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Comparison between Inpatients, Outpatients, and Normals on Three Self-Report Depression Inventories

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COMPARISON BETWEEN INPATIENTS, OUTPATIENTS, 
AND NORMALS ON THREE SELF-REPORT 
DEPRESSION INVENTORIES 

by 
Floyd C. Byerly 

A Dissertation 
Submitted to the 
Faculty of The Graduate College 
in partial fulfillment 
of the 
Degree of Doctor of Education 

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Kalamazoo, Michigan 
April 1979
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Floyd C. Byerly
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COMPARISON BETWEEN INPATIENTS, OUTPATIENTS, AND NORMALS ON THREE SELF-REPORT DEPRESSION INVENTORIES.

WESTERN MICHIGAN UNIVERSITY, ED.D., 1979

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CHAPTER I

THE PROBLEM

Introduction

Depression was labeled and described by early writers as "melancholia." Hippocrates detailed the symptoms of melancholia in the fourth century B.C. (Zilboorg, 1941). A physician in the second century A.D., Aretaeus, wrote of what was later coined the manic-depressive cycle (Zilboorg). Others throughout history have given vivid and detailed accounts of the human suffering wrought by this disorder.

Depression has continued to be a significant problem. Secunda, Katz, Friedman, and Schuyler (1973) called depression the disease of the 1970's and a rival with schizophrenia as the nation's number one mental health problem. Gallant and Simpson (1976) indicated that depression was the presenting problem in approximately one-half of all admissions to psychiatric institutions. O'Neil and Marziali (1976) said that depression was one of the most frequent complaints of students who were clients at university counseling centers. Levitt and Lubin (1975), in a national survey, found that about 3 percent of the noninstitutionalized adult population were at any given moment in time depressed to a degree warranting therapeutic intervention. Secunda et al. (1973) estimated that during any given year, 15 percent of all...
adults between 18 and 74 may suffer significant depressive symptoms.

Classification of depression as in psychiatric diagnosis (e.g., DSM II, 1968) has been of questionable reliability and validity (Mendels, 1970). Zubin (1967) indicated that the percentage agreement reported between psychiatrists for the general category of affective psychosis ranges from 35 to 65 percent; for involutional psychosis, from 26 to 57 percent; and for manic-depressive psychosis (depressed), from 36 to 82 percent. Therefore, an improved system of assessment and measurement of depression is an important clinical and research priority.

Four approaches to the measurement of depression have been described in the psychological literature. An example of one approach developed is observer rating scales such as the Hamilton Rating Scale for Depression (Hamilton, 1960). Approaches have been devised to directly observe the overt verbal behavior or overt motor behavior of depressives (e.g., the Behavior Rating Scale; Williams, Barlow, & Agras, 1972). Psychobiological or biochemical tests have been developed as well. These tests are in their developmental infancy and have not shown sufficient validity and reliability for general use (Hamilton, 1976; Pehm, 1976). Finally, researchers have utilized self-report measures of symptomatology, such as the Zung (1965) Self-Rating Depression Scale.

Self-report measures are perhaps the most studied of the
measurement alternatives. However, as Hamilton (1960) pointed out, perfection has not been achieved and, indeed, there is considerable room for improvement. Carroll, Fielding, and Blashki (1973) suggested that although a number of depression rating scales have been developed, their relative performances have not been well studied. This research hopes to contribute to a better understanding of the relative merits of depression self-report rating scales and is within the general framework of research on the assessment of depression.

**Review of the Literature**

The review of the literature was organized in the following manner: (1) a discussion of the definition of depression, (2) a review of attempts to classify depression, (3) the incidence of depression in various populations, (4) approaches to the measurement of depression, (5) a critique of selected self-report scales, and (6) a summary of sex differences in depression.

**Definition of Depression**

"Depression" as a label can be considered quite broad, nonspecific, and having many different definitions. Beck (1967) pointed out that the term has been used to designate (1) a particular type of symptom (e.g., sad feelings), (2) a syndrome or symptom-complex, and (3) a definable disease entity. The issue of definition is empirical and one of
semantics. In the author's opinion, a totally satisfactory solution has not emerged.

Most theorists have agreed that depression is best defined as a syndrome of moods, cognitions, and behavioral symptoms (Hudson & Proctor, Note 1). As an example, Beck (1967) defined depression as follows:

1. A specific alteration in mood: sadness, loneliness, apathy.
3. Regressive and self-punitive wishes: desires to escape, hide or die.
5. Change in activity level: retardation or agitation. (p. 6)

Lewinsohn (1974) broke down the constituents of the depressive syndrome into the categories of (1) dysphoria, (2) behavioral deficits, (3) behavioral excesses, (4) somatic symptoms, and (5) "cognitive" manifestations.

It is clear from the preceding definitions that considerable heterogeneity is subsumed under the term depression. However, Beck, Lewinsohn, and other authorities (e.g., Becker, 1974) seem to be describing the same symptoms. In this investigation, depression refers to a grouping of symptoms (e.g., moods, cognitions, behaviors, vegetative signs) which will not eliminate interlap with other clinical entities. These symptoms occur with considerable frequency in all
psychiatric and medical patients, and different depressed persons will present varying combinations of the symptoms as well as varying intensities (Carroll et al., 1973). However, this approach is currently in agreement with authorities in the field and provides an understandable basis for the discussion of this phenomenon.

Classification of Depression

The classification of psychopathology, in general, and depression, in particular, is considered intrinsically difficult (Hempel, 1961). The optimal classification system (Hempel) would order each diagnostic subclass in such a way as to be jointly inclusive and mutually exclusive of other subclasses. Such a classification system would aid in the scientific understanding of a phenomenon by showing that it occurs in accordance with general laws or theoretical principles. The American Psychiatric Association's attempt at classification is the Diagnostic and Statistical Manual of Mental Disorders (DSM II, 1968).

In the DSM II, there are three diagnoses of depression listed under Psychotic Disorders: (1) schizophrenia, schizoaffective type, depressed; (2) involutional melancholia; and (3) manic-depressive illness, depressed type. Depressive neurosis is listed under psychoneurotic disorders and cyclothymic personality under personality disorders. This system reflects a kaleidoscopic conglomerate of descriptive,
etiologic, prognostic, and phenomenologic variables (Zubin, 1967). Diagnostic reliability among investigators tends to be only average, whether defined by inter-rater agreement, reevaluation over time, or distribution of diagnoses between comparable samplings (Becker, 1974). The traditional nomenclature is suspect as a valid and reliable classification system of depression (Mendels, 1970); its use as a criterion to compare self-rating depression scales is also of limited value since clinician agreement is only moderate. Various other typologies of depression have emerged (e.g., Winokur, 1973), but it is beyond the scope of this review to consider them individually.

Beck (1967) listed other controversies in the depression literature, to wit: (1) endogenous versus exogenous, (2) autonomous versus reactive, (3) agitated versus retarded, and (4) psychotic versus neurotic. Two of the dichotomies (endogenous versus exogenous; psychotic versus neurotic) are of particular pertinence to this study and will be reviewed.

Kendell (1968) described endogenous versus exogenous controversy and the major principles as follows:

On the one hand have been those like Ross and Gillespie, and latterly Roth and his colleagues in Newcastle-upon-Tyne, who have been convinced that the two are distinct disease entities, differing in symptomatology, aetiology, treatment and prognosis. On the other hand have been those like Mapother, Lewis and Curran who have maintained that no valid or useful distinction can be drawn between the two, and that such broad differences as are observed are primarily differences in severity and chronicity. (p. 15)
Becker (1974) summarized the evidence for the different positions by concluding there is emerging consensus that endogenous and reactive depressions are distinguishable patterns of disorder but most depressives show a combination of the two patterns. Recently, Lewinsohn, Zeiss, Zeiss, and Haller (1977) reported results favorable to a two-symptom cluster interpretation but acknowledged that only a small number of cases in either extreme is to be expected. It would appear that both camps are partially correct.

The classification of depression into the psychotic-neurotic severity model has a long history. A psychotic depression is defined as involving impaired reality testing, which interferes substantially with the person's capacity to meet the ordinary responsibilities of day-to-day functioning (Zung, 1973). The definition of neurotic depression involves impaired mental functioning, but the patient is aware of the impediment. The patient's reality testing is impaired; however, psychotic distortions and misinterpretations are absent (Zung). Beck's (1967) conclusion is as follows:

There are no specific signs or symptoms, aside from delusions that distinguish psychotic from neurotic depressives; and the more severe the symptoms, the more likely a patient is to be diagnosed as psychotic depressed. These findings tend to support the thesis that so far as specific depressive symptoms are concerned, the difference between the neurotic and the psychotic depressive reactions is quantitative rather than qualitative. (p. 86)

The dichotomies just considered are aspects of the
general controversy as to whether or not depression is on a continuum. Considerable additional support can be gathered for the position that depression is on a continuum ranging from mild to severe forms. Beck (1967); Beck, Ward, Mendelson, Mock, and Erbaugh (1961); Metcalf and Goldman (1965); and others (e.g., Blatt, D'Affitti, & Quinland, 1976) have argued for the continuity position.

A related issue, important to this investigation, was whether the proposed continuum was reflected in various treatment settings. Paykel, Klerman, and Prusoff (1970) provided support by using a clinical interview for depression to investigate patients in four types of treatment settings: (1) an inpatient hospital, (2) an emergency treatment unit, (3) an outpatient clinic, and (4) a day hospital. During the period of the study, 875 patients were admitted to the different facilities and an average of 32 percent were diagnosed depressed. Paykel et al. confirmed their hypothesis that different clinical settings treat depressed patients who vary on the gradient of severity and chronicity. Inpatients were the most depressed, outpatients the least depressed, and day and emergency treatment unit patients were intermediate. Other research has reported lower mean scores on the Beck Depression Inventory for college students than for patient populations (Hammen & Padesky, 1977; Weckowicz, Muir, & Cropley, 1967).

In summary, Lewinsohn (1974) concluded that (1) consensus...
does not confirm a generally accepted typology for depressive disorders; and (2) the clinical diagnosis of depression may be referring to a broad number of symptoms, none of which are sufficient in themselves for the diagnosis or to rule out the presence of others. Beck (1972); Seligman, Klein, and Miller (1976); and Stern, McClure, and Costello (1970) agreed with Lewinsohn that the data were not sufficient to distinguish among different depressive syndromes. Evidence was moderate, for a continuum of depression and different populations (college students versus patients) were expected to vary in severity of depression.

Prevalence of Depression

Many authorities have contended that depression is a major problem within the general population. Levitt and Lubin (1975), in a national depression survey, used the Depression Adjective Check List, Form E (Lubin, 1967), and found that about 3 percent of the noninstitutionalized adult population are at any given moment in time depressed to a degree warranting therapeutic intervention. Levitt and Lubin's survey results are close to Lehmann's (1971) worldwide estimate of between 3 percent and 4 percent. Secunda et al. (1973) estimated that during any given year, 15 percent of all adults between 18 and 74 may suffer significant depressive symptoms.

Gallant and Simpson (1976) stated that depression is the

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presenting problem in approximately one-half of all admissions to psychiatric institutions. Secunda et al. (1973) estimated that depression accounts for 75 percent of all psychiatric hospitalizations. Within identified psychiatric populations, Schnurr, Hoaken, and Jarrett (1976) and Zung (1971) have commented on the high prevalence of depression. Carroll et al. (1973) found that 11 percent of the inpatients they studied received a primary diagnosis of depression. They purported no symptoms of depression unique to this condition and suggested that psychiatric patients in general would score in the depressed range on depression rating scales. Beck et al. (1961) found that in a large study of psychiatric patients, in only 26 percent of the cases was depression completely absent. Weckowicz et al. (1967) reported that in psychiatric patients of a large general hospital, 254 out of 391 tested scored 17 or more on the Beck Depression Inventory, indicating a clinically significant degree of depression.

Despite evidence for a high prevalence of depression in psychiatric populations, psychiatrists in the United States have diagnosed depression with less frequency than psychiatrists in the United Kingdom (Becker, 1974). This issue was studied in 1964 in a project entitled "Diagnosis of Mental Disorder in the United States and United Kingdom" (Cooper, Kendell, Gurland, Sharpe, Copeland, & Simon, 1971; Gurland, Fleiss, Sharpe, Simon, Barrett, Copeland, Cooper, & Kendell,
Research project psychiatrists diagnosed schizophrenia less and depression more than did psychiatrists in the United States, which indicated a tendency to diagnose depression less frequently in the United States.

In conclusion, depression, regardless of diagnosis, is significantly present in patient populations and would be expected to be at about 3 percent to 4 percent in noninstitutionalized adult populations. Based on this information, it would be reasonable to expect a valid and reliable measure of the severity of depression to detect a difference between a patient population and a nonpatient population.

Measurement of Depression

Presently, the researcher or clinician has three choices to select from in the measurement of depression: (1) self-report measures, (2) observer rating scales, and (3) behavioral observations. Within the domain of options are psychobiological or biochemical tests, but they have not shown sufficient validity and reliability to recommend their use (Hamilton, 1976; Pehm, 1976).

Observer rating scales have been developed by practitioners for clinical application. Illustrative scales are the Hamilton Rating Scale for Depression (Hamilton, 1960), the Psychiatric Judgment Depression Scale (Wechsler, Grosser, & Busfield, 1963), the Feelings and Concerns Check List (Grinker, Miller, Sabshin, Nunn, & Nunnally, 1961), and the
PPH Depression Rating Scale (Friedman, Cowitz, Cohen, & Granick, 1963). The general procedure for these instruments is for the observer to rate degree of severity on a 3- or 4-point scale. The sum scores give a composite measure of the intensity of depression. If the observers are well trained, then rating scales are highly reliable and discriminate validity is typically good. The Hamilton Rating Scale for Depression and the Grinker check list are the most frequently used and are discussed in detail in the original publications of the authors and by Pehm (1976).

Hamilton (1976) listed the merits of observer scales: (1) the skilled observer can match intensity of symptoms with experience, (2) the observer can rate features of depression that the patient cannot or at least finds very difficult to rate (e.g., loss of insight), (3) patients too sick for self-report measures can still be evaluated, and finally (4) the illiterate or those lacking in concentration can be assessed. Disadvantages are that observer ratings require skilled and experienced raters, which are in short supply, and ratings may take excessive amounts of time. The interview offers one form of reliability check on self-report (Pehm, 1976), but the issues of interviewer bias and inter-rater reliabilities must be taken into account. Observer ratings by well-trained interviewers can be a helpful adjunct to assessment and at times may be better than self-report. As direct methods are developed, observer ratings may be replaced in depression.
research and practice (Pehm, 1976).

Behavioral observations are broken down by Pehm into assessment of overt verbal behavior and overt motor depressive behavior. As might be expected, researchers (notably Lewinsohn) theoretically aligned to behavioral perspectives have pioneered in this area. Lewinsohn and colleagues (Lewinsohn, Weinstein, & Alper, 1970; Lewinsohn, Weinstein, & Shaw, 1970; Libet & Lewinsohn, 1973) have developed methods of coding verbal interactions of depressed persons in therapy groups and family settings. Their work, which resulted in a behavioral coding system, is outstanding and has been applied in a number of clinical cases. Reliability and validity of the behavioral coding system are good and use of this approach is recommended if the researcher has the multiple, well-trained observers and if the problem is appropriate (e.g., groups, couples, or family therapy). Practical requirements limit this approach (at least for the individual practitioner) and replication and normative data are needed (Pehm, 1976).

Examples of the assessment of overt-motor depressive behavior are the Behavior Rating Scale (Williams et al., 1972), continuous telemetric monitoring (Kupfer, Detre, Foster, Tucker, & Delgado, 1972), and activity schedules (MacPhillamy & Lewinsohn, 1974). These approaches have had limited study predominantly with inpatients. Direct assessment of overt-motor behavior, a promising area of research, has considerable potential utility.
In conclusion, observer rating scales and behavior ratings can provide valid and reliable assessment of depression, given an appropriate situation. Neither approach has been studied as extensively as have self-report measures.

Self-Report Rating Scales

Of the 23 self-administered depression scales described by Levitt and Lubin (1975), only those with empirical support or direct relevance to this study (i.e., Generalized Contentment Scale) will be reviewed.

MMPI Depression Scale. The oldest and most widely used instrument to assess depression is the MMPI D scale (Hathaway & McKinley, 1951). The D scale (Scale 2), a 60-item scale, is based on 49 items that discriminated hospitalized manic-depressives from other psychiatric patients. Since manic-depressives are a subgroup of the depressive disorders, the MMPI D scale was validated on an unusual group of depressives. The D scale correlates only moderately with other depression measures. D-scale correlations of .41 and .75 have been reported with the Beck Depression Inventory (Nussbaum, Wittig, Hanlon, & Kurland, 1963; Seitz, 1970). Correlations with the Depression Adjective Check Lists have ranged from .31 to .57 (Lubin, 1967; Nussbaum et al., 1963). With psychiatric rating, the D-scale correlations range from .11 to .50 (Nussbaum et al., 1963; Seitz, 1970). Concurrent validity correlations suggest that the D scale only moderately taps the
variables assessed by other rating scales. Discriminate validity is considered to be average (Pehm, 1976).

