PERSONALITY FACTORS ASSOCIATED WITH NEGATIVE AFFECT:
APPLICATION OF THE "BIG FIVE" TAXONOMY TO
DEPRESSION AND ANXIETY

by

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Kent W. Anderson
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ABSTRACT

Personality Factors Associated with Negative Affect: Application of the "Big Five" Taxonomy to Depression and Anxiety

by

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The purpose of this study was to examine the patterns and discriminant utility of the five-factor model of personality ("Big Five," consisting of neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness factors) with depressed and anxious outpatients.

One hundred two outpatients seeking services at a community mental health center in a small western community participated in the study. Subjects were 41 clients with a depressive disorder, 31 with an anxiety disorder, and 30 in a mixed clinical control group. Subjects completed the Neuroticism-Extraversion-Openness to Experience Five-Factor Inventory (NEO-FFI).

Results indicate that both depressed and anxious clients score in the "very high" range on neuroticism and "low" on extraversion. However, neither of these two
factors is useful in discriminating between depression and anxiety since their mean scores are essentially equivalent. Conscientiousness is the crucial variable that discriminates between depressed and anxious clients. The mean score for the anxiety group is in the "very low" range, significantly lower than the depressed group whose mean is in the "low-average" range. Openness to experience contributes mildly to discriminant utility, with the mean score of the depressed group in the "high-average" range and the mean score of the anxiety group in the "average" range. The agreeableness variable contributes minimally to the discriminant function.
Psychologists have long attempted to describe the vital aspects of human personality. Efforts to adequately describe personality have provided the impetus for innumerable research projects and theoretical writings. The paradox of this incredible endeavor is that the field has been flooded with such a vast number of personality descriptors that, until recently, general confusion was the order of the day.

Personality researchers over the past 50 years have attempted to find the most parsimonious set of personality factors that adequately represent the large diversity in personality descriptors. By using the lexical approach (Allport, 1937), research has merged to yield a five-factor taxonomy of personality. Although the appropriate label for these five dimensions is debatable, they are commonly referred to as: (a) openness to experience or intellect; (b) conscientiousness; (c) extraversion or surgency, (d) agreeableness, and (e) neuroticism (John, 1990; Norman, 1963; McCrae & Costa, 1985). The same five factors have been found in factor analyses across data sets, samples, raters, and cultures (John, 1990).

Researchers have suggested that the "Big Five" consistently and reliably depict the categorization of personality descriptors. Many are now calling for the application of this five-factor model to various domains of
interest. Application of the "Big Five" has already begun in such domains as personality change in aging (Conley, 1985a); physical health (Smith & Williams, 1992); interaction in close relationships (Buss, 1992); and job performance (McHenry, Hough, Toquam, Hanson, & Ashworth, 1990).

Researchers have also applied the five-factor model to clinical populations and affective dimensions. For instance, the "Big Five" personality factors have been used in attempts to differentiate between various personality disorders (Costa & McCrae, 1990; Widiger & Trull, 1992), the occurrence of general positive and negative affect (Costa & McCrae, 1980; Warr, Barter, & Brownbridge, 1983; Watson & Clark, 1984; Emmons & Diener, 1985; Meyer & Shack, 1989; McCrae & Costa, 1991; Watson & Clark, 1992), and the occurrence of specific negative emotions (Watson & Clark, 1992).

Although research efforts have focused on the relationship between the "Big Five" model and specific emotions such as sadness and fear, studies have not yet been conducted to delineate the personality constellation of clinically depressed and anxious individuals. This research effort could be particularly useful, since the ability to effectively differentiate between depression and anxiety has proven to be quite difficult (for reviews on the research
examining the similarities and differences between anxiety and depression, see Brier, Charney, & Henninger, 1985; Stavrakaki & Vargo, 1986). The utilization of personality variables to differentiate among the clinical syndromes of depression and anxiety may contribute to the understanding of discriminant and convergent factors associated with depressed and anxious individuals.

Thus, the ambiguous delineation of clinically depressed and anxious individuals can be further clarified by expanding the applicability of the "Big Five" personality factors to these clinical populations. The current ability to differentiate depression and anxiety is somewhat nebulous. More research effort is needed that considers domains which have not yet been considered, including personality factors. This research will also be of interest to personality researchers, since it will apply the five-factor model of personality to a research question that has not yet been considered.

The purpose of this research is to address three issues: (a) the pattern of responses of depressed and anxious outpatients on a measure of the five-factor model of personality; (b) determine which of these five personality variables is scored significantly differently by depressed and anxious outpatients; and (c) determine which of the five personality factors that comprise the "Big Five" best discriminate between the anxious and depressed groups.
Overview of Lexical Approach

Personality researchers have attempted for years to establish a parsimonious taxonomy that adequately accounts for the variance in personality trait descriptors. Because of the seemingly limitless number of adjectives used in personality characterization, clarification of the few underlying orthogonal factors that best subsume the large domain of personality descriptors is a meaningful endeavor.

One major effort to create such an integrative taxonomy is the lexical approach, which uses the natural language of personality descriptors to provide the item pool. The following is a brief summary of the history of this approach (for more comprehensive reviews on the lexical approach in personality research, see Goldberg, 1981; John, 1990; John, Angleitner, & Ostendorf, 1988; McCrae, 1989; McCrae & Costa, 1985). Gordon Allport pioneered the American effort to use the lexical approach to create a personality taxonomy. In short, his assumption was that salient personality characteristics over time would be accommodated in the natural language (Allport, 1937). Allport and Odbert (1936) performed the laborious task of extracting all personality-relevant terms found in the 1925 unabridged edition of Webster's New International Dictionary. They extracted all terms that had the capacity to "distinguish the behavior of
one human being from that of another" (Allport & Odbert, 1936, p. 24). This provided an item pool of 18,000 trait descriptors, which were then categorized into four distinct groups: (a) personal traits that were relatively neutral in their evaluative tone; (b) traits that described temporary moods, states, and activities; (c) terms that had an evaluative tone; and (d) miscellaneous terms that included descriptors of physical features and talents. The first category that described evaluatively "neutral" personality traits contained approximately 4,500 adjectives.

