in remitted depressives (e.g., Cutrona, 1983; Eaves & Rush, 1984; Golin,

Sweeney, & Shaeffer, 1981; Metalsky, Abramson, Seligman, Semmel, & Peterson, 1982; O'Hara, Rehm, & Campbell, 1982), the results are generally only partially supportive of predictions made by the theory. Moreover, numerous other investigations have found no such abnormalities on Seligman's measures of explanatory style (most notably the Attributional Style Questionnaire, Seligman, Abramson, Semmel, & von Baeyer, 1979) in premorbid or remitted depressives (e.g., Fennell & Campbell, 1984; Hamilton & Abramson, 1983; Hollan, Kendall, & Lumry, 1986; Lewinsohn, Steinmetz, Larson, & Franklin, 1981; Mukherji, Abramson, & Martin, 1982). Several of these studies are discussed further below.

Thus, although the reformulated learned helplessness theory remains a viable explanation of certain aspects of the phenomenon of depression, it has not escaped theoretical criticism (e.g., Power & Champion, 1986), and is only partially supported by empirical work.

Beck's cognitive theory of depression. By far the most popular and widely studied current psychological theory of depression is the cognitive theory developed by Aaron Beck over the past 20 years (Beck, 1967, 1976; Beck et al., 1979; Sacco & Beck, 1985). Trained as a psychoanalyst, Beck (1961, 1963) observed characteristic, idiosyncratic themes in his early studies of depressed patient's dreams and free

associations. Careful study of the content of these themes led to the development of a clinically based theory of depression (Beck, 1967). Since the original publication of his theory, a great deal of effort has been put into the development and evaluation of a comprehensive treatment program based on the theory, culminating in the publication of a detailed treatment manual (Beck et al., 1979). Regardless of the validity of Beck's theory as an etiological model of depression, his cognitive therapy for depression has been shown to be quite efficacious for many depressed persons (e.g., Blackburn, Bishop, Glen, Whalley, & Christie, 1981; Rush, Beck, Kovacs, & Hollon, 1977).

According to Beck's theory, "depression is primarily a result of the tendency to view the self, the future, and the world in an unrealistically negative manner" (Sacco & Beck, 1985, p. 4). This negative view of the self, future, and world is termed the "negative triad." The depressive sees him or herself as inept, deprived, and unworthy. Negative experiences are seen as being the result of a personal defect or abnormality. The future is anticipated to be bleak, as it is assumed that current difficulties will persist indefinitely. In addition, the world is seen as placing unrealistic demands upon him or her, and as presenting insurmountable obstacles to the realization of happiness.

The "negative triad" is maintained by certain deeply held beliefs or "schemas," which are thought to develop through early experiences in childhood. Schemas are defined as "stable cognitive patterns through which events are processed. Functioning like a template, schemas actively screen, code, categorize, and evaluate stimuli" (Sacco & Beck, 1985, p. 4). Examples of the schemas that Beck hypothesizes to be characteristic of depression include "If I am not loved by others, I am not a worthwhile person," and "I must achieve great things or I will be a failure in life" (Beck et al., 1983, p. 2). As Power and Champion (1986) have noted, Beck uses the term schema interchangeably with such terms as belief, assumption, and attitude. This interchangeable usage is reflected in the name of the instrument developed by Beck and his associates to assess depressogenic schemas -- The Dysfunctional Attitudes Scale (Weissman & Beck, 1978). The depressive's schemas are held to be stable, global, rigid, and negatively toned (Hollon & Beck, 1979).

The depressive's dysfunctional cognitive schemas are thought to remain dormant and relatively inactive until the individual is presented with a relevant environmental stressor. According to Sacco and Beck (1985, p. 5),

"[i]t is important to point out that the cognitive theory of depression represents a diathesis-stress model of psychopathology although many writers and researchers fail to acknowledge this important feature. It proposes that individuals who are prone to depression have

acquired a psychological predisposition toward depression through early experiences that shape the development of cognitive schemas in a negative, self-referential manner. The depressogenic cognitive schemas will remain latent until activated by stressors (precipitating factors) to which the individual is sensitized" (emphasis added).

The significance of this point will become more obvious shortly when the research that has been designed to evaluate Beck's theory is reviewed.

Once activated by a relevant environmental stressor (generally some kind of real or anticipated loss), the depressogenic schemas begin to manifest themselves through distorted, "primitive," negativistic thinking patterns consistent with themes of the negative triad. Such patterns include:

1. Arbitrary inference, in which (generally self-deprecatory) conclusions are drawn in the absence of evidence;
2. Selective abstraction, consisting of focusing exclusively on a negative detail of a situation;
3. Overgeneralization, in which a general conclusion is drawn from one or more isolated events, then applied indiscriminately to both related and unrelated situations;
4. Magnification and minimization, in which the significance and magnitude of negative events are overemphasized, whereas positive events are minimized;
5. Personalization, consisting of relating external events to oneself without evidence; and
6. Absolutistic, dichotomous thinking, in which one thinks in polarized black or white terms, and typically characterizes oneself in extremely negative terms (Beck, 1967; Beck et al., 1979; Sacco & Beck, 1985).

These irrational thinking patterns are thus held to be the proximate causes of the affective, vegetative, and behavioral symptoms that constitute depression.

Research on Beck's Theory

The assessment of depressogenic cognitions. Beck's theory has generated a great deal of research designed to evaluate its basic premises. Hollon and Beck (1979) reviewed several studies suggesting that depressives differ from control groups both in the content and the process of their cognitive activity. Depressives have been shown to differ from nondepressed individuals in reporting themes of personal loss and failure in dreams (Beck & Hurvich, 1959; Beck & Ward, 1961; Hauri, 1976). Numerous studies reveal significant correlations between standard measures of depression and endorsement of depressotypic attitudes, such as those postulated by Beck, on a variety of paper-and-pencil measures (e.g., Beck, Weissman, Lester, & Trexler, 1974; Crandell & Chambless, 1981; Dobson & Breiter, 1981; Hollon & Kendall, 1980; McNair, Lorr, & Droppleman, 1971; Minkoff, Bergman, Beck, & Beck, 1973; Nelson, 1977; Shahar, Zakai, & Berman, 1982; Weissman, 1979). Beck, Epstein, and Harrison (1983) reviewed the various measures of depression-related cognitions, which range from those assessing underlying

assumptions or schemas, to those assessing "surface-level" cognitions such as "automatic thoughts." These authors note the strong correlations between these cognitive measures and measures of depression.

In addition to the abnormal content of depressed persons' cognitions, Hollon and Beck (1979) reviewed several studies indicating that depressives differ from nondepressed controls in their cognitive processes. For example, Lishman (1972), and Lloyd and Lishman (1975) found that depressed persons were more inclined to remember negative events and less inclined to recall positive events than were nondepressives. Along similar lines, Bargh and Tota (in press) present data suggesting that depressives are more efficient at processing negative self-referential data relative to nondepressives, relative to positive self-referential data, and relative to data about others. Similarly, Derry and Kuiper (1981), and Kuiper and MacDonald (1982) demonstrate that depressed subjects recalled equal amounts of positive vs. negative self-referential material on an incidental recall task, whereas nondepressed subjects recalled more positive than negative information about themselves.

Several studies generated by the reformulated learned helplessness theory also suggest that depression is associated with anomalous cognitive processing. Several studies suggest

that depressives are more likely than nondepressed controls to offer lower estimates of the degree of control they have over outcomes in experimental tasks (e.g., Alloy & Abramson, 1979). Similarly, as noted above, several studies support the notion that depressives tend to attribute failures to internal causes, such as lack of ability (Klein, Fencil-Morse, & Seligman, 1976; Kuiper, 1978; Rizley, 1978).

"Sadder but wiser". The consistent finding among the studies outlined above is that depressed persons report more negative evaluations of themselves or of situations relative to nondepressed controls. For some time it was generally assumed that depressives' perceptions and conclusions were distorted and biased, consistent with Beck's theory. Several studies now suggest, however, that depressed persons actually view the world more accurately than do nondepressives, and that it is the nondepressed affective state that is actually associated with biased perception and cognition. For example, in the Alloy and Abramson (1979) study discussed above, it was found that depressed students were more accurate in their estimates of the degree of contingency between their behavior and its consequences in a laboratory task than were nondepressed students, who underestimated the degree of contingency for negative outcomes and overestimated it for positive outcomes. This finding was recently replicated using a somewhat different methodology by Dennard and Hokanson

(1986). Using another paradigm, Lewinsohn et al. (1980) found that depressives showed a close correspondence between their self-perceptions and the way in which others perceived them. In contrast, nondepressed control subjects saw themselves in a more positive light than others saw them. Depressed persons have also been shown to be more accurate or more realistic than nondepressives in their expectations of success vs. failure on laboratory tasks (Golin, Terrell, Weitz, & Drost, 1979), in their recall of the frequency of negative feedback on such tasks (Nelson & Craighead, 1977), in their attributions for positive vs. negative outcomes on such tasks (Kuiper, 1978; Rizley, 1978; Sackeim & Wegner, 1986), in the accuracy of their self-monitoring (Roth & Rehm, 1980), and in their ratings of ostensibly self-referential personality descriptors (Vestre & Caulfield, 1986).

It has been argued that these data are inconsistent with Beck's theory, since they suggest that it is the nondepressed person who holds a distorted view of reality (Layne, 1983). Indeed, to the extent that Beck's theory proposes that depressives' perceptions deviate more from "objective" standards than do those of nondepressed persons, the data are clearly contradictory. The important thrust of Beck's theory, however, does not depend upon objective indices of reality. Instead, it is the fact that depressed persons show systematic, negatively-skewed differences in their cognitive

activity relative to nondepressed persons. If normalcy therefore involves an illusory positive bias, then the depressive's heightened objectivity is in fact abnormal, and is clearly dysfunctional. Thus, although intriguing and provocative, the data suggesting that depressives view the world more accurately than nondepressives are not fundamentally at variance with Beck's theory.

The causal relationship between abnormal cognition and depression. Thus, substantial data support Beck's claim that depression is associated with negativistic, anomolous cognitive activity. As Willner (1984, p. 812) has noted, "[a]s a description of depression, Beck's theory is uncontroversial." Implicit in this quote is the point, however, that the data reviewed above do not speak directly to the hypothesized causal relationship between these problematic cognitions and depression. Two experimental paradigms have been employed to address this issue, one involving the induction of dysphoric mood in depressed subjects, and the other involving the comparison of subjects at risk for depression with actively depressed subjects.

The logic of the mood induction procedures (e.g., Velten, 1968) is as follows. A nondepressed subject is presented with negatively toned statements along the lines of those hypothesized by Beck to cause depression. An increase in the

subject's dysphoric mood as a function of this procedure is held to support the notion that similar statements, when said to oneself, cause depression. Several studies have employed the Velten or similar mood induction procedures successfully to induce dysphoric mood in nonclinical subjects (Averill, 1969; Coleman, 1975; Goodwin & Williams, 1983; Hale & Strickland, 1976; Isen, Shalcker, Clark, & Karp, 1978; Masters, Barden, & Ford, 1979; Moore, Underwood, & Rosenhan, 1973; Natale, 1977a,b; Polivy & Doyle, 1980; Strickland, Hale, & Anderson, 1975).

The use of standard mood induction procedures, however, presents certain problems. First, it has been suggested that the mechanism by which these procedures function may not be via a direct cognitive manipulation, but rather through experimenter demand processes (Buchwald, Strack, & Coyne, 1981; Polivy & Doyle, 1980). Second, it is unclear if the mood changes produced by such procedures are in fact related to clinical depression. Although this is an important concern, the centrality of dysphoric mood as the sine qua non of depression enhances the plausibility of this dependent measure as a potential analogue to clinical depression. Moreover, ethical considerations preclude experimental manipulations that might produce effects that more fully resemble the symptoms of clinical depression. A third concern with mood induction procedures as a test of Beck's theory is

that such procedures presumably only affect "surface level" cognitive processes, and do not modify or interact with underlying schemas. Since most nondepressed persons would not be expected to hold to depressogenic schemas, Beck's theory would not seem to predict that the presentation of affectively laden stimuli would result in substantial depressive-like symptoms in individuals with no history of or predisposition toward depression.

The second line of research designed to address the causal relationship between problematic cognitive processes and depression involves comparing persons at risk for depression but who are currently not depressed with individuals who are actively depressed. Such studies have been conducted longitudinally, in which subjects are tracked over time with repeated assessments made of both cognitive variables and depression, as well as cross-sectionally, in which a group of actively depressed persons are compared with other subject groups, such as remitted depressives and individuals who have never been depressed.

One of the most comprehensive longitudinal studies was conducted by Lewinsohn et al. (1981). These authors administered several measures of depressotypic cognitions, as well as standard measures of depression, to a large community sample (n = 998). Assessments were made at two different

points in time, with an average of 8.3 months between assessments. When a subject was assessed as being depressed at either of the two assessment phases he or she also tended to endorse depressotypic cognitions at that phase, supporting the hypothesized association between cognitive abnormalities and depression. Interestingly, however, the subjects who were not initially depressed, but who became depressed during the course of the study, did not differ on the cognitive measures at the initial assessment from subjects who did not become depressed. Similarly, subjects who were initially assessed as depressed, but who recovered during the course of the study, did not differ from the nondepressed subjects on the cognitive measures at the second assessment phase. Comparable results using longitudinal designs were obtained by Hamilton and Abramson (1983), Lewinsohn, Hoberman, and Rosenbaum (1988), and Silverman, Silverman, and Eardley (1984).

The same pattern of results has been obtained in several studies using a cross-sectional methodology in which the cognitions of remitted depressives are compared to those of actively depressed persons, as well as persons who have never been depressed. The logic of such studies is as follows. Since remitted depressives have been depressed and are at a high risk for future depressive episodes, they should demonstrate the stable depressogenic cognitive schemas suggested by Beck's theory. Remitted depressives would not

be expected to show all of the cognitive abnormalities that characterize actively depressed persons, since the more "surface-level" cognitions such as "automatic thoughts" are hypothesized to arise concomitantly with depression. Individuals who have never been depressed would not be expected to show abnormalities at either the level of automatic thoughts or at the level of underlying schemas. In a typical cross-sectional study, Hollon et al. (1986) administered the Dysfunctional Attitudes Scale (DAS; Weissman & Beck, 1978), a measure of the underlying depressogenic schemas postulated by Beck's theory, and the Automatic Thoughts Questionnaire (ATQ; Hollon & Kendall, 1980), a measure of ruminations experienced by depressed persons, to groups of actively depressed persons, remitted depressives, and never-depressed controls. Consistent with the results of the longitudinal investigations, the actively depressed subjects showed abnormalities on both measures, but the remitted depressives did not differ from the never-depressed controls on either measure. Similar results were obtained by Fennell and Campbell (1984), and by Wilkinson and Blackburn (1981).

A somewhat different pattern of results was obtained in a study by Eaves and Rush (1984). Using a longitudinal design, they administered the ATQ and DAS to a group of depressives when actively depressed, and then again after each

subject had been remitted for two to three weeks. As expected, both measures were elevated at the initial assessment. At the follow-up assessment, however, the remitted depressed subjects' ATQ scores were not different from a group of normal controls, but the DAS scores, although somewhat reduced, remained elevated relative to those of the controls. As noted by Hollon et al. (1986), however, the "remitted" depressed subjects continued to have relatively high scores on a standard depression measure, suggesting that the two to three week "remission" period was insufficient for full symptomatic recovery.

In summary, several studies have examined the potential role of depressogenic cognitions as predisposing or diathesis conditions for depression. These investigations support the notion that depressed persons tend to endorse measures of depressotypic cognitions. The literature provides little support, however, for the hypothesis that individuals at risk for depression will report depressogenic schemas even when not currently experiencing a depressive episode.

These results have posed a challenge to Beck's theory since it is based on the assumption that depressogenic schemas antedate the onset of a depressive episode and persist beyond its remission. A frequently overlooked but critical aspect of Beck's theory provides a clue to conducting more

appropriate evaluations of the theory. To wit, Beck proposes that the depressogenic schemas are latent or dormant during periods when the depression-prone individual is asymptomatic. Thus, the failure of persons at risk for depression to endorse depressogenic schemas on standard paper-and-pencil measures when not actively depressed is actually consistent with Beck's theory.

The hypothesized presence of latent, inactive depressogenic schemas in individuals at risk for depression presents a challenge to the testability of Beck's theory. How can the presence of these schemas be confirmed in the asymptomatic depression-prone person if the schemas cannot be measured by standard instruments? A possible solution might involve a variation in the assessment procedure. Wilkinson and Blackburn (1981, p. 290), for example, raise the possibility that "...recovered depressed patients or individuals vulnerable to depression do not display these dysfunctions under most conditions, but only in, say, stress conditions or situations which may have specific cue properties for the individual." Along similar lines, Riskind and Rholes (in press) suggest that the negative thinking style of depression-prone individuals may be more accessible under conditions similar to those in which the pattern was originally learned (e.g., following a significant failure or loss). Similarly, Rush (personal communication, May 28, 1987)

draws an analogy between certain medical diagnostic tests and a potential procedure for assessing latent depressogenic schemas. Many disease processes are at least initially latent, and do not appear under normal assessment conditions. If the diseased individual is stressed in a relevant way, however, the pathology will be manifested. For example, coronary artery disease may not show up on an electrocardiogram until the individual is given a treadmill stress test. Similarly, an electroencephalogram may not reveal a patient's seizure disorder unless conducted under conditions of sleep deprivation. Analogously, assessment of an individual's depressogenic cognitive schemas using standard self-report measures may be futile under normal resting conditions, but when presented with a relevant stressor (e.g., the threat of some kind of loss), the schemas may be revealed.

In the following sections, three different experimental paradigms are discussed that, when applied to the problem of assessing the latent depressogenic schemas postulated by Beck's theory, might overcome the difficulties associated with standard assessment procedures. The first paradigm to be discussed involves tachistoscopic presentation of depressotypic statements such that they are below the subject's awareness threshold. The second methodology involves the use of the Thematic Apperception Test (Murray, 1943), an instrument commonly used in clinical settings for

the purpose of assessing organizing beliefs. Finally, the third paradigm involves administration of the Dysfunctional Attitudes Scale (Weissman, 1979) both under standard instructional conditions, and conditions in which the instructions are modified in hopes of decreasing potential demand characteristics problems. Following a discussion of each methodology, their potential implications for Beck's theory are elaborated.

Subliminal Perception: History and Overview

The basic idea behind the notion of subliminal perception¹ is quite simple: Individuals may be affected psychologically by stimuli of which they are unaware. In introducing the concept, Dixon (1981, p. 1) writes that

"...the brain's capacity to register, process, and transmit information is by no means synonymous with that for providing conscious perceptual experience. Manifestations of either capacity may occur without the other, and each may be independent of the other.

Whereas conscious perceptual experience must presumably be dependent upon antecedent and underlying physiological events, these may well be quite different in kind from those responsible for the orderly transmission of information from input to output. By the same token, the capacity of the brain to process information does not depend upon, nor necessarily include, conscious representation of this information."

Few would argue against the notion that conscious perceptual processes regularly occur in the absence of immediate external

stimulation. Indeed, the occurrence of dreams, images, illusions, and hallucinations is generally taken as self-evident. The converse -- that external stimulation may impact behavior without the perceiver being aware or conscious of the stimulation -- is, however, an idea that is more difficult for many to accept.

In an exhaustive review and analysis of the theoretical and experimental work on subliminal perception up to that time, Dixon (1971) chronicles the history of the notion that people are affected by events outside of their awareness. According to Dixon, the first recorded references to subliminal perceptual phenomena are found in the writings of the Greek philosophers Democritus, Plato, and Aristotle. Aristotle, for example, was the first Western thinker to propose that unconscious stimuli during the waking hours may affect the content of subsequent dreams. Montaigne (1580, cited in Dixon, 1971) later used the notion of subliminal perception to address the problem of "Buridan's ass," an approach-approach conflict, in which an ass must choose between two ostensibly identical bales of hay. Over a century later, Leibniz (1698a & b, cited in Dixon, 1971) discussed subliminal perceptual phenomena at length, and anticipated several modern phenomena including the Poetzl phenomenon and perceptual defense; these phenomena are discussed below.

The credibility of subliminal perception grew with the advent of experimental psychology in the late nineteenth century, which began to provide an empirical basis for the phenomena. Throughout the first half of the twentieth century, researchers using a variety of methodologies and investigating numerous different perceptual phenomena obtained results supporting the hypothesis that unconscious stimulation alters behavioral measures. The so-called "New Look" in perception theory and research, which proposed that motivational factors play a role in perceptual processes, steadily gained momentum (Bruner & Postman, 1947a & b; Erdelyi, 1974; McGinnies, 1949; Postman, Bruner, & McGinnies, 1948).

The credibility of subliminal perception, as well as the research on subliminal phenomena, sharply declined during the late 1950's and early 1960's. Dixon (1971, 1981) argued that several factors conspired to damage the credibility of subliminal perception. First, rumors began circulating during the late 1950's that advertisers were using subliminal stimulation to promote the sale of popcorn and soft drinks at motion picture theatres (McConnell, Cutler, & McNeil, 1958). Both the public and the federal government were alarmed by these rumors. For their part, many psychologists renounced subliminal phenomena as nonexistent and therefore harmless.

Vigorous critiques of earlier experimental work in the area were undertaken at this time (Dixon, 1981).

A second, more substantial factor, which actually underlies the uproar over the putative use of subliminal stimulation in advertising, concerns the issue of free will. The idea that one may be influenced by factors outside of one's conscious experience, precluding conscious countercontrol of such stimulation, directly threatens cherished tenets of free will. The popular exposure of subliminal perceptual research to the lay public as a result of the advertising scare dramatically increased public and scientific concern about this threat to free will.

A third factor contributing to the downfall of subliminal perception involved changes in the mainstream academic Zeitgeist. In particular, subliminal effects were frequently, though unnecessarily, associated with psychoanalytic theory, which was rapidly falling out of favor during this period. Moreover, subliminal perceptual phenomena were associated by some with extrasensory perception, further damaging the respectability of the area.

A fourth and final factor contributing to the decline of subliminal perception was the advent of signal-detection theory. More specifically, the distinction between sensory

and response effects challenged the classical psychophysical notion of the perceptual threshold. Since subliminal perception seemed to rest upon the classical notion of the perceptual threshold, signal detection theory seemed to do away with subliminal phenomena in a single stroke. The current relationship between subliminal perception and signal detection theory is discussed in a later section.

Presenting various elaborations of the four themes discussed above, several review papers published during this period sharply criticized the notion of subliminal perception on both theoretical and empirical grounds. The most significant of these included papers by Goldiamond (1958), Eriksen (1960), and Neisser (1967). The impact of these papers was profound, virtually preventing research in this area from impacting mainstream academic psychology for several years (Dixon, 1971; Erdelyi, 1974).

But the critiques also had the positive, fortuitous effect of forcing researchers to examine closely and refine their methodologies, and forcing theorists to address the arguments raised against the phenomena. As is discussed further below, refined experimental methodologies, the demonstration that subliminal phenomena are completely compatible with signal detection theory, and advances in the neurosciences have led to a dramatic re-emergence of research

in the area over the past 15 to 20 years. A brief overview of the major criticisms that have been raised against subliminal perceptual phenomena, as well as counterarguments, is presented in a later section.

Basic Research in Subliminal Perception

There is a very large body of literature on the effects of subliminal stimulation of various sensory modalities, in which a number of different experimental methodologies have been employed. One of the earliest investigations of subliminal perception stemmed from the serendipitous discovery of Poetzl (1917) that aspects of stimuli of which subjects are not aware during the presentation of the stimulus tend to emerge into awareness, frequently in a somewhat disguised form, at a later time. The so-called Poetzl phenomenon has been widely studied, and has found to be robust across different modalities of stimulation and dependent measures. Another area that received wide attention in the 1950's and 1960's was perceptual defense. A large body of literature documents that stimulus recognition thresholds are not fixed, but instead vary as a function of the content of the stimulus, with emotionally threatening or anxiety provoking stimuli requiring longer presentation durations than less evocative stimuli. A third area of basic research in

subliminal perception involves the demonstration that subliminally presented verbal labels affect the perception of subsequently presented ambiguous stimuli. Cognitive psychologists have recently studied the phenomenon of priming, in which recognition of a stimulus (the target) is facilitated by preceding it immediately with a related stimulus (the prime). It has been demonstrated that such priming effects occur even when the prime is presented subliminally. A fifth experimental paradigm involves stereoscopic visual stimulation, in which simultaneous but inconsistent information is presented to the two eyes. In this paradigm, subjects report awareness of only the stimulus presented to one eye. It has been demonstrated, however, that the stimulus of which the subject is unaware (the nondominant stimulus) nevertheless affects the perception of the perceived (dominant) stimulus. Zajonc and his colleagues (e.g., Kunst-Wilson & Zajonc, 1980) have presented data demonstrating that the mere-exposure effect, in which subjects' aesthetic preferences for stimuli are affected by prior exposure to those stimuli, occurs even when the stimuli are presented subliminally. Another area of subliminal perception research involves the use of physiological measures such as cortical evoked potentials. It has been shown, for example, that greater evoked potentials occur in response to subliminal presentations of meaningful stimuli relative to meaningless stimuli.

Although it is impossible to do justice to this extremely rich and complex literature in only a few pages, a brief review of each of the areas of basic research in subliminal perception described above, as well as others, is included in Appendix B. For more thorough reviews, the interested reader is referred to Dixon (1971, 1981) and to Erdelyi (1974).

Virtually all of the research described above, although not incompatible with psychoanalytic theory, was not specifically designed to evaluate psychodynamic hypotheses. In the following section, a research program is described in which the methods derived from basic research in subliminal perception have been systematically applied to the evaluation of psychoanalytic propositions.

Subliminal Psychodynamic Activation

By far the most extensive application of subliminal methodologies to the study of clinical problems has been conducted by the late Dr. Lloyd Silverman at New York University.² Beginning in the mid 1960's, Silverman and his colleagues began using subliminal tachistoscopic stimulation to evaluate "dynamic propositions" (i.e., currently maintaining factors of personality and/or psychopathology) of

psychoanalytic theory (Silverman, 1983). Since, from a psychodynamic perspective, stimulation presented below threshold is thought to activate or quell unconscious conflicts, the method has come to be known as "subliminal psychodynamic activation."

The basic method is described by Silverman (1983, p. 70) as follows:

"The method involves the observation of behaviors before and after 4-millisecond tachistoscopic exposures of experimental and control stimuli under conditions in which both subject and experimenter are blind to stimulus content. The experimental stimuli consist of verbal messages and/or pictures, with content designed to stimulate the unconscious wishes, anxieties, and fantasies that psychoanalysis views as central motivators of behavior. The control stimuli consist of neutral verbal and pictorial content."

This general paradigm has been applied in three different contexts. First, in laboratory studies of clinical populations, persons with a particular form of psychopathology are presented with stimuli designed either to intensify temporarily or to reduce their symptomatology within one or two laboratory sessions. Secondly, laboratory studies of nonclinical populations are similar to the studies described above, except that normal subjects are employed. Finally, treatment adjunct studies involve repeated subliminal presentation of stimuli over a period of time in an effort to bring about lasting improvement in subjects' problems.

A brief discussion of each of these applications, including a description of a typical study from each category, is presented below. For more thorough reviews of this fascinating body of literature, the interested reader is referred to Silverman (1976, 1983), Silverman, Lachmann, and Milich (1982), and Weinberger and Silverman (1987).

Laboratory Studies of Clinical Populations

The typical laboratory study of a clinical sample involves the following procedures (Silverman, 1983; Weinberger & Silverman, 1987). In the first phase, subjects are introduced to the experimental setting, then provided with four flashes, each of 4 msec duration, of a neutral baseline stimulus. This is followed immediately by collection of baseline dependent measures. Next, four "critical" flashes of either an experimental stimulus or a control stimulus are presented, and dependent measures are again collected. In a second phase, which either takes place within the same session or in a subsequent session on the following day, the procedure outlined above is repeated with one variation. The critical stimulus (i.e., experimental or control) that was not shown in the first session is presented. Finally, a discrimination

task employing a signal detection methodology is presented to ensure the subliminality of the stimuli.

In all psychodynamic activation studies, the procedure is conducted under double-blind conditions. The experimenter is kept blind as to the experimental condition by having another experimenter who never comes into contact with the subjects code the back of the tachistoscopic cards according to the order in which they are to be presented. The experimenter then inserts the cards into the tachistoscope in such a way that he or she does not view what is printed on them. The subject's "blindness," of course, is assured by the fact that the stimuli are presented well below the awareness threshold. Finally, any ratings or codings that are made of the dependent measures are made by assessors who are kept blind to the within-subjects experimental condition, and, in the case in which different subject groups are compared, to the subjects' group condition.

A series of four experiments conducted by Silverman, Bronstein, and Mendelsohn (1976) illustrated the effectiveness of subliminal stimulation in affecting the pathology of clinical populations. Four groups of subjects were compared: hospitalized schizophrenic men, homosexual men, a mixed-gender sample of stutterers, and a group of hospitalized depressed women. Each group of subjects was run according to the

procedures outlined above. The experimental stimuli for each group reflected themes commonly held by psychoanalytic writers to be involved in the pathology of that group. The control stimuli reflected themes characteristic of another disorder. For example, the experimental stimuli (one pictorial and one verbal) for the schizophrenic sample were aggressive in theme, consisting of a drawing of an "angry man with teeth bared about to stab a woman," and the corresponding message DESTROY MOTHER. The control stimuli, reflecting the theme of incest, consisted of "a picture of a nude man and woman in a sexually suggestive pose with the accompanying verbal message FUCK MOMMY." Similar pathology-relevant (experimental) and pathology-irrelevant (control) stimuli were used for the other three groups. The experimental stimuli for one group constituted the control stimuli for another group and vice versa. For example, the incest stimuli described above were considered experimental stimuli for the homosexual sample, whereas the aggressive stimuli were considered the control stimuli. In addition to the pathology-relevant experimental and the pathology-irrelevant control stimuli, each subject was also administered a third "neutral-control" condition. The neutral control-stimuli for all groups consisted of "two men facing each other with bland looking expressions" along with the verbal message PEOPLE THINKING.

Each subject was run in each of the three experimental conditions (i.e., experimental, irrelevant-control, and neutral-control stimuli) in three separate sessions conducted on three consecutive days. The order of the three conditions was counterbalanced across subjects. A variety of dependent measures was employed, each designed to assess the relevant pathology for each subject group. These included ratings of story recall tests, carefully scored responses to projective tests, systematic observations by the experimenters, subject numerical ratings of the attractiveness of pictures, observer ratings of stuttering, and self-report mood measures.

For the schizophrenic, homosexual, and stutterer samples, the results were clear and consistent: The pathology-relevant stimuli significantly increased measures of the particular pathology characteristic of each group, whereas the control stimuli had no such effect. Only for the depressed subjects were the results equivocal. Consistent with the results of the other groups, the control stimuli had no effect on the depressives. The experimental stimuli did significantly increase a secondary measure ("non-verbal pathology"), but had no effect upon the primary dependent measure of mood ratings. Thus, for three of the four subject groups, specific effects were found only for stimuli theoretically linked to the disorder in question. Importantly, the specificity of the results rules out the possibility that intensification of all

four forms of psychopathology resulted simply from the affect associated with the experimental stimuli.

Numerous other studies of clinical populations have been conducted. Schizophrenics represent the most extensively studied group. In 14 of 17 investigations (reviewed in Weinberger & Silverman, 1987), a temporary exacerbation of pathological verbal behavior and/or pathological nonverbal behavior has been demonstrated in response to experimental relative to control stimuli. Moreover, studies of pathology reduction in schizophrenics have also been conducted. The most commonly used stimulus for this purpose is MOMMY AND I ARE ONE (for a discussion of the theoretical rationale behind this stimulus, see Silverman, 1983, and Silverman et al., 1982). In 11 of 12 studies, tachistoscopic exposures of this stimulus have significantly reduced the pathology of schizophrenics relative to control stimuli.

Despite the mixed results of the depressed sample of the Silverman et al. (1976) study described above, four studies have demonstrated an increase in dysphoric mood among depressives following presentation of aggressive stimuli relative to control stimuli (Cox, 1974; Miller, 1973; Rutstein & Goldberger, 1973; Varga, 1973). Only one study of depressives has completely failed to demonstrate any effects of subliminal psychodynamic stimuli (Oliver & Burkham, 1982).

As noted by Silverman (1985), however, the particular stimuli used in this study were rather poorly chosen, and would not be expected on theoretical grounds to intensify depressive pathology. In addition to the positive results for aggressive stimuli, Dauber (1984) reported two experiments in which guilt-inducing stimuli increased the dysphoric mood of mildly depressed female college students.

In addition to studies of schizophrenics and depressives, three studies have found positive results for stutterers (Silverman, Klinger, Lustbader, Farrell, & Martin, 1972 [two experiments]; Silverman et al., 1976), and three have obtained positive results for male homosexuals (Silverman, Kwawer, Wolitzky, & Coron, 1973 [two experiments]; Silverman et al., 1976). To the author's knowledge and consistent with the recent review by Weinberger and Silverman (1987), there exist no disconfirming studies of homosexuals or stutterers.

Laboratory Studies of Nonclinical Populations

Two general types of subliminal psychodynamic activation studies have been employed with nonclinical populations, generally consisting of undergraduate college students fulfilling a course requirement. The first involves studies designed to decrease anxiety among students, using the same

basic research design described above. Florek (1978) found that subliminal presentations of the stimulus MY LOVER AND I ARE ONE, accompanied by a picture of a man and a woman gazing affectionately at each other, significantly reduced scores on the state form of the State-Trait Anxiety Scale. This finding was subsequently replicated by Silverman and Grabowski (1982). This latter study revealed that the MY LOVER AND I ARE ONE stimulus served to decrease anxiety only for women, whereas the MOMMY AND I ARE ONE stimulus reduced anxiety only among the male subjects.

The second type of study using nonclinical samples focuses on the effects of arousal of "oedipal" conflicts among male students on competitive performance. In a series of four experiments, Silverman, Ross, Adler, and Lustig (1978) presented the stimulus BEATING DAD IS OK, accompanied by a picture of an older man looking approvingly at a younger man, as well as the stimulus BEATING DAD IS WRONG, accompanied by a similar picture in which the older man is looking disapprovingly. Both of these stimuli, along with control stimuli such as PEOPLE ARE TALKING, PEOPLE ARE SITTING, etc., were presented in counterbalanced order to all subjects. Immediately following each series of presentations of each stimulus, subjects engaged in a dart-throwing "tournament," and were told that cash prizes would be given to the three highest scorers. The dependent measure was the subject's

competitive performance, as measured by his total score for each series of eight dart throws.

The results of three of the four studies were clearly supportive of predictions: The "OK" condition resulted in significantly better performance relative to the "WRONG" condition. The one study that failed to obtain positive results (the third study in the series) differed from the first two in that the experimental stimuli were presented under much greater illumination conditions. To test the hypothesis that this increase in lighting was responsible for the null results, the fourth study varied illumination as an independent variable, and found that the effect only occurred in the low illumination condition. This rather unexpected finding underscored the necessity of carefully controlling the degree of illumination of the blank and experimental stimulus fields, as well as the background room lighting, in tachistoscopic research (Silverman, 1983, 1984).

Several attempts have been made to replicate and extend these findings. Among 11 such investigations reviewed by Silverman (1983), five represent clear replications, three only partially replicated the results, and three clearly failed to replicate. A recent replication attempt by Fisher, Glenwick, and Blumenthal (1986) also only partially replicated the original results. Similarly, Vitiello, Carlin, Becker,

Barris, and Dutton (1989) also failed to replicate these results. Several hypotheses have been proposed to account for these failures to replicate (Silverman, 1982, 1983), and further research designed to evaluate these hypotheses is needed. Nevertheless, effects using the dart-throwing paradigm do not appear to be nearly as robust, at least in terms of the proportion of successful replications, as either the research with clinical populations discussed previously or the research described below.

Therapy and Educational Adjunct Studies

In all of the studies reviewed thus far, the effects of subliminal stimulation have been quite brief. Given even the temporary ameliorative effects of certain stimuli for psychopathology, however, a natural extension of this work involves its application in therapeutic or educational contexts. Several such studies have been conducted. In contrast to the typical within-subjects design used in the studies discussed previously, "treatment-adjunct" studies typically employ a between-subjects design in which subjects are randomly assigned to one of two groups. Both groups receive the same intervention that in and of itself is believed to be effective for the condition in question. In addition, one group also receives repeated subliminal

exposures to an experimental stimulus that is hypothesized to enhance further the effectiveness of the treatment, while the other group is presented with a control stimulus. The stimuli are presented several times at the beginning and/or end of each treatment session.