Test-retest reliabilities as presented by Dahlstrom and Welsh (1960) are moderate; split-half reliabilities range from .35 to .84, with a median of .70. O'Connor, Stefic, and Gresock (1957) criticized the scale for its factorial complexity, and Dempsey (1963) pointed out a lack of dimensionality. Similar scores can reflect quite different depressive states qualitatively and quantitatively. Given only moderate reliability and validity, the D scale is not the best choice for depression assessment.

**Zung Self-Rating Depression Scale (SDS).** The SDS is a 20-item scale measuring symptoms of depression (Zung, 1965). Items sample three areas found to be associated with the diagnosis of depression: (1) pervasive affect, 2 items; (2) physiological equivalents, 8 items; and (3) psychological equivalents, 10 items. The subject rates each of the items quantitatively (i.e., higher scores indicate more depressed subjects).

Zung (1973) considered the scale to represent an operational definition of a depressive disorder. According to Zung, the scale has considerable construct validity. Discriminate validity has been found in some studies (Zung, 1965; Zung, Richards, & Short, 1965) where the SDS discriminated patients with depressive disorders from other diagnostic categories at a statistically significant level.
However, Carroll et al. (1973) compared the Hamilton Rating Scale for Depression and the SDS on their relative ability to discriminate patients diagnosed depressed from three settings. Results did not support the discriminate validity of the SDS, and the SDS was not recommended for research studies. Moderate discriminant validity for this measurement instrument is supported by current evidence (Pehm, 1976).

The SDS has significant correlations with other depression ratings including the Hamilton Rating Scale for Depression (Brown & Zung, 1972), the Beck Depression Inventory (Zung, 1969), the D scale (Zung, 1965), and the Depression Adjective Check Lists (Marone & Lubin, 1968). Generally, concurrent validity is moderate. The SDS has less evidence for reliability than the Beck Depression Inventory, but odd-even correlations of .73 have been reported (Zung, 1972). The scale has been used in clinical studies, cross-cultural studies, and studies of depression in normals with satisfactory results.

In summary, the SDS has considerable psychometric support, despite the reported inconsistencies (Carroll et al., 1973), and the scale is a quick and convenient measure of severity of depression.

**Beck Depression Inventory (BDI).** The BDI consists of 21 items which purport to provide a quantitative assessment of depression (Beck, 1972, Beck et al., 1961). The scale was originally administered with a trained interviewer; more
recently, the scale has been used in a self-report manner. The items are ranked in order of severity of the symptom. The examinee selects the statement which most accurately describes his or her present state.

Internal consistency was demonstrated by significant relationships between each item and BDI total scores and by an odd-even item correlation of .86, Spearman-Brown corrected to .93 (Beck et al., 1961). Test-retest reliability was not reported in the original study, but Miller and Seligman (1973) reported a test-retest reliability of .74 for 31 normal undergraduates with a 3-month interval.

Nussbaum et al. (1963), in a drug study, found a correlation of .67 between BDI change scores and changes in clinical ratings. Beck (1972) provided evidence for construct validity and discriminant validity. With a sample of 606 patients, Beck (1972) found a correlation of .72 between the BDI and clinicians' ratings of depression, but only .14 between the BDI and clinicians' anxiety ratings. Concurrent validity was moderate to good with other depression scales and psychiatric ratings.

In general, the BDI psychometric properties are above average, with discriminant validity especially notable. Satisfactory results have been reported in a variety of settings. Pehm (1976) stated that the BDI appears to be the best of presently available self-report measures of general depression severity.
Depression Adjective Check Lists (DACL). The DACL consists of seven forms, A through G. Forms A-D consist of balanced sets of 22 positive and 10 negative adjectives from a pool of items which significantly differentiated between a group of 48 depressed female psychiatric patients and a group of 179 normal females. Forms E-G consist of balanced sets of 22 positive and 12 negative adjectives from a pool of adjectives which significantly differentiated between a group of 47 depressed male psychiatric patients and a group of 100 normal males.

Lubin (1967) presented psychometric data and reported that intercorrelations among the seven forms are high, regardless of sex. Internal consistency indices range from .79 to .90, and split-half reliabilities range from .82 to .93 for normals and from .86 to .93 for patients. All forms were cross-validated in a large study using normals and depressed and nondepressed patient groups. Correlations with other depression instruments are moderate.

The DACL took only 2-1/2 minutes for normals, and equivalent forms are good for repeated assessment. Normative data were excellent, especially for Form E, which was administered to a cross-sectional sample of 3,009 adults in a national survey (Levitt & Lubin, 1975).

Generalized Contentment Scale (GCS). Hudson (Hudson & Proctor, Note 1) developed the GCS as a short-form measure of depression. The GCS is structured as a 25-item summated
category partition scale that is scored with a range from 0 to 100.

The GCS is a new scale only partially validated using a nonclinical sample. Test-retest and split-half reliabilities ranged from .887 to .963, with a mean of .930.

The author found no studies which compare the GCS to clinicians' ratings. Evidence for discriminate validity was provided by Hudson and Proctor (1977). As an indication of concurrent validity, in the aforementioned study, the GCS correlated .73 with the short form of the BDI. Construct validity was supported by allowing four other measures to compete against the GCS in a discriminant function, and the resulting standardized discriminant weights clearly showed the GCS to be the most important predictor.

Only one study has been done to test the GCS, and then only with a nonclinical population; therefore, the usefulness of the scale is largely unknown. However, given the promising initial evidence, further study of the GCS is warranted.

**Sex Differences in Depression**

Studies of depression typically have found that women preponderate. Lehmann (1971) asserted, "It is well known that the female to male ratio is about 2:1 for depressive illness in Europe and North America" (p. 24). Silverman (1968), in a book on the epidemiology of depression, concluded, "There appear to be no exceptions to the
generalization that depression is more in females than males, whether it is the feeling of depression, neurotic depression or depressive psychosis" (p. 74).

Weissman and Klerman (1977) indicated four sources: (1) clinical accounts of patients coming for treatment, (2) surveys of nonpatients, (3) studies of suicide and suicide attempts, and (4) investigations of grief and bereavement which reveal the preponderance of females among depressives. It is reasonable to assume that the findings of this study will also indicate greater prevalence of depression among females than among males.

Statement of the Problem

Practitioners or researchers have alternative methods for assessing the magnitude or degree of depression. Self-report measures, one promising avenue of assessment, can be combined with other modes of measurement for selecting, defining, and measuring change in depressed subject populations. A bewildering number of self-administered depression scales have been developed, and they often are weak in empirical support. Furthermore, studies comparing the relative merits of self-report depression scales are too few in number (Carroll et al., 1973; Davies, Burrows, & Poynton, 1975).

This research addressed the aforementioned issues by comparing the psychometric properties of the BDI, Form E of the DACL, and the GCS to distinguish between groups of
persons reasonably believed to differ in severity of depression in three different settings: inpatient, outpatient, and university. Research of this kind enlarges upon the number of comparative studies of depression scales and is unique in that the three instruments studied have not been previously compared and contrasted.

The BDI, a self-report instrument with strong psychometric support, is perhaps the most widely used depression scale. It will serve as a standard to evaluate the other two scales. The GCS (Hudson & Proctor, 1977) and Form E of the DACL (Lubin, 1967) purport to predominantly measure the affective component of depression and have not been compared on their relative abilities to discriminate persons known to experience depressive affect to a clinical degree.

Assumptions, supported by research findings presented in the review of the literature, are that (1) a continuum of depression exists; (2) this continuum will be reflected with normals (college students) at one extreme, to hospitalized patients at the other; and (3) the depressive syndrome is sufficiently present in all patient populations, irrespective of diagnosis, to show by use of self-report scales the expected continuum.

In summary, research in depression requires that the investigator have valid and reliable instruments for resolving theoretical controversies and methods-comparison with alternative forms of interventions. Practitioners also
require valid and reliable measures for evaluating therapeu-
tic change over time. This study will hopefully contribute to the scientific study of depression and may be of value to both clinicians and researchers in this area.

Hypotheses

The hypotheses for the study are as follows:

$H_1$: All three scales will discriminate the normals (college students) from the two patient samples.

$H_2$: A significant discrimination will be found between the inpatient and outpatient samples, with the inpatients having the significantly higher degree of depression as measured by the depression inventories.

$H_3$: Females in all three groups will show a significantly higher degree of depression as measured by the depression inventories.

$H_4$: In the two patient samples, patients diagnosed as depressed using the DSM II (1968) classification system will show a significantly higher score on the depression scales than those not diagnosed as depressed.
CHAPTER II

METHOD

The intent of this chapter is to outline the method of investigation and to make explicit the procedures used. Topics included are as follows: (1) the subjects for the study, (2) the instruments, and (3) data collection procedures used for analysis of the data.

Subjects

A total of 219 subjects, separated into three groups from four different settings, participated in this study. The first group, considered "normals" for the purposes of this investigation, consisted of 88 graduate students (32 males and 56 females) from a counseling and personnel department at a medium-sized (approximately 20,000) public, coeducational university located in a midwestern city of approximately 86,000. The average age of the college students was 31.4 years.

The second subject group consisted of 63 outpatients (31 males and 32 females) who completed the depression scales on their initial visit to the psychiatric outpatient component of a community general hospital located in a midwestern city of approximately 198,000. The average age of the outpatient sample was 30.9 years.

The third group of subjects was composed of 68 patients...
(36 males and 32 females) at two inpatient psychiatric locations. The inpatient component of the same community general hospital used to collect outpatient data, a small (50-bed) acute psychiatric unit, was selected as the first location. There were 10 male and 13 female study participants from this setting. The second location was a large state hospital (850 beds) with a 12-county catchment area (estimated population 1,550,300) located in a midwestern community of 86,000. There were 19 females and 26 males assessed at the state hospital. The average age of the inpatient sample was 31.2 years.

**Instruments**

The three self-rating depression measures used in this study were the Beck Depression Inventory (BDI) as originally published (Beck et al., 1961), Form E of the Depression Adjective Check Lists (DACL) developed by Lubin (1967), and the Generalized Contentment Scale (GCS) constructed by Hudson (Hudson & Proctor, 1977). The words *scale* and *inventory* are intended to be equivalent throughout this manuscript. The following discussion describes significant aspects of each inventory and provides information concerning reliability and validity of each instrument.

**Beck Depression Inventory**

Beck et al. (1961) developed a 21-item scale (see Appendix A) constructed to provide a quantitative assessment of
depression. A number of symptom-attitude categories frequently related to the depressive are graded by intensity. The inventory was originally administered with a trained interviewer but consistent with recent usage; the scale in this study was used in a self-report manner. The subject is asked to describe her or his present state.

Beck (1967) stated that the items in the inventory are primarily clinically derived. They are based on his own clinical experience and on the psychiatric literature. As a result of this process, he selected the following 21 symptom-attitude categories:

1. Mood 12. Social withdrawal
2. Pessimism 13. Indecisiveness
4. Lack of satisfaction 15. Work inhibition
5. Guilty feeling 16. Sleep disturbance
7. Self-dislike 18. Loss of appetite
8. Self-accusations 19. Weight loss
11. Irritability

Each category is graded into a series of four or five self-evaluative statements. Beck intended the items to reflect overt behavioral manifestations not related to any particular theory of depression.

For scoring, each of the graded series of statements was assigned a numerical value from 0 to 3. Zero indicated neutrality relative to the symptom, while 3 represented maximal severity. The person's total score represented a combination of the number of symptom categories endorsed and the severity
(0-3) of any particular symptom. The scoring range was from 0 to 63, with higher scores indicating greater severity of depression.

In the original study (Beck et al., 1961), reliability, reflecting interval consistency, was reported as an odd-even item correlation of .86. Spearman-Brown corrected to .93. Test-retest reliability was not reported in the 1961 study, but Miller and Seligman (1973) reported a test-retest reliability of .74 for 31 normal undergraduates with a 3-month interval.

Validity has been reported from a variety of perspectives. Concurrent validity has been found to be moderate to good with other depression scales and psychiatric ratings. Nussbaum et al. (1963) reported a correlation of .66 between the BDI and Form E of the DACL. The BDI and DACL forms A-D were found to correlate from .38 to .50 (Lubin, 1967), while the MMPI D-scale correlations have been .41 (Seitz, 1970) and .75 (Nussbaum et al., 1963). Seitz (1970) found a correlation of .83 between the BDI and Zung Self-Rating Depression Scale. Seitz (1970), Nussbaum et al. (1963), Beck (1972), and Lubin (1967) reported the following correlations, respectively: .19, .66, .67, and .67 between the BDI and psychiatric ratings.

Depression Adjective Check Lists

Form E of the DACL (Lubin, 1967; see Appendix B) was one of seven forms (A-G) which were intended to measure transient
depressive moods. Form E was selected for this study because it was the only form with normative data (Levitt & Lubin, 1975). It consisted of balanced sets of 22 positive and 12 negative adjectives which significantly differentiated between a group of 47 depressed male psychiatric patients and a group of 100 normal males. All seven forms are highly correlated regardless of sex of subject group. Subjects select, with a check mark, adjectives from the list that best describe their present feelings.

The check list is scored through use of a scoring key. To score, place the key over the check list and score 1 point for each plus (+) adjective (+ adjectives are negative, such as unhappy, blue) that is checked and 1 point for each minus (0) adjective that is not checked (0 adjectives are positive; for instance, active, composed). The score for each check list is the total number of plus (+) adjectives checked and minus (0) adjectives not checked. The range of possible scores is from 0 to 34. The higher the score, the greater the degree of depressive mood.

Two types of reliability were reported by Lubin (1967). Reliabilities for internal consistency for Form E were .88 for females and .83 for males. Split-half reliability for Form E was .86 for male patients and .88 for female patients; for normals, .85 for males and .84 for females.

Validity studies were reported by Lubin. The check list successfully discriminated between normals, nondepressed
patients, and depressed patients. Correlations with other depression scales range from low to moderate, .31 to .57 (Lubin, 1967; Nussbaum et al., 1963).

Normative data are excellent for Form E, which was administered to a cross-sectional sample of 3,009 adults in a national survey (Levitt & Lubin, 1975).

Generalized Contentment Scale

The GCS (Hudson & Proctor, 1977; see Appendix C), a 25-item summated category partition scale, was designed to be a self-report measure of depression. Item content emphasizes the affective and cognitive components of depression (Hudson & Proctor, Note 1). Roughly half the items are stated in a positive way and the remainder are structured in a negative way. The authors intended by the alternative wording approach to reduce or eliminate subject response set. Subjects are instructed to use the scale to measure the degree of contentment that they feel about their life and surroundings. No instructions regarding the specific time frame are included.

Possible responses to items are from 1 to 5, with 1 indicating "rarely or none of the time" and 5 being "most or all of the time"; other numbers indicate intermediate frequencies. Scoring proceeds by first reverse-scoring positively worded items; then, all scores are summed and a constant of 25 is subtracted from the total score. This
results in a score range from 0 to 100, with higher scores indicating a greater magnitude of depression.

The GCS is relatively new and has been only partially validated using a nonclinical sample. Test-retest and split-half reliabilities ranged from .89 to .96, with a mean of .93. No studies comparing the GCS to clinicians' ratings have been done. Evidence for discriminate validity was provided by the Hudson and Proctor (1977) study. This study was with a nonclinical sample and basically compared GCS scores to client self-report of degree of depression. As an indication of concurrent validity (in the same study mentioned above), the GCS correlated .73 with the short form of the BDI and the Zung Self-Rating Depression Scale. Construct validity was supported by allowing four other measures to compete against the GCS in a discriminant function. The resulting standardized discriminant weights showed the GCS to be the most important predictor.

In summary, initial results are encouraging but are of limited value since a nonclinical population was utilized. Further study using more rigorous criteria is warranted.

Data Collection Procedures

The BDI, the GCS, and Form E of the DACL were completed by all subjects during a 14-week interval from April 22 to July 14, 1978. A cover sheet was attached to each packet of scales which explained the purpose and voluntary nature of
the study (see Appendix D). Confidentiality was also assured. After each subject had thoroughly read the cover sheet, each subject was requested to initial his or her agreement to participate. Subjects were also requested to indicate their sex, birth date, and height. This information provided subject descriptive information and additionally was used to reduce the possibility of a person being tested twice.

Data were collected until a predetermined minimum of 30 was reached in each sample. The criteria for inclusion into the sample were that the subject be literate and sufficiently coherent to give meaningful responses. Of course, motivation to participate was also necessary. Approximately 90 percent of all outpatients met the criteria. In the inpatient sample, approximately 30 percent of available patients were able or willing to meet study inclusion criteria. In the patient samples, four scales were rejected due to being incomplete or improperly filled out. All normals approached agreed to take the scales and completed them properly.

In order to reduce the possibility of an effect due to scale order, the scales were rotated through each possible position so that each scale was in each position with approximately the same frequency.

The college student sample of 88 was obtained from a counseling and personnel graduate program at a medium-sized midwestern university. The sample was selected on the basis
of the willingness of various instructors to allow the investigator to come into the classrooms to distribute and pick up the scales. Due to a preponderance of females in the four classes tested, seven males were approached individually so that the preselected sample size of 30 could be reached. For the purposes of this study, the college student sample were considered "normals." Normality was defined as persons functioning independently and at age-appropriate activities.

In the outpatient setting, persons who were administered the depression inventories were consecutive admissions who were willing to participate, meet admission criteria, and were attending the clinic for their intake evaluation. The intake worker requested that the subjects complete the questionnaires before the interview. After the questionnaires were completed, the intake worker diagnosed the patients using the DSM II (1968). Diagnosis was independent of the depression scale results.

In the two inpatient settings, the scales were administered during the first 3 days after admission. Again, persons who were administered the scales were consecutive admissions in that they volunteered for the study, were literate, and were able to give meaningful responses. The patients were diagnosed with reference to DSM II following the agency's usual procedures and treatment staff. Diagnosis was arrived at independent of the results of the self-report depression scales.
In the two patient samples, 36 subjects received a primary or a secondary diagnosis of depression out of a total patient sample of 131. In the inpatient settings, typically, only one diagnosis was assigned per patient. However, the outpatient intake worker routinely assigned both a primary and a secondary diagnosis. Due to the relatively low number of patients diagnosed primarily as depressed, it was decided that for the purposes of data analysis, persons with a secondary diagnosis of depression would be combined with the primary depressives. No attempt was made to separate varying types of depression.

**Statistical Analysis**

Originally the major method of statistical analysis chosen was the two-way analysis of variance. However, in some cases, due to unequal sample variances and unbalanced sample sizes, analysis of variance assumptions were violated. Therefore, use of the two-way analysis of variance results was inappropriate since the resulting probabilities were likely to be inaccurate.

An alternative method of analyzing the data was recommended by the statistical consultant (Stoline, Note 2). The preferred approach used an approximate two-sample comparison of means using a Bonferroni procedure (Dunn, 1961; Miller, 1966). The logic behind this approach and the steps involved will be described using a general example.
The first step involved using the Western Michigan University Multivariate Analysis of Variance Package (Mitchell & Stoline, Note 3) to obtain for each of the situations studied: (1) descriptive statistics, (2) an analysis of variance table with Bartlett's test statistic, and (3) three types of t tests for mean score comparisons.

With the just-described information at hand, the descriptive statistics are inspected to appraise the sample size. If one sample is roughly twice as large as any of the other samples, it is concluded that the samples are unbalanced. Given unbalanced sample size, the Bartlett's test statistic is inspected. The Bartlett's test statistic is a measure of the equality of the population variances and uses the sample standard deviations and yields a chi-square probability of some given value. A significant Bartlett's test statistic, in combination with the unbalanced samples, results in ignoring the analysis of variance table and the t tests based upon it (e.g., the exact t tests). Of the three types of t test given in the data printout, the appropriate one to use is the approximate t test. The approximate t test and its confidence intervals are based on procedures developed by Satterthwaite (Winer, 1971). The approximate t test is robust even when the population variances are unequal, which is not true for the exact t test.

When sample sizes were equal or Bartlett's test statistic was nonsignificant, or both, the exact t test was used.
which is based on the analysis of variance table. Therefore, two types of $t$ test were employed in the study based upon the consideration of sample balance and the Bartlett's test statistic. The approximate $t$ test was used when sample unbalance and unequal population variance existed as measured by Bartlett's test statistic, and the exact $t$ test was employed with either balanced sample sizes or equal population variances.

The final statistical procedure was the Bonferroni method (Dunn, 1961; Miller, 1966). The Bonferroni method allowed multiple comparisons (simultaneous confidence intervals) for all pairwise $t$ tests of the means at a selected simultaneous probability level. Typically, this study compared at least four samples which yielded six different pairwise mean scale score comparisons in the $t$ table. To obtain, using the Bonferroni procedure, an overall significance level of $p < .10$, the value of .10 was divided by the number of comparisons (6) resulting in $p = .016$. The approximate two-sample $t$-test probabilities were compared to the $p = .016$. Probabilities less than .016 were significant, while probabilities larger than $p = .016$ were considered nonsignificant. The overall probability using the 10-percent Bonferroni procedure with 6 two-sample $t$ tests was, therefore, .10 or less for making at least one Type I error.

The Bonferroni approach was a conservative one, since in a 6-comparison example, individual comparisons must be less than .016 to be significant at an overall $p = .10$. The
p = .10 overall was used for this study because using an overall level of .05 would result in individual tests at .008 level of significance, which was felt to be too stringent (Stoline, Note 2).

Hypotheses 1 and 3 were studied using the approximate two-sample t tests with the Bonferroni approach, since the samples were unbalanced and the Bartlett's test statistic significant. Hypotheses 2 and 4 had a nonsignificant Bartlett's test statistic and hence the exact two-sample t tests which are based on the analysis of variance results could be utilized. To maintain consistency, the Bonferroni approach was applied to exact two-sample t tests at the .10 probability level as in the approximate two-sample t-test situations.

The four hypotheses were analyzed with the procedures just described. The following describes the approaches used to investigate the psychometric properties of the three depression scales.

The Kuder and Richardson (1937) approach to reliability is appropriate for a single administration of a single form and provides an inter-item consistency measure influenced by two sources of error variance: (1) content sampling, and (2) heterogeneity of the behavior domain sampled (Anastasi, 1976).

Due to the nature of the three depression inventories, two different Kuder-Richardson reliability formulas were used. In both cases, the Kuder-Richardson reliability coefficients
represent the mean of all split-half coefficients resulting from different splittings of a test (Cronbach, 1951). For the DACL Form E, the Kuder-Richardson Formula 20 was used. Kuder-Richardson 20 was appropriate because the DACL Form E is scored by an all-or-none system (i.e., the subjects checked the item or they did not). For the GCS and BDI, the correct Kuder-Richardson formula is known as coefficient alpha (Novick & Lewis, 1967). It was appropriate because both scales have multiple scored items.

In summary, the reliabilities reported were Kuder-Richardson reliabilities that were computed using different formulas. Coefficients in both cases reflected means of all split-half coefficients and measured content sampling and heterogeneity of the behavior domain sampled. Reliability coefficients were reported separately on each depression measure and for each of the subject samples.

Scale validity was approached in two different ways. Concurrent validity was studied by correlations between one scale and the other scales which were designed to measure the same construct. A positive correlation was expected if all scales were measuring depression. Pearson product-moment correlations were computed for the three depression inventories for each of the samples.

Construct validity was appraised by the method of discriminant function analysis treating items on the individual depression scales as the predictor variables and the subject
samples as the target groups.

The discriminant function was introduced by R. A. Fisher in 1926 as a statistical technique that facilitated the classification of persons or things. The purpose of this multivariate analysis was to weigh the measurement (in this case, depression scale items) to provide the optimum assignments into different groups (two or more). This linear function, when applied to a group, assigned the subjects to the various categories. The category breakdown predicted was the patient group and normal group and diagnosed depressed patients and nondiagnosed depressed patients. Male and female subjects were studied in combination and separately. Results were percentage of cases correctly classified. This analysis allowed comparison of the power of the scales to discriminate between groups that, on theoretical grounds, were expected to possess differing magnitudes on the construct being studied.
CHAPTER III

RESULTS

Introduction

This chapter presents the four hypotheses and the statistical analyses of the data related to the hypotheses. In addition, the statistical analyses for reliability, concurrent validity, and construct validity are presented.

Table 1 contains the mean ages and standard deviations

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inpatient females</td>
<td>32</td>
<td>32.88</td>
<td>11.68</td>
</tr>
<tr>
<td>Inpatient males</td>
<td>36</td>
<td>29.53</td>
<td>11.76</td>
</tr>
<tr>
<td>Outpatient females</td>
<td>32</td>
<td>31.13</td>
<td>8.96</td>
</tr>
<tr>
<td>Outpatient males</td>
<td>31</td>
<td>30.74</td>
<td>11.32</td>
</tr>
<tr>
<td>Normal females</td>
<td>56</td>
<td>30.80</td>
<td>6.70</td>
</tr>
<tr>
<td>Normal males</td>
<td>32</td>
<td>26.22</td>
<td>6.73</td>
</tr>
</tbody>
</table>

for inpatients, outpatients, and normals. The 32 inpatient females have a mean age of 32.88 with a standard deviation of 11.68, and the 36 inpatient males have a mean age of 29.53 with a standard deviation of 11.76. The mean age of the 32 outpatient females is 31.13 with a standard deviation of 8.96, and the mean age of the 31 outpatient males is 30.74 with a standard deviation of 11.32. The 56 normal females
have a mean age of 30.80 with a standard deviation of 6.70, and the 32 normal males have a mean age of 26.22 with a standard deviation of 6.73.

**Hypothesis 1**

Hₐ: All three scales will discriminate the normals (college students) from the two patient samples.

Descriptive statistics for the Generalized Contentment Scale (GCS), Beck Depression Inventory (BDI), and Form E of the Depression Adjective Check Lists (DACL) are presented in Table 2 by group and sex. For group comparison, the two

<table>
<thead>
<tr>
<th>Scale</th>
<th>Group</th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>GCS</td>
<td>Patient males</td>
<td>67</td>
<td>39.537</td>
<td>19.315</td>
</tr>
<tr>
<td></td>
<td>Patient females</td>
<td>64</td>
<td>46.875</td>
<td>19.595</td>
</tr>
<tr>
<td></td>
<td>Normal males</td>
<td>32</td>
<td>17.156</td>
<td>8.573</td>
</tr>
<tr>
<td></td>
<td>Normal females</td>
<td>56</td>
<td>18.732</td>
<td>10.920</td>
</tr>
<tr>
<td>BDI</td>
<td>Patient males</td>
<td>67</td>
<td>14.552</td>
<td>10.995</td>
</tr>
<tr>
<td></td>
<td>Patient females</td>
<td>64</td>
<td>18.531</td>
<td>11.386</td>
</tr>
<tr>
<td></td>
<td>Normal males</td>
<td>32</td>
<td>2.500</td>
<td>2.436</td>
</tr>
<tr>
<td></td>
<td>Normal females</td>
<td>56</td>
<td>4.179</td>
<td>3.134</td>
</tr>
<tr>
<td>DACL</td>
<td>Patient males</td>
<td>67</td>
<td>12.776</td>
<td>8.756</td>
</tr>
<tr>
<td></td>
<td>Patient females</td>
<td>64</td>
<td>14.297</td>
<td>7.311</td>
</tr>
<tr>
<td></td>
<td>Normal males</td>
<td>32</td>
<td>5.375</td>
<td>3.842</td>
</tr>
<tr>
<td></td>
<td>Normal females</td>
<td>56</td>
<td>6.625</td>
<td>4.429</td>
</tr>
</tbody>
</table>
patient samples are combined. The normal sample constitutes the other group.

Table 3 contains the approximate two-sample $t$ tests with Bonferroni procedure for the GCS mean scores. Inspection of the table finds that there is a consistent pattern to the difference between patients and normals. Patients are significantly more depressed across all four comparisons.

Table 3

Approximate Two-Sample $t$ Tests Using 10-Percent Bonferroni Procedure for Generalized Contentment Scale

<table>
<thead>
<tr>
<th>Group/Group</th>
<th>df</th>
<th>$t$</th>
<th>Diff</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient males/patient females</td>
<td>128</td>
<td>-2.157</td>
<td>-7.338</td>
<td>.033</td>
</tr>
<tr>
<td>Patient males/normal males</td>
<td>96</td>
<td>7.981</td>
<td>22.381</td>
<td>.000*</td>
</tr>
<tr>
<td>Patient males/normal females</td>
<td>107</td>
<td>7.499</td>
<td>20.805</td>
<td>.000*</td>
</tr>
<tr>
<td>Patient females/normal males</td>
<td>92</td>
<td>10.318</td>
<td>29.719</td>
<td>.000*</td>
</tr>
<tr>
<td>Patient females/normal females</td>
<td>101</td>
<td>9.871</td>
<td>28.143</td>
<td>.000*</td>
</tr>
<tr>
<td>Normal males/normal females</td>
<td>77</td>
<td>-0.749</td>
<td>-1.576</td>
<td>.456</td>
</tr>
</tbody>
</table>

*p < .016 for each comparison; overall $p < .10$.

The results of the approximate two-sample $t$ tests for the BDI presented in Table 4 indicate a significant difference between patients and normals. Patients are more severely depressed than normals across all four comparisons.

Table 5 contains the approximate two-sample $t$ tests for Form E of the DACL. As indicated by the data, patient-normal comparisons reflect significant differences, with patients showing greater depression than normals for all comparisons.
Table 4
Approximate Two-Sample t Tests Using 10-Percent Bonferroni Procedure for Beck Depression Inventory

<table>
<thead>
<tr>
<th>Group/Group</th>
<th>df</th>
<th>t</th>
<th>Diff</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient males/patient females</td>
<td>128</td>
<td>-2.033</td>
<td>-3.979</td>
<td>.044</td>
</tr>
<tr>
<td>Patient males/normal males</td>
<td>78</td>
<td>8.544</td>
<td>12.052</td>
<td>.000*</td>
</tr>
<tr>
<td>Patient males/normal females</td>
<td>78</td>
<td>7.373</td>
<td>10.374</td>
<td>.000*</td>
</tr>
<tr>
<td>Patient females/normal males</td>
<td>73</td>
<td>10.781</td>
<td>16.031</td>
<td>.000*</td>
</tr>
<tr>
<td>Patient females/normal females</td>
<td>73</td>
<td>9.674</td>
<td>14.353</td>
<td>.000*</td>
</tr>
<tr>
<td>Normal males/normal females</td>
<td>78</td>
<td>-2.794</td>
<td>-1.679</td>
<td>.007*</td>
</tr>
</tbody>
</table>

*p < .016 for each comparison; overall p < .10.

Table 5
Approximate Two-Sample t Tests Using 10-Percent Bonferroni Procedure for Form E of Depression Adjective Check Lists

<table>
<thead>
<tr>
<th>Group/Group</th>
<th>df</th>
<th>t</th>
<th>Diff</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient males/patient females</td>
<td>126</td>
<td>-1.081</td>
<td>-1.521</td>
<td>.282</td>
</tr>
<tr>
<td>Patient males/normal males</td>
<td>96</td>
<td>5.841</td>
<td>7.401</td>
<td>.000*</td>
</tr>
<tr>
<td>Patient males/normal females</td>
<td>101</td>
<td>5.031</td>
<td>6.151</td>
<td>.000*</td>
</tr>
<tr>
<td>Patient females/normal males</td>
<td>93</td>
<td>7.836</td>
<td>8.922</td>
<td>.000*</td>
</tr>
<tr>
<td>Patient females/normal females</td>
<td>105</td>
<td>7.046</td>
<td>7.672</td>
<td>.000*</td>
</tr>
<tr>
<td>Normal males/normal females</td>
<td>72</td>
<td>-1.388</td>
<td>-1.250</td>
<td>.170</td>
</tr>
</tbody>
</table>

*p < .016 for each comparison; overall p < .10.
Hypothesis 2

H₂: A significant discrimination will be found between the inpatient and outpatient samples with the inpatients having the significantly higher depression scale scores.

Descriptive statistics for the GCS, the BDI, and Form E of the DACL are provided in Table 6 by group and sex.

Table 6

Descriptive Statistics for Generalized Contentment Scale, Beck Depression Inventory, and Form E of Depression Adjective Check Lists on Inpatients and Outpatients

<table>
<thead>
<tr>
<th>Scale</th>
<th>Group</th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>GCS</td>
<td>Inpatient males</td>
<td>36</td>
<td>34.750</td>
<td>17.931</td>
</tr>
<tr>
<td></td>
<td>Inpatient females</td>
<td>32</td>
<td>41.031</td>
<td>19.810</td>
</tr>
<tr>
<td></td>
<td>Outpatient males</td>
<td>31</td>
<td>45.097</td>
<td>19.653</td>
</tr>
<tr>
<td></td>
<td>Outpatient females</td>
<td>32</td>
<td>52.719</td>
<td>17.815</td>
</tr>
<tr>
<td>BDI</td>
<td>Inpatient males</td>
<td>36</td>
<td>11.667</td>
<td>10.797</td>
</tr>
<tr>
<td></td>
<td>Inpatient females</td>
<td>32</td>
<td>16.000</td>
<td>11.868</td>
</tr>
<tr>
<td></td>
<td>Outpatient males</td>
<td>31</td>
<td>17.903</td>
<td>10.409</td>
</tr>
<tr>
<td></td>
<td>Outpatient females</td>
<td>32</td>
<td>21.063</td>
<td>10.460</td>
</tr>
<tr>
<td>DACL</td>
<td>Inpatient males</td>
<td>36</td>
<td>10.722</td>
<td>9.105</td>
</tr>
<tr>
<td></td>
<td>Inpatient females</td>
<td>32</td>
<td>12.406</td>
<td>8.560</td>
</tr>
<tr>
<td></td>
<td>Outpatient males</td>
<td>31</td>
<td>15.161</td>
<td>7.811</td>
</tr>
<tr>
<td></td>
<td>Outpatient females</td>
<td>32</td>
<td>16.188</td>
<td>5.288</td>
</tr>
</tbody>
</table>

Table 7 contains the exact two-sample t tests with Bonferroni procedure for the GCS. Inspection of the table reveals no two-sample comparisons with significant differences in the predicted direction. Inpatient males do not differ significantly from outpatient males, and neither is

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Table 7

Exact Two-Sample t Tests Using 10-Percent Bonferroni Procedure for Generalized Contentment Scale

<table>
<thead>
<tr>
<th>Group/Group</th>
<th>df</th>
<th>t</th>
<th>Diff</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inpatient males/inpatient females</td>
<td>127</td>
<td>-1.376</td>
<td>-6.281</td>
<td>.171</td>
</tr>
<tr>
<td>Inpatient males/outpatient males</td>
<td>127</td>
<td>-2.247</td>
<td>-10.347</td>
<td>.026</td>
</tr>
<tr>
<td>Inpatient males/outpatient females</td>
<td>127</td>
<td>-3.936</td>
<td>-17.969</td>
<td>.000*</td>
</tr>
<tr>
<td>Inpatient females/outpatient males</td>
<td>127</td>
<td>-0.859</td>
<td>-4.066</td>
<td>.392</td>
</tr>
<tr>
<td>Inpatient females/outpatient females</td>
<td>127</td>
<td>-2.488</td>
<td>-11.688</td>
<td>.014*</td>
</tr>
<tr>
<td>Outpatient males/outpatient females</td>
<td>127</td>
<td>-1.610</td>
<td>-7.622</td>
<td>.110</td>
</tr>
</tbody>
</table>

*p < .016 for each comparison; overall p < .10.