In a typical therapy adjunct study, Palmatier and Bornstein (1980) employed a "group-oriented, multicomponent behavior therapy package" for smoking cessation for all subjects. The 34 subjects were randomly divided into two groups. Subjects in the experimental group received four tachistoscopic presentations (4 msec) of the stimulus MOMMY AND I ARE ONE during each treatment session (no corresponding picture was used in this study). Subjects in the control group received the stimulus PEOPLE ARE WALKING. The treatment groups, composed of both experimental and control subjects, met for 12 sessions over an 18-day period. The group therapists, the experimenter administering the tachistoscopic stimuli, and the subjects themselves were kept blind to the subjects' experimental condition. Smoking behavior was assessed at 1-month and 3-month follow-up periods, utilizing both the subjects' self-report and confirmation by someone with regular knowledge of the smoking habits. The results revealed a dramatic effect of the experimental stimulus: At the one-month follow-up, 67% of the subjects in the experimental group were abstinent, compared to only 12.5% in

the control group. At the three-month follow-up assessment, substantial differences in abstinence rates between the groups remained: 44% for the experimental group relative to 12.5% for the control group.

Similar treatment studies have obtained positive results with a variety of subject populations, including insect phobics (Silverman, Frank, & Dachinger, 1974), hospitalized schizophrenics (Silverman, Levinson, Mendelsohn, Ungaro, & Bronstein, 1975), depressed outpatients (Thornton, 1987), overweight women (Martin, 1975; Silverman, Martin, Ungaro, & Mendelsohn, 1978; Ungaro, 1981), alcoholics (Schurtman, Palmatier, & Martin, 1982), personality disordered adolescents in a residential treatment setting (Bryand-Tuckett & Silverman, 1984), college students in group therapy (Linehan & O'Toole, 1982), and persons with assertiveness problems (Packer, 1984).

The subliminal psychodynamic activation method has also been employed in educational contexts. Ariam and Siller (1982), for example, presented Israeli high school students with two Hebrew translations of the English MOMMY AND I ARE ONE stimulus. The stimuli were presented four times per week for six weeks. Relative to subjects who received a control stimulus (the Hebrew translation of PEOPLE ARE WALKING IN THE STREET), the experimental subjects obtained significantly

higher grades on a mathematics exam given at the end of the six-week period. Similar results have been obtained in at least four additional studies (Hobbs, 1983; Parker, 1982; Qureshi, 1985; Zuckerman, 1980).

In discussing several conclusions based on the therapy and educational adjunct studies reviewed above, Weinberger and Silverman (1987) note the importance of dosage. Effects are strongest when subjects are seen at least three times per week for at least two to six weeks.³ Moreover, in the only study to date in which dosage has been systematically varied, Packer (1984) found strong effects when the experimental stimulus was presented four times per week, but only marginal effects when it was presented only two times per week.

Criticisms of Psychodynamic Activation Studies

Two criticisms have been raised against the subliminal psychodynamic activation research discussed above. First, a great deal of this work has been conducted at New York University under the supervision of the late Dr. Lloyd Silverman. It has been suggested that some (presumably undeliberate) factor unique to Silverman's laboratory could have been largely responsible for the observed treatment effects (Heilbrun, 1982). Nevertheless, as of 1984, at least

20 dissertation studies conducted outside of Silverman's laboratory, in addition to numerous other non-dissertation investigations, have obtained positive results (Silverman, 1984). Moreover, the ratio of studies conducted outside of Silverman's laboratory that have obtained positive results to those that obtained negative results is better than 3:1 (see Silverman, 1983, and Weinberger & Silverman, 1987, for listings of these studies). When the studies conducted within Silverman's laboratory are included, the overall ratio of supportive to nonsupportive studies is better than 4:1.

The second criticism concerns the fact that many of the studies conducted both within Dr. Silverman's laboratory and elsewhere have been doctoral dissertations (Porterfield & Golding, 1985). Far from being a weakness, however, this fact renders the evidence in favor of the subliminal psychodynamic activation method all the more impressive. First, as noted by Silverman (1985, p. 642), "unlike other studies that may or may not be exposed to the light of day (the file-drawer phenomenon of Rosenthal, 1979), all dissertations are listed and abstracted (in Dissertation Abstracts) so that a meaningful tally is possible." Thus, consideration of dissertation results is not hampered by the well-documented bias against publication of null results. The second reason that dissertation studies are not to be discounted is the fact that such studies are generally carefully planned and

thoroughly scrutinized by a committee of researchers before being conducted, and are generally directly supervised by a seasoned researcher.

Having addressed criticisms of the subliminal psychodynamic activation method in particular, an appraisal of the criticisms that have been raised against subliminal perceptual research in general is now presented.

Criticisms of Subliminal Perception Research

In this section the major criticisms that have been raised against subliminal perception are explored, as well as the degree to which research and theory to date have addressed these concerns. The criticisms can be divided into two broad categories: logical objections and methodological issues.

Logical objections. The primary "philosophical" objection to subliminal perception is that it is logically impossible, since one must first perceive in order not to perceive (as in perceptual defense). This argument has been proposed by Howie (1952) and Gibson (1968), and is reminiscent of Jean Paul Satre's famous criticism of the psychoanalytic notion of defense (i.e., one must first be aware of a conflict in order to raise defenses against it). This objection is

readily addressed by noting that current theories do not conceptualize perception as an all-or-none process whereby environmental stimulation either has no impact upon the organism or else evokes conscious phenomenal experience. Rather, "perception," broadly speaking, is a complex, integrated series of processes, not all of which need involve awareness. Simply put, there is nothing illogical in the idea that organisms can make discriminations without necessarily being aware of (a) the stimuli discriminated, and (b) the fact that a discrimination is even being made. Moreover, the organism's ability to make discriminations without awareness does not require invoking a discriminating homunculus, as has sometimes been suggested. As Dixon (1981, pp. 184-185) notes,

"...if an anthropomorphic preperceiver is necessitated by the phenomena of perceptual defence, then, logically, it must similarly be necessitated by all other systems of the living organism which do not rely upon phenomenal representation of the input. It would for example be obligatory to maintain that the cerebellum contains a homunculus able to discriminate the vestibular and proprioceptive inputs upon which skilled behavior depends."

It is worth noting at this point that the notion of subliminal perception is completely compatible with current knowledge of the structure and functioning of the nervous system. Dixon (1971, 1981) has proposed a detailed neurophysiological model of subliminal perception, which has been expanded upon by Shevrin (1978). Regardless of the ultimate validity of these particular models, they serve to

illustrate the plausibility of subliminal perception from a neurophysiological perspective (Shevrin & Dickman, 1980).

Moreover, contrary to popular opinion (e.g., Kihlstrom, 1987; Shevrin, 1986; Shevrin & Dickman, 1980), the notion of subliminal perception is not the least bit incompatible with a behavioristic position. One possible behavioral analysis of subliminal perception is as follows.⁴ A very weak stimulus might nevertheless be strong enough to elicit certain emotional respondents, such as feelings of dysphoria for example. This relatively weak level of stimulation may be insufficient, however, to evoke operant behavior that might interfere with the emotional respondent (e.g., such as a class of "defending" behavior). As the level of stimulation increases, the operant behavior is more likely to be evoked, thereby obscuring the effects of the respondent. This corresponds to the fact that subliminal effects are frequently strongest at very weak stimulus levels relative to stronger levels. Awareness can be thought of in behavioral terms as the result of a second operant behavior of overtly or covertly verbalizing a stimulus (or more precisely, a tacting relationship between the stimulus and a verbal response; Skinner, 1957). Subliminal perception simply refers to the situation in which some behavior (such as the emotional respondent referred to above) is produced by a stimulus under conditions in which that same stimulus does not evoke an

associated verbal response. As with the neurophysiological models referred to above, the significance of this interpretation lies not in its validity per se, but is simply to illustrate the compatibility of subliminal perceptual phenomena with a behavioral analytic theoretical perspective.

The majority of the criticisms leveled against subliminal perception have been methodological in nature. These criticisms are thoroughly reviewed by Dixon (1981) and by Erdelyi (1974), and can be grouped into three main categories: response bias, partial cues, and experimenter demand effects.

Response bias. The response bias argument, discussed previously in the context of perceptual defense, stems from the shortcomings of classical psychophysical methods to distinguish between so-called sensory and response effects. This argument holds that subjects would rather appear insensitive than hallucinated, and when in doubt tend to report not being aware of a stimulus (Goldiamond, 1958). In studies of subliminal perception in which signal detection methods have been applied in an effort to disconfound sensory and response effects, changes in sensory sensitivity (d') have been found to vary substantially as a function of subliminal stimulus content (Broadbent & Gregory, 1967; Dorfman, 1967; Hardy & Legge, 1968). Moreover, the typical finding in

perceptual defense studies that highly emotive or taboo stimuli are recognized at lower thresholds than are moderately arousing stimuli argues against a purely response bias position.

Finally, contrary to what might be deduced from a superficial overview of signal detection theory, the notion of subliminality is not at all incompatible with the theory. Both Dixon (1981) and Green (1964) argue that discrimination without awareness is in fact more compatible with signal detection theory than with classical psychophysics. In this regard, it is important to note that subliminal perception does not depend upon the notion of a fixed, invariant, all-or-nothing perceptual limen, as is sometimes claimed by critics (cf. Moore, 1982). Rather, the notion of subliminal perception simply entails the hypothesis that discrimination can occur at stimulus values below the range over which an individual's awareness threshold may range or vary (Dixon, 1981).

The partial cue hypothesis. The second methodological argument that has been raised against subliminal perceptual research is known as the partial cue hypothesis. The basic idea is that far from being completely unaware of the "subliminal" stimulus, the subject does consciously perceive part, if not all, of the stimulus, and makes a response on

the basis of partial information about the stimulus (Kellner, Butters, & Wiener, 1964). There is no question that much ongoing discrimination, especially discrimination of which one is aware, occurs in response to brief, supraliminal, "partial" stimuli. It is quite unlikely, however, that the results of all subliminal perception studies could be accounted for by supraliminal partial cues. Providing the strongest evidence against the partial cue hypothesis is the well-documented observation that many subliminal effects are greater well below the awareness threshold than when the threshold is approached (see Dixon, 1981, and Silverman, 1984 for a discussion of these studies).

Moreover, several studies reveal that subliminally presented stimuli do not affect subsequent recognition of structurally similar stimuli, as would be expected according to the partial cue hypothesis. For example, Worthington (1964) and Wallace and Worthington (1970) found that the time taken to dark adapt in order to become aware of taboo words such as SHIT and CUNT was greater than the time required for neutral words of similar structure (SHOT and CULT) and of dissimilar structure (BOOK and TEST). There was no enhancing effect, however, of prior presentation of the taboo words on recognition of the structurally similar words over the structurally dissimilar words. This finding is consistent with the binocular rivalry study by Somekh and Wilding (1973)

discussed previously, in which subliminal presentations of the words HARRY and SAP did not affect the dependent measure, whereas under supraliminal conditions they did, having been misread as HAPPY and SAD. Finally, several studies have found that a stimulus presented subliminally will affect a behavior that the same stimulus, presented supraliminally, will not. Zuckerman (1960), for example, found that the stimuli WRITE MORE and DON'T WRITE, superimposed on cards from the Thematic Apperception Test, only affected subjects' behavior when presented subliminally.

Thus, although the effects of partial cues cannot be ruled out completely in all subliminal perceptual studies, the results of several lines of research simply cannot be accounted for solely in terms of partial cues.

Experimenter demand effects. An obvious issue to be reckoned with in subliminal perceptual research concerns the possibility of experimental demand effects (Orne, 1962; Rosenthal, 1963). Indeed, this possibility has been raised as a general explanation for all subliminal perceptual effects (e.g., Neisser, 1967).

There are two points meriting consideration in this regard. First, much subliminal research (most notably all of the subliminal psychodynamic activation studies) has been

conducted under conditions in which both the subject and the experimenter were blind as to the subject's experimental condition. It should be noted that the majority of psychological research is not conducted under such stringent double-blind conditions. Interestingly, one study that explicitly set out to demonstrate "subliminal" effects by experimenter demand characteristics failed to produce any effects (Barber & Rushton, 1975).

The second point relevant to the issue of experimenter demand effects is the degree to which the experimenter takes care to ensure that subjects are relaxed and at ease during the experiment. Dixon (1981) reviews numerous studies suggesting that "sensitivity to stimuli below the awareness threshold depends upon the subject being passive, relaxed, and non-selectively attentive, and that the, to use a current expression, 'uptight,' focally attentive, and highly aroused subject may, conversely, remain wholly unaffected by such stimuli" (p. 199). Dixon goes on to suggest that a nonspecific "experimenter effect," concerning the degree to which the experimenter puts subjects at ease, may in fact be quite relevant to the likelihood of obtaining subliminal effects. This is not, of course, an alternative explanation of subliminal perceptual effects, but rather a potentially important contextual factor that may impact the probability that specific subliminal effects will occur.

In summary, a large body of literature employing a wide range of methodological paradigms suggests that stimuli of which one is completely unaware can affect one's behavior. The criticisms of this thesis have been adequately addressed on both theoretical and empirical grounds. Although problems can be identified with virtually any single study in any area of psychology, the empirical evidence from converging methodological paradigms supports the validity of subliminal perceptual phenomena beyond any reasonable doubt.

The Thematic Apperception Test

As a result of his work at the Harvard Psychological Clinic from 1927 to 1943, Henry Murray and his colleagues developed a theory of personality functioning organized around the notion of core conflicts (Murray, 1938). These conflicts were thought to result from the individual's "needs" confronting current environmental "presses" that facilitate or interfere with the satisfaction of needs. Examples of typical needs include achievement, affiliation, and aggression, and examples of presses include criticism from others, being comforted, and exposure to physical danger.

Working with C. Morgan, Murray (1943) developed the Thematic Apperception Test in order to evaluate these needs and presses. The test consists of 29 black-and-white pictures from various sources printed on cards, and one blank white card, although only 10 cards are typically administered to any subject. Most of the pictures are drawings depicting ambiguous interpersonal scenes. The subject is asked to make up an imaginative story to each card, which includes a beginning, a middle that describes what the characters are doing, thinking, and feeling, and an ending. Murray reasoned that intense, long, and/or frequently occurring themes in the subject's stories pointed to important areas of conflict.

Since the time of its original publication, the TAT has become one of the most widely used personality measures, and is included in most clinical test batteries in which personality is assessed. In addition to assessing areas of conflict, the test is also used to identify underlying organizing themes in a person's life of which the person may be unaware or unable to articulate. These themes have been referred to by various names, including "thema" (Murray, 1938), "games" (Berne, 1964), "scripts" (Schank & Abelson, 1977; Tomkins, 1978), "if-then sequences" (Alexander, 1987), and "leitmotifs" (Demorest, 1985). Despite theoretical differences, all of these concepts refer to general sequential

themes that help organize (or at least reflect) one's perception, cognition, and behavior.

The notion of these organizing themes is quite similar to Beck's notion of schemas. Although Beck does not discuss the TAT directly as a method of assessing depressotypic schemas, the test's long history as an instrument for assessing such constructs makes it a potentially useful tool in this regard.

Several scoring systems have been developed for the TAT that generate psychometrically reliable data. These systems are currently rarely used in either clinical or research settings, however, due to concerns that they compromise the test's validity and/or utility. Although many clinicians who use the TAT rely upon subjective norms developed over many years of using the test, much objective normative data has been published describing typical responses to each card (Atkinson, 1958; Holt, 1978; Murstein, 1963; Rapaport, Gill, & Schafer, 1968). These data allow the clinician or researcher to choose certain cards that tend to elicit particular themes. For example, card 3BM represents a person of ambiguous gender huddled next to a couch on the floor, next to whom is an ambiguous object that is often seen as a gun. This card tends to evoke themes of depression and suicidality, especially resulting from the loss of a loved one or the

failure in some important task (Holt, 1978; Rapaport et al., 1968). Of course, depressive themes are frequently given even by nondepressed persons in response to this card. The intensity, duration, and manner in which the story is concluded, as well as the degree to which depressive themes emerge in response to other cards, are keys that are used to distinguish the nondepressed person from the individual whose schemas are marked by significant depressive ideation.

On the basis of such normative data, it was hypothesized that cards that tend to pull for themes reflected in the depressotypic schemas proposed by Beck could be chosen for the present investigation. For example, a relatively small number of cards could be administered that tend to evoke themes of loss, failure in important strivings, achievement motivation and aspirations, intimacy, dependency, dysphoria, and suicidal impulses. Review of the depressotypic schemas proposed by Beck (1967; Sacco & Beck, 1985) reveal that such themes are central to these schemas. If remitted depressives do in fact hold depressotypic schemas, it follows that these might be revealed in their TAT data. More specifically, the TAT responses of remitted depressives and never-depressed persons would be expected to differ such that the remitted persons' data would be characterized by similar depressotypic themes as those found among actively depressed persons.

The Dysfunctional Attitudes Scale

The Dysfunctional Attitudes Scale (DAS; see Appendix C) was developed by Weissman (1979) as a self-report paper-and-pencil measure of the depressotypic schemas postulated by Beck. It consists of 40 statements reflecting general beliefs, that subjects rate according to their degree of agreement along a seven-point scale (from agree very much to disagree very much). The test items closely reflect Beck's schemas, and include issues concerning perfectionism, overconcern about approval from others, and over-generalizing from specific behaviors to global negative traits, among others.

The DAS has been found to be psychometrically sound. An eight-week test-retest correlation of .84 was obtained by Weissman (1979), and subsequently replicated by Hamilton & Abramson (1983). The construct validity of the DAS is supported by several studies. Weissman (1979) reported correlations of .36 and .47 with measures of depression among students. Two additional studies of student populations found that mildly depressed students endorsed more dysfunctional attitudes than did nondepressed students (Dobson & Breiter, 1983; Gotlib, 1984). Hamilton and Abramson (1983) found that depressed inpatients had higher DAS scores than nondepressed

psychiatric control patients. O'Hara, Rehm, and Campbell (1982) found a correlation of .28 between the DAS and the Beck Depression Inventory (a widely used measure of depressive symptomatology; Beck, 1978) among pregnant women. Weissman (1979) also reports a correlation coefficient of .52 between the DAS and the Cognitive Bias Questionnaire (Hammen & Krantz, 1976; Krantz & Hammen, 1979), a measure of the tendency to show negatively biased reasoning that is often found among depressed persons.

Despite the intent of the DAS to measure enduring depressotypic schemas, the measure has been found in many studies to covary with depressive episodes. That is, the measure has been found to return to the normal range following remission of the episode (Eaves & Rush, 1984; Hamilton & Abramson, 1983; Reda, Carpiniello, Secchiaroli, & Blanco, 1985; Silverman, Silverman, & Eadley, 1984; Simons, Garfield, & Murphy, 1984). Although this finding is frequently seen as being at odds with Beck's theory (e.g., Barnett & Gotlib, 1988), it is in fact quite consistent with the theory if one considers that Beck proposes that the depressotypic schemas again become latent upon remission of the depressive episode. One would therefore not expect face valid, self-report measures to reveal the presence of these latent schemas, even if they were present.

In an effort to overcome whatever editing processes might mask the presence of such schemas, the DAS might be administered under a different instructional set that decreased the pull for socially desirable responses. For example, nondepressed, depression-prone persons could be asked to rate the beliefs of others instead of themselves. Under such instructions, they might tend to endorse a higher level of depressotypic schemas relative to never-depressed persons. In any case, the DAS represents a valuable measure of the dysfunctional beliefs proposed by Beck for currently depressed persons. The absence of high DAS ratings among asymptomatic persons at risk for depression, however, should not be taken as evidence against the presence of depressotypic schemas in the context of Beck's theory.

Statement of Purpose

The present investigation examined the role of depressotypic schemas in unipolar depression by means of three different methodologies. As discussed previously, Beck's cognitive theory of depression proposes that individuals prone to depression hold unrealistically negative beliefs about themselves, the world, and the future. These deep-seated beliefs or schemas develop relatively early in life, but remain dormant until the individual is presented with a

relevant environmental stressor. Upon presentation of such a stressor, the schemas are activated, beginning a series of processes eventually resulting in depression. Although much research confirms the presence of the depressotypic schemas postulated by Beck among actively depressed persons, there is as yet little support for the presence of these schemas among individuals at risk for depression who are currently not depressed.

The failure of most studies conducted thus far to support this latter relationship seems to present a significant problem for Beck's theory. On the one hand, Beck specifically proposes that the schemas are latent when the individual is not actively depressed. Thus, studies that fail to document the presence of these schemas, using standard measures, in depression-prone persons who are not currently depressed can hardly be held to be inconsistent with Beck's theory. On the other hand, however, the presence of these latent schemas must somehow be identifiable in the person at risk for depression if the diathesis-stress aspect of Beck's theory is to be supported. Otherwise, the most parsimonious account of the current data is that "depressogenic" cognitions are simply symptoms or concomitants of depression. Thus, one of the most potentially problematic aspects of Beck's theory involves the difficulties associated with demonstrating that the abnormal cognitive processes seen among depressives are precursors of their depression. The observed correlation between abnormal

cognition and depression does not directly address this issue, since, as noted above, an equally plausible and more parsimonious explanation is that certain abnormal cognitions arise as symptoms or concomitants of depression. In order for the notion of latent depressogenic schemas to be theoretically and practically useful, some assessment procedure must be able to confirm their existence in the nondepressed, depression-prone person, despite their latent status.

Thus, an identification of abnormal cognitions among persons known to be at risk for depression is critical if Beck's theory is to be viewed as anything more than a useful description of depression. Moreover, if such a relationship were to be identified, it would represent a psychological marker for depression, and as such could potentially be of extreme practical utility in identifying persons at risk for the disorder. Such identification might then allow for preventative measures to be taken in order to prevent the development of this devastating condition.

Method I: Subliminal Stimulation of Depressotypic Statements

All of the studies investigating the role of depressotypic schemas among depression-prone persons that have been conducted to date have relied upon standard paper-and-pencil self-report measures administered under

normal assessment conditions. As discussed previously, several authors (e.g., Riskind & Rholes, in press; Rush, personal communication, 1987; Wilkinson & Blackburn, 1981) suggest that special assessment circumstances may be needed in order to verify the presence of abnormal schemas in the depression-prone person. The most commonly suggested variation in the assessment conditions involves the introduction of a significant stressor.

Another possibility is suggested by the research in subliminal perception, particularly the subliminal psychodynamic activation method developed by Silverman. As discussed previously, Silverman's method (particularly as used with clinical populations) involves presenting brief tachistoscopic presentations of theoretically derived stimuli to various populations while monitoring measures of the pathology characteristic of the population under study. This procedure has been successfully used to demonstrate the association between putative unconscious conflict areas and corresponding forms of psychopathology, including depression. To this writer's knowledge, all of the studies employing Silverman's method thus far have used stimuli derived from psychoanalytic theory. There is nothing about the method, however, that limits its use to psychodynamic stimuli.

The present study employed a variation of Silverman's methodology in an attempt to identify the presence of the depressogenic cognitive schemas postulated by Beck's theory in persons at risk for depression. The study also examined the impact of subliminal presentations of stimuli derived from Beck's theory on the dysphoric mood of actively depressed persons, remitted depressives, as well as "normal" controls. Moreover, the impact of supraliminal presentations of depressogenic schemas was also examined.

Three groups of subjects were solicited for the study: (a) actively depressed persons, (b) persons with a history of clinical depression but who are currently remitted, and (c) persons who have never experienced a significant depressive episode. Given the recurrent, episodic nature of depressive episodes, remitted depressives are known to be at significant risk for future depression. According to Beck's theory, this group should therefore hold latent depressotypic schemas.⁵

Each subject was presented with a series of stimuli. The stimuli were divided into two groups. One group was composed of stimuli reflecting the irrational, self-defeating schemas proposed by Beck (e.g., "I have to be perfect"). The other group reflected rational, nondepressive alternatives to the depressotypic items (e.g., "I don't have to be perfect"). All stimuli were presented both subliminally and

supraliminally to each subject. Two dependent measures were employed. These included a sensitive measure of dysphoric mood, presented following each experimental condition, and a visual analogue rating of agreement with each individual stimulus item.

On the basis of Beck's theory, as well as the literature on subliminal perception reviewed above, the following predictions were made. Neither subliminal nor supraliminal presentations of the irrational or rational stimuli were predicted to impact significantly the dysphoric mood of the never-depressed, "normal" subjects, since most if not all of these subjects were not thought to hold depressotypic beliefs. Moreover, the normal subjects were predicted to disagree consistently with the irrational stimulus items, and to endorse the rational items, regardless of presentation modality.

In contrast, the actively depressed subjects were expected to show the opposite pattern of agreement ratings. That is, relative to the normal subjects, they were predicted to show higher agreement with the irrational stimuli and lower agreement with the rational stimuli regardless of presentation modality. It was less clear, however, whether the subliminal or supraliminal stimuli would significantly impact the depressed subjects' dysphoria, as their depressogenic schema

were already thought to be "activated." It was thought that the irrational stimuli might, however, result in a mild, temporary exacerbation of the depressives' dysphoric mood, with a possible mild amelioration following the rational stimuli, especially when the stimuli were presented subliminally.

The most critical predictions concerned the remitted depressive group. According to Beck's theory, remitted depressives are expected to hold latent depressotypic beliefs. Prior research has examined these subjects' agreement ratings of irrational, depressotypic items, and has revealed no differences from normals. Assuming that a person truly does hold to such beliefs, the failure to endorse the beliefs may be due to either (a) the individual's lack of awareness of the beliefs, or (b) a deliberate attempt to present oneself as "normal." In either case, under proper subliminal stimulation, the remitted subjects were expected to endorse the depressotypic beliefs. Thus, relative to the normal subjects, the remitted group was predicted to report higher agreement ratings for the irrational items and lower agreement ratings for the rational items in the subliminal conditions. The remitted subjects' pattern of agreement ratings was not expected to differ from that of the normals in the supraliminal conditions. With regard to dysphoric mood, the subliminal presentation of the irrational stimuli was

predicted to increase temporarily the remitted depressives' dysphoric mood, whereas the rational stimuli were predicted to decrease dysphoric mood. Supraliminal presentations of either type of stimulus, however, were not predicted to impact dysphoric mood. Note that the remitted subjects were expected to respond similarly to the depressives in the subliminal conditions, and similarly to the normal subjects in the supraliminal conditions.

The present study was similar in some respects to the mood induction studies described earlier. The present methodology, however, was designed to overcome many of the problems inherent in most mood induction research. Since the stimuli were delivered by an experimenter who was "blind" as to their content, potential experimenter demand effects were eliminated. Moreover, since clinical rather than analogue populations were employed, the results can be expected to be much more relevant to the phenomenon of clinical depression than are most previous mood induction studies.

There are, of course, ethical concerns that must be addressed in any mood induction experiment, as well as special issues raised by the use of subliminal stimulation. These issues are considered and addressed in Appendix D.

Method II: The Thematic Apperception Test

In addition to the tachistoscopic procedure described above, two additional methodologies were employed in the present investigation in an attempt to evaluate the presence of latent depressotypic schemas in depression-prone persons. These included the Thematic Apperception Test (TAT) and two versions of the Dysfunctional Attitudes Scale (DAS). As discussed previously, the TAT is used in clinical settings to elucidate important organizing themes of which the individual may or may not be aware. It therefore represented a potentially useful tool for assessing the putatively latent depressotypic schemas among the remitted depressed subjects in the present study. It was hypothesized that if the remitted subjects did indeed hold latent depressotypic beliefs, these might be revealed in their TAT responses.

Four TAT cards were administered to each subject immediately upon completion of the tachistoscopic procedure. These particular cards, described below, were chosen because they are widely believed to elicit general themes including achievement motivation, dysphoria and depression, intimacy, and suicidal ideation. Each of these themes is reflected in the depressotypic schemas described by Beck.

Subjects' TAT responses were audiotaped, then transcribed. The latency between presentation of each card and the subject's first response, as well as the total response time to each card, were recorded. The transcribed responses were evaluated by 10 clinical psychologists experienced in the interpretation of the TAT, who were blind to the subjects' diagnostic status. The psychologists were asked to decide on the basis of the TAT data whether or not each subject was depressed.

It was predicted that the psychologists would, of course, diagnose a greater proportion of the actively depressed subjects as depressed relative to the never-depressed subjects. In accordance with Beck's theory, it was further predicted that more of the remitted subjects would be judged to be depressed relative to the normals. A similar pattern was predicted for the response latency measure. That is, the actively depressed and remitted subjects were predicted to have longer response latencies than the never-depressed controls. This was predicted because the TAT stimuli were expected to arouse particularly conflictual depressotypic themes in these subjects, thereby resulting in longer response latencies. The predictions for the total response time measure were less clear. The depressed subjects might be expected to have longer total response times relative to the

other two groups due to psychomotor slowness, or shorter times due to lack of involvement in the task.

In summary, the TAT was used in an effort to assess the presence of latent depressotypic schemas in the three subject groups. In order to provide support for the diathesis aspect of Beck's theory, the TAT data of the remitted subjects would have to resemble at least somewhat the data of the depressives, and would have to differ from those of the normal subjects.

Method III: The Dysfunctional Attitudes Scale

The final procedure employed in the present investigation was the Dysfunctional Attitudes Scale (DAS). Although scores on the DAS have been shown repeatedly to be strongly correlated with measures of active depression, several studies also have failed to find elevated DAS scores among remitted depressed persons.

Prior to completing the standard, self-evaluative version of the DAS, subjects were asked to complete a modified version of the questionnaire. The modified questionnaire itself was identical to the original version except for a change in the instructions. Instead of asking the subjects to rate their

own degree of agreement with each belief, they were asked to rate the beliefs of a hypothetical other person. This shifted the focus from self-evaluation to making general statements about the belief systems of others.

The existing literature on the DAS provided clear hypotheses for the standard version of the questionnaire: the actively depressed subjects were expected to endorse more dysfunctional beliefs than either of the other two groups, who were not expected to differ from one another. In contrast, it was predicted that the remitted subjects might respond more similarly to the actively depressed subjects on the other-person version. It was reasoned that if the remitted subjects do hold latent depressotypic schemas, these might be revealed when making general, non-self-referential judgments about dysfunctional beliefs.

The three methodologies described above are considerably different. What they share is the goal of bypassing the normal editing processes that might mask the presence of underlying depressotypic schemas in the nondepressed, depression-prone person.

METHOD

METHOD I

Participants

Three subject groups, each consisting of 10 persons, were employed. The groups consisted of an actively depressed group, a remitted depressed group, and a "normal" group of persons who had never been depressed. Potential subjects were introduced to the general purpose and nature of the study during their initial contact with the experimenter, usually over the telephone. Interested potential participants were then mailed two brief questionnaires (described below), and asked to return these in a self-addressed, stamped envelope. Those respondents who met the initial selection criteria were invited for a diagnostic interview, described below. Potential subjects were paid \$5.00 each for their participation in this screening interview. Qualified, consenting subjects were invited to return for a second session to participate in the study proper, or participated in the study immediately following the diagnostic interview. Subjects who actually participated in the study were paid an additional \$5.00 at the end of the experimental session. Both the screening interviews and the experimental sessions took

place at the UNCG Psychology Department. Due to the small number of male respondents, only female participants were employed. Only native English speakers were employed, as Silverman (1983, 1984) has reported that subliminally presented English stimuli may have little or no impact on persons whose native language is not English.

Actively depressed persons. The actively depressed subjects were solicited primarily from various outpatient mental health facilities in the Greensboro, N.C. area, including the UNCG Psychology Clinic and private psychiatric and psychological practices. In addition to referrals from these sources, potential depressed subjects were solicited through community announcements and bulletins. These included bulletins mailed to various women's clubs, an article in the UNCG student newspaper, public service radio announcements, and a local television news interview in the context of a discussion of the depression research underway in the UNCG Psychology Department.

Regardless of the means of solicitation, all participants underwent a diagnostic interview with the experimenter (see Appendix E for consent form), using an abbreviated version of the Schedule for Affective Disorders and Schizophrenia -- Life-time Version (SADS-L; Spitzer & Endicott, 1979; Appendix F) as a guide. The experimenter provided DSM-III-R diagnoses

on the basis of this interview. Of the 10 depressed subjects, four had a diagnosis of Major Depression, three of Dysthymia, and three of "Double Depression" (coexisting Major Depression and Dysthymia). None of the participants had readily identifiable Axis II diagnoses, although such diagnoses cannot be ruled out completely on the basis of the assessment procedures employed. None of the participants had a concomitant nonaffective Axis I diagnosis. The reliability of the diagnostic judgments is discussed below.

The actively depressed subjects were required to meet the following subject selection criteria: (a) an Axis I diagnosis, according to DSM-III-R, of a unipolar major mood disorder; (b) a score of 16 or above on the Beck Depression Inventory (BDI; Beck, 1978; Appendix G; $x = 32.40$, $SD = 7.40$), indicating the presence of significant depressive symptomatology; (c) absence of significant suicidal risk, evidenced by a score of 4 or below on the SAD PERSONS scale (Patterson, Dohn, Bird, & Patterson, 1983, Appendix H; $x = 1.9$, $SD = 0.74$); (d) written consent of the subject's primary therapist (Appendix I); and (e) an age of between 18 and 60 years ($x = 36.20$, $SD = 8.60$). The BDI and the SAD PERSONS were administered by the experimenter at the time of the diagnostic screening interview. Each participant's individual baseline data are presented in Table 1 (this table and all subsequent tables may be found in Appendix J).

Remitted depressives. In addition to the community announcements described above, the remitted depressed group was obtained through two other sources. First, eight women who had participated in a treatment study of depression at UNCG approximately two years earlier were contacted, and asked if they might be interested in participating in the present research. Of the five women who agreed to undergo the screening process, three met the criteria as remitted subjects, one met the criteria as a depressed subject, and one did not meet the criteria for either group (i.e., she was very mildly depressed). The second source of remitted subjects was a large psychiatric practice in Greensboro, N.C. Dr. Victor Morcos of Guilford Psychiatric Associates kindly agreed to send letters to 31 of his former patients with a known history of depression (postage and the cost of materials was paid for by the experimenter). The letters briefly described the study, and informed potential participants to contact the experimenter if they were interested in participating. Subjects who contacted the experimenter were then asked to sign a limited release of information form allowing the experimenter to contact Dr. Morcos, who then provided a brief overview of the potential subject's psychodiagnostic history (i.e., number, approximate dates, and duration of past depressive episodes and any other psychiatric conditions).

Regardless of the mode of solicitation, all potential remitted participants underwent a diagnostic interview with the experimenter based on the abbreviated SADS-L. Historical diagnoses were made by the experimenter through retrospective data provided by the potential subject during this interview. Only persons who unambiguously previously met the DSM-III-R criteria for a depressive disorder were selected to participate in the study. Of the 10 remitted subjects, nine had prior diagnoses of Major Depression and one had a prior diagnosis of "Double Depression." None of the 10 subjects reported current or historical symptoms indicative of other Axis I or Axis II disorders.

The remitted depressed subjects were required to meet the following selection criteria: (a) a history of one or more significant clinical depressive episodes, resulting in a diagnosis of a unipolar major mood disorder; (b) no current major Axis I psychiatric diagnosis according to DSM-III-R; (c) a score of 6 or below on the BDI, indicating the absence of significant depressive symptomatology ($x = 5.40$, $SD = 2.91$); (d) not currently obtaining psychiatric or psychological treatment of any kind; (e) absence of significant suicidal risk, assessed by a score of 4 or below on the SADS PERSONS scale ($x = 1.0$, $SD = 0.67$); and (f) an age of between 18 and 60 years ($x = 38.0$, $SD = 8.12$). As with the actively

depressed group, the experimenter administered the BDI and the SADS PERSONS to all potential participants in the context of the diagnostic screening interview.

Non-depressives. The "never-depressed" participants were solicited through community announcements and by word-of-mouth. They were required to meet the following selection criteria: (a) no historical or current major psychiatric diagnosis according to DSM-III-R; (b) a score of 6 or below on the BDI, reflecting no significant depressive symptomatology ($x = 4.20$, $SD = 3.36$); (c) not currently obtaining psychiatric or psychological treatment of any kind; and (d) the same criteria for age and absence of suicidal risk as the other two groups (age $x = 38.75$, $SD = 7.30$; SADPERSONS $x = 0.44$, $SD = 0.53$). As with participants from the other two groups, potential never-depressed participants underwent a brief diagnostic interview with the experimenter according to the SADS-L in order to rule out major current or historical psychopathology. The BDI and SAD PERSONS were also administered by the experimenter.

Additional information on participant selection. All of the screening interviews were audiotaped, and subsequently reviewed and independently assigned DSM-III-R diagnoses by a second diagnostician. This individual, who was blind to the experimenter's diagnostic judgments and the subject's

questionnaire data, was a doctoral candidate in clinical psychology at UNCG who has extensive experience in the psychodiagnosis of mood disorders. A randomly selected total of 26 of the 30 interviews (87%) were reviewed. The two diagnosticians achieved perfect agreement on all but two of the interviews (92%). They reviewed these two interviews together, and arrived at a consensus diagnosis for each.