The difference significant between mean scores for inpatient females and outpatient males. Significant results contrary to the hypothesis determine female outpatients more severely depressed than inpatient males or inpatient females.

The results for the exact two-sample t tests with Bonferroni procedure for the BDI are reported in Table 8. None of the inpatient-outpatient comparisons are significant in the postulated direction. Outpatient females report greater depression than inpatient males. The results do not support Hypothesis 2.

In Table 9 are the results of the exact two-sample t tests with Bonferroni procedure for Form E of the DACL. In contradiction to the hypothesis, outpatient females are more
Table 8

<table>
<thead>
<tr>
<th>Group/Group</th>
<th>df</th>
<th>t</th>
<th>Diff</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inpatient males/inpatient females</td>
<td>127</td>
<td>-1.636</td>
<td>-4.333</td>
<td>.104</td>
</tr>
<tr>
<td>Inpatient males/outpatient males</td>
<td>127</td>
<td>-2.335</td>
<td>-6.237</td>
<td>.021</td>
</tr>
<tr>
<td>Inpatient males/outpatient females</td>
<td>127</td>
<td>-3.548</td>
<td>-9.396</td>
<td>.001*</td>
</tr>
<tr>
<td>Inpatient females/outpatient males</td>
<td>127</td>
<td>-0.693</td>
<td>-1.903</td>
<td>.490</td>
</tr>
<tr>
<td>Inpatient females/outpatient females</td>
<td>127</td>
<td>-1.858</td>
<td>-5.063</td>
<td>.066</td>
</tr>
<tr>
<td>Outpatient males/outpatient females</td>
<td>127</td>
<td>-1.150</td>
<td>-3.159</td>
<td>.252</td>
</tr>
</tbody>
</table>

*p < .016 for each comparison; overall p < .10.

Table 9

<table>
<thead>
<tr>
<th>Group/Group</th>
<th>df</th>
<th>t</th>
<th>Diff</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inpatient males/inpatient females</td>
<td>127</td>
<td>-0.881</td>
<td>-1.684</td>
<td>.380</td>
</tr>
<tr>
<td>Inpatient males/outpatient males</td>
<td>127</td>
<td>-2.301</td>
<td>-4.439</td>
<td>.023</td>
</tr>
<tr>
<td>Inpatient males/outpatient females</td>
<td>127</td>
<td>-2.858</td>
<td>-5.465</td>
<td>.005*</td>
</tr>
<tr>
<td>Inpatient females/outpatient males</td>
<td>127</td>
<td>-1.389</td>
<td>-2.755</td>
<td>.167</td>
</tr>
<tr>
<td>Inpatient females/outpatient females</td>
<td>127</td>
<td>-1.921</td>
<td>-3.781</td>
<td>.057</td>
</tr>
<tr>
<td>Outpatient males/outpatient females</td>
<td>127</td>
<td>-0.517</td>
<td>-1.026</td>
<td>.606</td>
</tr>
</tbody>
</table>

*p < .016 for each comparison; overall p < .10.

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severely depressed than inpatient males. As shown in the table, all other comparisons are not significant. These findings do not support inpatients as more severely depressed than outpatients.

**Hypothesis 3**

\[ H_3: \text{Females in all three groups will show a significantly higher degree of depression as measured by the depression inventories.} \]

Descriptive statistics for the GCS, the BDI, and Form E of the DACL are reported in Table 10 by group and sex. Only sex comparisons within each of the three groups (inpatient, outpatient, normal) are presented in Tables 11, 12, and 13. The complete \( t \) tables with 15 two-sample comparisons for each scale are in Appendix E. With 15 comparisons, use of the Bonferroni procedure results in a level of significance of \( p < .0066 \) for each two-sample comparison, yielding an overall significance level of .10.

Table 11 contains the approximate two-sample \( t \) tests with Bonferroni procedure for the GCS. Inspection of the results indicates that females do not report greater depression than males for any of the within-sample comparisons. Therefore, Hypothesis 3 predicting sex differences is not supported.

Approximate two-sample \( t \) tests with the Bonferroni procedure were computed on BDI mean scores for the various groups. These data are presented in Table 12. As indicated
Table 10

Descriptive Statistics for Generalized Contentment Scale, Beck Depression Inventory, and Form E of Depression Adjective Check Lists on Inpatients, Outpatients, and Normals

<table>
<thead>
<tr>
<th>Scale</th>
<th>Group</th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>GCS</td>
<td>Inpatient males</td>
<td>36</td>
<td>34.750</td>
<td>17.931</td>
</tr>
<tr>
<td></td>
<td>Inpatient females</td>
<td>32</td>
<td>41.031</td>
<td>19.810</td>
</tr>
<tr>
<td></td>
<td>Outpatient males</td>
<td>31</td>
<td>45.097</td>
<td>19.653</td>
</tr>
<tr>
<td></td>
<td>Outpatient females</td>
<td>32</td>
<td>52.719</td>
<td>17.815</td>
</tr>
<tr>
<td></td>
<td>Normal males</td>
<td>32</td>
<td>17.156</td>
<td>8.573</td>
</tr>
<tr>
<td></td>
<td>Normal females</td>
<td>56</td>
<td>18.732</td>
<td>10.920</td>
</tr>
<tr>
<td>BDI</td>
<td>Inpatient males</td>
<td>36</td>
<td>11.667</td>
<td>10.797</td>
</tr>
<tr>
<td></td>
<td>Inpatient females</td>
<td>32</td>
<td>16.000</td>
<td>11.868</td>
</tr>
<tr>
<td></td>
<td>Outpatient males</td>
<td>31</td>
<td>17.903</td>
<td>10.409</td>
</tr>
<tr>
<td></td>
<td>Outpatient females</td>
<td>32</td>
<td>21.063</td>
<td>10.460</td>
</tr>
<tr>
<td></td>
<td>Normal males</td>
<td>32</td>
<td>2.500</td>
<td>2.436</td>
</tr>
<tr>
<td></td>
<td>Normal females</td>
<td>56</td>
<td>4.179</td>
<td>3.134</td>
</tr>
<tr>
<td>DACL</td>
<td>Inpatient males</td>
<td>36</td>
<td>10.722</td>
<td>9.105</td>
</tr>
<tr>
<td></td>
<td>Inpatient females</td>
<td>32</td>
<td>12.406</td>
<td>8.560</td>
</tr>
<tr>
<td></td>
<td>Outpatient males</td>
<td>31</td>
<td>15.161</td>
<td>7.811</td>
</tr>
<tr>
<td></td>
<td>Outpatient females</td>
<td>32</td>
<td>16.188</td>
<td>5.288</td>
</tr>
<tr>
<td></td>
<td>Normal males</td>
<td>32</td>
<td>5.375</td>
<td>3.842</td>
</tr>
<tr>
<td></td>
<td>Normal females</td>
<td>56</td>
<td>6.625</td>
<td>4.429</td>
</tr>
</tbody>
</table>

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### Table 11
Approximate Two-Sample t Tests Using 10-Percent Bonferroni Procedure for Generalized Contentment Scale

<table>
<thead>
<tr>
<th>Group/Group</th>
<th>df</th>
<th>t</th>
<th>Diff</th>
<th>p^a</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inpatient males/inpatient females</td>
<td>62</td>
<td>-1.364</td>
<td>-6.281</td>
<td>.177</td>
</tr>
<tr>
<td>Outpatient males/outpatient females</td>
<td>59</td>
<td>-1.611</td>
<td>-7.622</td>
<td>.112</td>
</tr>
<tr>
<td>Normal males/normal females</td>
<td>77</td>
<td>-0.749</td>
<td>-1.576</td>
<td>.456</td>
</tr>
</tbody>
</table>

**Note.** The complete table containing 15 two-sample comparisons is in Appendix E.

^a_p < .0066 for each comparison; overall p < .10.

### Table 12
Approximate Two-Sample t Tests Using 10-Percent Bonferroni Procedure for Beck Depression Inventory

<table>
<thead>
<tr>
<th>Group/Group</th>
<th>df</th>
<th>t</th>
<th>Diff</th>
<th>p^a</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inpatient males/inpatient females</td>
<td>63</td>
<td>-1.568</td>
<td>-4.333</td>
<td>.122</td>
</tr>
<tr>
<td>Outpatient males/outpatient females</td>
<td>60</td>
<td>-1.201</td>
<td>-3.159</td>
<td>.234</td>
</tr>
<tr>
<td>Normal males/normal females</td>
<td>78</td>
<td>-2.794</td>
<td>-1.679</td>
<td>.007</td>
</tr>
</tbody>
</table>

**Note.** The complete table containing 15 two-sample comparisons is in Appendix E.

^a_p < .0066 for each comparison; overall p < .10.
by the data, within-sample male-female comparisons reveal no significant sex differences as predicted by Hypothesis 3.

Approximate two-sample t tests with the Bonferroni procedure for Form E of the DACL are presented in Table 13. These data do not indicate significant sex differences. Females compared to males within the three samples are not significantly more depressed.

Table 13
Approximate Two-Sample t Tests Using 10-Percent Bonferroni Procedure for Form E of Depression Adjective Check Lists

<table>
<thead>
<tr>
<th>Group/Group</th>
<th>df</th>
<th>t</th>
<th>Diff</th>
<th>P&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inpatient males/inpatient females</td>
<td>65</td>
<td>-0.786</td>
<td>-1.684</td>
<td>.435</td>
</tr>
<tr>
<td>Outpatient males/outpatient females</td>
<td>52</td>
<td>-0.609</td>
<td>-1.026</td>
<td>.545</td>
</tr>
<tr>
<td>Normal males/normal females</td>
<td>72</td>
<td>-1.388</td>
<td>-1.250</td>
<td>.170</td>
</tr>
</tbody>
</table>

Note. The complete table containing 15 two-sample comparisons is in Appendix E.

<sup>a</sup><sub>p < .0066 for each comparison; overall p < .10.</sub>

Hypothesis 4

H<sub>4</sub>: In the two patient samples, patients diagnosed as depressed using the DSM II (1968) classification system will show significantly higher scores on the depression scales than those not diagnosed as depressed.

Descriptive statistics for the GCS, the BDI, and Form E of the DACL for patients diagnosed depressed and patients of all other diagnostic categories combined are reported in
Table 14.

Table 14
Descriptive Statistics for Generalized Contentment Scale, Beck Depression Inventory, and Form E of Depression Adjective Check Lists on Patients Diagnosed Depressed and Patients with Other Diagnostic Classifications

<table>
<thead>
<tr>
<th>Scale</th>
<th>Group</th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>GCS</td>
<td>Depressed males</td>
<td>14</td>
<td>48.000</td>
<td>20.188</td>
</tr>
<tr>
<td></td>
<td>Depressed females</td>
<td>22</td>
<td>55.364</td>
<td>20.186</td>
</tr>
<tr>
<td></td>
<td>Patient males</td>
<td>53</td>
<td>37.302</td>
<td>18.635</td>
</tr>
<tr>
<td></td>
<td>Patient females</td>
<td>42</td>
<td>42.429</td>
<td>17.954</td>
</tr>
<tr>
<td>BDI</td>
<td>Depressed males</td>
<td>14</td>
<td>21.929</td>
<td>9.008</td>
</tr>
<tr>
<td></td>
<td>Depressed females</td>
<td>22</td>
<td>24.727</td>
<td>9.755</td>
</tr>
<tr>
<td></td>
<td>Patient males</td>
<td>53</td>
<td>12.604</td>
<td>10.706</td>
</tr>
<tr>
<td></td>
<td>Patient females</td>
<td>42</td>
<td>15.286</td>
<td>10.913</td>
</tr>
<tr>
<td>DACL</td>
<td>Depressed males</td>
<td>14</td>
<td>18.214</td>
<td>7.954</td>
</tr>
<tr>
<td></td>
<td>Depressed females</td>
<td>22</td>
<td>17.227</td>
<td>5.999</td>
</tr>
<tr>
<td></td>
<td>Patient males</td>
<td>53</td>
<td>11.340</td>
<td>8.451</td>
</tr>
<tr>
<td></td>
<td>Patient females</td>
<td>42</td>
<td>12.762</td>
<td>7.528</td>
</tr>
</tbody>
</table>

Table 15 contains the exact two-sample $t$ tests with Bonferroni procedure for the GCS. Inspection of the table reveals that diagnosed depressed females have significantly higher depression scores than patient males and patient females.

The results of the exact two-sample $t$ tests with Bonferroni procedure for the BDI mean scores are presented in Table 16. In three of the four pertinent comparisons, diagnosed depressed patients reported significantly greater
### Table 15

**Exact Two-Sample t Tests Using 10-Percent Bonferroni Procedure for Generalized Contentment Scale on Diagnosed Depressed Patients and Patients with Other Diagnostic Classifications**

<table>
<thead>
<tr>
<th>Group/Group</th>
<th>df</th>
<th>t</th>
<th>Diff</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnosed depressed males/diagnosed depressed females</td>
<td>127</td>
<td>-1.143</td>
<td>-7.364</td>
<td>.255</td>
</tr>
<tr>
<td>Diagnosed depressed males/patient males</td>
<td>127</td>
<td>1.889</td>
<td>10.698</td>
<td>.061</td>
</tr>
<tr>
<td>Diagnosed depressed males/patient females</td>
<td>127</td>
<td>.958</td>
<td>5.571</td>
<td>.340</td>
</tr>
<tr>
<td>Diagnosed depressed females/patient males</td>
<td>127</td>
<td>3.778</td>
<td>18.062</td>
<td>.000*</td>
</tr>
<tr>
<td>Diagnosed depressed females/patient females</td>
<td>127</td>
<td>2.607</td>
<td>12.935</td>
<td>.010*</td>
</tr>
<tr>
<td>Patient males/patient females</td>
<td>127</td>
<td>-1.316</td>
<td>-5.127</td>
<td>.190</td>
</tr>
</tbody>
</table>

*p < .016 for each comparison; overall *p < .10.

### Table 16

**Exact Two-Sample t Tests Using 10-Percent Bonferroni Procedure for Beck Depression Inventory on Diagnosed Depressed Patients and Patients with Other Diagnostic Classifications**

<table>
<thead>
<tr>
<th>Group/Group</th>
<th>df</th>
<th>t</th>
<th>Diff</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnosed depressed males/diagnosed depressed females</td>
<td>127</td>
<td>-0.783</td>
<td>-2.799</td>
<td>.435</td>
</tr>
<tr>
<td>Diagnosed depressed males/patient males</td>
<td>127</td>
<td>2.967</td>
<td>9.325</td>
<td>.004*</td>
</tr>
<tr>
<td>Diagnosed depressed males/patient females</td>
<td>127</td>
<td>2.058</td>
<td>6.643</td>
<td>.042</td>
</tr>
<tr>
<td>Diagnosed depressed females/patient males</td>
<td>127</td>
<td>4.570</td>
<td>12.123</td>
<td>.000*</td>
</tr>
<tr>
<td>Diagnosed depressed females/patient females</td>
<td>127</td>
<td>3.430</td>
<td>9.442</td>
<td>.001*</td>
</tr>
<tr>
<td>Patient males/patient females</td>
<td>127</td>
<td>-1.241</td>
<td>-2.682</td>
<td>.217</td>
</tr>
</tbody>
</table>

*p < .016 for each comparison; overall *p < .10.

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depression than patients of other nosological categories.

Exact two-sample t tests with the Bonferroni procedure were computed on DACL Form E mean scores. These data are presented in Table 17. The diagnosed depressed men have a significantly higher depression score than the patient males of other diagnostic classes. The diagnosed depressed women also are significantly more depressed than the patient males.

Table 17

Exact Two-Sample t Tests Using 10-Percent Bonferroni Procedure for Form E of Depression Adjective Check Lists on Diagnosed Depressed Patients and Patients with Other Diagnostic Classifications

<table>
<thead>
<tr>
<th>Group/Group</th>
<th>df</th>
<th>t</th>
<th>Diff</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnosed depressed males/</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>diagnosed depressed females</td>
<td>127</td>
<td>.373</td>
<td>.987</td>
<td>.710</td>
</tr>
<tr>
<td>Diagnosed depressed males/</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>patient males</td>
<td>127</td>
<td>2.954</td>
<td>6.875</td>
<td>.004*</td>
</tr>
<tr>
<td>Diagnosed depressed males/</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>patient females</td>
<td>127</td>
<td>2.282</td>
<td>5.452</td>
<td>.024</td>
</tr>
<tr>
<td>Diagnosed depressed females/</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>patient males</td>
<td>127</td>
<td>2.998</td>
<td>5.888</td>
<td>.003*</td>
</tr>
<tr>
<td>Diagnosed depressed females/</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>patient females</td>
<td>127</td>
<td>2.191</td>
<td>4.465</td>
<td>.030</td>
</tr>
<tr>
<td>Patient males/patient females</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>127</td>
<td>-0.889</td>
<td>-1.422</td>
<td>.376</td>
</tr>
</tbody>
</table>

*p < .016 for each comparison; overall p < .10.

Scale Reliability

To evaluate the reliability of the three depression scales, two different Kuder-Richardson reliability formulas are used. Both formulas yield reliability coefficients that are the mean of all the possible splittings of a test.
(Cronbach, 1951). Kuder-Richardson Formula 20 is used with Form E of the DACL. Coefficient alphas are utilized for the GCS and the BDI (Novick & Lewis, 1967).

The reliability coefficients for all three scales and each of the three samples (sexes combined) are shown in Table 18. On the BDI, reliabilities are .865 for inpatients, .814 for outpatients, and .798 for normals. Reliabilities for the GCS are .873 for inpatients, .912 for outpatients, and .882 for normals. Kuder-Richardson Formula 20 reliabilities for DACL Form E are .654 for inpatients, .717 for outpatients, and .594 for normals.

Table 18
Reliabilities for Beck Depression Inventory, Generalized Contentment Scale, and Form E of Depression Adjective Check Lists

<table>
<thead>
<tr>
<th>Scale</th>
<th>Group</th>
<th>Formula</th>
<th>r</th>
</tr>
</thead>
<tbody>
<tr>
<td>BDI</td>
<td>Inpatients</td>
<td>Alpha</td>
<td>.865</td>
</tr>
<tr>
<td></td>
<td>Outpatients</td>
<td></td>
<td>.814</td>
</tr>
<tr>
<td></td>
<td>Normals</td>
<td></td>
<td>.798</td>
</tr>
<tr>
<td>GCS</td>
<td>Inpatients</td>
<td>Kuder-Richardson 20</td>
<td>.873</td>
</tr>
<tr>
<td></td>
<td>Outpatients</td>
<td></td>
<td>.912</td>
</tr>
<tr>
<td></td>
<td>Normals</td>
<td></td>
<td>.882</td>
</tr>
<tr>
<td>DACL</td>
<td>Inpatients</td>
<td></td>
<td>.654</td>
</tr>
<tr>
<td></td>
<td>Outpatients</td>
<td></td>
<td>.717</td>
</tr>
<tr>
<td></td>
<td>Normals</td>
<td></td>
<td>.594</td>
</tr>
</tbody>
</table>

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Concurrent Validity

Pearson product-moment correlations for the GCS, the BDI, and Form E of the DACL are presented in Table 19. Correlations are reported separately for each of the three samples; sexes are combined.

<table>
<thead>
<tr>
<th>Sample</th>
<th>Scale</th>
<th>BDI</th>
<th>DACL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inpatient (N = 68)</td>
<td>GCS</td>
<td>.73</td>
<td>.73</td>
</tr>
<tr>
<td></td>
<td>BDI</td>
<td>.73</td>
<td></td>
</tr>
<tr>
<td>Outpatient (N = 63)</td>
<td>GCS</td>
<td>.80</td>
<td>.78</td>
</tr>
<tr>
<td></td>
<td>BDI</td>
<td>.67</td>
<td></td>
</tr>
<tr>
<td>Normal (N = 88)</td>
<td>GCS</td>
<td>.58</td>
<td>.56</td>
</tr>
<tr>
<td></td>
<td>BDI</td>
<td>.42</td>
<td></td>
</tr>
</tbody>
</table>

In the inpatient sample (N = 68), correlations between all three depression inventories are identical (r = .73, p = .001).

For the outpatient sample (N = 63), the BDI correlates .80 (p = .001) with the GCS. The BDI correlates .67 (p = .001) with DACL Form E. The GCS and DACL Form E correlation is .78 (p = .001).

The correlation between the BDI and the GCS in the normal sample (N = 88) is .58 (p = .001). The BDI correlates .42 (p = .001) with Form E of the DACL. The GCS and DACL Form E correlation is .56 (p = .001).
Construct Validity

Construct validity of the three depression inventories is investigated by discriminant function analysis (Tatsuoka, 1969). The items on the GCS, the BDI, and Form E of the DACL are the predictor variables. The subject samples are divided in two different ways: (1) patients compared to normals, sexes combined and separate; and (2) diagnosed depressed patients compared to patients of all other diagnostic categories, both in which sexes are combined.

Table 20 contains the standardized discriminant function coefficients for the GCS which maximizes the discrimination.

<table>
<thead>
<tr>
<th>GCS Item</th>
<th>Coefficient</th>
<th>GCS Item</th>
<th>Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.11036</td>
<td>14</td>
<td>.18476</td>
</tr>
<tr>
<td>2</td>
<td>-.04112</td>
<td>15</td>
<td>.00999</td>
</tr>
<tr>
<td>3</td>
<td>.01026</td>
<td>16</td>
<td>-.06058</td>
</tr>
<tr>
<td>4</td>
<td>.12634</td>
<td>17</td>
<td>.29763</td>
</tr>
<tr>
<td>5</td>
<td>.13122</td>
<td>18</td>
<td>-.16790</td>
</tr>
<tr>
<td>6</td>
<td>-.14447</td>
<td>19</td>
<td>.18393</td>
</tr>
<tr>
<td>7</td>
<td>.16062</td>
<td>20</td>
<td>.03791</td>
</tr>
<tr>
<td>8</td>
<td>.07333</td>
<td>21</td>
<td>.08488</td>
</tr>
<tr>
<td>9</td>
<td>.01856</td>
<td>22</td>
<td>-.21588</td>
</tr>
<tr>
<td>10</td>
<td>.00761</td>
<td>23</td>
<td>.03304</td>
</tr>
<tr>
<td>11</td>
<td>.09492</td>
<td>24</td>
<td>-.18944</td>
</tr>
<tr>
<td>12</td>
<td>.21624</td>
<td>25</td>
<td>.17335</td>
</tr>
<tr>
<td>13</td>
<td>.19032</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
between patients and normals, sexes combined; Wilks's lambda = 0.5266, $\chi^2(25) = 130.498$, $p = .000$. This discriminant function has a conical correlation of 0.637 with the two groups. The discriminant function classification data are presented in Table 21. On the basis of the 25-item function, 76.9 percent (100 of 130) of the patient sample ($N = 130$) and 92 percent (81 of 88) of the normal sample ($N = 88$) are correctly classified as patient or normal. The total percentage of "grouped" cases correctly classified is 83.03 percent.

Table 21

Discriminant Analysis on Patients and Normals, Sexes Combined, Using Generalized Contentment Scale Items

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Predicted Group Membership</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Patient</td>
</tr>
<tr>
<td>Patients</td>
<td>130a</td>
<td>100 (76.9%)</td>
</tr>
<tr>
<td>Normals</td>
<td>88</td>
<td>7 (8.0%)</td>
</tr>
</tbody>
</table>

Note. "Grouped" cases correctly classified: 83.03%.

aOne GCS was not included in the analysis because an item was not filled out.

The discriminant function analysis for the BDI yields the standardized discriminant function coefficients presented in Table 22. Sexes are combined in both the patient and normal samples. The 21-item function which differentiates normals from patients has a Wilks's lambda = 0.5941, $\chi^2(21) = 107.530$, $p = .000$. Classification data are furnished in
Table 22

Beck Depression Inventory Items and Standardized Discriminant Function Coefficients for Patients and Normals

<table>
<thead>
<tr>
<th>BDI Item</th>
<th>Coefficient</th>
<th>BDI Item</th>
<th>Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.01407</td>
<td>12</td>
<td>.09924</td>
</tr>
<tr>
<td>2</td>
<td>.15543</td>
<td>13</td>
<td>.05744</td>
</tr>
<tr>
<td>3</td>
<td>.14027</td>
<td>14</td>
<td>.04205</td>
</tr>
<tr>
<td>4</td>
<td>.21009</td>
<td>15</td>
<td>.08197</td>
</tr>
<tr>
<td>5</td>
<td>.11337</td>
<td>16</td>
<td>.15883</td>
</tr>
<tr>
<td>6</td>
<td>.23379</td>
<td>17</td>
<td>.21128</td>
</tr>
<tr>
<td>7</td>
<td>.14214</td>
<td>18</td>
<td>.16483</td>
</tr>
<tr>
<td>8</td>
<td>.13056</td>
<td>19</td>
<td>.11723</td>
</tr>
<tr>
<td>9</td>
<td>.04827</td>
<td>20</td>
<td>.25381</td>
</tr>
<tr>
<td>10</td>
<td>.11573</td>
<td>21</td>
<td>.02331</td>
</tr>
<tr>
<td>11</td>
<td>.03975</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 23. On the basis of the discriminant function, 72.5 percent (95 of 131) of the patients and 96.6 percent (85 of 88) of the normals are correctly classified. The total correct rate of classification is 82.19 percent.

Standardized discriminant function coefficients resulting from the discriminant function analysis of Form E of the DACL on patients and normals are displayed in Table 24. The 34-item function that separates the patients from the normals (sexes combined) is significant (Wilks's lambda = .4732, $\chi^2(34) = 149.658, p = .000$) and has a conical correlation with the two groups of .726. Classification data are presented in Table 25. The patients are classified with 81.7 percent (107 of 131) accuracy and for normals, correct
### Table 23

**Discriminant Analysis on Patients and Normals, Sexes Combined, Using Beck Depression Inventory Items**

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Predicted Group Membership</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Patient</td>
<td>Normal</td>
<td></td>
</tr>
<tr>
<td>Patients</td>
<td>131</td>
<td>95 (72.5%)</td>
<td>36 (27.5%)</td>
<td></td>
</tr>
<tr>
<td>Normals</td>
<td>88</td>
<td>3 (3.4%)</td>
<td>85 (96.6%)</td>
<td></td>
</tr>
</tbody>
</table>

*Note. "Grouped" cases correctly classified: 82.1%.*

### Table 24

**Form E of Depression Adjective Check List Items and Standardized Discriminant Function Coefficients for Patients and Normals**

<table>
<thead>
<tr>
<th>DACL Item</th>
<th>Coefficient</th>
<th>DACL Item</th>
<th>Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-.00150</td>
<td>18</td>
<td>.09667</td>
</tr>
<tr>
<td>2</td>
<td>.28009</td>
<td>19</td>
<td>-.12860</td>
</tr>
<tr>
<td>3</td>
<td>-.32223</td>
<td>20</td>
<td>-.07184</td>
</tr>
<tr>
<td>4</td>
<td>.01609</td>
<td>21</td>
<td>-.10674</td>
</tr>
<tr>
<td>5</td>
<td>-.04364</td>
<td>22</td>
<td>-.07961</td>
</tr>
<tr>
<td>6</td>
<td>.36646</td>
<td>23</td>
<td>.16284</td>
</tr>
<tr>
<td>7</td>
<td>-.05316</td>
<td>24</td>
<td>.03354</td>
</tr>
<tr>
<td>8</td>
<td>-.01056</td>
<td>25</td>
<td>-.06967</td>
</tr>
<tr>
<td>9</td>
<td>-.37139</td>
<td>26</td>
<td>-.01783</td>
</tr>
<tr>
<td>10</td>
<td>-.07063</td>
<td>27</td>
<td>.02649</td>
</tr>
<tr>
<td>11</td>
<td>.03114</td>
<td>28</td>
<td>-.32156</td>
</tr>
<tr>
<td>12</td>
<td>-.02282</td>
<td>29</td>
<td>-.07623</td>
</tr>
<tr>
<td>13</td>
<td>-.01242</td>
<td>30</td>
<td>-.17424</td>
</tr>
<tr>
<td>14</td>
<td>.07020</td>
<td>31</td>
<td>.10762</td>
</tr>
<tr>
<td>15</td>
<td>-.10730</td>
<td>32</td>
<td>.31544</td>
</tr>
<tr>
<td>16</td>
<td>.08653</td>
<td>33</td>
<td>-.16114</td>
</tr>
<tr>
<td>17</td>
<td>-.07344</td>
<td>34</td>
<td>-.07789</td>
</tr>
</tbody>
</table>

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Table 25

Discriminant Analysis on Patients and Normals, Sexes Combined, Using Form E of Depression Adjective Check Lists

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Predicted Group Membership</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Patient</td>
</tr>
<tr>
<td>Patients</td>
<td>131</td>
<td>107 (81.7%)</td>
</tr>
<tr>
<td>Normals</td>
<td>88</td>
<td>7 (8.0%)</td>
</tr>
</tbody>
</table>

Note. "Grouped" cases correctly classified: 85.84%.

placement is 92 percent (81 of 88). The probability of correct classification overall for patients and for normals using the discriminant function is 85.84 percent.

In the following section are discriminant function analysis results for the GCS, the BDI, and Form E of the DACL on male normals and male patients.

The discriminant function analysis for the GCS yields the standardized discriminant function coefficients presented in Table 26. The 25-item function that differentiates the patient men from the normal men has a Wilks's lambda = .4987, $\chi^2(35) = 58.102, p = .000$. The discriminant function has a conical correlation of .708 with the two groups. Classification data are furnished in Table 27. On the basis of the discriminant function, 86.4 percent (57 of 66) of the patients and 93.8 percent (30 of 32) of the normals are correctly classified. The total correct rate of classification is 88.78 percent.

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### Table 26

Generalized Contentment Scale Items and Standardized Discriminant Function Coefficients for Male Patients and Male Normals

<table>
<thead>
<tr>
<th>GCS Item</th>
<th>Coefficient</th>
<th>GCS Item</th>
<th>Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.07121</td>
<td>14</td>
<td>.31515</td>
</tr>
<tr>
<td>2</td>
<td>-.03731</td>
<td>15</td>
<td>.00193</td>
</tr>
<tr>
<td>3</td>
<td>-.08593</td>
<td>16</td>
<td>-.04431</td>
</tr>
<tr>
<td>4</td>
<td>.20475</td>
<td>17</td>
<td>.37054</td>
</tr>
<tr>
<td>5</td>
<td>.20560</td>
<td>18</td>
<td>-.02889</td>
</tr>
<tr>
<td>6</td>
<td>-.22838</td>
<td>19</td>
<td>.05355</td>
</tr>
<tr>
<td>7</td>
<td>.33065</td>
<td>20</td>
<td>.06170</td>
</tr>
<tr>
<td>8</td>
<td>-.13871</td>
<td>21</td>
<td>.05808</td>
</tr>
<tr>
<td>9</td>
<td>.33221</td>
<td>22</td>
<td>-.44470</td>
</tr>
<tr>
<td>10</td>
<td>-.27902</td>
<td>23</td>
<td>.01271</td>
</tr>
<tr>
<td>11</td>
<td>.19511</td>
<td>24</td>
<td>-.34732</td>
</tr>
<tr>
<td>12</td>
<td>.29634</td>
<td>25</td>
<td>.35426</td>
</tr>
<tr>
<td>13</td>
<td>.11473</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table 27

Discriminant Analysis on Male Patients and Male Normals Using Generalized Contentment Scale Items

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Predicted Group Membership</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Patient</td>
</tr>
<tr>
<td>Male patients</td>
<td>66a</td>
<td>57 (86.4%)</td>
</tr>
<tr>
<td>Male normals</td>
<td>32</td>
<td>2 (6.3%)</td>
</tr>
</tbody>
</table>

Note. "Grouped" cases correctly classified: 88.78%.

aOne GCS was not included in the analysis because an item was not filled out.
Table 28 contains the standardized discriminant function coefficients for the BDI which maximizes the discrimination between male patients and the male normals (Wilks's lambda = .6087, $\chi^2(21) = 42.942$, $p = .003$). This 21-item discriminant function has a conical correlation of .626 with the patient-normal groups. The discriminant function classification data are presented in Table 29. On the basis of the item function, 70.1 percent (47 of 67) of the patients and 100 percent (32 of 32) of the normals are correctly classified. The total correct rate of classification is 79.8 percent.

Table 28
Beck Depression Inventory Items and Standardized Discriminant Function Coefficients for Male Patients and Male Normals

<table>
<thead>
<tr>
<th>BDI Item</th>
<th>Coefficient</th>
<th>BDI Item</th>
<th>Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-.17882</td>
<td>12</td>
<td>.33272</td>
</tr>
<tr>
<td>2</td>
<td>-.01590</td>
<td>13</td>
<td>-.06452</td>
</tr>
<tr>
<td>3</td>
<td>-.14269</td>
<td>14</td>
<td>-.21386</td>
</tr>
<tr>
<td>4</td>
<td>-.38700</td>
<td>15</td>
<td>-.13025</td>
</tr>
<tr>
<td>5</td>
<td>-.20881</td>
<td>16</td>
<td>.04475</td>
</tr>
<tr>
<td>6</td>
<td>-.24808</td>
<td>17</td>
<td>.08618</td>
</tr>
<tr>
<td>7</td>
<td>-.12076</td>
<td>18</td>
<td>-.08245</td>
</tr>
<tr>
<td>8</td>
<td>.19439</td>
<td>19</td>
<td>-.08581</td>
</tr>
<tr>
<td>9</td>
<td>.17449</td>
<td>20</td>
<td>-.12068</td>
</tr>
<tr>
<td>10</td>
<td>-.24371</td>
<td>21</td>
<td>.14830</td>
</tr>
<tr>
<td>11</td>
<td>-.10781</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Table 29

Discriminant Analysis on Male Patients and Male Normals Using Beck Depression Inventory Items

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Predicted Group Membership</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Patient ( % )</td>
</tr>
<tr>
<td>Male patients</td>
<td>67</td>
<td>47 (70.1%)</td>
</tr>
<tr>
<td>Male normals</td>
<td>32</td>
<td>0 (0.0%)</td>
</tr>
</tbody>
</table>

Note. "Grouped" cases correctly classified: 79.8%.