Each participant who was not currently obtaining psychiatric or psychological services (i.e., possibly some of the depressed subjects and all of the remitted depressed and never depressed subjects) was given a list of community mental health professionals upon completion of the assessment phase, whether or not they requested such information (Appendix K). Subjects were explicitly told that the experimenter's giving them this list was simply in keeping with the experimental protocol, and did not reflect a judgment that they do or do not need psychotherapeutic services.

As expected, a one-way analysis of variance (ANOVA) and corresponding Tukey's post hoc comparisons confirmed that the actively depressed subjects endorsed more depressive symptoms than the remitted and normal subjects, who did not differ from one another, on both the BDI and the MMPI-D (Tables 2 & 3). The same pattern was found for the SADPERSONS scale; although all three groups scored within the low-risk range for suicide

potential, the depressed subjects had significantly more risk factors than subjects in the other two groups, who did not differ from one another (Table 4). Finally, a one-way ANOVA revealed no significant differences in age between the three subject groups (Table 5).

Experimental Design

The present investigation employed a 3 (actively depressed vs. remitted depressed vs. never-depressed subjects) by 2 (subliminal vs. supraliminal stimulus presentation) by 2 (rational vs. irrational stimuli) mixed factorial design, with repeated measures on the last two factors. Thus, each subject was exposed to both subliminal and supraliminal presentations of both rational and irrational stimuli. In order to control for potential sequence effects, the order of the subliminal-supraliminal and rational-irrational manipulations was counterbalanced across subjects, under the condition that each subject received both subliminal conditions together and both supraliminal conditions together. The clustering of the subliminal and supraliminal conditions allowed the data to be analyzed for potential sequence effects with respect to this factor. The experiment was conducted under double blind conditions, as discussed below.

Stimuli and Apparatus

Stimuli. Each subject received four subliminal presentations and one supraliminal presentation of each of five "rational" and five "irrational" stimuli by means of an electronically-controlled tachistoscope (described below). The subliminal stimuli were presented four times in order to ensure adequate retinal stimulation. Due to the extreme brevity of stimulation, repeated stimulus presentations were needed to ensure that small, involuntary ocular movements (vibratory tremors, and rapid jerks called micronystagmæ) did not disrupt parafoveal retinal registration of the stimuli. The supraliminal stimulus presentations, which were by definition clearly visible, required only a single presentation. The irrational stimuli consisted of brief verbal messages that reflect typical depressotypic schemas postulated by Beck's (1967, 1979) theory of depression (see Beck et al., 1979, p. 246, and Weissman, 1978 for presentations of stimuli very similar to those presented here). The rational stimuli consisted of nondepressive, functional alternatives to the irrational stimuli.

The irrational stimuli were as follows:

1. I HAVE TO BE PERFECT

2. I HAVE TO BE LOVED BY EVERYONE
3. MAKING MISTAKES IS TERRIBLE
4. I MUST AGREE WITH EVERYONE
5. I HAVE TO BE SUCCESSFUL AT EVERYTHING

The rational alternative stimuli included:

1. I DON'T HAVE TO BE PERFECT
2. I DON'T HAVE TO BE LOVED BY EVERYONE
3. MAKING MISTAKES IS OK
4. IT'S OK TO DISAGREE
5. I DON'T ALWAYS HAVE TO BE SUCCESSFUL

Previous studies indicate that the frequency of day-to-day occurrence of words within verbal items is not critical to comparisons of subliminally presented stimuli as long as the stimuli being compared are not extremely discrepant (Erdelyi, 1974). Nevertheless, as an additional experimental control, the rational and irrational stimuli listed above were carefully designed to be as similar as possible along several dimensions, including word frequency. The total number of words for the irrational and rational stimulus sets are 28 and 29, respectively, and the total number of characters (including spaces between words) are 140 and 133, respectively. Moreover, the sum of the frequency

indices (i.e., the number of times the words occur in a representative sample of American English as described by Kucera and Francis, 1967), for the irrational stimuli is 160,126, relative to 169,321 for the rational stimuli, an insignificant difference in this context.

It is important to note that past research suggests that the close similarity between the present stimuli would not preclude their resulting in differential effects. Several studies have found that very slight differences between similar subliminally presented stimuli can result in quite different effects (e.g., Bronstein & Rodin, 1983; Dauber, 1984; Mendelsohn, 1981; Somekh & Wilding, 1973; Wallace & Worthington, 1970).

Consistent with Silverman's (1983, 1984) methodology, the stimuli were printed in black letters 8 mm high on 3 inch by 5 inch unlined white index cards, and occupied two lines on the card. The stimuli were printed on an Okidata laserline-6 laser jet printer, driven by a DrHalo IBM-PC graphics program. They were then lightened through photocopying using a Kodak Ektaprint photo enhancer screen. A blank white card with a cross in its center as a fixation point served as a blank stimulus field.

Tachistoscope. All stimuli were presented through an electronically controlled four-field Gerbrands tachistoscope (model T-4A). The viewing distance was 0.864 meters (34 inches). The illumination of the blank field, stimulus field, and room was carefully controlled according to the guidelines recommended by Silverman (1984). The illumination of the tachistoscopic fields and the room was set by means of a MacBeth model 6800 illuminometer, manufactured by Leeds & Northrup Company. The illuminometer was focused through the eyepiece of the tachistoscope when measuring the two fields, and each field remained constantly illuminated during measurement. When measuring the ambient room illumination, the illuminometer was focused toward the wall in the direction the subject would be looking when he or she was not looking into the tachistoscope. The room illumination was adjusted by means of an adjustable rheostat, and was set at 3.5 footlamberts.

The stimulus field illumination was set at the same level as the blank field illumination, at 3.5 footlamberts. The precise level of stimulus field illumination was dependent upon the darkness of the lines comprising the verbal stimuli, and was determined by means of an ascending threshold task, described by Silverman (1984). Several nonclinical pilot subjects viewed the experimental stimuli presented at progressively increasing durations, beginning at 4 msec and

increasing exposures at 3 msec intervals. The illumination of the stimulus field was adjusted so that no pilot subject reported seeing even a single line at less than 13 msec. Five pilot subjects met this criterion before the stimulus field illumination level was considered fixed. These pilot subjects were in the experimental room at least 10 minutes before beginning the ascending threshold task in order to dark-adapt sufficiently to the ambient lighting conditions.

The verbal stimuli were constructed so that the horizontal visual angle of each stimulus was under 5.5° . The visual angle was calculated using the following formula (from Silverman, 1984):

$$\text{Visual angle theta} = \text{arc tangent of } \frac{\text{width of message}}{\text{viewing distance}}$$

The visual angle of the rational stimuli ranged from 3.31° to 5.49° ($x = 4.60^\circ$, $SD = 0.918$). The visual angle of the irrational stimuli ranged from 3.25° to 5.42° ($x = 4.61^\circ$, $SD = 0.909$).

Procedure

The procedure is outlined in Table 6 (Appendix J). The experimenter who actually led the subject through the

experimental procedure (hereafter referred to as the "tachistoscope experimenter") was a different experimenter from the one who conducted the screening assessments (the "screening experimenter"), so that the former investigator could remain blind as to the subjects' group. The stimulus cards were coded on their backs as to the proper sequence of administration by the screening experimenter so that the tachistoscope experimenter could insert them into the tachistoscope without knowledge of their content, thereby remaining blind as to stimulus conditions. The cards were re-coded for each subject.

Rationale and instructions. After introducing herself to the participant, the tachistoscope experimenter provided a brief oral and written overview of the rationale and procedure of the study (Appendix L), and informed consent was obtained. Subjects were informed of all aspects of the study at this time except for the specific content of the stimuli. Thus, no deception was used in this study. Every effort was made to put the participants at ease throughout the experimental session. This was important both to make participation in the study interesting and enjoyable for the subjects, as well as to maximize the probability of obtaining effects of the subliminal stimulation. Dixon (1981, p. 213) reviewed data suggesting that subliminal stimulation is more

likely to produce effects when subjects are relaxed than when they are anxious or uncomfortable.

After informed consent was obtained (Appendix M), the subject was asked to read a standard eye chart to ensure visual acuity of at least 20/20. The participant was then seated in front of the tachistoscope, and presented with a printed copy of the following instructions. The subject was asked to read along as the instructions were presented on an audiotape. The use of the audiotape ensured that the instructions were identical across all participants.

The machine in front of you is called a tachistoscope, or "t-scope" for short. It is made to flash words very quickly. As we have already discussed, several different statements will be flashed on the t-scope in this study. At times, some of the statements will be flashed so quickly that you probably won't be able to read them, and in fact you'll probably only see a quick flash of light. Each of these statements will be flashed four times in a row. At other times, some of the statements will be presented for several seconds, so that you will be able to read them. When the statements are presented slowly like this they'll only be presented once. In this study we are interested in two things. First, how much do people agree with different statements when they are flashed very quickly compared to when they are presented slowly? After seeing each statement look back at the paper in front of you. Then, for that item, make a mark somewhere on the line showing how much you agree or disagree with the statement that was just presented to you. Marks closer to the left end of the line show more disagreement with the statement, and marks closer to the right end of the line show more agreement with the statement. [Experimenter presented visual analogue scale, and demonstrated range of agreement ratings]. Of course, when the statement is flashed very quickly it will be hard to say exactly how much you agree with it since you won't be able to read it. Please just guess how much you'd agree with it if you could read it. Do

you understand what to do? [Experimenter clarified procedure as needed].

The second thing we are interested in is how the different statements might affect people's mood. A number of research studies have found that if you pay close attention to your feelings, you can notice changes in your mood from day to day, and even from hour to hour and minute to minute. In this study we'd like to see how well you notice your own feelings. You will be given a mood scale several times during the study, and all you have to do is to make a mark on the line next to each item to show how much you are experiencing that particular feeling right at that time. [Experimenter presents mood scale and demonstrates range of mood ratings]. Do you have any questions? Before we get started, remember that your participation is completely voluntary and that you can decide to quit the study at any time if you choose. OK, please go ahead and complete this form now, showing how much of each feeling you have right now; [this represented the baseline mood measure].

The measure of agreement and of mood are described further below. This introductory period lasted at least 10 minutes to allow the subjects to dark adapt sufficiently to the ambient room lighting.

The participant was then instructed to look into the tachistoscope and to report what she saw. The word HELLO!, printed in the same manner as the experimental stimuli, was presented for several seconds. This procedure, introduced by Porterfield and Golding (1985), ensured that the subject's visual acuity was adequate, and served as an introduction to the tachistoscope.

Presentation of stimuli. The first set of five experimental stimuli was then presented. In the supraliminal condition, each stimulus was presented continuously for four seconds, after which the subject was asked to make an agreement rating. The second stimulus in the series was then presented for four seconds, followed by an agreement rating and so on, until all five stimuli had been presented. Following presentation of the series, the mood measure was administered. The subliminal condition was conducted in the same manner, except that the stimuli were presented four times each for four msec per exposure, with inter-exposure intervals of three seconds. The blank stimulus field was presented during these three-second inter-stimulus intervals.

Following presentation of the first series of five stimuli, a five-minute delay occurred, in which the subject was free to read one of several magazines in the room. This period was included to allow any effects of the previous stimuli to dissipate. Although the exact time required for the effects of supraliminal or subliminal stimuli presented in the manner outlined here to fade is unknown, Silverman (1977, p. 3) noted that subliminal laboratory effects (in contrast to effects produced in therapy and educational contexts) are "slight, without subjective discomfort, and very fleeting." In one study, for example, Silverman, Pettit, and Dunne (1971, cited in Silverman, 1977) found that certain

subliminally presented stimuli intensified subjects' pathology immediately following the stimulation. During a second assessment made 15 minutes to a half hour later, however, the measure of pathology had completely returned to its baseline level.

Following the brief delay, the second set of stimuli was presented in the same manner as the first set. Immediately following presentation of each stimulus (once for four seconds in the supraliminal condition, and four times for four msec in the subliminal condition), an agreement rating was made. After presentation of all five stimuli in the series, another mood assessment was made, followed by another five-minute break. The third and fourth stimulus sets were presented in the same manner, with agreement ratings made immediately following each stimulus, mood ratings made immediately following each series of stimuli, and a five-minute break between stimulus conditions (see Table 6).

Discrimination Task

Following presentation of all four series of stimuli, a discrimination task was conducted to determine if subjects were able to distinguish the stimuli presented at the same illumination and exposure levels employed during the subliminal conditions of the study proper. This task,

designed by Silverman (1966), consists of a methodology in which subjects were asked simply to state (or guess) whether two consecutively presented stimuli were the same or different from one another. A greater than chance "hit rate" across subjects would indicate that the stimuli may not have been sufficiently weak to preclude awareness. A chance hit rate, however, would indicate that subjects were clearly unaware of the content of the stimuli. Instructions to the subjects similar to those used by Dauber (1984) were employed. Again, the subjects were provided with a printed copy of the instructions, and were asked to read along as the instructions are presented on an audiotape.

I have two statements here and I want to see whether you can tell them apart when I flash them on at the same speed as I did during the experiment. First, I am going to show you four flashes of one of the statements. Then I will show you four other flashes. This second set of flashes will be either the same statement you just saw, or a different statement from the one you just saw. I will then ask you to tell me whether you think the last set of flashes was the same statement or a different statement from the one just before it. Just say "same" or "different" to tell me what you think. After that, I'll flash a statement again four times, and will ask you again try to tell me whether it's the same one or a different one from the one that came just before it. We will keep doing this a few times, and each time all you have to do is to tell me whether you think the statement you just saw was the same or different from the statement right before it. You will be comparing each set of flashes to the set you saw right before it. Do you understand what to do? [Experimenter clarified instructions as needed]. Okay, now please put your eyes up against the viewer, and we can get started. During this task, please keep your eyes focused into the viewer, and do not look up from the viewer. Here are four flashes of the first statement. Now I'm going to show you four more flashes of either the same or a different statement. Just say "same" or "different" to let me know

what you think. Now I will show another four flashes and tell me if they are the same as or different than the statement you just saw.

Eleven trials of four exposures at four msec per trial were presented, with the experimenter coding the subjects' responses. One of the irrational stimuli (I HAVE TO BE PERFECT) and one of the rational stimuli (IT'S OK TO DISAGREE) that were actually employed in the study served as the two comparison stimuli for the entire discrimination task. A three-second interval occurred between the four presentations of each stimulus, with a five second interval between different stimuli. The subject was prompted for her response during each five second interval between stimulus set presentations.

Following completion of the discrimination task, participants were asked to complete a brief Post-Experimental Questionnaire (Appendix N).

Dependent Measures

As noted above, two dependent measures were employed. The first was an agreement rating on a 97 mm visual analogue scale, labeled "agree completely" at one end and "disagree completely" at the other (Appendix O). This measure was

quantified simply by measuring the distance from the left (disagree) pole to the subject's mark (i.e., mm of agreement).

The second dependent measure, designed to assess the participants' immediate dysphoric mood state, was a modification of the Depression Adjective Check List (DACL; Lubin, 1965; Appendix P).⁶ The modification, introduced by Varga (1973) and subsequently employed by Dauber (1984), consists of a 50-point scale rather than a present-absent choice for each item, thereby increasing the measures sensitivity to finer variations in mood. The sum of the ratings of negative adjectives minus the sum for positive adjectives constituted the actual dependent measure.

Five separate versions of the DACL were employed, so that a different version was used for each of the five assessments of each subject's mood (baseline, and after each set of stimulus presentations). In its original form, the different versions of the DACL have been shown to demonstrate high intercorrelations (alternate form reliability ranges from .82 to .84; Lubin & Himelstein, 1976). The sequence of the five versions was counterbalanced across trials so that all versions of the modified DACL were equally represented across all trials and subjects (i.e., each version was used for six of the thirty subjects for any given trial).

METHOD II

The same 30 subjects who participated in the procedure described above also participated in the second experimental procedure. Method II was conducted immediately following completion of Method I. This project involved administering four items from the Thematic Apperception Test (TAT; Murray, 1943), one of the most widely employed personality assessment measures. The four cards chosen for presentation were Numbers 1, 3BM, 10, & 14 (see Figures 1 through 4, Appendix Q). Card 1 consists of a young boy contemplating a violin that sits on a table in front of him. Card 3BM is a person whose gender is ambiguous huddled on the floor next to a couch, next to whom is an ambiguous object (often seen as a revolver). Card 10 is a close-up of the faces of an embracing man and woman of ambiguous ages. Finally, Card 14 consists of a silhouette of a man against a bright, open window, with the rest of the picture being totally black. Although only two of these cards (3BM and 14) are typically thought to pull specifically for depressive ideation, the other two cards were also chosen because they are known to elicit themes of achievement motivation, dysphoria, and intimacy, among others. These themes are central to the phenomenology of depression, and are reflected in the depressotypic cognitive schemas described by Beck.

Upon completion of Method I, subjects were read the following instructions by the experimenter (from Murray, 1943):

This is a test of imagination, one form of intelligence. I am going to show you some pictures, one at a time; and your task will be to make up as dramatic a story as you can for each. Tell what has led up to the event shown in the picture, describe what is happening at the moment, what the characters are feeling and thinking; and then give the outcome. Speak your thoughts as they come to your mind. Do you understand? Here is the first picture.

Consistent with standard TAT administrative guidelines, the experimenter refrained from making extraneous comments or providing unnecessary guidelines. The experimenter did prompt subjects, however, if they did not provide a complete response (i.e., if a story did not have a beginning, middle, and ending). The four cards were presented in the order described above to all subjects.

All responses were audiotaped and transcribed. In addition to the subjects' actual responses, four other dependent measures were obtained. These were the response latency between presentation of each card and the first response to that card, the total response time to each card, the total of the response latencies across the four cards for each subject, and the total of the response times for each subject.

Transcribed copies of each subject's responses were given to 10 doctoral level clinical psychologists employed at Beth Israel Medical Center in New York City. All 10 of the psychologists had received formal training in the administration and interpretation of the TAT. Nine of the 10 rated their familiarity with interpretation of TAT data as "moderate," with one rating of "somewhat." The psychologists reported a mean of 7.55 years of clinical experience (SD = 2.99), and reported having either administered or supervised the administration of an average of 7.90 TAT protocols (SD = 5.78) during the preceding year.

Informed consent was obtained following a brief introduction to the purpose of the study. Each psychologist was then given a complete copy of the TAT data, as well as the following written instructions:

I want to express my sincere thanks for helping with my dissertation project. Recalling your own years as a graduate student, I'm sure you can appreciate how grateful I am for your assistance.

On the pages that follow are TAT stories from thirty subjects. Each subject generated responses to the following cards: #1 (a young boy contemplating a violin that rests on a table in front of him); #3BM (a person sitting on the floor huddled against a couch. On the floor beside the person is an object); #10 (a young woman's head against a man's shoulder); and #14 (the silhouette of a person against a bright window. The rest of the picture is totally black). The cards were administered under standard instructional conditions by a female undergraduate psychology student.

The purpose of this study is to assess the sensitivity of the TAT to detect depressotypic themes. Some of the subjects in the study were clinically depressed, whereas others were not depressed. After reading the responses to the four cards for each subject, your task is simply to make a judgment as to whether or not you think the subject was depressed. Please mark your judgments on the form on the following page. In clinical settings, of course, one would never diagnose depression on the basis of TAT data alone. Nevertheless, please make your best judgment on the basis of these limited data regarding whether or not each subject was depressed.

You will be given a debriefing statement that describes the study in more detail upon completion of the task. I will also be happy to provide a list of which subjects were depressed and which were not if you would like. Once again, thank you very much for your help.

The psychologists recorded their diagnostic judgments (i.e., depressed vs. not depressed) for each of the 30 subjects, and returned these to the experimenter at their leisure. Upon receipt of these data the psychologists were provided with a written and oral debriefing (Appendix R), and a form listing the actual diagnostic status of each subject.

METHOD III

Upon completion of Method II, all 30 participants engaged in one final task. Each subject was asked to complete two versions of the Dysfunctional Attitudes Scale (DAS, Form A;

Weissman & Beck, 1978; Appendix C). The DAS is a 40 item self-report checklist that was designed to assess the dysfunctional schemas that are thought to underlie depression. The subject rates his or her agreement with each of 40 beliefs on a 1 to 7 Likert scale from "totally agree" to "totally disagree."

The standard instructions were modified in the first version of the scale completed by subjects in the present study. Instead of asking subjects to rate their own degree of agreement with each statement, they were asked to rate how much they think someone else might agree with each statement. The following instructions were printed on the form:

This inventory lists different attitudes or beliefs which people sometimes hold. Read EACH statement carefully and decide how much you think ANOTHER PERSON (not you) might reasonably agree or disagree with the statement. For each of the attitudes, show your answer by placing a checkmark (✓) under the column that BEST DESCRIBES HOW YOU THINK SOMEONE ELSE MIGHT THINK. Be sure to choose only one answer for each attitude. Do not mark how you personally think, but rather how you believe someone else might think. You don't have to have any particular person in mind. Just estimate how much each belief might apply to someone else. For example, the first statement is "it is difficult to be happy unless one is good looking, intelligent, rich, and creative." If you could imagine that it might be reasonable for someone (anyone) to strongly agree with this statement, you would mark "agree very much."

Upon completion of the first version of the DAS, subjects were provided with a second copy of the questionnaire, in which the standard administrative instructions were provided.

The two versions of the questionnaire were identical except for the different instructions for each. The order of presentation of the two versions was the same for all subjects. That is, version one (modified instructions) always preceded version two (standard instructions). Counterbalancing the order of presentation across subjects was avoided because it was felt that the remitted subjects in particular would be unlikely to endorse many dysfunctional beliefs on the "other person" version of the questionnaire if it followed the standard version. The instructions for the second version were as follows:

Now please read each statement again, and decide how much YOU PERSONALLY agree or disagree with each statement. Place your checkmark under the appropriate column like before. Because people are different, there are no right or wrong answers. To decide whether a given attitude is typical of your way of looking at things, simply keep in mind what you are like MOST OF THE TIME.

Upon completion of this measure, the participants were thoroughly debriefed both verbally and in writing (Appendix S), thanked for their participation, and dismissed.

RESULTS

METHOD 1

Check for Subliminality of Stimuli

In order to evaluate whether or not the stimuli were in fact below the subjects' recognition threshold during the subliminal conditions, the number of correct discriminations made during the discrimination task was evaluated for each group. Since there were ten discrimination trials, five correct responses would be expected by chance. The depressed subjects had a mean of 5.8 correct responses, compared with 4.2 for the normals and 5.1 for the remitted subjects. A separate t-test was conducted for each subject group in which the number of correct responses was compared to the expected number of five. A significant t-test would indicate that the number of correct discriminations differed significantly from what would be expected on the basis of chance, thereby suggesting that the stimuli could at least sometimes be discriminated by the subjects. In contrast, a nonsignificant t-test would indicate chance responding on the discrimination task, thereby supporting the subliminality of the experimental stimuli. None of the three t-tests reached significance at $p < .05$ ($t = -0.95, 1.81, \text{ and } -0.17$ for the depressed, normal, and remitted groups, respectively), indicating that the

accuracy of subjects' discriminations did not differ from what would be expected on the basis of chance.

In order to evaluate the possibility of a response bias, additional t-tests compared the number of "same" and the number of "different" responses to the expected five (chance responding for ten trials). Again, a significant t-test would suggest a bias toward responding either "same" or "different," whereas a nonsignificant t-test would suggest that neither response predominated. The mean number of "same" responses was 4.7, 4.2, and 4.9 ($t = 0.45, 1.81, \text{ and } 0.32$), and the mean number of "different" responses was 5.3, 5.8, and 5.1 ($t = -0.45, -1.81, \text{ and } -0.32$) for the depressed, normal, and remitted subjects, respectively. None of these t-tests was significant, indicating that all three subject groups responded with a mix of "same" and "different" responses, and none of the groups had a bias toward either response.

Although the above analyses are consistent with random responding on the discrimination task, the question remains as to whether the three subject groups differed from one another in either their accuracy or their tendency to give "same" vs. "different" responses. These questions were evaluated by means of three one-way analyses of variance (ANOVA's) by group on the number of correct discriminations, the number of "same" responses, and the number of "different"

responses (Table 7). None of these analyses reached significance at $p < .05$, indicating no differences across groups in the accuracy or the pattern of responses on the discrimination task.

It should also be noted that none of the subjects reported seeing anything more than extremely brief flickers of light during the subliminal experimental phases or the discrimination task. Thus, the results of the discrimination task suggest that the experimental stimuli were in fact well below the subject's recognition threshold during the subliminal conditions.

The Effects of the Stimuli on Mood

Subjects completed a modified version of the Depressive Adjective Check List (DACL) at baseline then again after each of the four within-subjects experimental phases. As described above, the DACL consists of a series of dysphoric and euphoric adjectives with which the subject indicates his or her agreement. The present modification of the DACL consisted of adding a 130 mm visual analogue scale next to each adjective. Rather than agreeing or disagreeing completely with each adjective, subjects rated their degree of agreement on this scale. Scores on the DACL were obtained by measuring the

number of mm of agreement for each adjective, then subtracting the total agreement with the euphoric adjectives from the total agreement with the dysphoric adjectives.

A one-way ANOVA by group on the baseline DACL reached significance at $p = .0001$. Tukey's post hoc comparisons ($p < .05$) revealed that the depressed subjects were more dysphoric than the remitted subjects, who were in turn more dysphoric than the normal subjects at baseline (Table 8). This pattern is consistent with predictions made regarding the baseline mood states of the three groups insofar as the actively depressed subjects were expected to be more dysphoric than the other two groups. Although the obtained difference between the remitted and normal groups was not specifically predicted, it is quite small in magnitude and of little or no clinical significance. The effects of these baseline DACL differences on the analysis of the experimental data were controlled by means of gain scores (the method recommended by Huck & McLean, 1975). Gain scores were generated by partialling out each subject's baseline level of dysphoria from the subsequent dependent measures. This was accomplished by subtracting the subjects' baseline DACL score from each of the DACL scores collected after the four experimental phases. The resulting gain scores were then analyzed by means of a four-way ANOVA and associated post hoc comparisons, described below (Tables 9 & 10). The analyses of the gain scores

revealed the same pattern of results as the analyses of the unadjusted DACL scores, described below. For this reason, only the results of the analyses of the unadjusted DACL data are reported in detail.

The effects of the experimental manipulations on the unadjusted DACL were evaluated by means of a 4 (counterbalanced orders) by 3 (depressed vs. remitted vs. normal subjects) by 2 (subliminal vs. supraliminal stimulus presentation modality) by 2 (rational vs. irrational stimulus valence) ANOVA, with repeated measures on the last two factors (Table 11). The ANOVA revealed a significant main effect for group ($p = .0001$), and a significant order by modality interaction ($p = .0212$). Consistent with predictions, Tukey's post hoc comparisons revealed that the depressed subjects were more dysphoric across all experimental conditions than were the remitted and the normal subjects, whereas these latter two groups did not differ from one another (Table 12). This result is consistent with the baseline difference described above, in which the depressed subjects were more dysphoric at baseline relative to the other two groups. Although the remitted subjects were more dysphoric than the depressives at baseline, this difference disappeared when the data were averaged across the four within-subject experimental phases.

The significant order by modality interaction was evaluated not only by means of standard Tukey post hoc comparisons (Table 13), but also by means of a method described by Boik (1979; Table 14). The standard method of exploring a significant interaction involves conducting a series of a posteriori simple effect comparisons. For example, given a significant interaction between two factors A and B, each level of factor A would be compared against all other levels of factor A at a given level of factor B. Each level of factor B would in turn be compared against all other factor B levels at a given level of factor A. The method described by Boik allows more specific hypotheses to be tested by comparing combinations of certain levels of a factor against other levels of that factor. For example, if factor A has four levels, then a comparison could be made between Levels 1 + 3 and Levels 2 + 4 using a modified F-test.

In the present order by modality interaction, there were four levels of the order factor (Orders 1 through 4) and two levels of the modality factor (subliminal vs. supraliminal). The four orders consisted of different combinations of the two within-subjects factors. For example, Order 1 consisted of the following sequence of experimental phases: (a) subliminal-irrational, (b) subliminal-rational, (c) supraliminal-irrational, (d) supraliminal-rational. The sequence of the remaining orders, as well as the mean DACL for

each combination of order and modality, is presented in Table 15.

A series of interaction contrasts were conducted using the Boik method ($p < .05$) in which combinations of two order levels were compared to combinations of two other levels (Table 14). These contrasts were performed separately for the subliminal condition and for the supraliminal condition. They permitted an evaluation of whether it was the stimulus valence, the modality of presentation, or some combination of the two that comprised the orders' contribution to the interaction. These contrasts revealed that orders in which the first stimulus set presented was irrational resulted in more dysphoric mood than orders in which the rational stimuli were presented first. This effect occurred regardless of whether the initial stimulus set was presented subliminally or supraliminally. That is, subjects whose first experimental phase consisted of subliminal presentations of irrational stimuli became more dysphoric than subjects whose first phase was subliminal-rational. Similarly, subjects first presented with supraliminal-irrational stimuli became more dysphoric than subjects first presented with supraliminal-rational stimuli.

This effect of the initial stimulus valence occurred for both levels of the modality factor; i.e., on the DACL measures

taken after both the subliminal and supraliminal phases. For example, a subject whose first stimulus condition was subliminal-irrational was more dysphoric not only in the initial subliminal phases, but also in the later supraliminal phases, relative to a subject whose first stimuli were subliminal-rational. Thus, the valence of the first stimulus condition encountered, regardless of the modality of presentation, determined the subjects' mood for the remainder of the experimental task. Although the pattern of means for the four orders was somewhat different across the two modalities, thereby yielding the significant interaction on the omnibus test (see Table 15), the more detailed post hoc comparisons revealed the same effect of order for both the subliminal and supraliminal conditions.

In summary, consistent with predictions, analysis of the mood data revealed that the depressed subjects were more dysphoric than the remitted and normal subjects across all experimental conditions, whereas the latter two groups did not differ from one another. The valence of the initial stimulus condition presented to subjects determined the degree of dysphoria they reported across all of the experimental phases. Subjects who first encountered irrational stimuli became more dysphoric and remained so throughout the experiment than subjects who first encountered rational stimuli. This stimulus valence effect occurred regardless of

whether the stimuli were presented subliminally or supraliminally. This effect, however, did not occur differentially by subject group.

Although this pattern of results is consistent with predictions in that the irrational stimuli were expected to result in more dysphoric mood ratings than the rational stimuli, at least in certain conditions, they are inconsistent with predictions in two important ways. First and foremost, there were no differences across the three subject groups in the pattern of effects of the stimulus valence and modality of presentation factors. Recall that according to predictions derived from Beck's theory, the remitted subjects were expected to differ from both the depressives and the normals in their response to these manipulations. Specifically, they were predicted to respond similarly to the depressives in the subliminal conditions, and similarly to the normal subjects in the supraliminal conditions. The second way in which the results are inconsistent with predictions is that the subjects' mood was expected to vary as a function of each of the four experimental phases, rather than being affected only by the first phase encountered.

The Effects of the Stimuli on Agreement Ratings

Each of the four within-subjects experimental phases described above consisted of the presentation of five stimuli. Recall that following the presentation of each stimulus, subjects rated their agreement with that stimulus on a 97 mm visual analogue scale marked "disagree completely" at one pole and "agree completely" at the other. The degree of agreement with each stimulus was quantified by measuring the number of mm from the left (disagree) pole to the subject's mark.

An index of each subject's overall agreement with the stimuli within an experimental condition was obtained by summing the five agreement scores for each stimulus within that condition. Collapsing across the stimuli in this manner made conceptual sense since the stimuli are all hypothesized to reflect the same theoretical construct (i.e., depressotypic cognitive style). In order to evaluate empirically the covariation among the stimuli, a correlation matrix was constructed consisting of the agreement ratings with each of the five individual stimuli as well as the total agreement index (Table 16). Pearson correlations revealed that the agreement ratings for all stimuli were significantly positively correlated with the ratings for all other stimuli, including the total agreement index ($p < .0001$ for all comparisons). Given the high degree of positive covariation

among agreement ratings with the five stimuli, the total agreement index served as the dependent measure for the analyses described below.

The effects of the experimental manipulations on subjects' agreement ratings were evaluated by means of a 4 (counterbalanced orders) by 3 (depressed vs. remitted vs. normal subjects) by 2 (subliminal vs. supraliminal stimulus presentation modality) by 2 (rational vs. irrational stimulus valence) ANOVA, with repeated measures on the last two factors (Table 17).⁷ The ANOVA revealed a significant main effect for valence ($p = .0001$). Overall, subjects agreed more with the rational stimuli ($x = 305.35$) than with the irrational stimuli ($x = 178.60$).

A group by valence interaction also emerged ($p = .0001$). Tukey's post hoc comparisons ($p < .05$) revealed that whereas the remitted and normal subjects showed higher agreement with the rational relative to the irrational stimuli, there was no difference across valences for the depressed subjects (Table 19). Moreover, the three groups did not differ in their degree of agreement with the irrational stimuli. For the rational stimuli, the remitted subjects had higher agreement ratings relative to the depressed subjects, whereas the normal subjects did not differ from either of the other two groups.

The ANOVA also revealed a significant modality by valence interaction ($p = .0001$). Tukey's post hoc comparisons ($p < .05$) revealed that the rational stimuli elicited higher agreement ratings than the irrational stimuli only in the supraliminal conditions; there were no differences between the stimulus valences in the subliminal conditions (Table 20). Moreover, agreement ratings for the irrational stimuli were lower in the supraliminal conditions relative to the subliminal conditions. The opposite pattern occurred for agreement ratings with the rational stimuli: They were higher in the supraliminal conditions than in the subliminal conditions. Thus, agreement ratings in the subliminal conditions, regardless of stimulus valence, fell midway between the ratings for the supraliminal-rational stimuli on the one hand and the supraliminal-irrational stimuli on the other.

Finally, a group by modality by valence interaction also reached statistical significance ($p = .0001$). Tukey's post hoc comparisons ($p < .05$) revealed the following results (Table 21). First, there were no differences between the subject groups in any of the subliminal conditions. In the supraliminal conditions, however, the depressed subjects agreed more with the irrational stimuli and less with the rational stimuli than did the remitted and normal subjects, whereas these latter two groups did not differ from one

another. Second, subjects in all groups agreed more with the rational stimuli than with the irrational stimuli when they were presented supraliminally, but did not differ in their agreement with the two stimulus types when they were presented subliminally. Finally, the pattern of results described above for the modality by valence interaction only occurred for the remitted and normal subjects. That is, the remitted and normal subjects agreed more with the rational stimuli when presented supraliminal relative to subliminally, and less with the irrational stimuli when presented supraliminally relative to subliminally. There were no differences between the modality of stimulus presentation given either stimulus valence for the depressed subjects.

In summary, subjects' agreement ratings to the individual experimental stimuli were highly positively correlated, as expected. The rational stimuli elicited higher agreement than did the irrational stimuli, but only for the remitted and the normal subjects, and only in the supraliminal conditions. There were no differences between agreement with the rational vs. irrational stimuli for the depressed subjects, or for any subjects in the subliminal conditions. Although it was predicted that the three groups would show this pattern of agreement ratings in the supraliminal conditions, the greater agreement with the rational stimuli by the normal and remitted subjects was not expected to be limited to the supraliminal

conditions only. Contrary to predictions, there was no evidence that the subliminal stimuli affected subjects' agreement ratings. This lack of impact of the subliminal stimulation on the agreement ratings stands in contrast to the results of the mood data, in which the rational vs. irrational stimuli differentially affected subjects' mood even when presented subliminally. Interestingly, the difference between subject groups in their agreement ratings reflected a tendency for the remitted subjects in particular to agree more with the rational stimuli relative to the depressed subjects, rather than a difference between subjects in agreement with the irrational stimuli. This result was not predicted by Beck's theory, which emphasizes the association of a higher than normal degree of irrational beliefs with depression, rather than a lack of adequate rational beliefs. For the remitted and normal subjects, the agreement ratings for the subliminally presented stimuli, regardless of valence, fell midway between the ratings for the supraliminal-rational stimuli on the one hand, and the supraliminal-irrational stimuli on the other hand. No such difference emerged for the depressed subjects. This pattern is consistent with the results described above in which the stimulus valence affected the remitted and normal subjects only, and only in the supraliminal conditions.

METHOD 2

Latency Measures

As described previously, the latency between presentation of each TAT card and the first response to that card was recorded from audiotapes of subjects' TAT data. In addition, the total response time for each card was also recorded. Contrary to predictions, one-way ANOVA's by subject group revealed no differences across groups in either of these measures (Table 22). Two additional one-way ANOVA's were conducted on the sum of the response latencies across each subject's four TAT responses, and the sum of the total response times (Table 23). Both of these ANOVA's also failed to reach significance.

Diagnostic Judgments

The psychologists' diagnostic data consisted of categorical "depressed" vs. "not depressed" judgments. The primary dependent measure was the number of "depressed" diagnoses given to each of the 30 subjects. For any subject, this number could range from zero (when none of the ten psychologists diagnosed the subject as depressed) to ten (when all ten psychologists diagnosed the subject as depressed).

The mean number of depressed diagnoses per subject by subject group were 6.0 (SD = 1.70) for the depressed group, 1.9 (SD = 1.20) for the remitted group, and 3.5 (SD = 2.07) for the normal group. A one-way ANOVA by group reached significance at $p < .05$. Tukey's post hoc comparisons ($p < .05$) revealed that the depressed group was more likely than the remitted group to be diagnosed as depressed (Table 24). The depressed group did not differ from the normal group, however, nor did the normal and remitted groups differ. Although it did not reach statistical significance, there was an interesting trend for the remitted subjects to be less likely to be diagnosed as depressed relative to the normal subjects.

In order to clarify the pattern of "correct" vs. "incorrect" diagnoses, a 2 by 2 matrix was constructed for each subject, with the subjects' actual diagnostic status (depressed vs. normal) forming one side of the matrix, and the psychologists' diagnoses forming the other side. The judgments for the remitted subjects are not included in this matrix since their "true" diagnostic status is ambiguous; their data were instead summarized separately. The means and standard deviations of each cell of this matrix are presented in Table 25. Examination of this table reveals that the psychologists achieved a similar number of hits (6.0) and correct rejections (6.5), and a similar number of misses (4.0) and false alarms (3.5).

In summary, the results of the latency and response time measures revealed no differences across the three subject groups. Although the expected direction of the difference was uncertain, it was predicted that the depressed and remitted subjects would differ from the normal subjects in these time measures. The psychologists correctly diagnosed more of the depressed subjects as depressed relative to the remitted subjects. The number of depressed diagnoses given to the normal subjects did not differ, however, from either the remitted or the depressed groups. This pattern is contrary to predictions made from Beck's theory, in which a greater number of depressed diagnoses was expected to be assigned to both the remitted and actively depressed subjects relative to the normals.

METHOD 3

Subjects' scores on each version of the Dysfunctional Attitudes Scale (DAS) were subjected to one-way ANOVA's by subject group. The mean scores for the "other person" version of the DAS were 139.89 (SD = 24.68), 142.80 (SD = 47.58), and 147.30 (SD = 31.89) for the normal, remitted, and depressed subjects, respectively. A one-way ANOVA did not reach significance, revealing no differences across groups (Table

26). For the standard "self" version of the DAS, the normal subjects' mean score was 108.78 (SD = 16.28), the remitted subjects' mean score was 107.70 (SD = 22.15), and the depressed subjects' mean score was 152.20 (SD = 43.64). A one-way ANOVA reached significance at $p = .0038$. Tukey's post hoc comparisons revealed the predicted pattern: The depressives achieved a higher score (indicating more dysfunctional attitudes) relative to the normal and remitted subjects, who did not differ from one another (Table 27).

The difference between the modified and the standard versions of the DAS was compared by obtaining a difference score for each subject (DAS-other minus DAS-self), which was subjected to a one-way ANOVA by group. The mean difference scores were 31.11 (SD = 28.14), 35.10 (SD = 35.69), and -4.90 (SD = 68.04) for the normal, remitted, and depressed subjects, respectively. A one-way ANOVA by group on the difference scores failed to reach significance (Table 28). Although the difference scores were not significantly different across subject groups, examination of the means reveals a trend in which the depressives' scores on both versions of the DAS are comparable, and are similar to the normal and remitted subjects' scores on the "other person" version. The normal and remitted subjects, however, tended to endorse fewer dysfunctional beliefs on the "self" version relative to the "other" version.

In summary, as predicted, the depressed subjects demonstrated greater endorsement of dysfunctional beliefs relative to the normal and the remitted subjects on the standard, self-focused DAS, and the latter two groups did not differ from one another. Contrary to predictions, however, there were no differences between groups on a modified version of the DAS in which the beliefs of an abstract other person were rated. Recall that it was predicted that both the depressed and the remitted subjects would endorse more dysfunctional beliefs than the normals on this modified version of the DAS. Finally, also contrary to predictions derived from Beck's theory, there were no differences between groups in the difference between the "other" and the "self" versions of the DAS.

DISCUSSION

The purpose of the present investigation was to examine the hypothesis that a depressotypic cognitive style represents a diathesis condition in the etiology of depression. The cognitive theory of depression proposed by Beck and his colleagues (1976) holds that certain early experiences lead to the development of an irrational, self-defeating view of the self, the world, and the future. These themes, in the form of cognitive schemas, are thought to be situationally and longitudinally stable. They are latent or relatively unavailable to the individual him or herself until activated by a significant stressor, such as a major loss. Once activated, the schemas color a wide range of cognitive processes, resulting in the depressive syndrome. As the depressive episode remits, the schemas once again become latent.

There exists a large body of literature documenting the presence of depressotypic cognitions, including the core beliefs reflective of irrational schemas, in actively depressed persons (Hollon & Beck, 1979). The hypothesized presence of depressotypic schemas in depression-prone persons who are currently asymptomatic, however, has generally not been supported. Nevertheless, this negative finding is not

inconsistent with Beck's theory, since the majority of prior studies have not assessed for depressotypic schemas in ways that would be expected to expose their presence, given their latent status. If the diathesis aspect of Beck's theory, which is arguably the most critical component of the theory, is to be supported, these latent schemas must somehow be exposed.

The present investigation represented an effort to evaluate whether or not such depressotypic schemas are present in the depression-prone person by comparing the performance of actively depressed, remitted, and never-depressed persons using three different assessment methods. Each of the methods was designed to go beyond standard self-report measures in an effort to examine the presence of underlying beliefs of which the subjects themselves were presumably either unaware, or hesitant to reveal. The three methods differed in the degree to which they were obviously designed to assess cognitive schemas. The tachistoscopic procedure was designed to bypass any experimenter demand, social-editing, or defensive processes that might obscure the presence of latent depressotypic schemas. Since the subjects were unaware of the content of the stimuli during the subliminal conditions, they could not intentionally edit their reactions to the stimulation. The Thematic Apperception Test (TAT) task was somewhat less concealed in its purpose, presumably allowing

the subjects a greater degree of control over what they revealed about their core beliefs. The Dysfunctional Attitudes Scale (DAS) procedure was the least veiled of the three methods from the subjects' perspective.

A review of the predictions for each of the experimental methods, followed by a discussion of the results obtained, is presented below. The results are then discussed in terms of their implications for Beck's theory. Finally, a discussion of how the present results interface with other psychological research on diathesis conditions in the etiology of depression, followed by a discussion of directions for future research, is presented.

The Tachistoscopic Procedure

The first of the three experimental procedures was essentially a type of mood induction procedure in which participants were presented with five irrational statements derived from the depressotypic schemas outlined by Beck, as well as five rational counterpart statements. The stimuli were presented both subliminally and supraliminally to all subjects by means of a tachistoscope. Following presentation of each stimulus, participants were asked to rate their degree of agreement with that statement along a visual analogue

scale. Following each set of stimuli, subjects completed a sensitive mood measure designed to assess subtle changes in mood (especially along a dysphoria-euphoria dimension) that resulted from the previous stimulus set.

Mood measure. On the basis of Beck's theory and the results of studies employing the subliminal psychodynamic activation method with depressives (Cox, 1974; Dauber, 1984; Miller, 1973; Rutstein & Goldberger, 1973; Varga, 1973), the following predictions were made for the Depressive Adjective Check List (DACL, Lubin, 1965). These predictions can be summarized as a group by modality by valence interaction. First, it was predicted that the moods of the never-depressed subjects would be relatively unaffected by the stimuli, since they do not hold the depressotypic schemas reflected by the stimuli. The predictions for the actively depressed subjects were less clear. They might be expected to show an increase in dysphoric mood following the irrational stimuli, especially in the subliminal condition. Since their depressotypic schemas are presumed to have already been activated, however, it is not clear that an exacerbation of dysphoria would be expected. The most critical predictions concerned the remitted group. As discussed above, they are hypothesized to hold latent depressotypic schemas but are unable or unwilling to reveal such beliefs on standard self-report measures. It was therefore predicted that the subliminal presentation of

the irrational stimuli would result in an increase in dysphoria, with a corresponding decrease in dysphoria following the subliminal rational stimuli. The supraliminal stimuli were predicted to have little or no effect on the remitted subjects' mood.

The results of the DACL revealed that the depressed subjects were more dysphoric across all experimental conditions relative to both the remitted and the never-depressed subjects. This result is consistent with the baseline difference between the depressed subjects and the other two groups, and simply confirms the expected finding that the depressives were more dysphoric throughout the procedure.

The predicted differential effects by subject group were not obtained. All three groups responded similarly on the DACL to the experimental manipulations. The absence of any differential effects by subject group is, of course, inconsistent with the predictions made according to Beck's theory. The implications of this finding for Beck's theory are discussed along with other results in a separate section below.

Close analysis of the data also revealed an interesting and unexpected effect of the stimuli. The valence of the first stimulus set encountered by the participants, regardless of whether it was presented subliminally or supraliminally, determined the degree of dysphoria reported throughout the remainder of the procedure. Subjects who were presented with the irrational stimuli first were more dysphoric across not only that initial phase but also across the three remaining experimental phases, relative to subjects who were presented with the rational stimuli first. This effect occurred for all three subject groups.

This finding raises several implications. First, it suggests the occurrence of a kind of primacy effect. The first set of stimuli encountered by the participants appeared to set their mood, leaving it impervious to the effects of the stimuli that followed. Although the present procedure included a ten minute resting period between each experimental phase, it may have been that this was insufficient to allow the subjects' mood to return to baseline. In the only study to examine this issue directly, Silverman et al. (1971) found that the exacerbation of psychopathology that occurred following subliminal stimulation completely dissipated between 15 and 30 minutes later. No similar study has examined this issue with depressives, however, leaving open the question of exactly how long a dysphoric mood induction lasts.

The second feature of the above finding is its consistency with the mood induction literature (Averill, 1969; Coleman, 1975; Goodwin & Williams, 1983; Hale & Strickland, 1976; Isen et al., 1978; Masters et al., 1979; Moore et al., 1973; Natale, 1977a, 1977b; Polivy & Doyle, 1980; Strickland et al., 1975). Recall that standard mood induction techniques (e.g., Velten, 1968) involve measuring changes in dysphoria following the presentation of negatively toned statements to nondepressed subjects. A primary criticism that has been raised against such procedures in the study of clinical depression is the possibility that the results are due to experimenter demand effects (Buchwald, Strack, & Coyne, 1981; Polivy & Doyle, 1980). The present results suggest that a negative mood induction is possible in depressed, remitted, and never-depressed persons. Thus, negative mood induction is possible not only in nondepressed persons, but in persons demonstrating a wide range of baseline dysphoria levels. Moreover, the fact that such induction took place even when the stimuli were outside of both the experimenter's and the subjects' awareness mitigates against an experimenter demand explanation.

A third important feature of the results of the tachistoscopic procedure is the finding that the valence of the stimuli had an impact upon the participants' mood even

when presented subliminally. This result supports the treatment integrity of the experimental procedure. Despite being well below the recognition threshold, the stimuli nevertheless had an impact on mood. This finding adds yet another small piece of evidence to the growing body of literature documenting the various effects of stimulation without awareness in laboratory studies (Dixon, 1981).

Agreement ratings. The predictions for the agreement ratings were similar to the predictions for the mood data, and can also be summarized as a group by modality by valence interaction. Since they hold no predisposition toward depression, the normal subjects were predicted to agree with the rational statements and disagree with the irrational statements, regardless of modality. In contrast, the depressives were predicted to show lower agreement with the rational statements and higher agreement with the irrational statements relative to the normal subjects, regardless of modality. The remitted subjects were expected to respond similarly to the normals during the supraliminal conditions, and to the depressives during the subliminal conditions. That is, they were expected to show relatively higher agreement with the rational stimuli when they were presented supraliminally, and relatively higher agreement with the irrational stimuli when presented subliminally.

The results of the agreement ratings did not support the diathesis component of Beck's theory. Although the results were basically consistent with predictions for the depressed and normal subjects, the predictions for the remitted subjects were not supported. Specifically, there were no differences in the pattern of agreement ratings between the remitted and the normal subjects. Both of these groups agreed more with the rational stimuli than with the irrational stimuli, but only when the stimuli were presented supraliminally. There were no differences between the remitted and normal subjects' agreement ratings for the rational vs. irrational subliminally presented stimuli. Similarly, the depressed subjects did not differ in their agreement ratings for the rational vs. irrational subliminal stimuli.

These results are consistent with the results of the mood data described above. Like the mood data, they reveal the predicted difference between the actively depressed and the never depressed subjects. These findings are consistent with the large body of literature documenting irrational beliefs among depressives. These findings also validated that the sample of depressed subjects employed in this study was representative of the population described in the literature with respect to the presence of irrational beliefs.

Unlike the mood data, however, the agreement ratings were not affected in the subliminal conditions. There are at least two related explanations for this discrepancy. First, it is possible that the more analytical reasoning processes underlying the agreement ratings were less susceptible to subliminal stimulation relative to the more impressionistic mood ratings (cf. Dixon, 1981). Similarly, the subjects may have found the agreement task during the subliminal conditions significantly less plausible than the mood measure. Casual observations of the subjects' reaction to the experimental instructions suggested that the notion that subliminal stimulation may result in slight changes in mood was easier to accept by most subjects than the idea that they could rate their agreement with statements that they could not see. This impression may have led the participants to constrict their range of ratings on the visual analogue scales more for the agreement measures than for the mood measures. This interpretation is supported by comparison of the average standard deviations for the two measures. Although the length of the visual analogue scale for each item of the mood measure was somewhat longer than the scale for the agreement measure (130 mm vs. 97 mm.), the mean standard deviation for the mood measure across all conditions and all groups was over three times as large (367.41) as the standard deviation for the agreement measure (117.88).

As noted above, like the mood data, the agreement data were inconsistent with the diathesis component of Beck's theory. This point is discussed further below.

The Thematic Apperception Test

The Thematic Apperception Test (TAT; Murray, 1943) is one of the most widely used psychological assessment instruments among clinical psychologists, and is included in most standard test batteries in which personality functioning is assessed (Rapaport et al., 1968). One's responses to the ambiguous interpersonal scenes depicted on the TAT cards are held to reflect basic themes around which one's behavior and experiences are organized. Revelation of these themes in TAT responses is not thought to be contingent upon the subjects' awareness of them. The TAT was therefore chosen as a tool for investigating the presence of depressotypic schemas in the remitted depressive.

As described previously, there were two types of data extracted from the subject's TAT responses. First, time measures of the latency to the first response to each card, and the total response time for each card were recorded. It was predicted that the actively depressed subjects and the remitted subjects would have longer response latencies than

the normal controls. This pattern was predicted since two of the four cards administered are known to elicit depressive themes (Holt, 1978; Rapaport et al., 1968), which would be expected to be conflictual or threatening to these individuals, and therefore to result in longer response latencies. The predictions for the total response time were less clear; although the depressives might be expected to have longer total response times relative to the other groups due to their characteristic psychomotor retardation, they might also have shorter times due to lack of interest and involvement in the task.

The second class of data obtained from the TAT procedure was the psychologists' diagnostic judgments. It was reasoned that the presence of depressotypic themes among a subject's responses would increase the likelihood that she would be diagnosed as depressed. It was therefore predicted that a higher proportion of the subjects in the depressed and in the remitted groups would be diagnosed as depressed relative to the normal subjects.

Both the time measures and the diagnostic data failed to support the predictions. Like the results of the tachistoscopic procedure described above, the results of the TAT data were not consistent with predictions made according to Beck's theory. There were no differences between the

subject groups in either of the time measures. Although the depressed subjects were indeed more likely to be diagnosed as depressed relative to the remitted subjects, there were no differences between the normal subjects and either of the other two groups. There was an interesting trend for the remitted subjects to be less likely to be diagnosed as depressed relative to the normal subjects, which is consistent with the fact that only the remitted subjects differed significantly from the depressives. This finding suggests that the responses of the remitted subjects actually contained somewhat fewer depressive themes than the responses of the normal subjects. It is possible that the remitted subjects were going out of their way to give "normal" responses free of any depressive themes. Although intriguing, such an interpretation must remain most tentative due to the relatively small differences in the diagnostic data between the remitted and normal groups.

There are at least two potential explanations for the lack of predicted results. First, it could be argued that although the TAT is indeed sensitive to organizing schemas, it is not differentially sensitive to depressotypic schemas, even given the particular cards chosen for administration in the present investigation. That is, although the test may have elicited depressotypic themes, among others, from the depressed subjects, it may have elicited equally conflictual

nondepressotypic themes from the nondepressed subjects. This is consistent with the fact that not all of the four cards chosen for administration are typically thought to pull specifically for depressive themes. The similarity in the time measures might therefore be expected.

The second explanation for the lack of predicted results concerns the purpose of the TAT in general, and the manner in which the present data were collected in particular. The TAT is generally used to assess idiosyncratic organizing themes, as noted above. It is rarely if ever used alone to make broad nosological diagnostic judgments such as depressed vs. not depressed. The presence of certain themes or other response characteristics across several cards may suggest a diagnostic category. It may be asking too much of the test, however, to yield data that can be used in isolation to make valid clinical diagnoses.

Although the TAT was administered under standard conditions during the present investigation, there were three important aspects of the resulting data that may have limited their utility. First, due to time constraints, only four TAT cards were administered to each subject. In normal clinical settings, a minimum of 10 cards are administered, thereby obviously yielding more and richer data. Second, the same four cards were administered to all participants in this

study. In typical clinical settings, however, the particular cards chosen for administration are selected from a pool of 30 cards according to the question at hand and to prior knowledge of the subject's personality style, gender, age, etc. Although this was done, of course, in order to avoid potential confounds of presenting different cards to different subjects, it might have reduced the sensitivity of the test. Finally and perhaps most importantly, the diagnosticians did not administer the test themselves, but instead made their judgments on the basis of typewritten transcripts of the subjects' responses. Most clinicians who use the TAT feel that subtle nuances of the subject's verbal and nonverbal behavior frequently yield important data. Moreover, slight variations in administrative style, as well as the stimulus value each administrator him or herself brings into the testing situation, were not accommodated by the present procedure. Inclusion of such administrative nuances was, of course, impossible in the context of the present procedure. Although potentially useful clinically, tests such as the TAT that rely heavily on such subtleties are inherently difficult to employ in controlled experimental investigations.

As noted above, the results of the TAT data were not consistent with the diathesis aspect of Beck's model. This point is elaborated below.

The Dysfunctional Attitudes Scale

The Dysfunctional Attitudes Scale (DAS, Weissman, 1979) is a 40-item self-report inventory designed specifically to assess the depressotypic schemas proposed by Beck. The inventory consists of statements with which subjects rate their degree of agreement along a 7-point scale.

Before the standard self-focused version of the DAS was administered in the present investigation, subjects were asked to complete a version of the DAS in which the instructions had been modified. Instead of asking subjects to rate their own degree of agreement with each statement, they were asked to rate how someone else might possibly respond. It was predicted from past research (e.g., Eaves & Rush, 1984; Hamilton & Abramson, 1983) that the depressives would endorse higher agreement with dysfunctional attitudes on the standard version of the DAS than both the remitted and normal subjects, who would not differ from one another. For the "other person" version of the DAS, the results for the actively depressed and the normal subjects were predicted to be the same as for the standard version. The remitted subjects, however, were predicted to respond similarly to the depressed subjects on this modified version, that is, endorsing a large number of dysfunctional attitudes. It was reasoned that when the evaluative context of the test was made less threatening so

that their responses were not seen as a direct reflection on themselves, the remitted subjects might reveal the presence of underlying depressotypic schemas.

The results of the standard DAS data were consistent with predictions: The depressives expressed stronger agreement with dysfunctional beliefs than did either the remitted or never-depressed groups, and these latter two groups did not differ from one another. This result is consistent with past studies demonstrating higher DAS scores among actively depressed persons relative to control samples (Dobson & Breiter, 1983; Hamilton & Abramson, 1983; O'Hara, Rehm, & Campbell, 1982; Weissman, 1979). Like the previously discussed finding of higher agreement with the supraliminally presented irrational statements in the tachistoscopic procedure, this finding confirmed that the depressives in the present study were typical of the depressive population at large with respect to the presence of dysfunctional cognitions.

In contrast to the results of the standard version of the DAS, the results of the "other person" version were not consistent with predictions made from Beck's theory. When instructed to focus on another person rather than themselves, subjects in all three groups endorsed similar levels of dysfunctional attitudes. Examination of the means for each

group revealed an interesting pattern. It was not the depressives, but rather the remitted and normal subjects, who were inconsistent in their responses to the two measures. More specifically, although the remitted and normal subjects endorsed less dysfunctional attitudes relative to the depressives on the standard self-focused version of the DAS, all three groups endorsed the same relatively high level of dysfunctional attitudes on the modified version. Thus, depressives saw themselves and others as sharing an equally pessimistic outlook. The normal and remitted subjects, in contrast, viewed others as holding a relatively high degree of dysfunctional attitudes, whereas they rated themselves more positively.

This pattern of results suggests that depressed as well as nondepressed persons share the perception that other people hold a high degree of dysfunctional attitudes. Only the depressives, however, endorse such attitudes themselves. This finding, although counter to predictions for the nondepressed subjects, is nevertheless consistent with the "illusory self-glow" literature discussed previously. Recall that numerous studies have consistently found that depressives are more accurate in their evaluative judgments in a wide range of both social and nonsocial situations than are nondepressed persons. For example, Lewinsohn et al. (1980) found that depressives showed a close correspondence between their self-perceptions

and the way they were viewed by others, whereas nondepressives saw themselves more positively than others saw them. The present results may reflect a similar process, whereby nondepressed persons attribute a low degree of dysfunctional beliefs to themselves and a high degree of such beliefs to other persons in order to inflate their self-perception.

As noted above, like the results of the tachistoscopic procedure and the TAT procedure, the results of the DAS procedure were not consistent with predictions made according to Beck's theory. This issue is discussed next.

Implications for Beck's Theory of Depression

The three procedures described above were vastly different methodologies all converging in pursuit of the same construct: a depressotypic cognitive style that reflects a vulnerability for the development of depression. In order to be a true diathesis, such a cognitive style must precede the development of depression, and since depression is an episodic phenomenon, must endure beyond the remission of depression, at least in most individuals. The present investigation took advantage of the episodic nature of depression to examine the presence of depressotypic schemas in remitted depressives. Although other researchers have employed remitted depressives

in an effort to study depressotypic schemas, the unique feature of all three of the methods employed here is their attempt to bypass the normal editing processes that might otherwise obscure the presence of depressotypic cognitions in asymptomatic depression-prone persons. Such methods represent the only fair test of the diathesis component of Beck's theory, since he repeatedly emphasizes that the depressotypic schemas are latent in the asymptomatic individual (Sacco & Beck, 1985).

The remitted and the never-depressed participants did not differ on any of the measures employed in this investigation, findings which do not support Beck's proposal of latent, depressotypic schemas in the asymptomatic depression-prone person. All three experimental procedures were consistent in revealing no differences between these two groups. The most parsimonious explanation of the present results is that depressotypic cognitions are concomitants of a depressed state, rather than enduring traits. As discussed further below, this conclusion is consistent with the conclusions of a recent paper reviewing this body of literature (Barnett & Gotlib, 1988).

The possibility of latent depressotypic schemas in the asymptomatic depression-prone person cannot, of course, be categorically ruled out on the basis of the present results.

It is possible that the procedures employed here failed to reveal depressotypic schemas that were in fact present in the remitted depressives. Although this is always a possibility and the null hypothesis that remitted and normal persons are the same can never be definitively proven, the fact that three different methods all designed to reveal such schemas consistently found no differences between the remitted and the normal subjects mitigates against this conclusion. Moreover, the ad hoc argument that the present procedures failed to tap latent schemas can remain plausible only if the presence of such schemas can somehow be revealed in the asymptomatic person.

It might also be argued that the negative findings reflected something about the particular remitted subjects employed in the present study. For example, it might be argued that since these subjects were not assessed by the experimenter while they were actually depressed one cannot be certain that they were in fact representative of the population of remitted clinical depressives. Problems in subject selection were quite unlikely, however, for two reasons. First, great care was taken in the selection of the remitted participants for this study to ensure, as much as possible, that they had had at least one prior significant clinical depressive episode. Where possible, collateral data were obtained from outside sources, such as the subject's past

therapist, to supplement and validate the retrospective data provided by the subject herself. Secondly, the majority of the subjects employed in this study also served as participants in another dissertation project in which differences on an operant task employing behavioral measures, and on a social task employing physiological measures were found between the remitted and normal subjects (Sigmon, 1989). Thus, there were no obvious characteristics of the present sample of remitted subjects that would seem to preclude their possessing depressotypic schemas.

Thus, Beck's theory continues to represent a useful description of the cognitive content and processes associated with active depressive episodes. Moreover, his cognitive therapy for depression has proven quite efficacious, and is widely considered one of the most effective interventions for the disorder (Blackburn et al., 1981; Carson & Carson, 1984; Rush et al., 1977). The present results, as well as the bulk of the relevant literature, however, argued against the etiological significance of depressotypic cognitions.

Psychological Diatheses for Depression

Although Beck's theory is arguably the most well known current psychosocial theory of depression, it is by no means

the only such theory to propose a diathesis-stress model of the etiology of depression. In a recently published paper, Barnett and Gotlib (1988) presented a thorough review of the literature that has attempted to distinguish concomitants of depression from antecedents and sequelae of the disorder. They evaluated the results of studies examining six psychosocial variables: attributional style, dysfunctional attitudes, personality, social support, marital distress, and coping style. The authors concluded that, consistent with the present results, there is little support for a cognitive vulnerability for depression.

In contrast, Barnett and Gotlib found that various disturbances in personality and interpersonal functioning may be more likely to represent psychosocial diatheses for depression. Specifically, they concluded that there is evidence that remitted depressives demonstrate higher levels of dependency, especially in terms of desiring approval, attention, and help from others, relative to controls. At the same time, they also seem to socialize less than never-depressed controls. There is some evidence that depression-prone persons, including remitted depressives, also tend to be less socially integrated than controls, in that they have fewer important relationships and participate in fewer social activities. Finally, there is substantial support for the conclusion that high levels of marital distress is both an

antecedent and a sequela of depression, especially among women.

It should be noted that excessive dependency and other interpersonal disturbances highlighted by Barnett and Gotlib as enduring sequelae of depression are almost certainly related to some degree of cognitive dysfunction. For example, an excessively dependent person is likely to manifest irrational cognitions such as "if I were to make a decision on my own the consequences would certainly be disastrous." Thus, disturbances in personality and interpersonal functioning may partially vindicate Beck's theory by suggesting specific dysfunctional content areas in depressives' cognition. Moreover, the particular disturbances in interpersonal and personality functioning, and consequently the particular types of irrational cognitions, may differ across subgroups of depressives.

The diathesis-stress model represents a useful framework for theories attempting to explain the development and pathogenesis of psychopathology, including depression. The importance of identifying diathesis conditions cannot be overstated, given their potential utility for primary prevention. The probability that a single, general diathesis for depression can be identified, however, is called into question by the growing appreciation of the heterogeneity of

depression (Craighead, 1980; Liberman, 1981; McKnight, Nelson, Hayes, & Jarrett, 1984). Heterogeneity of symptom presentation, while pointing to the possibility of multiple etiologies of depression, does not rule out the possibility of a common diathesis for most depressive disorders. For example, many medical conditions (e.g., Lyme's disease) are characterized by widely differing patterns of symptoms across individuals, but share a common etiology. Nevertheless, it is entirely possible that there are many different etiological pathways leading to similar outcomes that fall under the general rubric of depression. If so, there may not be a single diathesis condition that underlies all depressive disorders, but instead multiple classes of both diatheses and precipitants.

Directions for Future Research

As noted above, the issue of whether or not a single psychosocial vulnerability can be identified in depression remains an open question. Given the rather heterogeneous symptomatology of depressive disorders, however, it would seem wise for future researchers to give strong consideration to the possibility that there may exist multiple etiological pathways to depression. Even within Beck's theory, for example, the specific beliefs that predispose certain

individuals to depression may be idiosyncratic, corresponding only roughly to the core dysfunctional attitudes that Beck describes.

Although the present results were inconsistent with Beck's proposal of a cognitive diathesis to depression, the issue is by no means resolved. The present investigation was, to the author's knowledge, the first to employ special assessment procedures in an attempt to measure latent cognitive schemas in depression-prone persons. The results of a single investigation, of course, cannot resolve the issue one way or the other. Moreover, as noted above, the null hypothesis that remitted and normal persons do not differ with respect to depressotypic schemas can never be definitively proven. It behooves future researchers to take seriously Beck's repeated assertion that the schemas he proposes are latent in the asymptomatic person. Even if such schemas are present, it cannot be assumed that they can be assessed simply by asking a person to rate his or her agreement with a series of beliefs.

The utility of subliminal perception methods. Despite the lack of differential effects by subject group in the present study, subliminal perception paradigms continue to represent potentially useful tools for exploring unconscious processes in clinical populations, including the possibility

of latent depressotypic cognitions in depression. It is generally now accepted that under certain conditions, tachistoscopically presented subliminal stimulation can produce measurable effects on a range of dependent measures (Dixon, 1981). The utility of Silverman's subliminal psychodynamic activation method in particular, on which the present tachistoscopic procedure was partially based, however, has recently been called into question.

In a recent critical review of the subliminal psychodynamic activation paradigm, Balay and Shevrin (1988) raise three criticisms of Silverman's method and interpretations of his results. First, they noted that the majority of the reported results are based on gain scores in which a measure collected immediately after an experimental stimulus is subtracted from a measure collected after a prior neutral baseline stimulus. They suggested that it is not possible to know if positive results were due to the effects of the "neutral" baseline stimulus or the critical experimental stimulus. Putatively neutral baseline stimuli (e.g., "people are talking") may evoke a temporary increase in anxiety or some other measure of psychopathology. A decrease in anxiety following the "experimental" stimulus (e.g., "mommy and I are one") may therefore simply reflect a return to the true baseline level, rather than an effect of the latter stimulus. This criticism is not relevant to the

present design since (a) the baseline mood measure was collected prior to the presentation of any stimulus, and (b) gain scores were not employed in the final analyses reported. Nevertheless, it does offer a more parsimonious interpretation of some of Silverman's more seemingly incredible results.

The second criticism concerned Silverman's hypothesis that a single, universal psychodynamic conflict could be identified that underlies the psychopathology of a given diagnostic group. Balay and Shevrin argued that although this position may be true and the issue remains an empirical one, it is more likely that the specific themes or conflicts underlying any individual's psychopathology are highly idiosyncratic. As an example of this idiographic approach, they point to ongoing work by Shevrin (in press) in which individualized conflictual themes are extracted from interviews and psychological test data. These themes are then presented, along with control stimuli, both subliminally and supraliminally, while brain event-related potentials are monitored. Greater evoked potentials result from the individualized stimuli than from the control stimuli, even when presented subliminally. This criticism is not, of course, unique to Silverman's method. Although Beck allows for somewhat more latitude in the specific dysfunctional beliefs held by different depressed individuals relative to Silverman, he does propose that the dysfunctional cognitions

of all depressives can be summarized by a small number of general statements.

The third and final criticism of Silverman's method was that he and his colleagues too quickly extended the subliminal psychodynamic activation method to new populations and applications, relying on sometimes complex ad hoc explanations to account for variations and discrepancies in results. Balay and Shevrin argued for the importance of careful demonstration of the contextual conditions necessary for subliminal effects to occur before attempting such broad applications. It is important to note that despite their criticisms of certain details of Silverman's method and interpretations, Balay and Shevrin strongly support the use of subliminal perception methods to investigate unconscious processes in psychopathology, as reflected in Shevrin's own work described above. In fact, one of their major concerns with the subliminal psychodynamic activation paradigm was that it may decrease the credibility of all subliminal applications; "...it would be misleading if the validity of subliminal perception were to stand or fall on subliminal psychodynamic activation research because the validity of the concept has been so well established in other ways" (p. 172).

Thus, subliminal perception methods remain potentially useful tools for investigating potential cognitive markers

for depression. In order for such methods to achieve their full potential, however, more systematic research is needed into the basic contextual conditions that facilitate the occurrence of subliminal effects.

Other approaches to the study of depressotypic schemas.

Despite the finding of no differences between the remitted and depressed subjects in the present study, and despite the unknown reliability of the test as it is typically used, the Thematic Apperception Test (TAT) remains a potentially useful tool for exploring depressotypic schemas. As an alternative to the diagnostic approach employed in the present study, experienced clinicians, blind to subject group, might extract general idiosyncratic themes from the data of actively depressed, remitted, and normal depressed subjects. Although there exists a wealth of observational data on the TAT (e.g., Holt, 1978; Rapaport et al., 1968; Tomkins, 1947), there are little controlled data on the degree to which certain themes are consistently reflected in the data of different diagnostic groups.

In contrast, the Dysfunctional Attitudes Scale (DAS) appears ineffective in the assessment of latent depressotypic schemas. Numerous studies, including the present one, have found no differences between remitted depressives and never-depressed controls on the DAS. The DAS is indisputably the

best existing instrument for measuring the depressotypic schemas postulated by Beck in the actively depressed person. Its straightforward self-report format, however, seems to preclude its ability to detect beliefs that are outside of the subject's awareness, regardless of the mode of administration.

In addition to the procedures employed in the present study, another approach to the search for latent cognitive antecedents and sequelae of depression would be to present asymptomatic depression-prone persons with a relevant stressor, then compare any cognitive changes to a pre-stressor baseline measure. For example, remitted depressives could be told that a confederate with whom they had just interacted disliked them. They could then be asked to complete something like the Dysfunctional Attitudes Scale. Some support could be claimed for the existence of latent depressotypic schemas among remitted depressives if they endorsed higher levels of dysfunctional attitudes following the feedback, relative to never-depressed controls. A potential problem with such a study is that presentation of a stressor that would be strong enough to represent a fair test of the theory would almost certainly be ethically problematic. It is not clear if a stressor could be identified that would activate the schemas only enough to measure their effects, but not enough to produce significant dysphoria. Furthermore, the particular

stressors that would elicit depressotypic schemas might be idiosyncratic across individuals.

Other psychological diatheses for depression. The increased sensitivity to the heterogeneity of depression is reflected in the recent interest in the relationship between various personality disorders and depression (Farmer & Nelson, in preparation; Hirschfeld & Cross, 1987). Estimates of the co-occurrence of DSM-III personality disorders among clinically depressed outpatients range from 48% (Shea, Glass, Pilkonis, Watkins, & Docherty, 1987) to 75% (Pilkonis & Frank, 1988). Akiskal, Hirschfeld, and Yerevanian (1983), among others, have suggested that a dysfunctional premorbid personality predisposes one to the development of depression, and that the symptomatology of the resulting depression will be colored by the nature of the particular personality style. Research in this area is just beginning, and much work is needed to examine the relationship between one's premorbid personality characteristics and factors that lead to depression.

In line with the conclusions of the Barnett and Gotlib (1988) review discussed above and consistent with Sigmon's (1989) recent findings, further research on interpersonal factors that render one vulnerable to depression is clearly indicated. Barnett and Gotlib noted that despite the

tentative conclusion that interpersonal dependency places one at risk for depression, there have not yet been developed any well-validated measures of this construct. The authors also stressed the importance of further work on the relationship between marital distress and depression.

Given the difficulty and expense of longitudinal research, investigators can continue to take advantage of the episodic nature of depression by comparing remitted depressives with never-depressed controls in searching for psychosocial predispositions to depression. Once a promising candidate for such a diathesis is identified, however, longitudinal designs are indispensable in verifying that the factor actually precedes depression, rather than being a consequence or "scar" (Zeiss & Lewinsohn, 1988) of the disorder.

FOOTNOTES

1. It has been argued that the term subliminal perception is oxymoronic, since perception by definition implies awareness. As used in the literature referred to in this discussion, however, the term does not require or even necessarily imply awareness. For the sake of simplicity and consistency with this literature, the effects of stimulation in the absence of awareness will be discussed here under the general rubric of "subliminal perception."

2. Gratitude is expressed to Dr. Doris Silverman and to Dr. Joel Weinberger for graciously providing reprints of some of the late Dr. Lloyd Silverman's unpublished manuscripts.

3. As noted by Weinberger and Silverman (1987), all 11 of the therapy and educational adjunct studies that have met these dosage criteria have produced positive results.

4. Gratitude is expressed to Dr. Richard Shull for his helpful insights into this analysis.

5. Of course, not all remitted depressives would necessarily be expected by Beck's theory to hold depressogenic schemas. It is conceivable, for example, that an intervention such as cognitive therapy or psychotherapy received during or subsequent to a person's last depressive episode may have effectively eliminated these schemas. The high rate of relapse, even among persons who have been treated for one or more episodes of clinical depression, however, suggests that the majority of remitted depressives do hold some diathesis condition that renders them vulnerable to future depression. Moreover, the hypothesis evaluated by the present study does not require that all remitted depressives hold depressogenic schemas, but only that a greater proportion of remitted depressives hold such schemas to a greater extent relative to persons who have never been depressed.