Form E of the DACL discriminant function analysis results in the standardized discriminant function coefficients displayed in Table 30. The 34-item function that separates male patients from the male normals is significant (Wilks's lambda = .3660, $\chi^2(34) = 80.419$, $p = .000$) and has a conical correlation with the two groups of .996. Classification data are presented in Table 31. The patients are classified with 91 percent (61 of 67) accuracy, and for normals correct placement is 96.9 percent (31 of 32). The probability of correct classification overall for patient males and normal males using the discriminant function is 92.93 percent.

The following discriminant function analysis results, for the three depression inventories, are for females of the two samples.

Standardized discriminant function coefficients resulting from the discriminant function analysis of the GCS are

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Table 30

Form E of Depression Adjective Check List Items and Standardized Discriminant Function Coefficients for Male Patients and Male Normals

<table>
<thead>
<tr>
<th>DACL Item</th>
<th>Coefficient</th>
<th>DACL Item</th>
<th>Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.12757</td>
<td>18</td>
<td>.02551</td>
</tr>
<tr>
<td>2</td>
<td>.17047</td>
<td>19</td>
<td>-.22593</td>
</tr>
<tr>
<td>3</td>
<td>-.30842</td>
<td>20</td>
<td>.01437</td>
</tr>
<tr>
<td>4</td>
<td>.02578</td>
<td>21</td>
<td>.07916</td>
</tr>
<tr>
<td>5</td>
<td>-.11647</td>
<td>22</td>
<td>-.26610</td>
</tr>
<tr>
<td>6</td>
<td>.40733</td>
<td>23</td>
<td>.18698</td>
</tr>
<tr>
<td>7</td>
<td>.30600</td>
<td>24</td>
<td>-.28043</td>
</tr>
<tr>
<td>8</td>
<td>-.19196</td>
<td>25</td>
<td>.23945</td>
</tr>
<tr>
<td>9</td>
<td>-.15389</td>
<td>26</td>
<td>.25109</td>
</tr>
<tr>
<td>10</td>
<td>-.32282</td>
<td>27</td>
<td>.11769</td>
</tr>
<tr>
<td>11</td>
<td>-.16948</td>
<td>28</td>
<td>-.34399</td>
</tr>
<tr>
<td>12</td>
<td>.02432</td>
<td>29</td>
<td>-.03936</td>
</tr>
<tr>
<td>13</td>
<td>-.06211</td>
<td>30</td>
<td>-.12250</td>
</tr>
<tr>
<td>14</td>
<td>.36995</td>
<td>31</td>
<td>.03032</td>
</tr>
<tr>
<td>15</td>
<td>-.15303</td>
<td>32</td>
<td>.37217</td>
</tr>
<tr>
<td>16</td>
<td>.02837</td>
<td>33</td>
<td>-.22120</td>
</tr>
<tr>
<td>17</td>
<td>-.00827</td>
<td>34</td>
<td>.05464</td>
</tr>
</tbody>
</table>

displayed in Table 32. The 25-item function that separates the female patients from the female normals is significant (Wilks's lambda = .4455, \( \chi^2(25) = 85.305, p = .000 \)). Classification data are presented in Table 33. The female patients are classified with 79.7 percent (51 of 64) accuracy, and the female normals are classified with 96.4 percent (54 of 64) accuracy. The probability of correct classification overall for female patients and normals is 87.5 percent.
Table 31

Discriminant Analysis on Male Patients and Male Normals Using Form E of Depression Adjective Check List Items

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Predicted Group Membership</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Male patients</td>
<td>67</td>
<td>Patient</td>
<td>61 (91.0%)</td>
<td>6 (9.0%)</td>
</tr>
<tr>
<td>Male normals</td>
<td>32</td>
<td>Normal</td>
<td>1 (3.1%)</td>
<td>31 (96.9%)</td>
</tr>
</tbody>
</table>

Note. "Grouped" cases correctly classified: 92.93%.

Table 32

Generalized Contentment Scale Items and Standardized Discriminant Function Coefficients for Female Patients and Female Normals

<table>
<thead>
<tr>
<th>GCS Item</th>
<th>Coefficient</th>
<th>GCS Item</th>
<th>Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.24728</td>
<td>14</td>
<td>-.06875</td>
</tr>
<tr>
<td>2</td>
<td>-.15467</td>
<td>15</td>
<td>.02164</td>
</tr>
<tr>
<td>3</td>
<td>.02857</td>
<td>16</td>
<td>-.07670</td>
</tr>
<tr>
<td>4</td>
<td>.21133</td>
<td>17</td>
<td>.26068</td>
</tr>
<tr>
<td>5</td>
<td>.13868</td>
<td>18</td>
<td>-.26769</td>
</tr>
<tr>
<td>6</td>
<td>-.14581</td>
<td>19</td>
<td>.42787</td>
</tr>
<tr>
<td>7</td>
<td>.03659</td>
<td>20</td>
<td>.19223</td>
</tr>
<tr>
<td>8</td>
<td>.00637</td>
<td>21</td>
<td>.08827</td>
</tr>
<tr>
<td>9</td>
<td>.07969</td>
<td>22</td>
<td>-.15395</td>
</tr>
<tr>
<td>10</td>
<td>.03157</td>
<td>23</td>
<td>-.08176</td>
</tr>
<tr>
<td>11</td>
<td>.05631</td>
<td>24</td>
<td>-.13550</td>
</tr>
<tr>
<td>12</td>
<td>.16578</td>
<td>25</td>
<td>.11853</td>
</tr>
<tr>
<td>13</td>
<td>.20661</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Table 33

Discriminant Analysis on Female Patients and Female Normals Using Generalized Contentment Scale Items

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Predicted Group Membership</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Patient</td>
<td>Normal</td>
</tr>
<tr>
<td>Female patients</td>
<td>64</td>
<td>51 (79.7%)</td>
<td>13 (20.3%)</td>
</tr>
<tr>
<td>Female normals</td>
<td>56</td>
<td>2 (3.6%)</td>
<td>54 (96.4%)</td>
</tr>
</tbody>
</table>

Note. "Grouped" cases correctly classified: 87.5%.

The 21 standardized discriminant function coefficients for the BDI are given in Table 34. The function that differentiates the female patients from the female normals is significant and has a Wilks' lambda = .4563, $\chi^2(21) = 84.353$, $p = .000$. This discriminant function has a conical correlation of .737 with the patient and normal samples. Classification data are furnished in Table 35. On the basis of the discriminant function, 76.6 percent (49 of 64) of the female patients and 98.2 percent (55 of 56) of the female normals are appropriately classified. The total correct rate of classification is 86.67 percent.

Form E of the DACL standardized discriminant function coefficients are given in Table 36. The 34-item function, which maximizes the discrimination between the female patients and the female normals, is significant (Wilks's lambda = .3665, $\chi^2(34) = 101.379$, $p = .000$). The discriminant function classification data are reported in Table 37. On the
Table 34

Beck Depression Inventory Items and Standardized Discriminant Function Coefficients for Female Patients and Female Normals

<table>
<thead>
<tr>
<th>BDI Item</th>
<th>Coefficient</th>
<th>BDI Item</th>
<th>Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-.17480</td>
<td>12</td>
<td>-.24405</td>
</tr>
<tr>
<td>2</td>
<td>-.34461</td>
<td>13</td>
<td>-.06512</td>
</tr>
<tr>
<td>3</td>
<td>.07738</td>
<td>14</td>
<td>.10042</td>
</tr>
<tr>
<td>4</td>
<td>.06273</td>
<td>15</td>
<td>-.10530</td>
</tr>
<tr>
<td>5</td>
<td>-.11485</td>
<td>16</td>
<td>-.14963</td>
</tr>
<tr>
<td>6</td>
<td>-.22064</td>
<td>17</td>
<td>.16740</td>
</tr>
<tr>
<td>7</td>
<td>-.00090</td>
<td>18</td>
<td>-.16038</td>
</tr>
<tr>
<td>8</td>
<td>.09108</td>
<td>19</td>
<td>-.19754</td>
</tr>
<tr>
<td>9</td>
<td>-.09744</td>
<td>20</td>
<td>-.30807</td>
</tr>
<tr>
<td>10</td>
<td>.03320</td>
<td>21</td>
<td>-.03014</td>
</tr>
<tr>
<td>11</td>
<td>.16897</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 35

Discriminant Analysis on Female Patients and Female Normals Using Beck Depression Inventory Items

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Predicted Group Membership</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Patient</td>
</tr>
<tr>
<td>Female patients</td>
<td>64</td>
<td>49 (76.6%)</td>
</tr>
<tr>
<td>Female normals</td>
<td>56</td>
<td>1 (1.8%)</td>
</tr>
</tbody>
</table>

Note. "Grouped" cases correctly classified: 86.67%.
Table 36  
Form E of Depression Adjective Check List Items and  
Standardized Discriminant Function Coefficients  
for Female Patients and Female Normals

<table>
<thead>
<tr>
<th>DACL Item</th>
<th>Coefficient</th>
<th>DACL Item</th>
<th>Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-.13490</td>
<td>18</td>
<td>.05913</td>
</tr>
<tr>
<td>2</td>
<td>.37977</td>
<td>19</td>
<td>-.05740</td>
</tr>
<tr>
<td>3</td>
<td>-.14814</td>
<td>20</td>
<td>.01099</td>
</tr>
<tr>
<td>4</td>
<td>.09130</td>
<td>21</td>
<td>-.19890</td>
</tr>
<tr>
<td>5</td>
<td>-.00106</td>
<td>22</td>
<td>-.00413</td>
</tr>
<tr>
<td>6</td>
<td>.20420</td>
<td>23</td>
<td>.18930</td>
</tr>
<tr>
<td>7</td>
<td>-.23711</td>
<td>24</td>
<td>.07135</td>
</tr>
<tr>
<td>8</td>
<td>.03358</td>
<td>25</td>
<td>-.03773</td>
</tr>
<tr>
<td>9</td>
<td>-.44644</td>
<td>26</td>
<td>-.18408</td>
</tr>
<tr>
<td>10</td>
<td>-.04295</td>
<td>27</td>
<td>-.02379</td>
</tr>
<tr>
<td>11</td>
<td>.16827</td>
<td>28</td>
<td>-.12653</td>
</tr>
<tr>
<td>12</td>
<td>-.11530</td>
<td>29</td>
<td>-.11671</td>
</tr>
<tr>
<td>13</td>
<td>.09503</td>
<td>30</td>
<td>-.31834</td>
</tr>
<tr>
<td>14</td>
<td>-.07735</td>
<td>31</td>
<td>.04558</td>
</tr>
<tr>
<td>15</td>
<td>-.07088</td>
<td>32</td>
<td>.34052</td>
</tr>
<tr>
<td>16</td>
<td>-.03980</td>
<td>33</td>
<td>-.08277</td>
</tr>
<tr>
<td>17</td>
<td>-.11646</td>
<td>34</td>
<td>-.04653</td>
</tr>
</tbody>
</table>

basis of the function, 82.8 percent (53 of 64) of the female patients and 89.3 percent (50 of 56) of the female normals are correctly classified. The total correct rate of classification is 85.83 percent.

The final series of discriminant function analyses treats the individual scale items as the predictor variables and patients diagnosed depressed in comparison to patients of other diagnostic categories as the two target groups.
Table 37

Discriminant Analysis on Female Patients and Female Normals Using Form E of Depression Adjective Check List Items

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Predicted Group Membership</th>
<th>Patient</th>
<th>Normal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female patients</td>
<td>64</td>
<td>53 (82.8%)</td>
<td>11 (17.2%)</td>
<td></td>
</tr>
<tr>
<td>Female normals</td>
<td>56</td>
<td>6 (10.7%)</td>
<td>50 (89.3%)</td>
<td></td>
</tr>
</tbody>
</table>

Note. "Grouped" cases correctly classified: 85.83%.

Depression inventories of male and female participants are combined.

Standardized discriminant function coefficients resulting from the discriminant function analysis of the GCS are displayed in Table 38. The 25-item function, which maximizes the distinction between diagnosed depressed patients and all other patients, is not significant (Wilks's lambda = .7948, $\chi^2(25) = 26.518, p = .380$). The function has a conical correlation of .453 with the two groups. The discriminant function classification data are presented in Table 39. The diagnosed depressed group is correctly classified with 75 percent (27 of 36) accuracy, and patients of all other diagnostic classifications are correctly classified with 66 percent (62 of 94) accuracy. The total correct rate of classification is 68.46 percent.

Standardized coefficients for the BDI are reported in Table 40. The function that differentiates the diagnosed
Table 38
Generalized Contentment Scale Items and Standardized Discriminant Function Coefficients for Diagnosed Depressed Patients and Nondiagnosed Depressed Patients

<table>
<thead>
<tr>
<th>GCS Item</th>
<th>Coefficient</th>
<th>GCS Item</th>
<th>Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.19358</td>
<td>14</td>
<td>-.21802</td>
</tr>
<tr>
<td>2</td>
<td>-.36949</td>
<td>15</td>
<td>-.15637</td>
</tr>
<tr>
<td>3</td>
<td>-.06045</td>
<td>16</td>
<td>-.11467</td>
</tr>
<tr>
<td>4</td>
<td>-.38861</td>
<td>17</td>
<td>-.15915</td>
</tr>
<tr>
<td>5</td>
<td>.21995</td>
<td>18</td>
<td>.05927</td>
</tr>
<tr>
<td>6</td>
<td>.05838</td>
<td>19</td>
<td>-.16178</td>
</tr>
<tr>
<td>7</td>
<td>-.25295</td>
<td>20</td>
<td>.47225</td>
</tr>
<tr>
<td>8</td>
<td>-.10716</td>
<td>21</td>
<td>-.20094</td>
</tr>
<tr>
<td>9</td>
<td>-.04246</td>
<td>22</td>
<td>.05679</td>
</tr>
<tr>
<td>10</td>
<td>.06563</td>
<td>23</td>
<td>-.11261</td>
</tr>
<tr>
<td>11</td>
<td>.06814</td>
<td>24</td>
<td>-.32787</td>
</tr>
<tr>
<td>12</td>
<td>-.00159</td>
<td>25</td>
<td>.08078</td>
</tr>
<tr>
<td>13</td>
<td>.21844</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 39
Discriminant Analysis for Diagnosed Depressed Patients and Nondiagnosed Depressed Patients Using Generalized Contentment Scale Items

<table>
<thead>
<tr>
<th>Patient Group</th>
<th>N</th>
<th>Predicted Group Membership</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Group 1</td>
</tr>
<tr>
<td>Diagnosed depressed</td>
<td>36</td>
<td>27 (75.0%)</td>
</tr>
<tr>
<td>Nondiagnosed depressed</td>
<td>94&lt;sup&gt;a&lt;/sup&gt;</td>
<td>32 (34.0%)</td>
</tr>
</tbody>
</table>

Note. "Grouped" cases correctly classified: 68.46%.

<sup>a</sup>One GCS was not included in the analysis because an item was not filled out.

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Table 40
Beck Depression Inventory Items and Standardized Discriminant Function Coefficients for Diagnosed Depressed Patients and Nondiagnosed Depressed Patients

<table>
<thead>
<tr>
<th>BDI Item</th>
<th>Coefficient</th>
<th>BDI Item</th>
<th>Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-.33304</td>
<td>12</td>
<td>-.06679</td>
</tr>
<tr>
<td>2</td>
<td>-.00280</td>
<td>13</td>
<td>-.03539</td>
</tr>
<tr>
<td>3</td>
<td>-.09734</td>
<td>14</td>
<td>.06845</td>
</tr>
<tr>
<td>4</td>
<td>-.21516</td>
<td>15</td>
<td>.21854</td>
</tr>
<tr>
<td>5</td>
<td>-.18058</td>
<td>16</td>
<td>.08262</td>
</tr>
<tr>
<td>6</td>
<td>-.06320</td>
<td>17</td>
<td>-.16681</td>
</tr>
<tr>
<td>7</td>
<td>-.45449</td>
<td>18</td>
<td>-.41186</td>
</tr>
<tr>
<td>8</td>
<td>-.40613</td>
<td>19</td>
<td>.24514</td>
</tr>
<tr>
<td>9</td>
<td>.08397</td>
<td>20</td>
<td>-.22299</td>
</tr>
<tr>
<td>10</td>
<td>-.00812</td>
<td>21</td>
<td>.19052</td>
</tr>
<tr>
<td>11</td>
<td>.24312</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

depressed patients from other patients has a Wilks's lambda $\lambda^2(21) = 36.896, p = .017$. The conical correlation of the function with the groups is .517. Classification data are presented in Table 41. The diagnosed depressed patients are correctly identified with 77.8 percent (28 of 36) accuracy, and 78.9 percent (75 of 95) of all other patients are appropriately placed. The overall rate of correct classification is 78.6 percent.