6. I am grateful to Dr. Richard Dauber for providing me a copy of this measure.

7. In order to evaluate further any potential differences between the five experimental stimuli, this 4-way ANOVA was re-run adding the stimuli as a fifth within-subjects factor (see Table 18). The results of this 4 (order) by 3 (group) by 2 (modality) by 2 (modality) by 5 (stimulus) ANOVA revealed only two significant effects involving the stimulus factor: The valence by stimulus interaction was significant ($p = .0069$), and the modality by valence by stimulus interaction was significant ($p = .0111$). Despite the significance of the

valence by stimulus interaction on the omnibus test, more conservative post hoc comparisons (Tukey's tests with $p < .05$) revealed no differences across the five stimuli for either the rational or the irrational conditions. Tukey's tests on the modality by valence by stimulus interaction revealed that for all five stimuli, agreement ratings in the supraliminal conditions were greater than in the subliminal conditions for the rational stimuli, with the opposite pattern for the irrational stimuli. The only exception was the irrational version of the stimulus "I have to be successful at everything," in which there was no difference in agreement ratings between the supraliminal and subliminal modalities. Given the large number of comparisons made, this single minor result carries little weight, and does not alter the conclusion that there were no differential effects of any of the stimuli that would preclude collapsing across stimuli in the analyses.

BIBLIOGRAPHY

- Abraham, K. (1911). Notes on the psychoanalytic investigation and treatment of manic-depressive insanity and allied conditions. In Selected papers on Psycho-Analysis (pp. 137-156). London: Hogarth Press, 1927.
- Abraham, K. (1916). The first pregenital stage of the libido. In Selected papers on Psycho-Analysis (pp. 248-279). London: Hogarth Press, 1927.
- Abramson, L. Y., & Sackeim, H. A. (1977). A paradox in depression: Uncontrollability and self-blame. Psychological Bulletin, 84, 835-851.
- Abramson, L. Y., Seligman, M. E. P., & Teasdale, J. D. (1978). Learned helplessness in humans: Critique and reformulation. Journal of Abnormal Psychology, 87, 49-74.
- Adam, G. (1978). Visceroception, awareness and behavior. In G. E. Schwartz & D. Shapiro (Eds.), Consciousness and self-regulation (pp. 199-213). Chichester: Wiley.
- Akiskal, H. S., Hirschfeld, R. M. A., & Yerevanian, B. I. (1983). The relationship of personality to affective disorders: A critical review. Archives of General Psychiatry, 40, 801-810.
- Allers, R., & Teler, J. (1924/1960). On the utilization of unnoticed impressions in associations. Monograph 7, Psychological Issues, 2, 121-154.
- Alloy, L. B., & Abramson, L. Y. (1979). Judgement of contingency in depressed and nondepressed students: Sadder but wiser? Journal of Experimental Psychology: General, 108, 441-485.
- Alexander, I. E. (in press). On personology, personality assessment, and psychobiography. Journal of Personality.
- American Psychiatric Association (1987). Diagnostic and statistical manual of mental disorders (3rd ed., revised). Washington, D.C.: Author.
- Ariam, S., & Siller, J. (1982). Effects of subliminal oneness stimuli in Hebrew on academic performance of Israeli high school students: Further evidence on the adaptation-enhancing effects of symbiotic fantasies in another culture using another language. Journal of Abnormal Psychology, 91, 343-349.

- Atkinson, J. W. (1958, Ed.). Motives in fantasy, action, and society. Princeton: Van Nostrand.
- Averill, J. R. (1969). Autonomic response patterns during sadness and mirth. Psychophysiology, 5, 399-414.
- Balay, J., & Shevrin, H. (1988). The subliminal psychodynamic activation method: A critical review. American Psychologist, 43, 161-174.
- Baldessarini, R. J. (1983). Biomedical aspects of depression and its treatment. American Psychiatric Press.
- Barber, P. J., & Rushton, J. P. (1975). Experimenter bias and subliminal perception. British Journal of Psychology, 66, 357-372.
- Bargh, J. A., & Tota, M. E. (in press). Context-dependent automatic processing in depression: Accessibility of negative constructs with regard to self but not others. Journal of Personality and Social Psychology.
- Barnett, P. A., & Gotlib, I. H. (1988). Psychosocial functioning and depression: Distinguishing among antecedents, concomitants, and consequences. Psychological Bulletin, 104, 97-126.
- Beck, A. T. (1961). A systematic investigation of depression. Comprehensive Psychiatry, 2, 163-170.
- Beck, A. T. (1963). Thinking and depression: 1. Idiosyncratic content and cognitive distortions. Archives of General Psychiatry, 9, 324-333.
- Beck, A. T. (1967). Depression: Clinical, experimental, and theoretical aspects. New York: Harper and Row.
- Beck, A. T. (1976). Cognitive theory and the emotional disorders. New York: International Universities Press.
- Beck, A. T. (1978). Depression inventory. Philadelphia: Center for Cognitive Therapy.
- Beck, A. T., Epstein, N., & Harrison, R. (1983). Cognitions, attitudes and personality dimensions in depression. British Journal of Cognitive Psychotherapy, 1, 1-16.
- Beck, A. T., & Hurvich, M. S. (1959). Psychological correlates of depression. 1. Frequency of 'masochistic' dream content in a private practice sample. Psychosomatic Medicine, 21, 50-55.

- Beck, A. T., Rush, A. J., Shaw, B. F., & Emery, G. (1979). Cognitive therapy of depression. New York: Guilford.
- Beck, A. T., & Ward, C. H. (1961). Dreams of depressed patients: Characteristic themes in manifest content. Archives of General Psychiatry, 5, 462-467.
- Beck, A. T., Weissman, A., Lester, D., & Trexler, L. (1974). The measurement of pessimism: The Hopelessness Scale. Journal of Consulting and Clinical Psychology, 42, 861-865.
- Becker, J. (1977). Affective disorders. Morristown, NJ: General Learning Press.
- Begleiter, H., Gross, M., & Kissin, B. (1969). Evoked cortical responses to affective visceral stimuli. Psychophysiology, 5, 517-529.
- Beloff, J., & Beloff, H. (1959). Unconscious self-evaluation using a stereoscope. Journal of Abnormal Psychology, 59, 275-278.
- Beloff, J., & Couper, S. (1968). Some transactional perceptions of African faces. British Journal of Social and Clinical Psychology, 7, 169-175.
- Berg, P. S. D., & Toch, H. (1964). 'Impulsive' and 'neurotic' inmates: A study in personality and perception. Journal of Criminal Law, Criminology, and Police Science, 55, 230-234.
- Berne, E. (1964). Games people play. New York: Grove Press.
- Bibring, E. (1953). The mechanism of depression. In P. Greenacre (Ed.), Affective disorders (pp. 14-47). New York: International Universities Press.
- Blackburn, I. M., Bishop, S., Glen, A. I. M., Whalley, L. J., & Christie, J. E. (1981). The efficacy of cognitive therapy in depression: A treatment trial using cognitive therapy and pharmacotherapy, each alone and in combination. British Journal of Psychiatry, 139, 181-189.
- Boik, R. J. (1979). Interactions, partial interactions, and interaction contrasts in the analysis of variance. Psychological Bulletin, 86, 1084-1089.

- Bornstein, R. F., Leone, D. R., & Galley, D. J. (1987). The generalizability of subliminal mere exposure effects: Influence of stimuli perceived without awareness on social behavior. Journal of Personality and Social Psychology, 53, 1070-1079.
- Boswell, P. C., & Murray, E. J. (1981). Depression, schizophrenia, and social attraction. Journal of Consulting and Clinical Psychology, 49, 641-647.
- Boyd, J. H., & Weissman, M. M. (1981). Epidemiology of affective disorders: A reexamination and future directions. Archives of General Psychiatry, 38, 1039-1046.
- Broadbent, D. E., & Gregory, M. (1967). Perception of emotionally toned words. Nature, 215, 581-584.
- Bronstein, A. A., & Rodin, G. C. (1983). An experimental study of internalization fantasies in schizophrenic men. Psychotherapy: Theory, Research, and Practice, 20, 408-416.
- Brown, W. P. (1961). Conceptions of perceptual defence. British Journal of Psychological Monographs, Supplement No. 35.
- Bruner, J. S., & Postman, L. (1947a). Emotional selectivity in perception and reaction. Journal of Personality, 16, 69-77.
- Bruner, J. S., & Postman, L. (1947b). Tension and tension-release as organizing factors in perception. Journal of Personality, 15, 300-308.
- Bryant-Tuckett, R., & Silverman, L. H. (1984). Effects of the subliminal stimulation of symbiotic fantasies on the academic performance of emotionally handicapped students. Journal of Counseling Psychology, 31, 295-305.
- Buchwald, A. M., Coyne, J. C., & Cole, C. S. (1978). A critical evaluation of the learned helplessness model of depression. Journal of Abnormal Psychology, 87, 180-193.
- Burgess, E. P. (1969). The modification of depressive behaviors. In R. D. Rubin & C. M. Franks (Eds.), Advances in Behavior Therapy, 1968 (pp. 193-199). New York: Academic Press.

- Cadore, R. J., & Tanna, V. L. (1977). Genetics of affective disorders. In G. Usdin (Ed.), Depression: Clinical, biological, and psychological perspectives (pp. 104-121). New York: Brunner/Mazel.
- Carson, T. P., & Carson, R. C. (1984). The affective disorders. In H. E. Adams & P. B. Sutker (Eds.), Comprehensive handbook of psychopathology (pp. 349-381). New York: Plenum.
- Chapman, C. R., & Feather, B. W. (1972). Modification of perception by classical conditioning procedures. Journal of Experimental Psychology, 93, 338-342.
- Cobb, W., Morton, H., & Ettlenger, G. (1967). Cerebral potentials evoked by pattern reversal and their suppression in visual rivalry. Nature, 216, 1123-1125.
- Coleman, R. E. (1975). Manipulation of self-esteem as a determinant of mood of elated and depressed women. Journal of Abnormal Psychology, 84, 693-700.
- Costello, C. G. (1972). Depression: Loss of reinforcers or loss of reinforcer effectiveness? Behavior Therapy, 3, 240-247.
- Costello, C. G. (1978). A critical review of Seligman's laboratory experiments on learned helplessness and depression in humans. Journal of Abnormal Psychology, 87, 21-31.
- Cowley, J. J., Johnson, A. L., & Brooksbanck, B. W. L. (1977). The effect of two odorous compounds on performance in an assessment-of-people test. Psychoneuroendocrinology, 2, 159-172.
- Coyne, J. C. (1976a). Depression and the response of others. Journal of Abnormal Psychology, 85, 186-193.
- Coyne, J. C. (1976b). Toward an interactional description of depression. Psychiatry, 39, 28-40.
- Coyne, J. C. (1984). Strategic therapy with depressed married persons: Initial agenda, themes, and interventions. Journal of Marital and Family Therapy, 10, 53-62.
- Cox, L. (1974). Depressive symptoms as affected by aggressive stimuli subliminally and supraliminally presented. Unpublished doctoral dissertation, Fordham University.
- Craighead, W. E. (1980). Away from a unitary model of depression. Behavior Therapy, 11, 122-128.

- Crandell, C. J., & Chambless, D. L. (1981, November). The validation of an inventory for measuring depressive thoughts: The Crandell Cognitions Inventory. Paper presented at the annual meeting of the Association for Advancement of Behavior Therapy, Toronto.
- Cutrona, C. E. (1983). Causal attributions and perinatal depression. Journal of Abnormal Psychology, 92, 161-172.
- Dauber, R. B. (1984). Subliminal psychodynamic activation in depression: On the role of autonomy issues in depressed college women. Journal of Abnormal Psychology, 93, 9-18.
- Demorest, A. P. (1985). A theory of leitmotifs. Unpublished manuscript, Duke University.
- Dennard, D. O., & Hokanson, J. E. (1986). Performance on two cognitive tasks by dysphoric and nondysphoric students. Cognitive Therapy and Research, 10, 377-386.
- Derry, P. A., & Kuiper, N. A. (1981). Schematic processing and self-reference in clinical depression. Journal of Abnormal Psychology, 90, 286-297.
- Dixon, N. F. (1958). Apparent changes in the visual threshold as a function of subliminal stimulation: A preliminary report. Quarterly Journal of Experimental Psychology, 10, 211-219.
- Dixon, N. F. (1971). Subliminal perception: The nature of a controversy. London: McGraw-Hill.
- Dixon, N. F. (1981). Preconscious processing. New York: Chichester.
- Dixon, N. F., & Haider, M. (1961). Changes in the visual threshold as a function of subception. Quarterly Journal of Experimental Psychology, 13, 229-235.
- Dobson, K. S., & Breiter, H. J. (1981, September). The cognitive assessment of depression: Construct and external validity. Paper presented at the annual meeting of the American Psychological Association, Los Angeles.
- Dobson, K. S., & Breiter, H. J. (1983). Cognitive assessment of depression: Reliability and validity of three measures. Journal of Abnormal Psychology, 92, 107-109.
- Dorfman, D. D. (1967). Recognition of taboo words as a function of a priori probability. Journal of Personality and Social Psychology, 7, 1-10.

- Dorfman, D. D., Grossberg, J. M., & Kroeker, L. (1965). Recognition of taboo stimuli as a function of exposure time. Journal of Personality and Social Psychology, 2, 552-562.
- Eaves, G., & Rush, A. J. (1984). Cognitive patterns in symptomatic and remitted unipolar major depression. Journal of Abnormal Psychology, 93, 31-40.
- Erdelyi, M. H. (1974). A new look at the new look: Perceptual defense and vigilance. Psychological Review, 81, 1-25.
- Erdley, C. A., & D'Agostino, P. R. (1988). Cognitive and affective components of automatic priming effects. Journal of Personality and Social Psychology, 54, 741-747.
- Eriksen, C. W. (1958). Unconscious processes. In M. R. Jones (Ed.), Nebraska Symposium on Motivation: 1958. Lincoln: University of Nebraska Press.
- Eriksen, C. W. (1960). Discrimination and learning without awareness: A methodological survey and evaluation. Psychological Review, 67, 279-300.
- Fennell, M. J. V., & Campbell, A. (1984). The cognitions questionnaire: Specific thinking errors in depression. British Journal of Clinical Psychology, 23, 81-92.
- Ferster, C. B. (1973). A functional analysis of depression. American Psychologist, 28, 857-870.
- Ferster, C. B. (1981). A functional analysis of behavior therapy. In L. P. Rehm (Ed.), Behavior therapy for depression: Present status and future directions (pp. 181-196). New York: Academic Press.
- Fisher, C. (1954). Dreams and perception. The role of preconscious and primary modes of perception in dream formation. Journal of the American Psychoanalytic Association, 2, 389-445.
- Fisher, C. (1957). A study of the preliminary stages of the construction of dreams and images. Journal of the American Psychoanalytic Association, 5, 5-60.
- Fisher, C. (1960). Subliminal and supraliminal influences on dreams. American Journal of Psychiatry, 116, 1009-1017.

- Fisher, C. B., Glenwick, D. S., & Blumenthal, R. S. (1986). Subliminal Oedipal stimuli and competitive performance: An investigation of between-group effects and mediating subject variables. Journal of Abnormal Psychology, 95, 292-294.
- Fisher, C., & Paul, I. H. (1959). The effect of subliminal visual stimulation on imagery and dreams: A validation study. Journal of the American Psychoanalytic Association, 7, 35-83.
- Fiss, H., Goldberg, F., & Klein, G. S. (1963). Effects of subliminal stimulation on imagery and discrimination. Perceptual and Motor Skills, 17, 31-44.
- Florek, W. (1978). Effects of subliminal stimulation of anxiety and cognitive adaptation. Unpublished manuscript, St. John's University.
- Fowler, C. A., Wolford, G., Slade, R., & Tassinari, L. (1981). Lexical access with and without awareness. Journal of Experimental Psychology: General, 110, 341-362.
- Freud, S. (1895/1950). Draft G: Melancholia. Standard edition (Vol. 1). London: Hogarth Press.
- Freud, S. (1917). Mourning and melancholia. In Collected papers (Vol. 2). London: Hogarth Press and the Institute of Psychoanalysis.
- Gero, G. (1936). The construction of depression. International Journal of Psycho-Analysis, 17, 423-461.
- Gibson, J. J. (1968). The senses considered as perceptual systems. London: George Allen & Unwin.
- Giddan, N. S. (1967). Recovery through images of briefly flashed stimuli. Journal of Personality, 35, 1-19.
- Glazer, H. I., Clarkin, J. F., & Hunt, H. F. (1981). Assessment of depression. In J. F. Clarkin & H. I. Glazer (Eds.), Depression: Behavioral and directive intervention strategies (pp. 3-30). New York: Garland.
- Goldiamond, I. (1958). Indicators of perception: 1. Subliminal perception, subception, unconscious perception: An analysis in terms of psychophysical indicator methodology. Psychological Bulletin, 55, 373-411.

- Golin, S., Sweeney, P. D., & Shaeffer, D. E. (1981). The causality of causal attributions in depression: A cross-lagged panel correlational analysis. Journal of Abnormal Psychology, 90, 14-22.
- Golin, S., Terrell, F., Weitz, J., & Drost, P. L. (1979). The illusion of control among depressed patients. Journal of Abnormal Psychology, 88, 454-457.
- Goodwin, A. M., & Williams, J. M. G. (1983). Mood-induction research: its implications for clinical depression. Behaviour Research and Therapy, 20, 373-382.
- Gotlib, I. H. (1984). Depression and general psychopathology in university students. Journal of Abnormal Psychology, 93, 19-30.
- Gotlib, I. H., & Colby, C. A. (1987). Treatment of depression: An interpersonal systems approach. New York: Pergamon.
- Green, A. R., & Costain, D. W. (1979). The biochemistry of depression. In E. S. Paykel & A. Coppen (Eds.), Psychopharmacology of affective disorders (pp. 14-40). Oxford: Oxford University Press.
- Green, D. M. (1964). Psycho-acoustics and detection theory. In J. A. Swets (Ed.), Signal detection and recognition by human observers (pp. 58-94). New York: Wiley.
- Groeger, J. A. (1986). Preconscious influences on word substitutions. Irish Journal of Psychology, 7, 88-97.
- Haber, R. N., & Erdelyi, M. H. (1967). Emergence and recovery of initially unavailable perceptual material. Journal of Verbal Learning and Verbal Behavior, 6, 618-627.
- Hale, W. D., & Strickland, B. R. (1976). Induction of mood states and their effect on cognitive and social behaviors. Journal of Consulting and Clinical Psychology, 44, 155.
- Haley, W. E. (1985). Social skills deficits and self-evaluation among depressed and nondepressed psychiatric inpatients. Journal of Clinical Psychology, 41, 162-168.
- Hamilton, E. W., & Abramson, L. Y. (1983). Cognitive patterns and major depressive disorder: A longitudinal study in a hospital setting. Journal of Abnormal Psychology, 92, 173-184.

- Hammen, C., & Krantz, S. E. (1976). Effects of success and failure on depressive cognitions. Journal of Abnormal Psychology, 85, 577-586.
- Hammen, C. L., & Peters, S. D. (1978). Interpersonal consequences of depression: Responses to men and women enacting a depressed role. Journal of Abnormal Psychology, 87, 322-332.
- Hardy, G. R., & Legge, D. (1968). Cross-modal induction of changes in sensory thresholds. Quarterly Journal of Experimental Psychology, 20, 20-29.
- Harrison, A. A. (1969). Exposure and popularity. Journal of Personality, 37, 359-377.
- Harter, M., Seiple, W., & Musso, M. (1974). Binocular summation and suppression: Visually evoked cortical responses to dichoptically presented patterns of different spatial frequencies. Vision Research, 14, 1169-1180.
- Harter, M., Towle, V., & Musso, M. (1976). Size specificity and interocular suppression: Monocular evoked potentials and reaction times. Vision Research, 16, 1111-1117.
- Hartley, L. (1969). The influence of information and meaning on the electrical activity of the brain. Unpublished doctoral dissertation, University of London.
- Hauri, P. (1976). Dreams in patients remitted from reactive depression. Journal of Abnormal Psychology, 85, 1-10.
- Heilbrun, K. S. (1982). Reply to Silverman. Journal of Abnormal Psychology, 91, 134-135.
- Hendler, N. (1982). The anatomy and psychopharmacology of chronic pain. Journal of Clinical Psychiatry, 43, 15-21.
- Henley, S. H. A. (1974). Preconscious processing in normals and schizophrenics. Unpublished doctoral dissertation, University of London.
- Henley, S. H. A. (1975). Cross modal effects of subliminal verbal stimuli. Scandinavian Journal of Psychology, 16, 30-36.
- Henley, S. H. A., & Dixon, N. F. (1976). Preconscious processing in schizophrenia: An exploratory study. British Journal of Medical Psychology, 49, 161-166.

- Herbert, J. D., Nelson, R. O., Herbert, D. L. (1987). The effects of feedback on the behavior of depressed inpatients in two structured interactions. Unpublished master's thesis, University of North Carolina at Greensboro.
- Hersen, M., Bellack, A. S., & Himmelhoch, J. M. (1980). Treatment of unipolar depression with social skills training. Behavior Modification, 4, 547-556.
- Hirschfeld, R. M. A., & Cross, C. K. (1987). The measurement of personality in depression. In A. J. Marsella, R. M. A. Hirschfeld, & M. M. Katz (Eds.), The measurement of depression (pp. 319-343). New York: Guilford.
- Hobbs, S. (1983). The effects of activated Oedipal and symbiotic fantasies on prejudiced attitudes. Unpublished doctoral dissertation.
- Hoberman, H. M., & Lewinsohn, P. M. (1985). The behavioral treatment of depression. In E. E. Beckham & W. R. Leber (Eds.), Handbook of Depression: Treatment, Assessment, and Research (pp. 39-81). Homewood, Il: Dorsey.
- Hollon, S. D., & Beck, A. T. (1979). Cognitive therapy of depression. In P. C. Kendall & S. D. Hollon (Eds.), Cognitive-behavioral interventions: Theory, research, and procedures (pp. 153-204). New York: Academic Press.
- Hollon, S. D., & Kendall, P. C. (1980). Cognitive self-statements in depression: Development of an automatic thoughts questionnaire. Cognitive Therapy and Research, 4, 383-395.
- Hollon, S. D., Kendall, P. C., & Lumry, A. (1986). Specificity of depressotypic cognitions in clinical depression. Journal of Abnormal Psychology, 95, 52-59.
- Holt, R. R. (1978). Methods in clinical psychology: Volume 1. Projective assessment. New York: Plenum.
- Howes, M. J., & Hokanson, J. E. (1979). Conversational and social responses to depressive interpersonal behavior. Journal of Abnormal Psychology, 88, 625-634.
- Howie, D. (1952). Perceptual defence. Psychological Review, 59, 308-315.
- Huck, S. W., & McLean, R. A. (1975). Using a repeated measures ANOVA to analyze the data from a pretest-posttest design: A potentially confusing task. Psychological Bulletin, 82, 511-518.

- Ikeda, H., & Wright, M. J. (1974). Is amblyopia due to inappropriate stimulation of the 'sustained' pathway during development? British Journal of Ophthalmology, 58, 165-175.
- Isen, A. M., Shalcker, T. E., Clark, M., & Karp, L. (1978). Affect, accessibility of material in memory, and behavior: A cognitive loop? Journal of Personality and Social Psychology, 36, 1-12.
- Jacobson, E. (1971). Depression. New York: International Universities Press.
- Jacobson, N. S. (1981). The assessment of overt behavior. In L. P. Rehm (Ed.), Behavior therapy for depression: Present status and future directions (pp. 279-300). New York: Academic Press.
- Kellner, H., Butters, N., & Wiener, M. (1964). Mechanisms of defence: An alternative response. Journal of Personality, 32, 601-621.
- Kihlstrom, J. F. (1987). The cognitive unconscious. Science, 237, 1445-1452.
- King, D. A., & Heller, K. (1984). Depression and the response of others: A re-evaluation. Journal of Abnormal Psychology, 93, 477-480.
- Kirk-Smith, M., Booth, D. A., Carroll, D., & Davies, P. (1978). Human social attitudes affected by androstenol. Research Communication in Psychological and Psychiatric Behavior, 3, 379-384.
- Klein, D. C., Fencil-Morse, E., & Seligman, M. E. P. (1976). Learned helplessness, depression, and attribution of failure. Journal of Personality and Social Psychology, 33, 508-516.
- Klein, M. (1948). Contribution to Psycho-Analysis, 1921-1945. London: Hogarth Press and the Institute of Psycho-Analysis.
- Krantz, S. E., & Hammen, C. L. (1979). Assessment of cognitive bias in depression. Journal of Abnormal Psychology, 88, 611-619.
- Kucera, H., & Francis, N. (1967). Computational analysis of present-day American English. Providence, R. I.: Brown University Press.

- Kuiper, N. A. (1978). Depression and causal attributions for success and failure. Journal of Personality and Social Psychology, 36, 236-246.
- Kuiper, N. A., & MacDonald, M. R. (1982). Self and other perception in mild depressives. Social Cognition, 1, 223-239.
- Kunst-Wilson, W. R., & Zajonc, R. B. (1980). Affective discrimination of stimuli that cannot be recognized. Science, 207, 557-558.
- Layne, C. (1983). Painful truth about depressives' cognitions. Journal of Clinical Psychology, 39, 848-852.
- Lazarus, A. A. (1968). Learning theory and the treatment of depression. Behavior Research and Therapy, 6, 83-89.
- Lehman, D., & Fender, D. (1968). Component analyses of human averaged evoked potentials: Dichoptic stimuli using different target structures. Electroencephalography and Clinical Neurophysiology, 24, 542-553.
- Lewinsohn, P. M. (1974). Clinical and theoretical aspects of depression. In K. S. Calhoun, H. E. Adams, & K. M. Mitchell (Eds.), Innovative treatment methods in psychopathology (pp. 63-120). New York: Wiley.
- Lewinsohn, P. M. (1975). The behavioral study and treatment of depression. In M. Hersen, R. M. Eisler, & P. M. Miller (Eds.), Progress in behavior modification (Vol. 1) (pp. 19-64). New York: Academic Press.
- Lewinsohn, P. M., Hoberman, H. M., & Rosenbaum, M. (1988). A prospective study of risk factors for unipolar depression. Journal of Abnormal Psychology, 97, 251-264.
- Lewinsohn, P. M., Hoberman, H. M., Teri, L., & Hautzinger, M. (1985). An integrative theory of depression. In S. Reiss & R. Bootzin (Eds.), Theoretical issues in behavior therapy. New York: Academic Press.
- Lewinsohn, P. M., Mischel, W., Chaplin, W., & Barton, R. (1980). Social competence and depression: The role of illusory self-perceptions. Journal of Abnormal Psychology, 89, 203-212.
- Lewinsohn, P. M., Steinmetz, J. L., Larson, D. W., & Franklin, J. (1981). Depression-related cognitions: Antecedent or consequence? Journal of Abnormal Psychology, 90, 213-219.

- Lewinsohn, P. M., Weinstein, M. S., & Alper, T. (1970). A behavioral approach to the group treatment of depressed persons: A methodological contribution. Journal of Clinical Psychology, 26, 525-532.
- Lewinsohn, P. M., Weinstein, M. S., & Shaw, D. A. (1969). Depression: A clinical research approach. In R. D. Rubin & C. M. Franks (Eds.), Advances in behavior therapy, 1968 (pp. 231-240). New York: Academic Press.
- Liberman, R. P. (1970). Behavioral approaches to family and couple therapy. American Journal of Orthopsychiatry, 40, 106-118.
- Liberman, R. P. (1981). A model for individualizing treatment. In L. P. Rehm (Ed.), Behavior therapy for depression (pp. 231-253). New York: Academic.
- Libet, B. (1973). Electrical stimulation of cortex in humans and conscious sensory aspects. In A. Iggo (Ed.), Handbook of Sensory Physiology (vol. 2) (pp. 744-790). New York: Springer.
- Libet, B., Alberts, W. W., Wright, E. W., & Feinstein, B. (1967). Responses of human somato-sensory cortex to stimuli below threshold for conscious sensation. Science, 158, 1597-1600.
- Libet, J. M., & Lewinsohn, P. M. (1973). Concept of social skill with special reference to the behavior of depressed persons. Journal of Consulting and Clinical Psychology, 40, 304-312.
- Linehan, E., & O'Toole, J. (1982). The effects of subliminal stimulation of symbiotic fantasy on college students' self-disclosures in group counseling. Journal of Counseling Psychology, 29, 151-157.
- Linehan, M. M. (1981). A social-behavioral analysis of suicide and parascicide: Implications for clinical assessment and treatment. In J. F. Clarkin & H. I. Glazer (Eds.), Depression: Behavioral and directive intervention strategies (pp. 229-294). New York: Garland.
- Lishman, W. A. (1972). Selective factors in memory: II. Affective disorders. Psychological Medicine, 2, 248-253.
- Lloyd, G. G., & Lishman, W. A. (1975). Effect of depression on the speed of recall of pleasant and unpleasant experiences. Psychological Medicine, 5, 173-180.

- Lubin, B. (1965). Adjective checklists for the measurement of depression. Archives of General Psychiatry, 12, 57-62.
- Luborsky, L., & Shevrin, H. (1956). Dreams and day residues: A study of the Poetzl observation. Bulletin of the Menninger Clinic, 20, 135-148.
- Malamud, W. (1934). Dream analysis: Its application in therapy and research in mental diseases. Archives of Neurological Psychiatry, 31, 356-372.
- Malamud, W., & Linder, F. E. (1931). Dreams and their relationship to recent impressions. Archives of Neurological Psychiatry, 25, 1081-1099.
- Marcel, A. J. (1974, July). Perception with and without awareness. Paper presented at the meeting of the Experimental Psychology Society, Stirling, Scotland.
- Marcel, A. J. (1983). Conscious and unconscious perception: Experiments on visual masking and word recognition. Cognitive Psychology, 15, 197-237.
- Martin, A. (1975). The effect of subliminal stimulation of symbiotic fantasies on weight loss in obese women receiving behavioral treatment. Unpublished doctoral dissertation, New York University.
- Masters, J. C., Barden, R. C., & Ford, M. E. (1979). Affective states, expressive behavior and learning in children. Journal of Personality and Social Psychology, 37, 380-390.
- Matlin, M. W. (1970). Response competition as a mediating factor in the frequency-affect relationship. Journal of Personality and Social Psychology, 16, 536-552.
- McConnell, J. V., Cutler, R. L., & McNeil, E. B. (1958). Subliminal stimulation: An overview. American Psychologist, 13, 229-242.
- McGinnies, E. (1949). Emotionality and perceptual defense. Psychological Review, 56, 244-251.
- McKean, K. (1985). In search of the unconscious mind. Discover, 6, 12-16.
- McKnight, D. L., Nelson, R. O., Hayes, S. C., & Jarrett, R. B. (1984). Importance of treating individually assessed response classes in the amelioration of depression. Behavior Therapy, 15, 315-335.

- McNair, D. M., Lorr, M., & Droppleman, L. F. (1971). Profile of mood states (POMS). San Diego: Educational and Industrial Testing Service.
- Mendlewicz, J. (1985). Genetic research in depressive disorders. In E. E. Beckham, & W. R. Leber (Eds.), Handbook of depression: Treatment, assessment, and research (pp. 795-815). Homewood, Il.: Dorsey.
- Mendels, J., & Cochrand, C. (1968). The nosology of depression: The endogenous-receptive concept. American Journal of Psychiatry, 124, 1-11.
- Mendels, J., Fiere, A., Fitzgerald, R. G., Ramsey, T. A., & Stokes, J. W. (1972). Biogenic amine metabolites in cerebrospinal fluid of depressed and manic patients. Science, 175, 1380-1382.
- Mendelsohn, E. M. (1981). The effects of stimulating symbiotic fantasies on manifest pathology in schizophrenics: A revised formulation. The Journal of Nervous and Mental Disease, 169, 580-590.
- Metalsky, G. I., Abramson, L. Y., Seligman, M. E. P., Semmel, A., & Peterson, C. (1982). Attributional styles and life events in the classroom: Vulnerability and invulnerability to depressive mood reactions. Journal of Personality and Social Psychology, 43, 612-617.
- Meyer, D. E., & Schvaneveldt, R. W. (1971). Facilitation in recognizing pairs of words: Evidence of a dependence between retrieval operations. Journal of Experimental Psychology, 90, 227-234.
- Miller, J. (1973). The effects of aggressive stimulation upon young adults who have experienced death of a parent during childhood or adolescence. Unpublished doctoral dissertation, New York University.
- Minkoff, K., Bergman, E., Beck, A. T., & Beck, R. (1973). Hopelessness, depression, and attempted suicide. American Journal of Psychiatry, 130, 455-459.
- Moore, B. S., Underwood, B., & Rosehan, D. L. (1973). Affect and altruism. Developmental Psychology, 8, 99-104.
- Moore, M. (1966). Aggression themes in a binocular rivalry situation. Journal of Personality and Social Psychology, 3, 685-688.
- Moore, T. E. (1982). Subliminal advertising: What you see is what you get. Journal of Marketing, 46, 38-47.

- Morris, J. B., & Beck, A. T. (1974). The efficacy of anti-depressant drugs: A review of research (1958 to 1972). Archives of General Psychiatry, 30, 667-674.
- Mukherji, B. R., Abramson, L. Y., & Martin, D. J. (1982). Induced depressive mood and attributional patterns. Cognitive Therapy and Research, 6, 15-21.
- Murray, H. A. (1938). Explorations in personality. New York: Oxford.
- Murray, H.A. (1943). Thematic Apperception Test. Cambridge: Harvard University Press.
- Murstein, B. I. (1963). Theory and research in projection techniques. New York: Wiley.
- Natale, M. (1977a). Effects of induced elation-depression on speech in the initial interview. Journal of Consulting and Clinical Psychology, 45, 45-52.
- Natale, M. (1977b). Induction of mood states and their effect on gaze behavior. Journal of Consulting and Clinical Psychology, 45, 717-723.
- Neisser, U. (1967). Cognitive Psychology. New York: Appleton Century Crofts.
- Nelson, R. E. (1977). Irrational beliefs in depression. Journal of Consulting and Clinical Psychology, 45, 1190-1191.
- Nelson, R. E., & Craighead, W. E. (1977). Selective recall of positive and negative feedback, self-control behaviors, and depression. Journal of Abnormal Psychology, 86, 379-388.
- Nelson, R. O., Herbert, J. D., Herbert, D. L., Brannon, S. E., & Sigmon, S. T. (1987). The importance of assessment in the treatment of depression. Unpublished manuscript, University of North Carolina at Greensboro.
- O'Hara, M. W., Rehm, L. P., & Campbell, S. B. (1982). Predicting depressive symptomatology: Cognitive-behavioral models and postpartum depression. Journal of Abnormal Psychology, 91, 457-461.
- Oliver, J. M., & Burkham, R. (1982). Subliminal psychodynamic activation in depression: A failure to replicate. Journal of Abnormal Psychology, 91, 337-342.

- Orne, M. T. (1962). On the social psychology of the psychological experiment: With particular reference to demand characteristics and their implicatins. American Psychologist, 17, 776-783.
- Overbeeke, C. J. (1986). Changing the perception of behavioral properties by subliminal presentation. Perception and Motor Skills, 62, 255-258.
- Overmier, J. B., & Seligman, M. E. P. (1967). Effects of inescapable shock upon subsequent escape and avoidance learning. Journal of Comparative and Physiological Psychology, 63, 23-33.
- Packer, S. (1984). Unconscious fantasy activation as treatment aid in behavior-assertiveness training. Paper presented at APA convention, Toronto.
- Palmatier, J. R., Bornstein, P. H. (1980). Effects of subliminal stimulation of symbiotic merging fantasies on behavioral treatment of smokers. Journal of Nervous and Mental Disease, 168, 715-720.
- Parker, K. A. (1982). The effects of subliminal merging stimuli on the academic performance of college students. Journal of Counseling Psychology, 29, 19-28.
- Patterson, Dohn, Bird, & Patterson (1983). The SAD PERSONS Scale. Journal of the Academy of Psychosomatic Medicine, 24, 343-349.
- Paul, I. H., & Fisher, C. (1959). Subliminal visual stimulation: A study of its influence on subsequent images and dreams. Journal of Nervous and Mental Disease, 129, 315-340.
- Paykel, E. S. (1979). Predictions of treatment response. In E. S. Paykel & A. Coppen (Eds.), Psychopharmacology of affective disorders (pp. 193-220). Oxford: Oxford University Press.
- Peterson, C. (1979). Uncontrollability and self-blame in depression: Investigation of the paradox in a college population. Journal of Abnormal Psychology, 88, 620-624.
- Peterson, C. & Seligman, M. E. P. (1984). Causal explanations as a risk factor for depression: Theory and evidence. Psychological Review, 91, 347-374.

- Peterson, C., & Seligman, M. E. P. (1985). The learned helplessness model of depression: Current status of theory and research. In E. E. Beckham & W. R. Leber (Eds.), Handbook of Depression: Treatment, Assessment, and Research (pp. 914-939). Homewood, Il: Dorsey.
- Peterson, C., & Villanova, P. D. (1984). Attributional style and depressive symptoms: A quantitative review. Unpublished manuscript, Virginia Polytechnic Institute and State University.
- Pettigrew, T. F., Allport, G. W., & Barnett, E. O. (1958). Binocular resolution and the perception of race in South Africa. British Journal of Psychology, 49, 265.
- Pilkonis, P. A., & Frank, E. (1988). Personality pathology in recurrent depression: Nature, prevalence, and relationship to treatment response. American Journal of Psychiatry, 145, 435-441.
- Poetzl, O. (1917/1960). The relationship between experimentally induced dream images and indirect vision. Monograph No. 7, Psychological Issues, 2, 41-120.
- Polivy, J. & Doyle, C. (1980). Laboratory induction of mood states through the reading of self-referent mood statements: Affective changes or demand characteristics. Journal of Abnormal Psychology, 89, 286-290.
- Poppel, E., Held, R. & Frost, D. (1973). Residual visual functions after brain wounds involving the central visual pathways in man. Nature, 243, 295-296.
- Porterfield, A. L. (1985). Reply to Silverman. Journal of Abnormal Psychology, 94, 645-646.
- Porterfield, A. L., & Golding, T. L. (1985). A failure to find an effect of subliminal psychodynamic activation upon cognitive measures of pathology in schizophrenia. Journal of Abnormal Psychology, 94, 630-639.
- Postman, L., Bruner, J. S., & McGinnies, E. (1948). Personal values as selective factors in perception. Journal of Abnormal and Social Psychology, 43, 142-154.
- Power, M. J., & Champion, L. A. (1986). Cognitive approaches to depression: A theoretical critique. British Journal of Clinical Psychology, 25, 201-212.
- Purcell, K., & Clifford, E. (1966). Binocular rivalry and the study of identification in asthmatic and non-asthmatic boys. Journal of Consulting Psychology, 30, 388-394.

- Qureshi, Z. (1985). A study of the effects of subliminal symbiotic stimulation on academic performance in Pakistani high school students. Unpublished master's thesis, New York University.
- Rado, S. (1928). The problem of melancholia. International Journal of Psycho-Analysis, 9, 420-438.
- Rapaport, D., Gill, M. M., & Schafer, R. (1968). Diagnostic psychological testing. New York: International Universities.
- Reda, M. A., Carpinello, B., Secchiaroli, L., & Blanco, S. (1985). Thinking, depression, and antidepressants: Modified and unmodified beliefs during treatment with amitryptiline. Cognitive Therapy and Research, 9, 135-143.
- Rehm, L. P. (1977). A self-control model of depression. Behavior Therapy, 8, 787-804.
- Rehm, L. P. (1981a). A self-control therapy program for treatment of depression. In J. F. Clarkin & H. I. Glazer (Eds.), Depression: Behavioral and directive intervention strategies (pp. 68-110). New York: Garland.
- Rehm, L. P. (1981b). Assessment of depression. In M. Hersen & A. S. Bellack (Eds.), Behavioral assessment (2nd ed.) (pp. 246-295). New York: Pergamon.
- Reynolds, D., & Toch, H. H. (1965). Perceptual correlates of prejudice. Stereoscopic constancy using bi-racial stereograms. Journal of Social Psychology, 66 127-133.
- Riggs, L., & Whittle, P. (1967). Human occipital and retinal potentials evoked by subjectively faded visual stimuli. Vision Research, 7, 444-451.
- Riskind, J. H., & Rholes, W. S. (in press). Cognitive accessibility and the capacity of cognitions to predict future depression: A theoretical note. Cognitive Therapy and Research.
- Rizley, R. (1978). Depression and distortion in the attribution of causality. Journal of Abnormal Psychology, 87, 32-48.

- Robbins, E. & Guze, S. B. (1969). Classification of affective disorders: The primary-secondary, the endogenous-reactive, and the neurotic-psychotic concepts. In T. A. Williams, M. M. Katz, & J. A. Shield, Jr. (Eds.), Recent advances in the psychobiology of the depressive illnesses (pp. 283-295). Chevy Chase, Maryland: U.S. Dept. of Health, Education, and Welfare.
- Robins, E., Munoz, R. A., Martin, S., & Gentry, K. A. (1972). Primary and secondary affective disorders. In J. Zubin & F. A. Freyhan (Eds.), Disorders of mood (pp. 33-46). Baltimore: Johns Hopkins Press.
- Rosenthal, N. E., Sack, D. A., Gillin, J. C., Lewy, A. J., Goodwin, F. K., Davenport, Y., Mueller, P. S., Newsome, D. A., & Wehr, T. A. (1984). Seasonal affective disorder: A description of the syndrome and preliminary findings with light therapy. Archives of General Psychiatry, 41, 72-80.
- Rosenthal, R. (1963). On the social psychology of the psychological experiment: The experimenter's hypothesis as unintended determinant of experimental results. American Scientist, 51, 268-283.
- Roth, D., & Rehm, L. P. (1980). Relationships among self-monitoring processes, memory, and depression. Cognitive Therapy and Research, 4, 149-157.
- Ruiz, R. A., & Krauss, H. H. (1968). Perceptual defense versus response suppression. Journal of Psychology, 69, 33-37.
- Rush, A. J., Beck, A. T., Kovacs, M., & Hollon, S. (1977). Comparative efficacy of cognitive therapy and pharmacotherapy in the treatment of depressed outpatients. Cognitive Therapy and Research, 1, 17-37.
- Rutstein, E. H., & Goldberger, L. (1973). The effects of aggressive stimulation on suicidal patients: An experimental study of the psychoanalytic theory of suicide. Psychoanalysis and Contemporary Science: An Annual Review of Integrative and Interdisciplinary Studies, 2, 157-174.
- Sacco, W. P., & Beck, A. T. (1985). Cognitive therapy of depression. In E. E. Beckham & W. R. Leber (Eds.), Handbook of Depression: Treatment, Assessment, and Research (pp. 3-38). Homewood, Il: Dorsey.

- Sackeim, H. A., Packer, I. K., & Gur, R. C. (1977). Hemisphericity, cognitive set and susceptibility to subliminal perception. Journal of Abnormal Psychology, 86, 624-630.
- Sackeim, H. A., & Wegner, A. Z. (1986). Attributional patterns in depression and euthymia. Archives of General Psychiatry, 43, 553-560.
- Saegert, S. C., Swap, W., & Zajonc, R. B. (1973). Exposure, context, and interpersonal attraction. Journal of Personality and Social Psychology, 25, 234-242.
- Schank, R. C., & Abelson, R. P. (1977). Scripts, plans, goals, and understanding. Hillsdale, N.J.: Erlbaum.
- Schurtman, R., Palmatier, J. R., & Martin, E. S. (1982). On the activation of symbiotic gratification fantasies as an aid in the treatment of alcoholics. The International Journal of the Addictions, 17, 1157-1174.
- Seligman, M. E. P. (1972). Learned helplessness. Annual Review of Medicine, 23, 407-412.
- Seligman, M. E. P. (1973, June). Fall into helplessness. Psychology Today, pp. 43-48.
- Seligman, M. E. P. (1974). Depression and learned helplessness. In R. J. Friedman & M. M. Katz (Eds.), The psychology of depression: Contemporary theory and research (pp. 83-113). Washington, DC: Winston-Wiley.
- Seligman, M. E. P. (1975). Helplessness: On depression, development, and death. San Francisco: W. H. Freeman.
- Seligman, M. E. P. (1981). A learned helplessness point of view. In L. P. Rehm (Ed.), Behavior therapy for depression: Present status and future directions (pp. 123-141). New York: Academic Press.
- Seligman, M. E. P., Abramson, L. U., Semmel, A., & von Baeyer, C. (1979). Depressive attributional style. Journal of Abnormal Psychology, 88, 242-247.
- Seligman, M. E. P., & Maier, S. F. (1967). Failure to escape traumatic shock. Journal of Experimental Psychology, 74, 1-9.
- Shahar, A., Zakai, D., & Berman, A. (1982). The depression eliciting effects of cognitive distortions. Unpublished manuscript, Tel Aviv University.

- Shea, M. T., Glass, D. R., Pilkonis, P. A., Watkins, J., & Docherty, J. P. (1987). Frequency and implications of personality disorders in a sample of depressed outpatients. Journal of Personality Disorders, 1, 27-42.
- Shelley, E. L. V., & Toch, H. H. (1962). The perception of violence as an indicator of adjustment in institutionalized offenders. Journal of Criminal Law, Criminology, and Police Science, 53, 463-469.
- Shevrin, H. (1978). Evoked potential evidence for unconscious mental processes: A review of the literature. In A. S. Prangishvili, A. E. Sherozia, & F. V. Bassin (Eds.), The unconscious: Nature, functions, methods of study. Tbilisi, U.S.S.R.: Metsniereba.
- Shevrin, H. (1986). Subliminal perception and dreaming. The Journal of Mind and Behavior, 7, 379-396.
- Shevrin, H. (in press). Unconscious conflict: A convergent psychodynamic and electrophysiological approach. In M. Horowitz (Ed.), Emotions and cognitive factors in unconscious processes. Chicago: University of Chicago Press.
- Shevrin, H., & Dickman, S. (1980). The psychological unconscious: A necessary assumption for all psychological theory? American Psychologist, 35, 421-434.
- Shevrin, H., & Fisher, C. (1967). Changes in the effects of a waking subliminal stimulus as a function of dreaming and non dreaming sleep. Journal of Abnormal Psychology, 72, 362-368.
- Shevrin, H., & Fritzler, D. E. (1968a). Visual evoked response correlates of unconscious mental processes. Science, 161, 295.
- Shevrin, H., & Fritzler, D. E. (1968b). Brain response correlates of repressiveness. Psychological Reports, 23, 887-892.
- Shevrin, H., & Luborsky, L. (1958). The measurement of preconscious perception in dreams and images: An investigation of the Poetzl Phenomenon. Journal of Abnormal and Social Psychology, 56, 285-294.
- Shevrin, H., & Rennick, P. (1967). Cortical response to a tactile stimulus during attention, mental arithmetic and free associations. Psychophysiology, 3, 381-388.

- Sigmon, S. T. (1989). Sensitivity to aversive events in currently depressed and remitted depressed subjects. Unpublished doctoral dissertation, University of North Carolina at Greensboro.
- Silverman, J. S., Silverman, J. A., & Eardley, D. A. (1984). Do maladaptive attitudes cause depression? Archives of General Psychiatry, 41, 28-30.
- Silverman, L. H. (1965, April). The use of subliminal stimuli to study the relationship between aggressive activation and pathological thinking. Paper presented at the Eastern Psychological Association, Atlantic City.
- Silverman, L. H. (1966). A technique for the study of psychodynamic relationships: The effects of subliminally presented aggressive stimuli on the production of pathological thinking in a schizophrenic population. Journal of Consulting Psychology, 30, 103-111.
- Silverman, L. H. (1976). Psychoanalytic theory: "The reports of my death are greatly exaggerated." American Psychologist, 13, 621-637.
- Silverman, L. H. (1977). Ethical considerations and guidelines in the use of subliminal psychodynamic activation. Unpublished manuscript, New York University.
- Silverman, L. H. (1982). A comment on two subliminal psychodynamic activation studies. Journal of Abnormal Psychology, 91, 126-130.
- Silverman, L. H. (1983). The subliminal psychodynamic activation method: Overview and comprehensive listing of studies. In J. Masling (Ed.), Empirical studies of psychoanalytical theories (vol. 1) (pp. 69-100). Hillsdale, N.J.: Erlbaum.
- Silverman, L. H. (1984). Further comments on subliminal psychodynamic activation studies. Unpublished manuscript, New York University.
- Silverman, L. H. (1985a). Comments on three recent subliminal psychodynamic activation investigations. Journal of Abnormal Psychology, 94, 640-643.
- Silverman, L. H. (1985b). Rejoinder to Oliver and Burkham and to Porterfield. Journal of Abnormal Psychology, 94, 647-648.

- Silverman, L. H., Bronstein, A., & Mendelsohn, E. (1976). The further use of the subliminal psychodynamic activation method for the experimental study of the clinical theory of psychoanalysis: On the specificity of the relationship between symptoms and unconscious conflicts. Psychotherapy: Theory, Research and Practice, 13, 2-16.
- Silverman, L. H., Frank, S. G., & Dachinger, P. (1974). A psychoanalytic reinterpretation of the effectiveness of systematic desensitization: Experimental data bearing on the role of merging fantasies. Journal of Abnormal Psychology, 83, 313-318.
- Silverman, L. H., & Grabowski, R. (1982). The effects of activating oneness fantasies on the anxiety level of male and female college students. Unpublished manuscript, New York University.
- Silverman, L. H., Klinger, H., Lustbader, L., Farrell, J., & Martin, A. D. (1972). The effects of subliminal drive stimulation on the speech of stutterers. Journal of Nervous and Mental Disease, 155, 14-21.
- Silverman, L. H., Kwawer, J. S., Wolitzky, C., & Coron, J. N. (1973). An experimental study of aspects of the psychoanalytic theory of male homosexuality. Journal of Abnormal Psychology, 82, 178-188.
- Silverman, L. H., Lachmann, F. M., & Milich, R. H. (1982). The search for oneness. New York: International Universities Press.
- Silverman, L. H., Levinson, P., Mendelsohn, E., Ungaro, R., & Bronstein, A. (1975). A clinical application of subliminal psychodynamic activation: On the stimulation of symbiotic fantasies as an adjunct in the treatment of hospitalized schizophrenics. Journal of Nervous and Mental Disease, 161, 379-392.
- Silverman, L. H., Martin, A., Ungaro, R., & Mendelsohn, E. (1978). Effect of subliminal stimulation of symbiotic fantasies on behavior modification treatment of obesity. Journal of Consulting and Clinical Psychology, 46, 432-441.
- Silverman, L. H., Ross, D. L., Adler, J. M., & Lustig, D. A. (1978). Simple research paradigm for demonstrating subliminal psychodynamic activation: Effects of Oedipal stimuli on dart-throwing accuracy in college males. Journal of Abnormal Psychology, 87, 341-357.

- Silverman, L. H., & Silverman, D. K. (1964). A clinical-experimental approach to the study of subliminal stimulation. Journal of Abnormal and Social Psychology, 69, 158-172.
- Silverman, J. S., Silverman, J. A., & Eardley, D. A. (1984). Do maladaptive attitudes cause depression? Archives of General Psychiatry, 41, 28-30.
- Simons, A. D., Garfield, S. L., & Murphy, G. E. (1984). The process of change in cognitive therapy and pharmacotherapy for depression. Archives of General Psychiatry, 41, 45-51.
- Skinner, B. F. (1953). Science and human behavior. New York: The Free Press (MacMillan Co.).
- Skinner, B. F. (1957). Verbal behavior. New York: Appleton-Century-Crofts.
- Skinner, B. F. (1974). About behaviorism. New York: Vintage Books.
- Smith, G. J. W., Spence, D. P., & Klein, G. S. (1959). Subliminal effects of verbal stimuli. Journal of Abnormal and Social Psychology, 59, 167-176.
- Somekh, D. E., & Wilding, J. M. (1973). Perception without awareness in a dichoptic viewing situation. British Journal of Psychology, 64, 339-349.
- Spekreijse, H., Van Der Tweel, L., & Ragan, D. (1972). Interocular sustained suppression: Correlations with evoked potential amplitude and distribution. Vision Research, 12, 521-526.
- Strack, S., & Coyne, J. C. (1983). Social confirmation of dysphoria: Shared and private reactions to depression. Journal of Personality and Social Psychology, 44, 798-806.
- Spitzer, R. L., & Endicott, J. (1979). Schedule for affective disorders and schizophrenia -- Life-time version. Unpublished manuscript, NIMH Clinical Research Branch Collaborative Program on the Psychobiology of Depression.
- Strickland, B. R., Hale, W. D., & Anderson, L. K. (1975). Effect of induced mood states on activity and self-reported affect. Journal of Consulting and Clinical Psychology, 43, 587.

- Sulloway, F. J. (1983). Freud: Biologist of the mind. New York: Basic Books.
- Thornton, J. W. (1987). A test of subliminal symbiotic activation as a means of alleviating depression. Psychoanalytic Psychology, 4, 335-342.
- Toch, H. H., & Schulte, R. (1961). Readiness to perceive violence as a result of police training. British Journal of Psychology, 52, 389-393.
- Tomkins, S. S. (1978). Script theory: Differential magnification of affects. In C. B. Keasey (Ed.), Nebraska symposium on motivation, Lincoln, Neb.: University of Nebraska Press.
- Tomkins, S. S. (1947). The Thematic Apperception Test: The theory and technique of interpretation. New York: Grune & Stratton.
- Ungaro, R. (1981). The therapeutic effects of subliminal stimulation of symbiotic fantasies on behavior modification treatment of obesity. Unpublished doctoral dissertation, Adelphi University.
- Varga, M. (1973). An experimental study of aspects of the psychoanalytic study of elation. Unpublished doctoral dissertation, New York University.
- Velten, E. (1968). A laboratory task for the induction of mood states. Behaviour Research and Therapy, 6, 473-482.
- Vestre, N. D., & Caulfield, B. P. (1986). Perception of neutral personality descriptions by depressed and nondepressed subjects. Cognitive Therapy and Research, 10, 31-36.
- Vitiello, M. V., Carlin, A. S., Becker, J., Barris, B. P., & Dutton, J. (1989). The effect of subliminal oedipal and competitive stimulation on dart throwing: Another miss. Journal of Abnormal Psychology, 98, 54-56.
- Walker, P. (1975). The subliminal perception of movement and the 'suppression' in binocular rivalry. British Journal of Psychology, 66, 347-356.
- Walker, P. (1978). Binocular rivalry: Central or peripheral selective processes? Psychological Bulletin, 85, 376-389.

- Wallace, G., & Worthington, A. G. (1970). The dark adaptation index of perceptual defence: A procedural improvement. Australian Journal of Psychology, 22, 41-46.
- Weinberger, J. L., & Silverman, L. H. (1987). Subliminal psychodynamic activation: A method for studying psychoanalytic dynamic propositions. Perspectives in Personality, 2, 251-287.
- Weiskrantz, L. (1977). Trying to bridge some neuropsychological gaps between monkeys and man. British Journal of Psychology, 68, 431-445.
- Weissman, A. W. (1979). The Dysfunctional Attitude Scale: A validation study. Unpublished dissertation, University of Pennsylvania.
- Weissman, A., & Beck, A. T. (1978, November). Development and validation of the dysfunctional attitude scale. Paper presented at the meeting of the Association for Advancement of Behavior Therapy, Chicago.
- Weissman, M. M., & Paykel, E. S. (1974). The depressed woman. Chicago: Chicago Press.
- Wells, H. K., & Bell, D. M. (1960). Binocular rivalry of parental figures in the humascope. Journal of Psychology, 50, 145-152.
- Wells, K. C., Hersen, M., Bellack, A. S., & Himmelhoch, J. (1979). Social skills training in unipolar nonpsychotic depression. American Journal of Psychiatry, 136, 1331-1332.
- Wilkinson, I. M., & Blackburn, I. M. (1981). Cognitive style in depressed and recovered depressed patients. British Journal of Clinical Psychology, 20, 283-292.
- Willner, P. (1984). Cognitive functioning in depression: A review of theory and research. Psychological Medicine, 14, 807-823.
- Winer, D. L., Bonner, T. O., Jr., Blaney, P. H., & Murray, E. J. (1981). Depression and social attraction. Motivation and Emotion, 5, 153-166.
- Winokur, G. (1973). The types of affective disorders. Journal of Nervous and Mental Disease, 156, 82-96.
- Worthington, A. G. (1964). Differential rates of dark adaptation to 'taboo' and 'neutral' stimuli. Canadian Journal of Psychology, 18, 257-265.

- Worthington, A. G. (1969). Paired comparison scaling of brightness judgements: A method for the measurement of perceptual defence. British Journal of Psychology, 60, 363-368.
- Youngren, M. A., & Lewinsohn, P. M. (1980). The functional relation between depression and problematic interpersonal behavior. Journal of Abnormal Psychology, 89, 333-341.
- Zajonc, R. B. (1968). Attitudinal effects of mere exposure. Journal of Personality and Social Psychology Monograph Supplement, 9, (2, Part 2), 2-27.
- Zeiss, A. M., Lewinsohn, P. M., & Munoz, R. F. (1979). Nonspecific improvement effects in depression using interpersonal skills training, pleasant activity schedules, or cognitive training. Journal of Consulting and Clinical Psychology, 47, 427-439.
- Zeiss, A. M., & Lewinsohn, P. M. (1988). Enduring deficits after remissions of depression: A test of the scar hypothesis. Behaviour Research and Therapy, 26, 151-158.
- Zigler, E., & Yospe, L. (1960). Perceptual defense and the problem of response suppression. Journal of Personality, 28, 220-239.
- Zuckerman, M. (1960). The effects of subliminal and supraliminal suggestion on verbal productivity. Journal of Abnormal and Social Psychology, 60, 404-411.
- Zuckerman, S. (1980). The effects of subliminal symbiotic and success-related stimuli on the school performance on high school underachievers. Unpublished doctoral dissertation, New York University School of Education.

APPENDICES

Appendix A

An Overview of Theories of Unipolar DepressionThe Amine Theory

A large part of the etiological research that has been conducted on unipolar depression has focused on neurophysiological factors. This research centers around the so-called amine theory of depression (Baldessarini, 1983; Green & Costain, 1979). Although the specific details of the amine theory are controversial, the basic proposition is that depression is caused by a deficit in certain brain neurotransmitters, especially the catecholamine norepinephrine, and the indolamine serotonin. Although these amines make up only 2% to 5% of all neurotransmitters in the central nervous system, approximately 90% of the amine transmitters are found in the limbic system, which is believed to be involved in autonomic arousal and emotional functioning (Hendler, 1982). Numerous studies lend support to the relationship between low levels of amine neurotransmitters and depression (e.g., Mendels, Fiere, Fitzgerald, Ramsey, & Stokes, 1972). It remains to be demonstrated, however, that a reduction in these substances causes depression, as opposed to being a consequence or a correlate of depression.

Current somatic interventions for depression, including psychotropic medications and electroconvulsive therapy, have been shown to be quite effective for many (though not all) depressed persons. The use of somatic interventions presents several problems, however, including contraindicating factors for many individuals, potentially dangerous short-term and long-term side effects, and the potential for chemical dependence in the case of antidepressant medication.

Psychoanalytic Theories

Virtually all modern theories of psychopathology owe an often-unrecognized debt to the pioneering work of Sigmund Freud (Sulloway, 1983), and current theories of depression are no exception. As early as 1895, in a letter to his friend Wilhelm Fliess, Freud noted three themes that continue to permeate thinking on depression: the theme of loss in the etiology of the condition, the analogy between depression and the process of mourning, and the frequent association of depression and anxiety (Freud, 1895/1950).

Early psychoanalytic formulations of depression, first presented by Abraham (1911, 1916) and subsequently developed by Freud (1917), involve the notion of introjection of hostility and anger unconsciously directed toward a lost love

object. According to Freud (1917), the depressive harbors a fundamentally ambivalent attitude toward a particular (often abstract) love object. When the object is lost, libido is not divested from the object and displaced onto a new object, as is the normal course in mourning. Rather, the depressive continues to identify with the lost object. As reality testing proceeds, two consequences of this "narcissistic identification" occur. First, the gradual realization that the object is truly lost becomes synonymous with loss of ego, resulting in low self-esteem. Second, feelings of hostility toward the lost object, which are repressed from consciousness, are introjected onto the self, resulting in feelings of worthlessness and guilt, and tendencies toward self-destructiveness.

Later Freudians, such as Rado (1928) and Gero (1936), expanded upon Freud's theory to incorporate his tripartite structure of personality functioning, and his theory of infantile sexuality. The ego psychologists, especially Bibring (1953), emphasized the depressive's realization of the discrepancy between the ego's actual state and its ideal state, as well as the ego's helplessness to achieve its ideal state. The object-relations theorists (e.g., Klein, 1948; Jacobson, 1971) extended Freudian concepts back into the first months of life, focusing on the relationship between the infant and significant objects in his or her world.

Depression (or at least a predisposition toward depression in later life) was held to result from problems in the formation of object-relations, particularly a failure to discriminate sufficiently the self from significant objects.

Empirical data directly evaluating psychodynamic theories of depression are sparse, although recent methodological innovations have provided some support for certain psychoanalytic propositions (Silverman, 1976). Psychoanalytic interventions for depression have rarely been subjected to systematic empirical evaluation. Despite the paucity of "hard" data, the insightful clinical observations and theoretical work of psychoanalysts continues to exert a powerful influence on the study of depression by theorists and researchers from a variety of theoretical perspectives.

Behavioral Theories

Several behaviorally-oriented theorists have proposed theories and models in an effort to account for the behavior of depressed persons. Common themes among the various behavioral approaches to depression include a loss of reinforcement and a reduction in the overall rate of emitted behavior. Skinner (1953, 1974) conceptualizes depression as an extinction phenomenon. A reduction in reinforcement or the instigation of response cost for operant behavior leads

directly to a reduction in the overall rate of operant behavior. The conceptualization of depression as an extinction phenomenon has been central to all behavioral approaches to depression (Hoberman & Lewinsohn, 1985; Lewinsohn, 1975). Similarly, Lazarus (1968) views depression as the result of a loss of reinforcement, resulting in a weakened behavioral repertoire.

Ferster (1973, 1981) conceptualizes depression as a reduction in the rate of operant behavior, and suggests three general factors that might produce this reduction. First, a lean schedule of positive reinforcement will result in a decrease in operant behavior, as suggested by Skinner and Lazarus. Second, failure to escape from aversive social stimuli may result in a reduction in behavior. Third, sudden environmental changes may result in removal of discriminative stimuli for ongoing behavior, thereby resulting in a reduced rate of behavior. Ferster also proposes that the verbal behavior of depressives is controlled primarily by immediate states of deprivation rather than by appropriate social cues. Costello (1972) expands upon Ferster's idea of the removal of discriminative stimuli for behavior as a possible cause for the reduction in the rate of the depressive's behavior. He suggests that depression is the result of a loss of reinforcement effectiveness, rather than a reduction in the rate or amount of reinforcement. This may occur as the result

of neurophysiological changes or the disruption of a behavioral chain.

Seligman (1973, 1974) describes a model of depression known as "learned helplessness." Depression is viewed as the result of repeated exposure to inescapable aversive stimulation. Facing both theoretical and empirical arguments against the original model, Abramson, Seligman, and Teasdale (1978) proposed a revised version of the theory, essentially arguing that it is the perception of noncontingency between behavior and environmental events, in particular unattainable reinforcement and unavoidable punishment, that causes depression. This revised version of the learned-helplessness theory is discussed further in the next section.

A deficit in appropriate self-control behavior constitutes the major theme of a model of depression proposed by Rehm (1977, 1981a). Depressed persons are described as having deficits in self-monitoring, self-evaluation, and self-reinforcement behavior. These deficits are considered relatively stable personality traits, and combine with stressful events in the person's life to produce a depressive episode. For example, in the face of a stressful event, depression-prone persons may only attend to negative aspects of the event, as well as only to the immediate consequences of their behavior. They may simultaneously set unrealistic

criteria for their behavior, then punish themselves excessively for not attaining their goals. It is this style of interaction with the environment that is hypothesized to lead to depression.

Probably the best known behavioral theorist of depression is Peter Lewinsohn. Lewinsohn and his colleagues have proposed a theory of depression in which a low rate of response-contingent reinforcement ("reconposre") functions as an eliciting stimulus for the emission of some depressive respondents, including feelings of dysphoria, fatigue, and other somatic complaints (Lewinsohn, 1974, 1975; Lewinsohn, Weinstein, & Shaw, 1969). A low rate of response-contingent positive reinforcement also produces other depressive behaviors through the process of operant extinction. Finally, some depressive behaviors may be maintained by reinforcement from the social environment. Thus, Lewinsohn combines both operant and respondent processes in his theory of depression.

Lewinsohn maintains that a low rate of response-contingent positive reinforcement is a function of three variables: (a) a small number of events that are potentially reinforcing for an individual (determined by biological and experiential factors); (b) a small amount or rate of reinforcement available from the environment; and (c) a deficit in an individual's social skills (Lewinsohn, 1975).

Of these factors, a deficit in appropriate social skills is considered especially important to the development and maintenance of depression (Lewinsohn, Weinstein, & Alper, 1970; Libet & Lewinsohn, 1973). Given a loss of or a reduction in socially-mediated reinforcement, the individual who does not possess the appropriate skills with which to regain or replace this reinforcement is likely to become depressed.

Several studies support the general notion of broad social skills problems in depression (Haley, 1985; Herbert, Nelson, & Herbert, 1987; Lewinsohn, Mischel, Chaplin, & Barton, 1980; Weissman & Paykel, 1974; Youngren & Lewinsohn, 1980), but the precise behaviors that are problematic remain largely unidentified (Coyne, 1976a; Libet & Lewinsohn, 1973; Winer, Bonner, Blaney, & Murray, 1981). Regardless of the role played by social skills in depression, several studies have demonstrated the efficacy of social skills training in the treatment of some depressives (Hersen, Bellack, & Himmelhoch, 1980; Lewinsohn, Weinstein, & Alper, 1970; McKnight, Nelson, Hayes, & Jarrett, 1984; Nelson, Herbert, Herbert, Sigmon, & Brannon, 1987; Wells, Hersen, Bellack, & Himmelhoch, 1979).

Lewinsohn and his colleagues have recently proposed a new theory of the etiology and maintenance of depression (Hoberman & Lewinsohn, 1985; Lewinsohn, Hoberman, Teri, & Hautzinger,

1985). Briefly, the theory proposes that environmental stressors result in the disruption of automatic, "scripted" behavior patterns, thereby reducing the rate of positive reinforcement and/or increasing the rate of aversive experiences in the individual's environment. This change in reinforcing conditions then results in a heightened state of self-awareness, especially for negative events. This enhanced self-awareness then leads to increased dysphoria and, ultimately, to the various other depressive symptoms. Once the depressive syndrome has emerged, it feeds into the heightened state of self-awareness to create a vicious cycle of symptom maintenance. Although the model is promising, it has not yet been directly subjected to empirical evaluation.

Although not explicitly presented as behavioral, Coyne (1976b) presents a theory of depression in which the depressed person's ongoing interactions with his or her social environment serve to establish and maintain depression. The behavior of the depressive is hypothesized to evoke negative reactions in others in the social environment, causing others to desire to reject and to avoid the depressive. Such escape is impossible, however, due to potential repercussions from the social community at large, who might view rejection of a depressed person as insensitive and uncaring. Thus, the competing demands on significant others in the depressive's environment (desire to avoid vs. potential punishment for

rejecting the depressive) results in a disturbed pattern of social interaction, which further exacerbates the depression.

Coyne's theory, like Lewinsohn's, highlights the role of social behavior in depression, although Lewinsohn's hypothesis of a social skills deficit in depression is not necessary to Coyne's theory. Several studies support the notion that others find interacting with depressives aversive (Coyne, 1976a; Hammen & Peters, 1978; Herbert et al., 1987; Howes & Hokanson, 1979; Strack & Coyne, 1983), although other studies suggest that a tendency to elicit negative reactions in others is not unique to depressives (Boswell & Murray, 1981; Haley, 1985; King & Heller, 1984). Coyne (1984) outlines an intervention for depression similar to the approaches described by Burgess (1969) and Liberman (1970), in which others (especially family members) are encouraged to provide veridical feedback to the depressed person regarding his or her behavior in social situations. A similar program has recently been proposed by Gotlib and Colby (1987). Although initial clinical reports from these authors appear favorable, further research is needed to evaluate the efficacy of this approach to therapy for depression.

Appendix B

Review of Basic Research in Subliminal PerceptionThe Poetzl Phenomenon

One of the earliest investigations of subliminal perceptual phenomena resulted from the serrendipitous observations of a contemporary of Freud. Poetzl (1917), studying the neurological effects of lesions in the visual system, found that subjects tended to "release" into consciousness at a later time aspects of stimuli that they were unaware of at the initial time of presentation. This phenomenon has been extensively studied, and has come to be known as the Poetzl effect. In general, the effect refers to the subsequent emergence, usually in dreams but also in other modalities, of stimuli of which the subject was unaware during their initial presentation. Poetzl (1917) labeled the effect the "law of exclusion," referring to the fact that only aspects of a stimulus that are excluded from awareness at the initial presentation subsequently emerge in dreams. In one of Poetzl's (1917) original studies, subjects were presented with 10 msec exposures of a slide of the temple ruins at Thebes, and were asked to describe what they saw, to report any subsequent dreams, and to draw their dream imagery. Consistent with the law of exclusion, only those features of

the stimulus that were not reported during the initial presentation of the stimulus appeared in subsequent dreams.

The Poetzl effect has received a great deal of scientific attention, and has been shown to be quite robust across methodological variations (see Shevrin, 1986, for a recent review of this literature). The effect has been shown to be relatively independent of the mode of stimulation. The effect has been demonstrated with very brief stimulus exposures (e.g., Fisher, 1954, 1957, 1960; Fisher & Paul, 1959; Fiss, Goldberg, & Klein, 1963; Giddan, 1967; Haber & Erdelyi, 1967; Luborsky & Shevrin, 1956; Paul & Fisher, 1959; Poetzl, 1917; Shevrin & Luborsky, 1958; Silverman, 1965), and with prolonged stimulus exposures (Malamud, 1934; Malamud & Linder, 1931). Moreover, a wide range of dependent measures have been successfully employed, including dream content (Fisher, 1954; Shevrin & Luborsky, 1958), fantasy drawings (Giddan, 1967), reported imagery (Allers & Teler, 1924; Fiss, Goldberg, & Klein, 1963; Luborsky & Shevrin, 1956), word associations (Allers & Teler, 1924; Shevrin & Fisher, 1967; Shevrin & Fritzler, 1968), and responses to Rorschach cards (Silverman, 1965; Silverman & Silverman, 1964).

In many studies, it has been found that subsequent responses by subjects appear to be related symbolically, rather than literally, to the initial stimulus (Dixon, 1981).

Fisher (1954), in fact, has suggested that the content of normal dreams may be determined by symbolic transformation of prior stimulation of which the individual was unaware or to which he or she was not attending. Of course, the primary criticism of the purported demonstrations of symbolic transformation concerns how objectively the content of subjects' dreams, free associations, and the like can be assessed. That is, how can we be certain that the material obtained by subjects is really reflective of the original stimulus? Later replications and extensions of the Poetzl effect leave little doubt as to the validity of such dependent measurement. For example, Giddan (1967) had judges who were blind to experimental condition evaluate drawings made by subjects as to whether or not they were similar to experimental stimuli that had been tachistoscopically presented for 2.5 msec. The judges placed each drawing into one of three categories according to its relatedness to the original stimulus: "Probable," "Possible," and "None." The results confirmed the Poetzl effect, and the raters achieved an acceptably high level of inter-rater reliability.

Perceptual Defense

At the heart of the "New Look" movement in perception is the phenomenon of perceptual defense. The basic idea is that

recognition thresholds are not fixed, but vary as a function of subject characteristics and the nature of the stimulus, with emotionally threatening or anxiety provoking stimuli requiring longer durations for recognition than less arousing stimuli (Erdelyi, 1974). Most of the work on perceptual defense uses tachistoscopic presentations of verbal or pictorial stimuli. The typical early paradigm involved subjects verbally or otherwise indicating when they recognized a series of stimuli that were presented for different durations. The results of these studies can be summarized as follows (Brown, 1961; Dixon, 1981): (a) an inverse U relationship exists between stimulus affect and recognition thresholds, with medium levels of emotionality producing higher thresholds relative to low or high levels of stimulus affect; (b) this same relationship holds for individual differences across subjects as a function of their anxiety concerning specific conflict areas; and (c) galvanic skin response (GSR) measures taken before stimulus recognition are higher for emotive than for neutral stimuli.

Dixon (1958) has designed an alternative paradigm for studying perceptual defense. While subliminal presentations of high vs. low emotive stimuli are presented to one eye, varying intensities of a neutral stimulus -- a spot of light -- are simultaneously presented to the other eye. The subject is asked simply to respond when he or she sees the spot of

light. The emotive or neutral stimuli remain subliminal, and the subject is not even aware of the fact that he or she is being stimulated. The results of several studies using this methodology have demonstrated perceptual defense effects; the awareness threshold of the neutral stimulus in one eye varies as a function of the emotionality of the stimulus presented subliminally to the other eye (Dixon, 1958; Dixon & Haider, 1961; Henley, 1974; Henley & Dixon, 1976). For example, Henley and Dixon (1976) found that stimuli hypothesized to be particularly disturbing to schizophrenics (i.e., words such as "Breast" and pictorial stimuli of mother-child interactions) raised the awareness threshold for a spot of light presented to the other eye. In contrast to normal controls, however, the emotional word "Cancer" lowered rather than raised the recognition threshold for the neutral stimulus.