Standardized discriminant function coefficients resulting from the discriminant function analysis of DACL Form E on diagnosed depressed patients and patients of other diagnostic groups are displayed in Table 42. The 34-item
Table 41

<table>
<thead>
<tr>
<th>Patient Group</th>
<th>N</th>
<th>Predicted Group Membership</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Group 1</td>
</tr>
<tr>
<td>Diagnosed depressed</td>
<td>36</td>
<td>28 (77.8%)</td>
</tr>
<tr>
<td>Nondiagnosed depressed</td>
<td>95</td>
<td>20 (21.1%)</td>
</tr>
</tbody>
</table>

Note. "Grouped" cases correctly classified: 78.63%.

A function that separates the diagnosed depressed patients from the nondiagnosed depressed patients is not significant (Wilks's lambda = .6880, $\chi^2(34) = 41.882, p = .166$) and has a conical correlation with the two groups of .559. Classification data are presented in Table 43. The diagnosed depressed patients are correctly identified with 75 percent (27 of 36) accuracy, and 74.7 percent (71 of 95) of all other patients are appropriately placed. The overall rate of correct classification is 74.81 percent.
Table 42

Form E of Depression Adjective Check List Items and Standardized Discriminant Function Coefficients for Diagnosed Depressed Patients and Nondiagnosed Depressed Patients

<table>
<thead>
<tr>
<th>DACL Item</th>
<th>Coefficient</th>
<th>DACL Item</th>
<th>Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.02185</td>
<td>18</td>
<td>.12311</td>
</tr>
<tr>
<td>2</td>
<td>-.24341</td>
<td>19</td>
<td>.08752</td>
</tr>
<tr>
<td>3</td>
<td>.38696</td>
<td>20</td>
<td>-.37067</td>
</tr>
<tr>
<td>4</td>
<td>-.44806</td>
<td>21</td>
<td>-.38341</td>
</tr>
<tr>
<td>5</td>
<td>.24305</td>
<td>22</td>
<td>.04500</td>
</tr>
<tr>
<td>6</td>
<td>-.18686</td>
<td>23</td>
<td>.30951</td>
</tr>
<tr>
<td>7</td>
<td>.19072</td>
<td>24</td>
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<table>
<thead>
<tr>
<th>Patient Group</th>
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<tr>
<td></td>
<td></td>
<td>Group 1</td>
</tr>
<tr>
<td>Diagnosed depressed</td>
<td>36</td>
<td>27 (75.0%)</td>
</tr>
<tr>
<td>Nondiagnosed depressed</td>
<td>95</td>
<td>24 (25.3%)</td>
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Note. "Grouped" cases correctly classified: 74.81%.
Each of the four hypotheses will be discussed, followed by consideration of the psychometric findings of the study. The limitations of the study will be reviewed and, finally, recommendations for future research will be presented.

Discussion

Normal-Patient Comparisons

The first hypothesis was that all three scales would discriminate the normals (college students) from the two patient samples. The findings of this study indicate that patients do have significantly higher mean scores for each of the depression inventories than do normals. Depression as measured by the Generalized Contentment Scale (GCS), the Beck Depression Inventory (BDI), and Form E of the Depression Adjective Check Lists (DACL) is significantly greater in a general psychiatric patient sample than in a normal group.

These results are in concordance with previous research on the BDI and Form E of the DACL. Braff and Beck (1974) found significant mean score differences between depressed patients, normals, and schizophrenics on the BDI. Depressed patients had the highest mean score, followed by schizophrenic patients; normals had the lowest mean score. Lubin (1967)
reported that Form E of the DACL discriminated to a significant degree between normals, nondepressed patients, and depressed patients. The highest mean score was affixed to the depressed patient group, normals had the lowest mean score, and nondepressed patients scored intermediately. Patient-normal comparisons on the GCS (other than the present study) have not been done.

This study provides evidence for the construct validity of the GCS, the BDI, and Form E of the DACL. Previous research finding discriminate power for the BDI and the DACL Form E is further confirmed, and new support for the GCS is provided for discriminating patient-normal differences.

**Inpatient-Outpatient Comparisons**

The second hypothesis was that a significant discrimination would be found between the inpatient and outpatient samples with inpatients having significantly higher depression scale scores. This hypothesis is based on the assumption that within a general psychiatric population depression exists on a continuum of severity and treatment settings reflect this continuum of illness. Evidence for this assumption was provided by Paykel et al. (1970), although results of this have been inconsistent (e.g., Klerman & Paykel, 1970). Hypothesis 2, and by association the continuity assumption, is not supported by the findings of this study.

In fact, significant differences are in contradiction to
the hypothesis. Outpatient women are more depressed than inpatient men or inpatient women as measured by the GCS. On the BDI, outpatient women reported greater depression than inpatient men and, finally, outpatient women indicated a higher magnitude of depression than inpatient men on Form E of the DACL. On all three scales, outpatient women are more depressed than at least one of the inpatient groups.

Four possible explanations are offered to account for the findings of this study. The first is that differences in the frequency of diagnosed depressed patients resulted in nonequivalence between samples for depression. The samples in this investigation were taken from general inpatient and outpatient populations and only 36 of 131 were clinically judged to be depressed. Of the patients diagnosed depressed, 25 were outpatients; the 11 inpatients remaining were diagnosed as primary depressives. In the Paykel et al. (1970) study, all patients in the various treatment settings were diagnosed depressed and a clinical interview was used in addition to self-report. It would seem that an imbalance in the prevalence of depression between the samples may have contributed to the results being contrary to the hypothesis. The preponderance of diagnosed depressed patients in the outpatient sample concurs with the observation made by Prusoff and Klerman (1974), that the majority of depressed patients are young, ambulatory, and nonpsychotic. In summary, the results of this study may reflect reality; that is,
depression as measured by self-report was higher in the outpatient sample because young, ambulatory, and nonpsychotic depressed patients are not as likely to be inpatients. Additionally, findings indicating a continuum of depression based on treatment setting may require clinical interview in addition to self-report to assess the severity of depression.

An alternative explanation of the reported findings concerns the nature of self-report as a measure of depressive symptomatology. Paykel and Prusoff (1973) rated depressed patients by psychiatric interview and a self-report symptom inventory and found that patients with psychotic depression and obsessional personalities rated themselves low on self-report relative to interview assessments, and younger patients and those showing neurotic, hysterical, and oral-dependent personalities rated themselves as more severely ill than did the clinician. Carroll et al. (1973) concluded that even the best designed self-rating scale will suffer from distortion of information when applied to patients with psychotic illness, who have impaired perception and testing of reality. It appears reasonable that the inpatient population had a higher percentage of individuals that would rate themselves low on self-report (due to the nature of their problems). The reverse would probably be true for the outpatients. A related point is that due to the severity of their psychological difficulties, a much higher percentage of the inpatients were unable to complete the self-report
inventories. As a consequence, many of the most disturbed patients were not included in the inpatient sample and undoubtedly some of them were depressed.

A variable that may have contributed to inpatients having an equivalent or lower level of self-reported depressive symptoms may have been the effect of medication. Clinical experience confirms that a high percentage of inpatients are typically on medication. The outpatients may have been without medication or on smaller doses since they were attending the clinic for their intake interview. (In some cases, this might have been their initial contact with the mental health system.) Therefore, it is quite possible that in the inpatient sample, a high percentage of patients were on medication and the effect of medication may have reduced clients' self-reported depressive concerns.

Finally, lower reports of depression from inpatients may have reflected the effects of hospitalization. Conceivably, hospitalization and hence relief from a stressful environment may reduce self-report of symptoms of depression in some patients. This issue has received little study but remains a potential source of variance.

**Sex Differences**

Hypothesis 3, predicting females in all three groups will show a significantly higher degree of depression as measured by the depression inventories, is not supported by
the data. Possible reasons will be discussed for normals and for the patient groups.

The finding that normals did not differ in severity of depression as measured by self-report depression inventories is not unique. For example, in a study of 972 men and 1,300 women enrolled in introductory psychology courses, Hammen and Padesky (1977) found that BDI scores of men and women did not differ significantly. They suggested the results may represent an actual attenuation of sex differences or differences between their sample and other samples. Lubin (1967) reported nonsignificant sex differences for normals using Form E of the DACL. It may be that the failure to find sex differences is due to an actual attenuation of sex differences or represents sample variations. Of the two possible explanations, the latter makes the most sense given that other investigators (e.g., Grove & Tudor, 1973; Markush & Favero, 1974; Radloff, 1975) have commented on variability of depression in different samples. It appears that marital status, age, social class, education, and work status may have an effect on prevalence of depression and, as yet, these factors are poorly understood.

While it may be true that prevalence of depression is a function of the nature of the sample, there is an alternative methodological explanation not considered by Hammen and Padesky (1977). First, the evidence for the preponderance of women among depressives is supported most directly by (1)
clinical observations of patients coming for treatment, and (2) surveys of persons not under treatment (Weissman & Kler-
man, 1977). In general, evidence from both approaches indi-
cates a preponderance of women at about a 2:1 ratio (Weissman & Klerman). The significance of these facts for the current study and for the Hammen and Padesky (1977) and Lubin (1967) studies is that separating groups of persons on the basis of clinical judgment or epidemiologic analysis from community surveys is considerably different from studying sex differ-
ences by using self-report depression inventories. The fundamental distinction is that for self-report depression studies the scores for a number of subjects are summed into one mean score and sex variations are examined for mean scores of males and females. Assuming that in a normal popu-
lation only a few people of either sex are depressed, what differences exist are obscured by the computation of mean scores. In other words, when subjects are examined one by one as in clinical diagnosis, results are frequency counts sensitive to individual differences and support the predomi-
nance of female depressives, but when large groups of persons are tested and the results are summarized, individual differ-
ences are averaged out, since the majority of normals of either sex are not depressed.

The findings of sex differences would appear to be, at least in part, a consequence of the method used to identify depressives. Studies such as this one, that test groups of
normals and then compare mean scores for males and females, are not as likely to find sex differences in depression as are studies using frequency counts.

The points made in regard to the normal population may apply to the failure to find sex differences in the patient samples. Again, sex differences may be obscured by the heterogeneity of the groups and the procedure of computing averages. It is interesting to note that of the 35 diagnosed depressed patients, 22 were females and 14 were males, which is close to the 2:1 ratio reported in most prevalence and incidence studies. The total patient sample appears to have been sufficiently similar to observe sex differences. Alternatively, the failure to find sex differences may be due to differences in this sample and samples in other studies. Lubin (1967) found that DACL Form E mean scores indicated sex differences with females significantly higher for nondepressed patient males and nondepressed females, and males and females diagnosed depressed. This suggests that in some patient samples sex differences are sufficiently prevalent to show mean score differences, but that this is not true in normal groups.

In conclusion, sex differences in depression are not found in this study. The methodologic approach of this study or sample variations in depression appear to account most adequately for these findings.
Diagnosed Depressed Patient -
Nondiagnosed Depressed 
Patient Comparisons

The final hypothesis—that in the two-patient sample, patients diagnosed as depressed using the DSM II (1968) classification system would show a significantly higher score on the depression scales than those not diagnosed as depressed—receives support. Diagnosed depressed females reported a greater degree of depression than did male or female patients of all other diagnostic categories on the GCS. For the BDI, diagnosed depressed males indicated a higher degree of depression than nondiagnosed depressed males. In addition, diagnosed depressed females reported a greater degree of depression than male and female patients of all other diagnostic categories. Form E of the DACL, consistent with the hypothesis, differentiated diagnosed depressed men from male patients and diagnosed depressed women from male patients.

These results add support to previous studies where sensitivity to diagnostic differences were found for the BDI and Form E of the DACL. Braff and Beck (1974) found that diagnosed depressed patients had a significantly higher mean score than schizophrenics on the BDI. Lubin (1967) reported that the mean score on Form E was significantly higher for patients diagnosed psychotically depressed than the mean score for patients diagnosed as personality disorder, psycho-neurosis, or schizophrenia. A similar study comparing patients across diagnostic groups on the GCS is not available.

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Failure to find consistent differences between diagnostic groups for all three scales may be due to (1) unreliability in the diagnostic criteria, (2) specific individual scale insensitivities, (3) response biases on self-report for certain patient groups, or finally (4) a combination of the three possibilities. The design of this study does not allow an unambiguous answer to this issue. However, the BDI was used as a standard of comparison because it has strong psychometric support. Therefore, a reasonable explanation of the findings is that differences in the group existed as reflected by the BDI and the other two scales are less sensitive to those differences.

In conclusion, evidence is provided that the GCS, the BDI, and Form E of the DACL are sensitive to some differences between diagnostic groups reasonably expected to differ in magnitude of depression. Of the three scales, the BDI appears to be the most adequate for separating both sexes of patients diagnosed depressed from general psychiatric patients.

Scale Reliability

Kuder-Richardson reliabilities were computed for all three depression inventories for each of the three populations. Reliabilities reported for the BDI and the GCS are the Kuder-Richardson coefficient alpha, and for DACL Form E the formula is the Kuder-Richardson 20. It is desirable
that reliability coefficients fall in the .80's to .90's (Anastasi, 1976). However, Nunnally (1967) stated that scales may be accepted as reliable if they attain a Kuder-Richardson value of .50 or greater.

BDI reliabilities are .865 for inpatients, .814 for outpatients, and .798 for normals. Reliabilities for the GCS are .873 for inpatients, .912 for outpatients, and .882 for normals. Kuder-Richardson 20 coefficients for Form E of the DACL are .655 for inpatients, .717 for outpatients, and .594 for normals.

In conclusion, the GCS appears to have the best reliability, with the BDI a close second. Form E of the DACL can be considered reliable, but not to the degree of the other two depression inventories.

Concurrent Validity

Concurrent validity was appraised by computing Pearson product-moment correlations for the three self-report depression scales on each of the samples. All correlations are positive and significant at the .001 level. For the inpatient sample, the three scale correlations are an identical .73. In the outpatient sample, the BDI correlates .67 with Form E of the DACL, and .80 with the GCS. Form E of the DACL correlates .78 with the GCS. For normals, the BDI correlates .42 with Form E of the DACL, and .58 with the GCS. Form E of the DACL correlates .56 with the GCS.
In the outpatient and normal samples, the BDI correlates higher with the GCS than it does with Form E of the DACL, while the GCS correlates with greater magnitude with Form E of the DACL than does the BDI. This correlation pattern appears reasonable since the BDI was constructed to measure behaviors, cognitions, affects, and somatic aspects of depression; the GCS emphasizes affective and cognitive components of depression; and finally, Form E of the DACL predominantly measures transient depressive mood. In other words, the correlation patterns may reflect the scale loadings on the various components of depression. Why the inpatient sample did not show this same pattern is uncertain, but could reflect sample differences or chance variations.

In conclusion, concurrent validities show significant positive correlations between the BDI, the GCS, and Form E of the DACL in their ranking of people with regard to overall level of depression. Interpretation of the predominant patterns of correlations suggests agreement with the intent of the scales' authors to measure differing aspects of the depressive syndrome.

**Construct Validity**

Discriminant function analysis (Tatsuoka, 1969) was used to study the construct validity of the three self-report depression scales. Discussion will be organized by subject divisions. The standardized discriminant function
coefficients will not be interpreted (since making sense out of large numbers of coefficients is difficult). Reported differences between individual scales for the various classification tasks should be interpreted cautiously since the extent to which reported differences are statistically significant is not known.

The first series of discriminant function analyses uses individual scale items for each inventory to derive a discriminant function to separate the patient and normal samples in which sexes were combined. For the three depression measures, overall rates of correct group classification are 83.03 percent for the GCS, 82.19 percent for the BDI, and 85.84 percent for Form E of the DACL. All three measures discriminate normals from patients significantly better than chance. These results seem quite good, given the great variations within the patient population of reported depression. Differences between the rates of classification are small and do not clearly indicate superiority for any of the scales.

The second series of discriminant function analyses utilizes scale items from each self-report scale to develop a discriminant function to separate male patients from male normals. Correct classifications with discriminant functions derived from the scale items are as follows: GCS, 88.78 percent; BDI, 79.8 percent; and DACL Form E, 92.93 percent. These results suggest that Form E is superior to the other two scales in discriminating male patients from male normals.
It may be that the transient mood component of depression best separates male normals from male patients. The GCS, which is second best, also focuses heavily on the affective component of depression.

In the third series of discriminant function analyses, discriminant functions were computed using individual scale items to determine maximum separation of the female patients from the female normals. The BDI classifies correctly with 86.67 percent accuracy. Female patients and female normals are classified correctly 87.5 percent of the time using the function derived from the GCS; and for DACL Form E, placement is 85.83 percent correct. For separating female patients from female normals, all three depression measures seem to be roughly equivalent.

The final series of discriminant function analyses treats the individual scale items as the predictor variables to derive a discriminant function and patients diagnosed depressed in contrast to patients of all other diagnostic categories as the two target groups. Depression inventories from male and female participants are combined. The function derived from the GCS items classifies correctly 68.46 percent of the time and Form E of the DACL classifies with 74.81 percent accuracy. The BDI function differentiates the diagnosed depressed patients from the general patient population with 78.63 percent accuracy. The analyses of the data derived from the GCS and Form E of the DACL are not significant at
an acceptable level. These results indicate that the BDI most clearly conforms to clinical diagnosis in identifying depressed patients.