Using a related methodology, Hardy and Legge (1968) demonstrated that visual thresholds for neutral stimuli vary as a function of the emotionality of subliminal auditory stimuli. A second experiment demonstrated the same effects using the converse relation, in which the emotionality of subliminal visual stimuli affected auditory thresholds.

Finally, Worthington (1969) asked subjects to compare the phenomenal brightness of pairs of verbal stimuli of varying

degrees of emotionality. The stimuli were presented at equal intensities, well below the recognition threshold, such that they appeared as two faint areas of light on a screen. Consistent with other perceptual defense demonstrations, the highly emotive stimuli were consistently judged as less bright relative to the less emotive stimuli.

The previously discussed reappraisal of subliminal perceptual phenomena that took place in 1950's focused heavily on purported demonstrations of perceptual defense. Interestingly, even the critics generally acknowledged that the effects described above were well-established. The focus of concern was instead directed toward distinguishing perceptual from response effects. The "response-bias" criticism of subliminal research is discussed further in a later section, but given its particular relevance to the issue of perceptual defense, it is briefly addressed here. The basic idea is that "subjects recognize taboo and neutral words with equal facility but are reluctant to report embarrassing items, requiring greater certainty and therefore longer exposure durations" (Erdelyi, 1974, p. 8). In signal detection terms, the sensitivity (d') for both types of stimuli are identical, but the decision criterion (B) is more stringent for reporting affectively-laden stimuli.

Although it is difficult to imagine that decision criteria are irrelevant to stimulus reporting, it does not appear that all perceptual defense effects can be accounted for simply in response bias terms. Consider, for example, studies by Ruiz and Krauss (1968) and by Zigler and Yospe (1960) in which perceptual defense effects were demonstrated even when subjects were required to respond outloud to neutral stimulus words with taboo words and vice versa. Studies employing signal detection procedures in an effort to distinguish stimulus sensitivity (d') from response criterion (B) factors suggest that the former are most important (Broadbent & Gregory, 1967; Chapman & Feather, 1972; Dorfman, 1967; Dorfman, Grossberg, & Kroeker, 1965). It is interesting to note that, according to Dixon (1981), both Dorfman, and Broadbent and Gregory initially espoused a response-bias position on perceptual defense, and actually anticipated finding the opposite results than those obtained.

Another argument against the response-bias explanation concerns the typical finding of an inverse U relationship between emotionality and recognition thresholds, discussed above. Recall that the threshold for moderately emotive stimuli is generally higher than the threshold for low emotive stimuli. This finding, combined with the results of supportive studies in which subjects were made to respond to neutral items with taboo words, argues against the notion of

a response bias against reporting consciously perceived emotive stimuli.

In conclusion, the demonstration of perceptual defense effects using a wide range of carefully controlled experimental paradigms leaves the validity of the phenomenon beyond any reasonable doubt.

The Effects of Labels upon the Perception of Ambiguous Stimuli

One of the most simple demonstrations of subliminal perception involves the effects of subliminally presented verbal stimuli upon responses given to subsequent supraliminally presented ambiguous stimuli (e.g., Erdley & D'Agostino, 1988). In a classic study, Smith, Spense, and Klein (1959) presented subjects tachistoscopic exposures of gradually increasing durations of the words "Happy" and "Angry," interspersed with supraliminal exposures of an expressionless male face. The results revealed that the face was judged as more pleasant when it had just been preceded by "Happy" than by "Angry." Moreover, this effect was no weaker at extremely brief levels of stimulation than at longer durations of exposure. This effect is not confined to the visual modality, as Henley (1975) found that descriptions of an ambiguous face were influenced by stimulation presented below the auditory threshold. Similarly, Groeger (1986) found

that subjects' responses on a sentence completion task were influenced by subliminally presented auditory cues.

The results of the Smith et al. (1959) study have been replicated by Sackeim, Packer, and Gurr (1977), and by Somekh and Wilding (1973). In the Somekh and Wilding study, the authors presented "happy" and "sad" stimuli subliminally to one eye, while the neutral face was presented simultaneously supraliminally to the other eye. In addition to replicating the results of the earlier study, the Somekh and Wilding study included conditions in which stimuli structurally similar to "happy" and "sad" ("harry" and "sap") were presented under both sub- and supraliminal conditions. Interestingly, these latter stimuli were only misread in the supraliminal condition, having no effect upon descriptions of the neutral face when presented subliminally.

Visual Priming

Cognitive psychologists interested in semantic memory have extensively studied a phenomenon known as priming, in which recognition of a stimulus (the target) is facilitated by preceding it immediately with a related stimulus (the prime). For example, it takes subjects less time to say the word "chair" when it immediately follows the word "table" than when it follows "bread" (Meyer & Schvaneveldt, 1971).

Of particular interest in the present context is the discovery by Marcel (1974, 1983) that priming effects occur even when the prime is presented subliminally. Marcel's paradigm involves two phases. In the initial phase, the prime stimulus (a picture or a word) is immediately followed by a "masking" stimulus, consisting of randomly oriented characters, which impairs recognition of the prime. The duration of the stimuli and the interval between the prime and mask are manipulated in an effort to find critical values below which the prime cannot be identified. Thus, the masking stimulus effectively renders the prime subliminal to the subject. The second phase involves a series of trials in which supraliminal exposures of target words are preceded immediately by prime-mask stimuli or nonprime-mask stimuli, which are presented tachistoscopically at values well below the predetermined critical recognition threshold. The primary dependent measure is the reaction time to identify the target stimuli. The typical results are lower reaction times for target stimuli preceded by primes than for targets preceded by nonprimes.

Using a similar methodology, Fowler, Wolford, Slade, and Tassinary (1981) presented very brief (10 msec) exposures of prime stimuli followed by a mask. The brief stimulus exposure and the prime-mask interval were such that the subjects were

at a chance level of guessing whether any prime stimulus had been presented (as opposed to a blank field). Subjects were required simply to indicate if the target stimulus was a word or a nonword string of letters. Again, priming effects were demonstrated; reaction times were lower when the prime was related to the target stimulus, even though subjects reported being unaware of the prime.

In both of the paradigms described above, conditions were also included in which the priming stimuli were presented supraliminally. The differences in recognition times between primed and nonprimed targets were the same whether the primes were presented sub- or supraliminally. Thus, the consistent finding of studies of visual priming is that comparable priming effects occur when subjects are unaware of the prime as when the prime is presented supraliminally.

A related experiment using nonverbal stimuli was recently conducted by Overbeeke (1986) in The Netherlands. Brief but supraliminal (750 msec) exposures of a profile of a 10-year old boy were preceded by extremely brief (1 msec) tachistoscopic exposures of either a younger profile, an older profile, or a blank card. Following presentation of the supraliminal stimulus, subjects were asked to estimate the age of the profile. Subjects who received the younger prime judged the target profile as significantly younger than those

who received the control (blank) prime, although there were no significant differences between judgments of subjects in the older and control groups.

Stereoscopic Visual Stimulation

Numerous researchers have investigated the perceptual effects of simultaneous but inconsistent stimulation of the two eyes. These investigations suggest that visual stimulation of which a subject is apparently unaware may nevertheless exert an influence upon perception. In studies of binocular rivalry, in which only the information presented to one eye is perceived, changes in the stimulus field of the other (nondominant) eye will result in an immediate shift in dominance, even though the subject does not report noticing the stimulation that precipitated this shift. For example, Walker (1975, 1978) presented subjects with a red field in one eye and a green field in the other, and the subjects reported seeing only one of the two colors. An additional stimulus of moving black and white squares was then presented to the nondominant eye, which immediately caused it to assume dominance, even though the subjects did not report seeing the squares.

Other studies demonstrate the influence of factors such as personality variables and gender on perceptual dominance effects. For example, Wells and Bell (1960) presented a portrait of the subject's father to one eye and the subject's mother to the other eye, and found that the boys showed perceptual dominance for the female parent, whereas the girls showed dominance for the male parent. Dixon (1981) reviewed numerous other investigations using stereoscopic visual stimulation that demonstrate the interaction of the content of such stimulation with a range of subject variables to determine perceptual experience (e.g., Beloff & Beloff, 1959; Beloff & Coupar, 1968; Berg & Toch, 1964; Moore, 1966; Pettigrew, Allport, & Barnett, 1958; Purcell & Clifford, 1966; Reynolds & Toch, 1965; Shelley & Toch, 1962; Toch & Schulte, 1961). Moreover, Shevrin and Dickman (1980) cited several studies of binocular rivalry that demonstrated that a visual evoked response is generated by the stimulation of both the dominant and the suppressed eye (e.g., Cobb, Morton, & Ettlenger, 1967; Harter, Seiple, & Musso, 1974; Harter, Towle, & Musso, 1976; Lehman & Fender, 1968; Spekrijse, Van Der Tweel, & Ragan, 1972).

The Mere-Exposure Effect

The effects of repeated exposure to virtually any stimulus upon subjects' emotional or aesthetic judgments of that stimulus are well documented: Subjects prefer familiar stimuli over unfamiliar ones (Harrison, 1969; Matlin, 1970; Saegert, Swap, & Zajonc, 1973; Zajonc, 1968). Kunst-Wilson and Zajonc (1980) have recently demonstrated that even repeated subliminal exposures to stimuli increase the appeal of these stimuli relative to novel stimuli. This experiment consisted of an exposure phase followed by a test phase. During the exposure phase, 20 irregular octagons were divided into two groups. Half of the subjects were presented with 1 msec exposures of stimuli from one group, whereas half were presented with stimuli from the other group. Pretesting with a prior group of subjects revealed that such brief stimulus exposures precluded above chance accuracy in judgments as to whether a stimulus or a blank field was presented. During the test phase, all subjects were presented with 1 second exposures of ten pairs of stimuli, each pair consisting of one stimulus from each original group. The subjects were asked to identify (a) the stimulus they liked best, and (b) the stimulus they had seen before. The results indicated that recognition performance was at a chance level, but a clear preference effect for the familiar stimuli was found. These

findings were recently replicated and extended by Bornstein, Leone, & Galley (1987).

Medical Conditions: Cortical Blindness and Anaesthesia

Studies of blind or partially blind individuals whose peripheral visual organs are intact, but whose condition is caused by damage to central visual pathways are also relevant to the notion of perception without awareness. These studies reveal that cortically blind persons are able to respond to stimuli that they report being completely unable to see (e.g., Ikeda & Wright, 1974; Poppel, Held, & Frost, 1973). In one such study, Weiskrantz (1977) describes an extensive investigation of a man with blindness in both left half fields as the result of a lesion in his right calcarine fissure. When asked to guess the position of stimuli presented on a screen to his blind field by pointing, or to guess whether an "O" or an "X" was presented on a screen, he proved remarkably accurate. He never acknowledged "seeing" these stimuli, however, although he readily acknowledged seeing even a faint stimulus that was presented to his good field.

Another medical condition that is relevant to the present discussion concerns surgical patients under deep anaesthesia. McKean (1985) discussed the recent work of Bennett on the effects of auditory stimulation under anaesthesia on

subsequent waking behavior. In one study, anaesthetized subjects undergoing surgery were instructed to signal that they heard the message by pulling their ear during a postoperative interview. Almost all of the experimental subjects pulled at their ear during the interview, although none recalled having been instructed to do so, whereas less than half of a control group of subjects pulled at their ear.

Other Basic Research Programs

In addition to the investigations described above, several other research areas demonstrate that stimuli of which one is unaware can affect behavioral and physiological measures. Several studies demonstrated that visual stimuli presented below the awareness threshold result in cortical evoked potentials (e.g., Begleiter, Gross, & Kissin, 1969; Libet, Alberts, Wright, & Feinstein, 1967; Shevrin & Rennick, 1967). Shevrin and Fritzler (1968) demonstrated that the primary wave amplitude in response to 1 msec tachistoscopic stimulus exposures was greater for meaningful than for meaningless stimuli. Hartley (1969) used the stereoscopic visual stimulation paradigm to demonstrate that cortical evoked responses associated with stimulation of the dominant eye are reduced in magnitude when emotive stimuli, relative to neutral stimuli, are presented to the suppressed eye.

Kemp-Wheeler and Hill (1987) recently demonstrated that subjects exposed to subliminal presentation of affectively-laden words, relative to a group of subjects exposed to neutral words, showed significant increases in several physiological measures of anxiety, including sweating, shaking, and muscular tension.

Although most of the work in subliminal perception has focused on the visual system, subliminal effects are not limited to this modality. In studies of visceroreception, Adam (1978) has demonstrated that internal stimulation of which the subject reports no awareness, such as the inflation of an intestinal balloon and mild electric shocks to the cervix uteri, result in specific EEG responses. Effects of subliminal auditory stimulation have already been discussed. Libet and his associates (Libet, 1973; Libet et al., 1967) have shown that electrical stimulation of the skin results almost immediately in a cortical evoked response, but that the subject remains unaware of the stimulus until it has been presented for approximately 500 msec. Similarly, direct electrical stimulation of the brain only results in perceptible sensation after continuous stimulation for half a second. Finally, subliminal olfactory stimulation, such as weak concentrations of androstenol or aliphatic acid (which is found in vaginal secretions of primates) have been shown to influence affective judgments of photographs and written

descriptions of other people (Cowley, Johnson, & Brooksbanck, 1977; Kirk-Smith, Booth, Carroll, & Davies, 1978).

PLEASE NOTE:

Copyrighted materials in this document have not been filmed at the request of the author. They are available for consultation, however, in the author's university library.

These consist of pages:

213-217, Original Version of D.A.S.

U·M·I

Appendix D

Ethical Considerations

The finding in numerous previous studies that subliminally presented stimuli can affect behavior and mood obviously raises important ethical concerns. Silverman (1977) was well aware of these concerns, and has written an extensive report on ethical considerations and guidelines in the use of subliminal stimulation. The unanimous conclusion of experts in the field is that, except under conditions of repeated exposure over several sessions, the effects of subliminal stimulation are "slight, without subjective discomfort, and very fleeting" (Silverman, 1977, p. 3). Recent reviews of the attempted use of subliminal stimulation for advertising purposes (e.g., Moore, 1982) revealed no evidence for their effectiveness in modifying consumer behavior. This is undoubtedly due to the weak and short-lived nature of subliminally-produced effects under most conditions. In fact, the only studies that have reliably yielded lasting effects of subliminal stimulation are the therapy and educational adjunct studies employing Silverman's (1983, 1984) methodology, in which a therapeutic stimulus is repeatedly presented over many sessions. Silverman (1977) presented the following observations that argue against the possibility that subliminal stimulation in a single laboratory session might produce large or lasting effects:

"1) Clinically sophisticated experimenters report that even when they make concerted efforts to judge from Ss' reactions whether an experimental or control stimulus had been exposed, they do not see large enough differences to confidently make such judgments. 2) In the debriefing at the end of each experiment, subjects typically react with disbelief that stimuli had been subliminally exposed and sometimes explicitly comment that there was no change they subjectively experienced during the experiment" (p. 3).

In addition to these observations, Silverman (1977) reported two kinds of objective data that reveal the fleeting nature of subliminal effects. First, subjects who received the experimental stimulus in an initial phase and the control stimulus in a second phase (usually one to three days later) have been compared to those who received the opposite order of conditions. Comparisons of the baseline levels of pathology just prior to the second phase have been made in several studies, and reveal "no differences that even approached significance" (p. 4). The second piece of objective data supporting the short-lived nature of subliminal effects comes from a study by Silverman, Pettit, and Dunne (1971, cited in Silverman, 1977). In this study, two assessments of subjects' pathology were made following presentation of experimental and control stimuli. The first was made immediately following stimulus presentation, whereas the second was made 15 to 30 minutes later. The first assessment revealed an increase in pathology immediately following the experimental stimulus, as predicted. By the

second assessment, however, the level of pathology had completely returned to its baseline level. Finally, in a recent study of mildly depressed women, Dauber (1984) found statistically significant effects of subliminal stimulation on the same dependent measure that was employed in the present study (i.e., a modified version of the Depressive Adjective Checklist). It should be noted, however, that the actual magnitude of these effects was quite small, and an extremely sensitive measure was required to reveal any change in mood. Although the possibility of risk to any participant in the present study was very unlikely, several precautions were taken in accordance with the guidelines proposed by Silverman (1977). Briefly, these included the following:

- 1) Each participant received detailed information about the experiment prior to his or her participation. No deception was employed, and the absence of deception was explicitly made clear to the subjects. Informed consent was obtained.
- 2) Subjects were encouraged to ask questions and voice concerns about the experiment. They were reminded that they could choose to discontinue their participation at any time without any penalty whatsoever.

3) An extensive oral and written debriefing took place in which the subliminal stimuli were revealed, as well as the rationale for their use.

4) Each participant was invited to contact the experimenter following the experimental session in order to discuss any lingering negative impact he or she thinks the stimuli may have had.

In addition to these precautions recommended by Silverman (1977), the following preventative measures were also taken:

1) All subjects who participate in the study were screened for suicidal potential using a standard measure (the SAD PERSONS scale), and were free of significant suicidal risk.

2) All participants not receiving psychiatric or psychological services at the time of their participation (i.e., possibly some of the depressed subjects, and all of the remitted and never-depressed subjects) were provided a list of community mental health professionals upon completion of the initial screening interview. They were explicitly told that the experimenter's giving them this list in no way reflected a judgment that psychotherapeutic services were needed or recommended, but was simply part of the experimental protocol.

3) In the unlikely event that a subject were to have become visibly upset or disturbed during any phase of the experimental session, the experiment would have been stopped immediately. The experimenter would have then discussed any potential concerns the subject might have had, and would have made appropriate referrals as needed.

It should be noted that no subject reported being disturbed or upset in any way by the tachistoscopic experimental procedure. All 30 subjects who began the procedure completed it without incident.

Appendix E

Consent for Screening

I agree to undergo a brief interview and to complete a brief questionnaire to be used in selecting participants for a psychological study on the effects of verbal stimuli on mood. I have been informed that my participation in this interview is completely voluntary, and that I can decide to stop the interview at any time if I wish. I also understand that all information collected from me will be held completely confidential.

If I am currently receiving psychological or psychiatric treatment, or if I have received such treatment in the past, I give my permission for the experimenter to contact my therapist to obtain a brief description of his or her view of my main problems. My therapist's name is/was: _____
_____.

I understand that if I am selected for participation in this study, the experimental procedure will be explained to me later. At that time, I will be given another opportunity to decide whether or not I want to continue to participate.

Signature

Date

Witness

Appendix F

Sample Items from the Schedule for Affective Disorders
And Schizophrenia -- Life-time Version

1. I would like to hear about any problems or difficulties you are having in your life now.
2. When would you say you first noticed that something was wrong (this time)?
3. Are you feeling better now or is it at its worst now?
4. How long has it been since you were (description of full-blown condition)?
5. Did you ever go to a doctor for your nerves?
6. Were you ever a patient in a psychiatric hospital or ward (before)?
7. Were there any (other) times when you or someone else felt you needed help because of your feelings, your nerves, or the way you were acting?
8. Did you ever have a period that lasted at least 1 week when you were bothered by feeling depressed, sad, blue, hopeless, down in the dumps, that you didn't care anymore, or didn't enjoy anything?
9. What about feeling irritable or easily annoyed?
10. During that time did you seek help from anyone, like a doctor, or minister or even a friend, or did anyone suggest that you seek help? Did you take any medication? Did you act differently with people, your family, at work, or at school?
11. How many episodes like this have you had?
12. When you were (depressed, down), did you have any beliefs or ideas which you later found out were not true -- like people being out to get you, or talking about you behind your back, or that your thoughts or movements were controlled?
13. Did you hear voices or other sounds that other people couldn't hear?...have visions or see things that were not visible to other people?...What about strange smells, or strange feelings in your body?

14. Did people have trouble understanding what you were talking about?
15. Were you unusually cheerful and energetic at any time, just before, during, or right after you were depressed?
16. Have there been any times other than when you were (depressed, manic), that you were (sick, emotionally upset, in the hospital, heard voices, had strange experiences, felt people were against you...?)
17. What have your drinking habits been like?
18. Was there ever a period in your life when you drank too much?
19. Since you have been an adult have you been the kind of person who often has a few days when you feel down or depressed and then at other times has a few days when you feel even better than normal or high? (Does your mood swing from high to low?) (Are you clearly more active during the high periods? Do you have a lot of energy?)
20. Did you ever have a period that lasted at least 1 week when you were bothered by feeling depressed, sad, blue, hopeless, down in the dumps, or that you just didn't care anymore?
21. Have you ever had panic attacks or anxiety attacks when you suddenly felt very frightened and had physical symptoms like...? (When does this happen?)
22. Have you had periods of at least 2 weeks when you felt anxious or tense (jittery, nervous, restless, "uptight") most of the time?
23. How about being bothered by thoughts that kept coming back to you, that didn't make sense, that you couldn't get rid of or put out of your mind?
24. Have you ever tried to kill yourself or done anything that could have killed you?

PLEASE NOTE:

Copyrighted materials in this document have not been filmed at the request of the author. They are available for consultation, however, in the author's university library.

These consist of pages:

226-228, Beck Inventory

U·M·I

Appendix H

SADS PERSONS ScaleFor Assessing the Risk of Suicide

Name _____ Subject # _____
 Age _____ Date _____ Score _____

Sex.....	0 Female	1 Male
Age.....	19 to 45	< 19 or > 45
Depression.....	No	Yes
Previous attempt.....	No	Yes
Ethanol abuse.....	No	Yes
Rational thinking loss.....	No	Yes
Social supports lacking.....	No	Yes
Organized plan.....	No	Yes
No spouse.....	No	Yes
Sickness.....	No	Yes

Appendix I

Therapist Consent Form

This statement acknowledges my permission for the participation of _____ a client/patient under my care, as a participant in a psychological research project concerning the effects of subliminal stimulation on mood. The purpose, nature, and procedures of this project have been fully explained to me. I have been informed that subjects may experience a mild increase or decrease in dysphoric mood as a result of the experimental stimulation, and that past research with this methodology suggests that any such effects are likely to be very mild and fleeting. I understand that any identifying information obtained will be kept strictly confidential, and will be available only to James Herbert, M.A., Principal Investigator, Rosemary O. Nelson, Ph.D., Professor of Psychology at UNCG, and their research associates.

I understand that my client/patient has consented to the experimenter's contacting me regarding his or her case. The client's/patient's current diagnosis is (per DSM-III or DSM-III-R; please specify):

Axis I:

Axis II:

Axis III:

I understand that informed consent will be obtained from my client/patient prior to his or her participation in the study proper, and that the voluntary nature of the study has been emphasized to him/her.

Therapist's signature

Date

Witness

Appendix J

Tables

Table 1

Descriptive Data by Subject

S	A	M	D	B	M	S
S	G	A	I	D	M	A
#	E	R	A	I	P	D
.	.	I	G	.	I	P
.	.	T	N	.	D	E
.	.	A	O	.	.	R
.	.	L	S	.	.	S
.	.	.	I	.	.	O
.	.	.	S	.	.	N
.
01	29	2	12	7	24	1
03	43	1	12	2	21	0
28	51	1	12	1	21	1
02	45	1	12	5	21	0
23	37	1	12	3	22	1
17	34	2	12	10	25	1
27	34	2	12	8	19	1
21	32	1	12	0	16	0
29	32	1	12	1	14	0
30	39	1	12	5	22	0
06	33	2	7	6	33	1
09	38	1	7	3	21	1
25	39	2	11	2	23	1
07	42	1	7	9	27	2
16	20	2	7	4	30	1
19	47	1	7	10	30	2
24	31	1	7	9	24	1
18	46	1	7	3	21	1
22	41	1	7	4	19	0
26	43	1	7	4	22	0
04	26	1	5	24	47	1
08	40	2	5	34	40	2
20	39	1	1	28	43	1
05	25	1	1	29	36	1
15	30	2	1	45	30	2
11	37	1	5	38	41	3
13	34	2	1	36	37	2
10	45	1	2	40	35	2
12	33	2	5	28	35	3
14	53	1	2	22	35	2

Key to Variables

DIAGNOSIS: 1 = Major Depression 7 = 1-Remitted 12 = No dx
 2 = Dysthymia 8 = 2-Remitted
 5 = Double Depression 11 = 5-Remitted

MARITAL STATUS: 1 = Married 2 = Single

Table 2
 One-Way Analysis of Variance and Tukey Post Hoc
 Comparisons on Beck Depression Inventory

Source	Sums of Squares	d.f.	F	p
Group	5085.60	2	102.41	0.0001
Error	670.40	27		

Group	Mean	Grouping (Means with same letter are not significantly different at $p < .05$)
Normal	4.20	A
Remitted	5.40	A
Depressed	32.40	B

Table 3
 One-Way Analysis of Variance and Tukey Post Hoc
 Comparisons on MMPI-Depression Scale

Source	Sums of Squares	d.f.	F	p
Group	1631.40	2	42.57	0.0001
Error	517.40	27		

Group	Mean	Grouping (Means with same letter are not significantly different at $p < .05$)
Normal	20.50	A
Remitted	25.00	A
Depressed	37.90	B

Table 4
 One-Way Analysis of Variance and Tukey Post Hoc
 Comparisons on SADPERSONS

Source	Sums of Squares	d.f.	F	p
Group	10.32	2	12.07	0.0002
Error	11.12	26		

Group	Mean	Grouping (Means with same letter are not significantly different at $p < .05$)
Normal	0.44	A
Remitted	1.00	A
Depressed	1.90	B

Table 5
One-Way Analysis of Variance on Subjects' Age

Source	Sums of Squares	d.f.	F	p
Group	31.76	2	0.24	0.7860
Error	1633.86	25		

Table 6

Method I: Outline of Procedure

1. Visual acuity test
2. Baseline DACL
3. First critical stimulus set (5 stimuli, 4 4-msec exposures each in subliminal condition, or 1 4-sec exposure of each in supraliminal condition), followed by agreement ratings after each series of four exposures (subliminal) or one exposure (supraliminal)
4. First critical DACL
5. 5-minute break
6. Second critical stimulus set and agreement ratings
7. Second critical DACL
8. 5-minute break
9. Third critical stimulus set and agreement ratings
10. Third critical DACL
11. 5-minute break
12. Fourth critical stimulus set and agreement ratings
13. Fourth critical DACL
14. Discrimination Task
15. Post-Experimental Questionnaire
16. Debriefing (written and oral)

Table 7
One-Way Analyses of Variance
On Discrimination Task Data

I. Number of Correct Discriminations

Source	Sums of Squares	d.f.	F	p
Group	12.87	2	1.52	0.2367
Error	114.10	27		

II. Number of "Same" Responses

Source	Sums of Squares	d.f.	F	p
Group	2.60	2	0.53	0.5963
Error	66.60	27		

III. Number of "Different" Responses

Source	Sums of Squares	d.f.	F	p
Group	2.60	2	0.53	0.5963
Error	66.60	27		

Table 8
 One-Way Analysis of Variance and Tukey
 Post Hoc Comparisons on Baseline DACL

Source	Sums of Squares	d.f.	F	p
Group	43152536.27	2	148.07	0.0001
Error	17048786.40	117		

Group	Mean	Grouping (Means with same letter are not significantly different at $p < .05$)
Normal	-547.70	A
Remitted	-339.10	B
Depressed	815.80	C

Table 9
Four-Way Analysis of Variance on DACL Gain Scores

Source	Sums of Squares	d.f.	F	p
Group	1088744.92	2	1.89	0.1798
Order	850140.37	3	0.98	0.4224
Group X Order	1544232.76	6	0.89	0.5201
Ss(Group X Order)	5183595.63	18		
Modality	59096.57	1	1.39	0.2439
Valence	5831.11	1	0.14	0.7128
Group X Modality	216300.27	2	2.54	0.0883
Group X Valence	60744.41	2	0.71	0.4946
Modality X Valence	47710.17	1	1.12	0.2945
Order X Modality	48534.40	3	3.51	0.0212
Order X Valence	60505.98	3	0.47	0.7019
Grp X Ord X Mod	265710.59	6	1.04	0.4099
Grp X Ord X Val	164121.11	6	0.64	0.6958
Ord X Mod X Val	89701.37	3	0.70	0.5548
Grp X Mod X Val	23230.80	2	0.27	0.7623
Ord X Grp X Mod X Val	208427.59	6	0.82	0.5624
Error	2299279.21	54		

Table 10
 Tukey Post Hoc Tests on Order by Modality
 Interaction for DACL Gain Scores

SUBLIMINAL	Order 3 (-112.92)	Order 1 (17.28)	Order 2 (148.92)	Order 4 (201.72)
Order 3 (-112.92)	-	n.s.	*	*
Order 1 (17.28)		-	n.s.	n.s.
Order 2 (148.92)			-	n.s.
Order 4 (201.72)				-
SUPRALIMINAL	Order 3 (-88.58)	Order 2 (-45.67)	Order 4 (76.27)	Order 1 (131.78)
Order 3 (-88.58)	-	n.s.	n.s.	n.s.
Order 2 (-45.67)		-	n.s.	n.s.
Order 4 (76.27)			-	n.s.
Order 1 (131.78)				-

*p < .05

Table 10 (Continued)
 Tukey Post Hoc Tests on Order by Modality
 Interaction for DACL Gain Scores

ORDER 1	Subliminal (17.28)		Supraliminal (131.78)
Subliminal Supraliminal	(17.28) (131.78)	-	n.s. -
ORDER 2	Supraliminal (-45.67)		Subliminal (148.92)
Supraliminal Subliminal	(-45.67) (148.92)	-	* -
ORDER 3	Subliminal (-112.92)		Supraliminal (-88.58)
Subliminal Supraliminal	(-112.92) (-88.58)	-	n.s. -
ORDER 4	Supraliminal (76.28)		Subliminal (201.72)
Supraliminal Subliminal	(76.28) (201.72)	-	n.s. -

*p < .05

Table 11
Four-Way Analysis of Variance on Unadjusted DACL Scores

Source	Sums of Squares	d.f.	F	p
Group	53856421.80	2	63.64	0.0001
Order	3066641.15	3	2.42	0.1000
Group X Order	1945651.18	6	0.77	0.6059
Ss(Group X Order)	7616763.63	18		
Modality	59096.57	1	1.39	0.2439
Valence	5831.11	1	0.14	0.7128
Group X Modality	216300.27	2	2.54	0.0883
Group X Valence	60744.41	2	0.71	0.4946
Modality X Valence	47710.17	1	1.12	0.2945
Order X Modality	448534.40	3	3.51	0.0212
Order X Valence	60505.98	3	0.47	0.7019
Grp X Ord X Mod	265710.59	6	1.04	0.4099
Grp X Ord X Val	164121.11	6	0.64	0.6958
Ord X Mod X Val	89701.37	3	0.70	0.5548
Grp X Mod X Val	23230.80	2	0.27	0.7623
Ord X Grp X Mod X Val	208427.59	6	0.82	0.5624
Error	2299279.21	54		

Table 12
Tukey Post Hoc Tests on Group Main Effect
For Unadjusted DACL Scores

Group	Mean	Grouping (Means with same letter are not significantly different at $p < .05$)
Normal	-585.63	A
Remitted	-517.97	A
Depressed	869.90	B

Table 13
 Tukey Post Hoc Tests on Order by Modality
 Interaction for Unadjusted DACL Scores

SUBLIMINAL	Order 2 (-361.42)	Order 4 (-275.94)	Order 1 (98.39)	Order 3 (144.92)
Order 2 (-361.42)	-	-	*	*
Order 4 (-275.94)		-	*	*
Order 1 (98.39)			-	-
Order 3 (144.92)				-
SUPRALIMINAL	Order 2 (-166.83)	Order 4 (-150.50)	Order 1 (-16.11)	Order 3 (120.58)
Order 2 (-166.83)	-	n.s.	n.s.	*
Order 4 (-150.50)		-	n.s.	*
Order 1 (-16.11)			-	n.s.
Order 3 (120.58)				-

*p < .05

Table 13 (Continued)
 Tukey Post Hoc Tests on Order by Modality
 Interaction for Unadjusted DACL Scores

ORDER 1	Supraliminal (-16.11)	Subliminal (98.38)
Supraliminal (-16.11)	-	n.s.
Subliminal (98.38)		-
ORDER 2	Subliminal (-361.42)	Supraliminal (-166.83)
Subliminal (-361.42)	-	*
Supraliminal (-166.83)		-
ORDER 3	Supraliminal (120.58)	Subliminal (144.92)
Supraliminal (120.58)	-	n.s.
Subliminal (144.92)		-
ORDER 4	Subliminal (-275.94)	Supraliminal (-150.50)
Subliminal (-275.94)	-	n.s.
Supraliminal (-150.50)		-

*p < .05

Table 14

Post Hoc Tests on Order by Modality Interaction For Unadjusted
DACL Scores Using Method Described by Boik (1979)

Unlike standard Tukey post hoc comparisons, in which each level of one treatment (A) is tested against every other level of that treatment at a single level of treatment B, the procedure described by Boik allows grouping of the treatment A means. This allows specific hypotheses to be tested, rather than the standard null hypothesis that all levels are the same. The procedure involves computing an F-test, using the following formula to calculate the sums of squares:

$$SS = \frac{n q A^2}{E c^2}$$

where n = number of subjects per cell, q = number of levels of factor X collapsed across, and $A = E cM$, where M = the means being compared, and c = the vector coefficients (which must always sum to zero). The vector coefficients are used to determine which means are compared. The vector coefficients for the present analyses are listed in the table below:

ORDER	First Condition Of Each Order	MODALITY						
		Sub			Supra			
1	Sub	Irrational	+1	+1	+1	+1	+1	+1
			-----	-----	-----	-----	-----	-----
2	Sub	Rational	+1	-1	-1	+1	-1	-1
			-----	-----	-----	-----	-----	-----
3	Supra	Irrational	-1	+1	-1	-1	+1	-1
			-----	-----	-----	-----	-----	-----
4	Supra	Rational	-1	-1	+1	-1	-1	+1
			-----	-----	-----	-----	-----	-----

1 2 3 4 5 6
COMPARISON NUMBER

Comparison 1: F (1,54) = 1.65 (n.s.)
 Comparison 2: F (1,54) = 67.53 (p < .01)
 Comparison 3: F (1,54) = 0.10 (n.s.)
 Comparison 4: F (1,54) = 2.06 (n.s.)
 Comparison 5: F (1,54) = 15.67 (p < .01)
 Comparison 6: F (1,54) = 1.28 (n.s.)

Table 14 (Continued)

Post Hoc Tests on Order by Modality Interaction For Unadjusted
DACL Scores Using Method Described by Boik (1979)

Thus, only Comparisons 2 and 5 were significant. Both of these involved comparing orders in which the rational statements were presented first vs. orders in which the irrational statements were presented first, regardless of modality of presentation.

Table 15
 Sequence of Orders and Means Broken Down By
 Order X Modality for Unadjusted DACL Scores

ORDER	SEQUENCE
1	Sub-Irrat / Sub-Rat / Supra-Irrat / Supra-Rat
2	Sub-Rat / Sub-Irrat / Supra-Rat / Supra-Irrat
3	Supra-Irrat / Supra-Rat / Sub-Irrat / Sub-Rat
4	Supra-Rat / Supra-Irrat / Sub-Rat / Sub-Irrat

(Note that Sub = subliminal, Supra = supraliminal,
 Rat = rational, and Irrat = irrational)

ORDER	MODALITY	
	Sub	Supra
1	93.39	-16.11
2	-361.42	-166.83
3	144.92	120.58
4	-275.94	-150.50

Table 16
 Pearson's Correlations of Agreement Ratings
 For Individual Stimuli

	<u>Stimulus Number</u>					
	1	2	3	4	5	Sum
1	-	0.75678 p < .0001	0.82759 p < .0001	0.71133 p < .0001	0.72874 p < .0001	0.90057 p < .0001
2		-	0.74730 p < .0001	0.72358 p < .0001	0.74984 p < .0001	0.89766 p < .0001
3			-	0.77877 p < .0001	0.73846 p < .0001	0.91613 p < .0001
4				-	0.67760 p < .0001	0.86805 p < .0001
5					-	0.87578 p < .0001
Sum						-

Definition of Stimuli

Rational

1. I don't have to be perfect.
2. I don't have to be loved by everyone.
3. Making mistakes is OK.
4. It's OK to disagree.
5. I don't always have to be successful.

Irrational

1. I have to be perfect.
2. I have to be loved by everyone.
3. Making mistakes is terrible.
4. I must agree with everyone.
5. I have to be successful at everything.