In conclusion, these results suggest that the BDI, the GCS, and Form E of the DACL are approximately equivalent for discriminating between normals and patients and female normals and female patients. Form E of the DACL is more accurate for discriminating between male patients and male normals, and the BDI is superior for discriminating between diagnosed depressed patients and nondiagnosed depressed patients.

**Limitations of Data Interpretation**

This study investigated the psychometric properties of three self-report depression scales. More specifically, construct validity, concurrent validity, and reliability were assessed. The interpretation of the results of the concurrent validity and reliability components of the study are not problematic since conventional and well-established psychometric procedures were used. The major deficiencies of the study relate to construct validity as assessed by the four hypotheses.

Group differentiation (construct validity) in depression research is demonstrated by showing that a depression scale clearly differentiates between two groups of subjects known to vary in severity of depression (Hamilton, 1976). The best
criterion for knowing whether groups vary in severity of depression is professional clinical judgment. For example, Snaith, Mehta, and Hamilton (1971) investigated psychometric properties of the Wakefield Self-Assessment Depression on a group of hospital employee "normals" and patients diagnosed as suffering from primary depressive illness and showed that there was very little overlap in the scores obtained by these two groups. Hypotheses 1, 2, and 3 of this study made group comparisons but are weaker because patients were not uniformly diagnosed depressed. Therefore, conclusions drawn are not as clear and unambiguous as would be desirable.

The second major deficiency cutting across the study is that no uniform diagnostic criteria other than DSM II (1968) were used in the various settings, and no checks on reliability of diagnosis were included. It is well known that reliability of psychiatric diagnosis using DSM II is only moderate and, therefore, the same patient might have been given different diagnostic labels depending on which clinician did the assessment. The investigation could have been improved upon by using the same diagnostic team, using uniform research diagnostic criteria such as the one developed by Feighner, Robins, Guz, Woodruff, Winokur, and Munoz (1972) and including checks for reliability.
Recommendations

One purpose of the present study was to enlarge upon the number of comparative studies of depression scales. Carroll et al. (1973) and Davies et al. (1975) commented on the need for studies comparing the relative merits of self-report depression scales. Much more research needs to be done in this area. More specific answers are needed for the following questions:

1. What scale loadings are most effective for obtaining accurate self-report of depression? For instance, is a scale which primarily focuses on transient mood state (e.g., Form E of the DACL) more effective for some depression assessment tasks than is a scale which measures a more comprehensive portion of the depression symptom complex (i.e., BDI)?

2. Do self-report depression measures vary in their sensitivity over a wide range of severity of depression? Will even the best designed self-rating scale be inadequate when applied to patients with psychotic depression? If so, what type of self-report depression scale will reduce the response bias of differing patient samples?

3. With what patient samples, under what circumstances, and for what research or clinical purpose will the various self-report depression measures have the greatest reliability and validity? At times, a scale that merely requires the patient to estimate their degree of depression on a continuum from least to most depressed may provide sufficient
information. However, a clinician planning to implement cognitive treatment of depression may want a scale that assesses relevant aspects of the depressed patient's thinking.

Finally, research that compares the different assessment approaches is an important priority. Answers to many of the preceding questions may be most clearly answered by research which utilizes self-report, direct observation, observer ratings, and biochemical tests with a variety of depressed persons in differing circumstances. After all, Akiskal and McKinney (1975), in a review of research on depression, concluded that depression can be understood as the feedback interaction of three sets of variables at chemical, experiential, and behavioral levels, with the diencephalon serving as the field of action. Such a complex problem is likely to require assessment from a number of perspectives, of which self-report is only one.
REFERENCE NOTES


REFERENCES


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Winokur, G. The types of affective disorders. Journal of Nervous and Mental Disease, 1973, 156, 82-96.


APPENDIX A

Beck Depression Inventory
BDI QUESTIONNAIRE

In each group of statements, please circle the letter in front of the statement that best describes how you feel right now.

If two or more statements are true, circle the latter statement in the group.

Be sure to read all the statements in the group before making your answer.

1. a I do not feel sad.
   b I feel blue or sad.
   c I am blue or sad all the time and I can't snap out of it.
   d I am so sad or unhappy that it is quite painful.
   e I am so sad or unhappy that I can't stand it.

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

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

4. a I am not particularly dissatisfied.
   b I feel bored most of the time.
   c I don't enjoy things the way I used to.
   d I don't get satisfaction out of anything any more.
   e I am dissatisfied with everything.
5. a I don't feel particularly guilty.
b I feel bad or unworthy a good part of the time.
c I feel quite guilty.
d I feel bad or unworthy practically all the time now.
e I feel as though I am very bad or worthless.

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

7. a I don't feel disappointed in myself.
b I am disappointed in myself.
c I don't like myself.
d I am disgusted with myself.
e I hate myself.

8. a I don't feel I am any worse than anybody else.
b I am critical of myself for my weakness or mistakes.
c I blame myself for my faults.
d I blame myself for everything bad that happens.

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

10. a I don't cry any more than usual.
b I cry more now than I used to.
c I cry all the time now. I can't stop it.
d I used to be able to cry, but now I can't cry at all even though I want to.

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

12. a I have not lost interest in other people.
b I am less interested in other people now than I used to.
c I have lost most of my interest in other people and have little feeling for them.
d I have lost all my interest in other people and don't care about them at all.
13. a I make decisions about as well as ever.  
    b I try to put off making decisions.  
    c I have great difficulty in making decisions.  
    d I can't make any decisions at all any more.

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

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

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

17. a I don't get any more tired than usual.  
    b I get tired more easily than I used to.  
    c I get tired from doing anything.  
    d I get too tired to do anything.

18. a My appetite is no worse than usual.  
    b My appetite is not as good as it used to be.  
    c My appetite is much worse now.  
    d I have no appetite at all any more.

19. a I haven't lost much weight, if any, lately.  
    b I have lost more than 5 pounds.  
    c I have lost more than 10 pounds.  
    d I have lost more than 15 pounds.

20. a I am no more concerned about my health than usual.  
    b I am concerned about aches and pains or upset stomach or constipation.  
    c I am so concerned with how I feel or what I feel that it's hard to think of much else.  
    d I am completely absorbed in what I feel.
21.  a I have not noticed any recent changes in my interest in sex.
    b I am less interested in sex than I used to be.
    c I am much less interested in sex now.
    d I have lost interest in sex completely.

THANK YOU FOR YOUR COOPERATION!
APPENDIX B

Form E—Depression Adjective Check Lists
CHECK LIST
DACL FORM E
By Bernard Lubin

Name_____________________________  Age______  Sex______
Date ___________________ Highest grade completed in school___

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

1. _____ Unhappy
2. _____ Active
3. _____ Blue
4. _____ Downcast
5. _____ Dispirited
6. _____ Composed
7. _____ Distressed
8. _____ Cheerless
9. _____ Lonely
10. _____ Free
11. _____ Lost
12. _____ Broken
13. _____ Good
14. _____ Burdened
15. _____ Forlorn
16. _____ Vigorous
17. _____ Peaceful
18. _____ Well
19. _____ Apathetic
20. _____ Chained
21. _____ Strong
22. _____ Dejected
23. _____ Awful
24. _____ Glum
25. _____ Great
26. _____ Finished
27. _____ Hopeless
28. _____ Lucky
29. _____ Tortured
30. _____ Listless
31. _____ Safe
32. _____ Wilted
33. _____ Criticized
34. _____ Fit
APPENDIX C

Generalized Contentment Scale
GENERALIZED CONTENTMENT SCALE (GCS)  

NAME: ________________________________

This questionnaire is designed to measure the degree of contentment that you feel about your life and surroundings. It is not a test, so there are no right or wrong answers. Answer each item as carefully and accurately as you can by placing a number beside each one as follows:

1 = Rarely or none of the time  
2 = A little of the time  
3 = Sometime  
4 = Good part of the time  
5 = Most or all of the time

Please begin.

1. I feel powerless to do anything about my life. ______
2. I feel blue. ______
3. I am restless and can't keep still. ______
4. I have crying spells. ______
5. It is easy for me to relax. ______
6. I have a hard time getting started on things that I need to do. ______
7. I do not sleep well at night. ______
8. When things get tough, I feel there is always someone I can turn to. ______
9. I feel that the future looks bright for me. ______
10. I feel downhearted. ______
11. I feel that I am needed. ______
12. I feel that I am appreciated by others. ______
13. I enjoy being active and busy. ______
14. I feel that others would be better off without me. ______

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15. I enjoy being with other people. 
16. I feel it is easy for me to make decisions. 
17. I feel downtrodden. 
18. I am irritable. 
19. I get upset easily. 
20. I feel that I don't deserve to have a good time. 
21. I have a full life. 
22. I feel that people really care about me. 
23. I have a great deal of fun. 
24. I feel great in the morning. 
25. I feel that my situation is hopeless.
APPENDIX D

Informed Consent Form
INFORMED CONSENT:

I agree to have these data used for research purposes only, knowing that my responses will be used anonymously and my identity will not be revealed. I understand that at any time I may stop the test or refuse to have the test results used. If I have any questions, I have been notified that my questions will be answered.

Initials: _______________

Please list only the following:

Male _____ Female _____ (check)

Birth date: _____________

Height: _________________
### Table A
(From Table 11)
Approximate Two-Sample $t$ Tests Using 10-Percent Bonferroni Procedure for Generalized Contentment Scale

<table>
<thead>
<tr>
<th>Group/Group</th>
<th>df</th>
<th>$t$</th>
<th>Diff</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inpatient males/inpatient females</td>
<td>62</td>
<td>-1.364</td>
<td>-6.281</td>
<td>.177</td>
</tr>
<tr>
<td>Inpatient males/outpatient males</td>
<td>61</td>
<td>-2.237</td>
<td>-10.347</td>
<td>.029</td>
</tr>
<tr>
<td>Inpatient males/outpatient females</td>
<td>65</td>
<td>-4.139</td>
<td>-17.969</td>
<td>.000*</td>
</tr>
<tr>
<td>Inpatient males/normal males</td>
<td>51</td>
<td>5.251</td>
<td>17.594</td>
<td>.000*</td>
</tr>
<tr>
<td>Inpatient males/normal females</td>
<td>51</td>
<td>4.816</td>
<td>16.018</td>
<td>.000*</td>
</tr>
<tr>
<td>Inpatient females/outpatient males</td>
<td>60</td>
<td>0.818</td>
<td>-4.066</td>
<td>.417</td>
</tr>
<tr>
<td>Inpatient females/outpatient females</td>
<td>61</td>
<td>-2.482</td>
<td>-11.688</td>
<td>.016</td>
</tr>
<tr>
<td>Inpatient females/normal males</td>
<td>42</td>
<td>6.257</td>
<td>23.875</td>
<td>.000*</td>
</tr>
<tr>
<td>Inpatient females/normal females</td>
<td>41</td>
<td>5.878</td>
<td>22.299</td>
<td>.000*</td>
</tr>
<tr>
<td>Outpatient males/outpatient females</td>
<td>59</td>
<td>1.611</td>
<td>-7.622</td>
<td>.112</td>
</tr>
<tr>
<td>Outpatient males/normal males</td>
<td>40</td>
<td>7.274</td>
<td>27.941</td>
<td>.000*</td>
</tr>
<tr>
<td>Outpatient males/normal females</td>
<td>40</td>
<td>6.903</td>
<td>26.365</td>
<td>.000*</td>
</tr>
<tr>
<td>Outpatient females/normal males</td>
<td>44</td>
<td>10.176</td>
<td>38.563</td>
<td>.000*</td>
</tr>
<tr>
<td>Outpatient females/normal females</td>
<td>44</td>
<td>9.792</td>
<td>33.987</td>
<td>.000*</td>
</tr>
<tr>
<td>Normal males/normal females</td>
<td>77</td>
<td>-0.749</td>
<td>-1.576</td>
<td>.456</td>
</tr>
</tbody>
</table>

*$p < .0066$ for each comparison; overall $p < .10$. 

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Approximate Two-Sample $t$ Tests Using 10-Percent Bonferroni Procedure for Beck Depression Inventory

<table>
<thead>
<tr>
<th>Group/Group</th>
<th>df</th>
<th>$t$</th>
<th>Diff</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inpatient males/inpatient females</td>
<td>63</td>
<td>-1.568</td>
<td>-4.333</td>
<td>.122</td>
</tr>
<tr>
<td>Inpatient males/outpatient males</td>
<td>64</td>
<td>-2.403</td>
<td>-6.237</td>
<td>.019</td>
</tr>
<tr>
<td>Inpatient males/outpatient females</td>
<td>65</td>
<td>-3.642</td>
<td>-9.396</td>
<td>.001*</td>
</tr>
<tr>
<td>Inpatient males/normal males</td>
<td>38</td>
<td>4.954</td>
<td>9.167</td>
<td>.000*</td>
</tr>
<tr>
<td>Inpatient males/normal females</td>
<td>38</td>
<td>4.053</td>
<td>7.488</td>
<td>.000*</td>
</tr>
<tr>
<td>Inpatient females/outpatient males</td>
<td>60</td>
<td>-0.677</td>
<td>-1.903</td>
<td>.501</td>
</tr>
<tr>
<td>Inpatient females/outpatient females</td>
<td>61</td>
<td>-1.810</td>
<td>-5.063</td>
<td>.075</td>
</tr>
<tr>
<td>Inpatient females/normal males</td>
<td>33</td>
<td>6.304</td>
<td>13.500</td>
<td>.000*</td>
</tr>
<tr>
<td>Inpatient females/normal females</td>
<td>33</td>
<td>5.526</td>
<td>11.821</td>
<td>.000*</td>
</tr>
<tr>
<td>Outpatient males/outpatient females</td>
<td>60</td>
<td>-1.201</td>
<td>-3.159</td>
<td>.234</td>
</tr>
<tr>
<td>Outpatient males/normal males</td>
<td>33</td>
<td>8.029</td>
<td>15.403</td>
<td>.000*</td>
</tr>
<tr>
<td>Outpatient males/normal females</td>
<td>33</td>
<td>7.163</td>
<td>13.725</td>
<td>.000*</td>
</tr>
<tr>
<td>Outpatient females/normal males</td>
<td>34</td>
<td>9.777</td>
<td>18.563</td>
<td>.000*</td>
</tr>
<tr>
<td>Outpatient females/normal females</td>
<td>34</td>
<td>8.905</td>
<td>16.884</td>
<td>.000*</td>
</tr>
<tr>
<td>Normal males/normal females</td>
<td>78</td>
<td>-2.794</td>
<td>-1.679</td>
<td>.007</td>
</tr>
</tbody>
</table>

* $p < .0066$ for each comparison; overall $p < .10$. 

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Table C
(Table 13)

Approximate Two-Sample *t* Tests Using 10-Percent Bonferroni Procedure for Form E of Depression Adjective Check Lists

<table>
<thead>
<tr>
<th>Group/Group</th>
<th>df</th>
<th><em>t</em></th>
<th>Diff</th>
<th><em>p</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>Inpatient males/inpatient females</td>
<td>65</td>
<td>-0.786</td>
<td>-1.684</td>
<td>.435</td>
</tr>
<tr>
<td>Inpatient males/outpatient males</td>
<td>64</td>
<td>-2.148</td>
<td>-4.439</td>
<td>.035</td>
</tr>
<tr>
<td>Inpatient males/outpatient females</td>
<td>57</td>
<td>-3.067</td>
<td>-5.465</td>
<td>.003*</td>
</tr>
<tr>
<td>Inpatient males/normal males</td>
<td>48</td>
<td>3.216</td>
<td>5.347</td>
<td>.002*</td>
</tr>
<tr>
<td>Inpatient males/normal females</td>
<td>45</td>
<td>2.516</td>
<td>4.097</td>
<td>.016</td>
</tr>
<tr>
<td>Inpatient females/outpatient males</td>
<td>60</td>
<td>-1.334</td>
<td>-2.755</td>
<td>.187</td>
</tr>
<tr>
<td>Inpatient females/outpatient females</td>
<td>51</td>
<td>-2.126</td>
<td>-3.781</td>
<td>.038</td>
</tr>
<tr>
<td>Inpatient females/normal males</td>
<td>42</td>
<td>4.239</td>
<td>7.031</td>
<td>.000*</td>
</tr>
<tr>
<td>Inpatient females/normal females</td>
<td>40</td>
<td>3.558</td>
<td>5.781</td>
<td>.001*</td>
</tr>
<tr>
<td>Outpatient males/outpatient females</td>
<td>52</td>
<td>-0.609</td>
<td>-1.026</td>
<td>.545</td>
</tr>
<tr>
<td>Outpatient males/normal males</td>
<td>43</td>
<td>6.279</td>
<td>9.786</td>
<td>.000*</td>
</tr>
<tr>
<td>Outpatient males/normal females</td>
<td>40</td>
<td>5.606</td>
<td>8.536</td>
<td>.000*</td>
</tr>
<tr>
<td>Outpatient females/normal males</td>
<td>56</td>
<td>9.358</td>
<td>10.813</td>
<td>.000*</td>
</tr>
<tr>
<td>Outpatient females/normal females</td>
<td>55</td>
<td>8.643</td>
<td>9.563</td>
<td>.000*</td>
</tr>
<tr>
<td>Normal males/normal females</td>
<td>72</td>
<td>-1.388</td>
<td>-1.250</td>
<td>.170</td>
</tr>
</tbody>
</table>

*p* < .0066 for each comparison; overall *p* < .10.