Table 17
Four-Way Analysis of Variance on Sum of Agreement Ratings

Source	Sums of Squares	d.f.	F	p
Group	2127.64	2	0.21	0.8089
Order	13358.91	3	0.90	0.4613
Group X Order	16729.84	6	0.56	0.7546
Ss(Group X Order)	89249.63	18		
Modality	1442.17	1	0.28	0.6012
Valence	421128.57	1	80.72	0.0001
Group X Modality	7913.29	2	0.76	0.4733
Group X Valence	120076.45	2	11.51	0.0001
Modality X Valence	393822.11	1	75.49	0.0001
Order X Modality	35069.31	3	2.24	0.0940
Order X Valence	31581.94	3	2.02	0.1223
Grp X Ord X Mod	24559.71	6	0.78	0.5858
Grp X Ord X Val	33131.37	6	1.06	0.3988
Ord X Mod X Val	5382.86	3	0.34	0.7936
Grp X Mod X Val	131569.72	2	12.61	0.0001
Ord X Grp X Mod X Val	27644.73	6	0.88	0.5136
Error	281709.21	54		

Table 18

Five-Way Analysis of Variance on Individual Agreement Ratings

Source	Sums of Squares	d.f.	F	p
Group	424.11	2	0.21	0.8095
Order	2671.78	3	0.90	0.4613
Group X Order	3345.97	6	0.56	0.7546
Ss(Group Order)	17849.93	18		
Modality	288.43	1	0.92	0.3376
Valence	84225.71	1	269.30	0.0001
Stimulus	1382.24	4	1.10	0.3541
Group X Modality	1582.66	2	2.53	0.0811
Group X Valence	24015.29	2	38.39	0.0001
Group X Stimulus	498.65	8	0.20	0.9908
Modality X Valence	78764.42	1	251.84	0.0001
Modality X Stimulus	593.27	4	0.47	0.7547
Order X Group	3345.97	6	1.78	0.1017
Order X Modality	7013.86	3	7.48	0.0001
Order X Valence	6316.39	3	6.73	0.0002
Order X Stimulus	2892.66	12	0.77	0.6807
Valence X Stimulus	4501.18	4	3.60	0.0069
Grp X Ord X Mod	4911.94	6	2.62	0.0171
Grp X Ord X Stm	3730.34	24	0.50	0.9788
Grp X Ord X Val	6626.27	6	3.53	0.0021
Ord X Mod X Val	1076.57	3	1.15	0.3300

Table 18 (Continued)

Five-Way Analysis of Variance on Individual Agreement Ratings

Source	Sums of Squares	d.f.	F	p
Ord X Mod X Stm	2916.44	12	0.78	0.6742
Ord X Val X Stm	2288.08	12	0.61	0.8341
Grp X Mod X Val	26313.94	2	42.07	0.0001
Mod X Val X Stm	4141.98	4	3.31	0.0111
Grp X Mod X Stm	1401.62	8	0.56	0.8103
Grp X Val X Stm	798.95	8	0.32	0.9585
Ord X Grp X Mod X Val	5528.95	6	2.95	0.0081
Ord X Grp X Mod X Stm	4046.00	24	0.54	0.9644
Ord X Grp X Val X Stm	2757.60	24	0.37	0.9976
Grp X Mod X Val X Stm	3628.39	8	1.45	0.1745
Ord X Mod X Val X Stm	2298.15	12	0.61	0.8318
Grp X Ord X Mod X Val X Stm	2941.52	24	0.39	0.9961
Error	106963.24	342		

Table 19
 Tukey Post Hoc Tests on Group X Valence Interaction
 For Sum of Agreement Ratings

IRRATIONAL				
	Remitted (151.90)		Normal (170.70)	Depressed (213.20)
Remitted (151.90)	-		n.s.	n.s.
Normal (170.70)			-	n.s.
Depressed (213.20)				-
RATIONAL				
	Depressed (261.05)		Normal (310.25)	Remitted (344.75)
Depressed (261.05)	-		n.s.	*
Normal (310.25)			-	n.s.
Remitted (344.75)				-
NORMAL				
		Irrational (170.70)		Rational (310.25)
Irrational (170.70)		-		*
Rational (310.25)				-
REMITTED				
		Irrational (151.90)		Rational (344.75)
Irrational (151.90)		-		*
Rational (344.75)				-
DEPRESSED				
		Irrational (213.20)		Rational (261.05)
Irrational (213.20)		-		n.s.
Rational (261.05)				-

*p < .05

Table 20
 Tukey Post Hoc Tests on Modality X Valence Interaction
 For Sum of Agreement Ratings

IRRATIONAL	Supraliminal (123.87)	Subliminal (233.33)
Supraliminal (123.87) Subliminal (233.33)	-	* -
RATIONAL	Subliminal (241.30)	Supraliminal (369.40)
Subliminal (241.30) Supraliminal (369.40)	-	* -
SUBLIMINAL	Irrational (233.33)	Rational (241.30)
Irrational (233.33) Rational (241.30)	-	n.s. -
SUPRALIMINAL	Irrational (123.87)	Rational (369.40)
Irrational (123.87) Rational (369.40)	-	* -

*p < .05

Table 21
 Tukey Post Hoc Tests on Group X Modality X Valence
 Interaction for Sum of Agreement Ratings

SUBLIMINAL-IRRATIONAL		Depressed (223.40)	Normal (232.50)	Remitted (244.10)
Depressed	(223.40)	-	n.s.	n.s.
Normal	(232.50)		-	n.s.
Remitted	(244.10)			-
SUBLIMINAL-RATIONAL		Normal (216.90)	Depressed (242.80)	Remitted (264.20)
Normal	(216.90)	-	n.s.	n.s.
Depressed	(242.80)		-	n.s.
Remitted	(264.20)			-
SUPRALIMINAL-IRRATIONAL		Remitted (59.70)	Normal (108.90)	Depressed (203.00)
Remitted	(59.70)	-	n.s.	*
Normal	(108.90)		-	*
Depressed	(203.00)			-
SUPRALIMINAL-RATIONAL		Depressed (279.30)	Normal (403.60)	Remitted (425.30)
Depressed	(279.30)	-	*	*
Normal	(403.60)		-	n.s.
Remitted	(425.30)			-

*p < .05

Table 21 (Continued)

Tukey Post Hoc Tests on Group X Modality X Valence
Interaction for Sum of Agreement Ratings

NORMAL-SUBLIMINAL		Rational (216.90)	Irrational (232.50)
Rational	(216.90)	-	n.s.
Irrational	(232.50)		-
NORMAL-SUPRALIMINAL		Irrational (108.90)	Rational (403.60)
Irrational	(108.90)	-	*
Rational	(403.60)		-
REMITTED-SUBLIMINAL		Irrational (244.10)	Rational (264.20)
Irrational	(244.10)	-	n.s.
Rational	(264.20)		-
REMITTED-SUPRALIMINAL		Irrational (59.70)	Rational (425.30)
Irrational	(59.70)	-	*
Rational	(425.30)		-
DEPRESSED-SUBLIMINAL		Irrational (223.40)	Rational (242.80)
Irrational	(223.40)	-	n.s.
Rational	(242.80)		-
DEPRESSED-SUPRALIMINAL		Irrational (203.00)	Rational (279.30)
Irrational	(203.00)	-	*
Rational	(279.30)		-

*p < .05

Table 21 (Continued)

Tukey Post Hoc Tests on Group X Modality X Valence
Interaction for Sum of Agreement Ratings

NORMAL-IRRATIONAL	Supraliminal (108.90)	Subliminal (232.50)
Supraliminal (108.90)	-	*
Subliminal (232.50)		-
NORMAL-RATIONAL	Subliminal (216.90)	Supraliminal (403.60)
Subliminal (216.90)	-	*
Supraliminal (403.60)		-
REMITTED-IRRATIONAL	Supraliminal (59.70)	Subliminal (244.10)
Supraliminal (59.70)	-	*
Subliminal (244.10)		-
REMITTED-RATIONAL	Subliminal (264.20)	Supraliminal (425.30)
Subliminal (264.20)	-	*
Supraliminal (425.30)		-
DEPRESSED-IRRATIONAL	Supraliminal (203.00)	Subliminal (223.40)
Supraliminal (203.00)	-	n.s.
Subliminal (223.40)		-
DEPRESSED-RATIONAL	Subliminal (242.80)	Supraliminal (279.30)
Subliminal (242.80)	-	n.s.
Supraliminal (279.30)		-

*p < .05

Table 22
 One-Way Analyses of Variance on TAT
 Latency and Response Time Data

I. Card 1: Latency to First Response

Source	Sums of Squares	d.f.	F	p
Group	126.67	2	1.23	0.3077
Error	1388.30	27		

II. Card 1: Total Response Time

Source	Sums of Squares	d.f.	F	p
Group	630.46	2	0.21	0.8122
Error	40604.90	27		

Table 22 (Continued)
 One-Way Analyses of Variance on TAT
 Latency and Response Time Data

I. Card 3BM: Latency to First Response

Source	Sums of Squares	d.f.	F	p
Group	136.87	2	0.90	0.4179
Error	2049.80	27		

II. Card 3BM: Total Response Time

Source	Sums of Squares	d.f.	F	p
Group	1128.20	2	0.26	0.7735
Error	58742.60	27		

Table 22 (Continued)
 One-Way Analyses of Variance on TAT
 Latency and Response Time Data

I. Card 10: Latency to First Response

Source	Sums of Squares	d.f.	F	p
Group	330.20	2	1.03	0.3705
Error	4326.50	27		

II. Card 10: Total Response Time

Source	Sums of Squares	d.f.	F	p
Group	651.86	2	0.20	0.8174
Error	40096.00	25		

Table 22 (Continued)
 One-Way Analyses of Variance on TAT
 Latency and Response Time Data

I. Card 14: Latency to First Response

Source	Sums of Squares	d.f.	F	p
Group	355.45	2	2.63	0.0913
Error	1758.00	26		

II. Card 14: Total Response Time

Source	Sums of Squares	d.f.	F	p
Group	1246.61	2	0.32	0.7279
Error	50407.26	26		

Table 23
 One-Way Analyses of Variance on Sum of TAT
 Latency and Response Time Measures

I. Latency to First Response

Source	Sums of Squares	d.f.	F	p
Group	1915.49	2	1.03	0.3699
Error	24095.96	26		

II. Total Response Time

Source	Sums of Squares	d.f.	F	p
Group	9597.05	2	0.20	0.8187
Error	594917.37	25		

Table 24

One-Way Analysis of Variance and Tukey Post Hoc Comparisons
On Number of Depression Diagnoses Assigned to Each Group

Source	Sums of Squares	d.f.	F	p
Group	85.40	2	5.16	p < .05
Error	223.40	27		

Group	Mean	Grouping (Means with same letter are not significantly different at p < .05)
Normal	3.5	A B
Remitted	1.9	A
Depressed	6.0	B

Table 25

Mean Number of Depression Diagnoses in Relation to Actual
Diagnostic Status for Depressed and Normal Subjects

		Psychologists' Judgment	
		Depressed	Not Depressed
A c t u a l	D i a g n o s i s		
	Dep	x = 6 SD = 1.70	x = 4 SD = 1.70
	Not Dep	x = 3.5 SD = 2.07	x = 6.5 SD = 2.07

Remitted Ss - | -Judgment of depressed: x = 1.9, SD = 1.20
 -Judgment of not depressed: x = 8.1, SD = 1.20

Table 26
One-Way Analysis of Variance on Modified DAS

Source	Sums of Squares	d.f.	F	p
Group	266.58	2	0.10	0.9045
Error	34398.59	26		

Table 27
 One-Way Analysis of Variance and Tukey
 Post Hoc Comparisons on Standard DAS

Source	Sums of Squares	d.f.	F	p
Group	12683.57	2	6.96	0.0038
Error	23675.26	26		

Group	Mean	Grouping
(Means with same letter are not significantly different at $p < .05$)		
Normal	108.78	A
Remitted	107.70	A
Depressed	152.20	B

Table 28
One-Way Analysis of Variance on Difference
Between Standard and Modified DAS

Source	Sums of Squares	d.f.	F	p
Group	9591.17	2	2.10	0.1431
Error	59464.69	26		

Table 29

Raw Data (Key to Variables at End of Table)

SUBJECT #	GRADUATE	MODALITY	VARIABLE	ORDER	DIAGNOSIS	BIRTH	MONTH	SEX	BIRTH	CARD	DAYS	DAYS	SUM
01	1	1	1	1	12	07	24	1	-708	-706	121	104	249
01	1	1	2	1						-652			270
01	1	2	1	1						-593			226
01	1	2	2	1						-746			357
03	1	1	1	1	12	02	21	0	403	-309	111	97	84
03	1	1	2	1						112			77
03	1	2	1	1						-300			123
03	1	2	2	1						-413			363
28	1	1	1	1	12	01	21	1	-820	-704	138	84	248
28	1	1	2	1						-340			251
28	1	2	1	1						-430			22
28	1	2	2	1						-455			454
02	1	1	1	2	12	05	21	0	-921	-1120	135	117	339
02	1	1	2	2						-1070			235
02	1	2	1	2						-1186			15
02	1	2	2	2						-977			409
23	1	1	1	2	12	03	22	1	-1029	-1259	139	96	287
23	1	1	2	2						-989			314
23	1	2	1	2						-1127			131
23	1	2	2	2						-1071			426
17	1	1	1	3	12	10	25	1	-740	-572	109	132	233
17	1	1	2	3						-410			226
17	1	2	1	3						-745			82
17	1	2	2	3						-687			468
27	1	1	1	3	12	8	19	1	-24	136	.	.	246
27	1	1	2	3						163			238
27	1	2	1	3						75			224
27	1	2	2	3						-10			330
21	1	1	1	4	12	0	16	0	-302	-600	177	126	228
21	1	1	2	4						-564			227
21	1	2	1	4						-443			104
21	1	2	2	4						-525			360
29	1	1	1	4	12	1	14	0	-752	-764	172	100	223
29	1	1	2	4						-942			93
29	1	2	1	4						-572			12
29	1	2	2	4						-744			470

Table 29 (Continued)

Raw Data

S U B J E C T #	G R O U P	M O D E L I T Y	V A R I A N T S	O R D E R	D I F F E R E N C E	B I N S	M I D P O I N T	S E R I A L	B E T W E E N	C O N T R A S T	D I S T R I B U T I O N	D E V I A T I O N	S T A N D A R D D E V I A T I O N
30	1	1	1	4	12	5	22	0	-584	-406	157	123	188
30	1	1	2	4						-384			238
30	1	2	1	4						-508			150
30	1	2	2	4						-588			399
06	2	1	1	1	7	6	33	1	395	232	186	133	316
06	2	1	2	1						-493			307
06	2	2	1	1						-553			41
06	2	2	2	1						-149			461
09	2	1	1	1	7	3	21	1	-402	-696	93	109	223
09	2	1	2	1						-618			228
09	2	2	1	1						-488			13
09	2	2	2	1						-491			460
25	2	1	1	1	11	2	23	1	-224	-262	118	102	214
25	2	1	2	1						-288			296
25	2	2	1	1						-546			152
25	2	2	2	1						-677			462
07	2	1	1	2	7	9	27	2	-456	-622	182	108	384
07	2	1	2	2						-517			460
07	2	2	1	2						-371			26
07	2	2	2	2						-483			353
16	2	1	1	2	7	4	30	1	-487	-677	189	146	182
16	2	1	2	2						-704			251
16	2	2	1	2						-723			52
16	2	2	2	2						-667			346
19	2	1	1	3	7	10	30	2	32	-242	59	77	236
19	2	1	2	3						-136			254
19	2	2	1	3						-45			93
19	2	2	2	3						-151			456
24	2	1	1	3	7	9	24	1	-681	-532	193	127	240
24	2	1	2	3						-692			66
24	2	2	1	3						-437			53
24	2	2	2	3						-821			458
18	2	1	1	4	7	3	21	1	-256	-334	156	81	178
18	2	1	2	4						-121			294
18	2	2	1	4						-375			54
18	2	2	2	4						-388			444

Table 29 (Continued)

Raw Data

S U B J E C T #	G R O U P	M O D E L I T Y	V A R I E N T E	O R D E R	D I A G N O S I S	B I P O L A R	M I P O L A R	S E M I P O L A R	B I P O L A R	C O L L E C T I O N	D I S T R I B U T I O N	D I S T R I B U T I O N	S U M M A R Y
22	2	1	1	4	7	4	19	0	-388	-960	153	100	206
22	2	1	2	4						-878			222
22	2	2	1	4						-682			73
22	2	2	2	4						-675			365
26	2	1	1	4	7	4	22	0	-924	-824	99	94	262
26	2	1	2	4						-1036			264
26	2	2	1	4						-753			40
26	2	2	2	4						-844			448
04	3	1	1	1	5	24	47	1	550	1178	114	167	145
04	3	1	2	1						1097			205
04	3	2	1	1						757			253
04	3	2	2	1						541			244
08	3	1	1	1	5	34	40	2	754	831	164	94	236
08	3	1	2	1						838			287
08	3	2	1	1						839			207
08	3	2	2	1						977			366
20	3	1	1	1	1	28	43	1	1093	1384	198	133	179
20	3	1	2	1						1167			411
20	3	2	1	1						944			51
20	3	2	2	1						1493			470
05	3	1	1	2	1	29	36	1	389	408	150	207	222
05	3	1	2	2						-42			196
05	3	2	1	2						621			296
05	3	2	2	2						492			181
15	3	1	1	2	1	45	30	2	1229	1008	119	140	236
15	3	1	2	2						1247			254
15	3	2	1	2						1819			227
15	3	2	2	2						1671			250
11	3	1	1	3	5	38	41	3	445	953	98	195	217
11	3	1	2	3						910			224
11	3	2	1	3						447			228
11	3	2	2	3						680			302
13	3	1	1	3	1	36	37	2	1160	755	153	34	282
13	3	1	2	3						1406			195
13	3	2	1	3						1792			335
13	3	2	2	3						1349			177

Table 29 (Continued)

Raw Data

S	G	M	V	O	D	B	M	S	B	C	D	D	S
U	R	O	A	R	I	D	M	A	D	R	A	A	U
B	O	D	L	D	A	I	P	D	A	D	S	S	M
J	U	A	E	E	G	.	I	P	C	A	1	2	A
E	P	L	N	R	N	.	D	E	L	C	.	.	G
C	.	I	C	.	O	.	.	R	.	L	.	.	R
T	.	T	E	.	S	.	.	S	.	.	.	.	E
#	.	Y	.	.	I	.	.	O	.	.	.	.	E
.	.	.	.	.	S	.	.	N	.	.	.	.	.
.
10	3	1	1	4	2	40	35	2	1358	566	138	189	275
10	3	1	2	4						550			250
10	3	2	1	4						917			279
10	3	2	2	4						532			208
12	3	1	1	4	5	28	35	3	834	961	154	172	243
12	3	1	2	4						823			238
12	3	2	1	4						1460			107
12	3	2	2	4						677			221
14	3	1	1	4	2	22	35	2	346	36	72	53	199
14	3	1	2	4						-90			168
14	3	2	1	4						219			47
14	3	2	2	4						583			374

Key to Variables

GROUP: 1 = Normal
 2 = Remitted
 3 = Depressed

MODALITY: 1 = Subliminal
 2 = Supraliminal

VALENCE: 1 = Irrational
 2 = Rational

ORDER: See Table 9

DIAGNOSIS: 1 = Major Depression 7 = 1-Remitted 12 = No
 2 = Dysthymia 8 = 2-Remitted dx
 5 = Double Depression 11 = 5-Remitted

CRDACL: Unadjusted DACL scores

SUMAGREE: Sum of agreement ratings

Appendix K

Some Mental Health Professionals in the Greensboro Area

AGENCIES WITH A SLIDING FEE SCHEDULE:

Guilford County Mental Health Center	373-3630
UNCG Psychology Clinic	334-5662

PSYCHOLOGISTS

Dr. Isis Badawi	275-9889
Dr. Floyd Heiney	275-9889
Dr. Jane Perrin	378-0398
Dr. Richard Cook (Kernersville)	993-8281

PSYCHIATRISTS

Dr. Raouf Badawi	854-2391
Dr. Gary Henschen	299-0108
Dr. Victor Morcos	854-2391
Dr. Edward Rhoads	299-0511

Please note that we are giving this list of names to everyone who participates in the study who is not already seeing a therapist. Your receiving this list is simply routine, and does not in any way imply that you need to see a therapist.

Appendix L

Information About Study of Subliminal Stimulation on Mood

There are many things that reduce and intensify sad or depressed feelings. One important group of factors, we believe, are faint or indistinct experiences people have. By experimentally studying these factors in different groups of people we hope to understand better what causes clinical depression.

If you decide to participate in this study you will be asked at different points in time to indicate the degree to which you are experiencing different feelings, and how much you agree with certain statements. You will also be asked to look at flashes of light that will be statements very quickly exposed. Some of the statements may make you feel slightly more sad, some may have no effect at all on your mood, and some of the statements may make you feel slightly less sad. From past research with this procedure we know that the effects of these statements are typically very fleeting, and as soon as the study is over I will tell you exactly what the statements were. Moreover, no deception is used in this study. In other words, we are not trying to trick you in any way. From this study we hope to learn something about depression, which will hopefully be useful in treating and perhaps preventing this disturbing experience.

You do not have to participate in this study, and if you do agree to participate you can still change your mind at any time and withdraw from it. All identifying information collected from you will remain strictly confidential.

Appendix M

Consent Form

I agree to participate in this psychological study investigating the effects of subliminal stimulation on mood. The nature of the study has been fully explained to me. I understand that I will be looking at flashes of light that will be statements exposed very quickly, and that these statements may temporarily slightly reduce or intensify certain feelings, particularly sad or depressed feelings.

I understand that as soon as the experiment is over I will be told what the statements are, and the purpose of the study will be explained more fully. I understand that I am free to ask the experimenter any questions about the study at any time.

I have been informed that this study is not meant to be psychological treatment of any kind. I further understand that my participation is completely voluntary, and that I can withdraw from the study at any time. Finally, I understand that any identifying information collected from me will remain strictly confidential.

Signature

Date

Witness

Appendix N

Post-Experimental Questionnaire

Name _____

S# _____

Date _____

Please answer the following questions:

1. Did you notice any change in your mood during the course of the experiment?

Yes _____

No _____

If yes, how much of a change did you notice?

A small negative change _____

A moderate negative change _____

A large negative change _____

A small positive change _____

A moderate positive change _____

A large positive change _____

2. Please briefly describe any mood changes you noticed during the study.

3. How difficult was it for you to rate how much you agreed with the statements when they were exposed very quickly?

Impossible _____

Very difficult _____

Moderately difficult _____

Moderately easy _____

Very easy _____

4. During the last part of the experiment in which the different stimuli were flashed, were you able to tell them apart?

Could you actually read the statements during this last phase?

5. Did you find the study in any way unpleasant? If so, please describe.

6. Any further comments?

Appendix O

Agreement Ratings

Name _____

S# _____

Date _____

Please put a mark along the line to indicate how much you agree or disagree with each statement. Sometimes the statements will be flashed so quickly that it will be very difficult or even impossible to see them. In this case, please mark your guess as to how much you'd agree with the statement if you could see it.

1. Disagree completely _____ Agree completely

2. Disagree completely _____ Agree completely

3. Disagree completely _____ Agree completely

4. Disagree completely _____ Agree completely

5. Disagree completely _____ Agree completely

Appendix P

MOOD SCALE A

A number of research studies have found that if you pay close attention to your emotions, you can sometimes detect changes in emotional states not only from one day to another, but also from hour to hour and even minute to minute. We would like you to try this experiment on yourself. Observe your feelings throughout this experiment and see if you can detect any changes in feelings.

You will be given different versions of this mood scale several times during the experiment. Your job is simply to mark the line at the point along each scale that best represents the extent to which you are experiencing that particular mood or feeling at that time. Although only a few points along the scale are labeled, feel free to place your line at any point along the scale. Work as rapidly as possible.

HOW MUCH OF THIS FEELING DO YOU HAVE RIGHT NOW? DO YOU FEEL:

Not-at-all Slightly Somewhat Moderately Very Much Extremely

Wilted	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Safe	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Miserable	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Gloomy	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Dull	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Gay	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Low-spirited	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Unwanted	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Fine	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Broken- hearted	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Down-cast	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Enthusiastic	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Failure	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |

Not-at-all Slightly Somewhat Moderately Very Much Extremely

Afflicted	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Active	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Strong	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Tortured	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Listless	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Sunny	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Wretched	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Broken	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Light- hearted	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Criticized	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Grieved	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Dreamy	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Hopeless	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Oppressed	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Joyous	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Weary	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Droopy	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |

MOOD SCALE B

A number of research studies have found that if you pay close attention to your emotions, you can sometimes detect changes in emotional states not only from one day to another, but also from hour to hour and even minute to minute. We would like you to try this experiment on yourself. Observe your feelings throughout this experiment and see if you can detect any changes in feelings.

You will be given different versions of this mood scale several times during the experiment. Your job is simply to mark the line at the point along each scale that best represents the extent to which you are experiencing that particular mood or feeling at that time. Although only a few points along the scale are labeled, feel free to place your line at any point along the scale. Work as rapidly as possible.

HOW MUCH OF THIS FEELING DO YOU HAVE RIGHT NOW? DO YOU FEEL:

Not-at-all Slightly Somewhat Moderately Very Much Extremely

Downhearted	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Lively	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Unfeeling	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Alone	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Unhappy	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Alive	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Terrible	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Poor	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Forlorn	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Alert	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Heartsick	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Bright	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Glum	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Desolate	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |

Not-at-all Slightly Somewhat Moderately Very Much Extremely

Composed	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Clean	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Dispirited	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Moody	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Pleased	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Dead	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Sorrowful	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Bleak	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Morbid	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Heavy- hearted	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Easy-going	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Gray	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Melancholy	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Hopeful	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Mashed	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Unlucky	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |

MOOD SCALE C

A number of research studies have found that if you pay close attention to your emotions, you can sometimes detect changes in emotional states not only from one day to another, but also from hour to hour and even minute to minute. We would like you to try this experiment on yourself. Observe your feelings throughout this experiment and see if you can detect any changes in feelings.

You will be given different versions of this mood scale several times during the experiment. Your job is simply to mark the line at the point along each scale that best represents the extent to which you are experiencing that particular mood or feeling at that time. Although only a few points along the scale are labeled, feel free to place your line at any point along the scale. Work as rapidly as possible.

HOW MUCH OF THIS FEELING DO YOU HAVE RIGHT NOW? DO YOU FEEL:

Not-at-all Slightly Somewhat Moderately Very Much Extremely

Cheerless	|	|	|	|	|
Animated	|	|	|	|	|
Blue	|	|	|	|	|
Lost	|	|	|	|	|
Dejected	|	|	|	|	|
Healthy	|	|	|	|	|
Discouraged	|	|	|	|	|
Bad	|	|	|	|	|
Despondent	|	|	|	|	|
Free	|	|	|	|	|
Despairing	|	|	|	|	|
Uneasy	|	|	|	|	|
Peaceful	|	|	|	|	|
Grim	|	|	|	|	|

Not-at-all Slightly Somewhat Moderately Very Much Extremely

Distressed	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Whole	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Buoyant	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Tormented	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Weak	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Optimistic	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Low	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Deserted	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Burdened	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Wonderful	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Crushed	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Somber	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Interested	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Joyless	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Crestfallen	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Lucky	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Chained	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Pessimistic	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |

MOOD SCALE D

A number of research studies have found that if you pay close attention to your emotions, you can sometimes detect changes in emotional states not only from one day to another, but also from hour to hour and even minute to minute. We would like you to try this experiment on yourself. Observe your feelings throughout this experiment and see if you can detect any changes in feelings.

You will be given different versions of this mood scale several times during the experiment. Your job is simply to mark the line at the point along each scale that best represents the extent to which you are experiencing that particular mood or feeling at that time. Although only a few points along the scale are labeled, feel free to place your line at any point along the scale. Work as rapidly as possible.

HOW MUCH OF THIS FEELING DO YOU HAVE RIGHT NOW? DO YOU FEEL:

Not-at-all Slightly Somewhat Moderately Very Much Extremely

Depressed	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Elated	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Awful	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Lifeless	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Grief- stricken	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Inspired	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Woeful	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Lonely	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Suffering	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Mellow	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Drooping	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Rejected	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |
Fortunate	| _____ |	| _____ |	| _____ |	| _____ |	| _____ |

Not-at-all Slightly Somewhat Moderately Very Much Extremely

Dreary	|	|	|	|	|
Lousy	|	|	|	|	|
Good	|	|	|	|	|
Fit	|	|	|	|	|
Lonesome	|	|	|	|	|
Unloved	|	|	|	|	|
Glad	|	|	|	|	|
Grave	|	|	|	|	|
Sunk	|	|	|	|	|
Shot	|	|	|	|	|
Merry	|	|	|	|	|
Wasted	|	|	|	|	|
Washed Out	|	|	|	|	|
Clear	|	|	|	|	|
Gruesome	|	|	|	|	|
Tired	|	|	|	|	|
High	|	|	|	|	|
Worse	|	|	|	|	|
Drained	|	|	|	|	|

MOOD SCALE E

A number of research studies have found that if you pay close attention to your emotions, you can sometimes detect changes in emotional states not only from one day to another, but also from hour to hour and even minute to minute. We would like you to try this experiment on yourself. Observe your feelings throughout this experiment and see if you can detect any changes in feelings.

You will be given different versions of this mood scale several times during the experiment. Your job is simply to mark the line at the point along each scale that best represents the extent to which you are experiencing that particular mood or feeling at that time. Although only a few points along the scale are labeled, feel free to place your line at any point along the scale. Work as rapidly as possible.

HOW MUCH OF THIS FEELING DO YOU HAVE RIGHT NOW? DO YOU FEEL:

Not-at-all Slightly Somewhat Moderately Very Much Extremely

Sorrowful	|	|	|	|	|
Lively	|	|	|	|	|
Uneasy	|	|	|	|	|
Tormented	|	|	|	|	|
Low-spirited	|	|	|	|	|
Clean	|	|	|	|	|
Discouraged	|	|	|	|	|
Suffering	|	|	|	|	|
Broken- hearted	|	|	|	|	|
Easy-going	|	|	|	|	|
Downhearted	|	|	|	|	|
Washed Out	|	|	|	|	|
Playful	|	|	|	|	|

Not-at-all Slightly Somewhat Moderately Very Much Extremely

Joyless	|	|	|	|	|
Despairing	|	|	|	|	|
Gay	|	|	|	|	|
Friendly	|	|	|	|	|
Successful	|	|	|	|	|
Rejected	|	|	|	|	|
Crestfallen	|	|	|	|	|
Jolly	|	|	|	|	|
Deserted	|	|	|	|	|
Grieved	|	|	|	|	|
Low	|	|	|	|	|
Steady	|	|	|	|	|
Wretched	|	|	|	|	|
Terrible	|	|	|	|	|
Inspired	|	|	|	|	|
Woeful	|	|	|	|	|
Unworthy	|	|	|	|	|
Joyous	|	|	|	|	|
Destroyed	|	|	|	|	|
Somber	|	|	|	|	|
Unconcerned	|	|	|	|	|

PLEASE NOTE:

Copyrighted materials in this document have not been filmed at the request of the author. They are available for consultation, however, in the author's university library.

These consist of pages:

290-293, Figures

U·M·I

Appendix Q
Figures

Appendix R

TAT Study: Psychologists' Debriefing Form

The TAT stories you read were obtained from thirty subjects who participated in a series of studies on unipolar depression. The purpose of these studies is to examine hypotheses derived from Aaron Beck's cognitive theory of depression. As you know, Beck proposes that depression-prone individuals develop depressogenic cognitive schemas, largely as the result of childhood experiences. These schemas remain latent until activated by a stressor. Once activated, the schemas influence a wide range of perceptual and cognitive phenomena, eventually leading to depression. Beck's is a classic diathesis-stress model, with the underlying schemas constituting a psychological diathesis for depression, and the stressor that activates them being the stress component of the model.

Beck groups depressogenic cognitions into several levels, with underlying schemas -- statements that reflect general themes or contingencies in one's life -- being the deepest, most stable. Other cognitions such as "automatic thoughts" are more transient and closer to awareness.

There is a great deal of research supporting certain aspects of Beck's theory. Several studies, for example, suggest that both depressogenic schemas and automatic thoughts are present in most persons who are currently depressed. Moreover, most of the studies that examine these cognitions longitudinally have found that they appear to covary with the clinical course of depression, so that once the depressive episode resolves, the cognitions seem to normalize. These results call into question the etiological significance of abnormal cognitions. The "depressogenic" cognitions might simply be concomitants of depression, rather than causes of depression.

Recall that the underlying schemas postulated by Beck constitute a diathesis condition for depression. They are held to be temporally stable, in that during inter-episode intervals they once again become dormant. Thus, the failure of standard self-report measures to identify these schemas in the depression-prone person who is currently between episodes is not surprising. If Beck's theory is to hold, however, these schemas must somehow be shown to be present, despite their latent status, in the currently asymptomatic depression-prone individual.

The present series of studies employs a variety of methods in an effort to assess the presence of depressogenic

schemas in the depression-prone person. In the present study, ten of the thirty subjects were in fact currently clinically depressed. Ten others were remitted depressives, who had previously experienced at least one episode of unipolar depression, and the remaining ten had no history of depression. Since one of the primary uses of the TAT is to identify important underlying themes that guide or reflect one's behavior, we reasoned that the test might be sensitive to the schemas discussed by Beck. If Beck's theory is correct, we are hypothesizing that most of the ten actively depressed subjects, as well as most of the ten currently remitted depressed subjects, will be classified as depressed, whereas the normal control subjects will be classified as not depressed.

There are, of course, many limitations to the present methodology, including the fact that only four cards were administered, and you, the clinical judge, were not able to have direct contact with the subjects yourself. Nevertheless, in combination with the other studies in this series, we hope that the results of the present study will shed some light on this intriguing theoretical issue.

If you have any further questions, or if you would like to discuss further the purpose or results of this study, please do not hesitate to contact me at 212-420-2800 (work), or 718-435-5108 (home). Thank you once again for your help.

Appendix S

Debriefing Statement

As was explained to you when this study was introduced, we are interested in how certain motivating factors that people may not be fully aware of may be involved in the development of clinical depression. A major theory of depression proposes that persons at risk for depression may hold certain unrealistically negative attitudes or beliefs about themselves, the world, and the future. An example of such a belief might be something like "I must be successful at everything I do or else I'm no good as a person." Past research suggests that some people at risk for depression readily acknowledge having these beliefs. Other people, however, such as many of those who have been depressed in the past but who are not currently depressed, usually don't report having these beliefs.

In order to investigate the possibility that different groups of people might hold such negative beliefs, we presented stimuli, consisting of short sentences, on the tachistoscope (or "t-scope" for short). Sometimes the stimuli were exposed very quickly (or "subliminally"), and sometimes they were exposed for a longer time (or "supraliminally"). Past research shows that people sometimes react differently to stimuli when they are presented subliminally compared to

when they are presented supraliminally. We presented two types of stimuli in this manner. One group consisted of statements reflecting the negative beliefs that some people may hold, and included the following:

"I have to be perfect"
"I have to be loved by everyone"
"Making mistakes is terrible"
"I must agree with everyone"
"I have to be successful at everything."

The other group of stimuli were more positive alternatives to each of these statements, and included:

"I don't have to be perfect"
"I don't have to be loved by everyone"
"Making mistakes is OK"
"It's OK to disagree"
"I don't always have to be successful."

Three different groups of people are being compared in this study: 1) people who are currently depressed; 2) people who have been depressed in the past but are not currently depressed; and 3) people who have never been depressed. We think that people who have had some experience with depression either currently or in the past may respond more to the stimuli, especially when they are presented subliminally, than people who have never been depressed. For example, people who have been depressed may feel slightly more sad when they see the negative statements and slightly more happy when they see the positive statements, whereas people who haven't been depressed may not be affected one way or the other. By

comparing how these three groups of people respond to the different stimuli described above, we hope to be able to see what role (if any) negative beliefs play in causing depression. We hope that the results of this study will lead toward a better understanding of the causes of depression, and will hold implications for improved treatments and preventative measures for the condition.

Past studies using similar procedures to those used here have found that any effects the stimuli may have had on your mood are very small and very fleeting. That is, if you noticed any change at all in your feelings, it was probably very slight, and won't last more than a few minutes. If, however, you feel that the stimuli may have had any other effects, or if you have any questions at all about the study, please don't hesitate to call the Principal Investigator, Mr. James Herbert, at 334-5662 or 334-5013, or the project supervisor, Dr. Rosemary O. Nelson, at 334-5013. You can also drop by Mr. Herbert's office in the Eberhart building at UNCG (Rm. 382 or Rm. 377).

Your participation in this project has been greatly appreciated. Let me ask you one last favor: Please don't discuss any details about the study with anyone you know who might also be a participant in the study in the future, as this could possibly contaminate our results.