**"Big Five" Taxonomy**

Allport and Odbert’s adjective pool provided the impetus for further research. Cattell (1945) took the initial 4,500 traits from Allport and Odbert’s first category and attempted to reduce them to a parsimonious categorization of independent trait variables. Using a series of clustering techniques, he reduced these descriptors into 35 trait clusters. Cattell (1945) used these 35 variables for ratings of thirteen small groups of adult male subjects, who were rank-ordered by two trained assistants on all 35 variables. Cattell used factor analysis and extracted 12 factors which he considered to be the primary personality factors. However, three factors did not contain any loadings above .30, and the last seven factors contained only secondary loadings. Only the first five factors had substantial primary loadings. Even though
Cattell's work was important, it has been criticized for numerous undocumented decisions which complicate the replication of the research (John, 1990). Fiske (1949) used a much clearer description of 22 of Cattell's variables to rate 128 clinical psychology trainees. Factor analyses on self-ratings, ratings by fellow trainees, and ratings by training staff all yielded a five-factor solution.

A crucial study in the effort to develop a taxonomy of personality traits was conducted by Tupes and Christal (1961). They reanalyzed the correlational matrices from eight different samples with diverse populations and various types of raters (self, peers, supervisors, etc.). They reported "five relatively strong and recurrent factors and nothing more of any consequence" (Tupes & Christal, 1961, p. 14). The factors, numbered in order of their relative size, were (I) Extraversion (assertiveness, surgency, energetic); (II) Agreeableness (likability, friendly compliance, cooperative); (III) Conscientiousness (dependability, impulse control, conformity); (IV) Neuroticism (emotional stability, emotionality, ego strength); and (V) Openness to experience (culture, intelligence, inquiring intellect). This five-factor model was later replicated by other authors (Norman, 1963; Borgatta, 1964; Digman & Takemoto-Chock, 1981). These findings suggested that various samples and raters consistently yielded five taxonomic factors of personality traits when using Cattell's adjective pool.
Since all the authors cited above used Cattell’s adjective pool, studies using an adjective pool other than Cattell’s were needed to determine if the "Big Five" could be found with a different initial variable pool. One such study was conducted by Conley (1985b). Conley used ratings from dating couples both in the 1930s and again in the 1970s. Both data sets converged into five factors resembling the "Big Five" factor structure.

Norman (1967) used the unabridged version of the 1961 Webster’s Third New International Dictionary to extract all personality-relevant terms. Despite his exhaustive effort, he only added 171 new terms to the original list of Allport and Odbert (1936). With this initial variable pool, he began an objective, specified exclusion process which eliminated (a) quantifiers and evaluative terms, (b) ambiguous, vague, and metaphorical terms, (c) obscure and little-known terms, and (d) terms referring to physical and anatomical features. The remaining terms were then categorized by four trained raters into four groups: (a) stable traits, (b) temporary states, (c) social roles and relationships, and (d) terms describing the effects of one’s behavior on another. Using the list of words depicting stable traits, he was left with 1,600 terms.

Goldberg (1990) used Norman’s trait list and constructed an inventory of trait adjectives. A large sample of college undergraduates rated themselves on these
adjectives to provide the data for factor-analytic investigation. With this independent data set, Goldberg replicated the five-factor model across a variety of extraction and rotation methods. More importantly, these five factors were virtually identical to the five-factor taxonomy found by other researchers. Research using other initial data sets also rendered a factor structure to the personality adjectives that was identifiable as the "Big Five" (e.g., Peabody & Goldberg, 1989).

While the "Big Five" have consistently emerged in studies using English trait descriptors, cross-cultural studies were necessary to establish the universality of the factors. Such research efforts have been conducted in Dutch (Brokken, 1978; De Raad, Mulder, Kloosterman, & Hofstee, 1988; John et al., 1988) and German (Borkenau & Ostendorf, 1989), and the "Big Five" were consistently identified across various adjective pools and samples. Evidence has accumulated for generalizability to nonwestern cultures, including Filipino (Church & Katigbak, 1989), Hebrew (Birenbaum & Montag, 1986), Japanese, and Chinese samples (Bond, 1979; Yang & Bond, 1990). Thus, the five-factor model of personality has been established across data sets, samples, raters, and cultures using the lexical approach.

In conclusion, the "Big Five" have been consistently found when participants rate themselves, close associates, peers, or strangers. Factor analytic studies consistently
yield a five-factor solution that are identifiable as the "Big Five." There is also mounting evidence for the emergence of five-factor solutions in lexicons other than English. Studies in nonwestern cultures are also finding factor solutions comparable to the "Big Five."

**Application of the "Big Five"**

Research on the association between various domains and the "Big Five" has already begun, including personality change in aging (Conley, 1985a), physical health (Smith & Williams, 1992), and interaction in close relationships (Buss, 1992). Of particular importance to clinical psychology is the application of the five-factor personality model to the psychopathological taxonomy, as represented by the Diagnostic and Statistical Manual for Mental Disorders (DSM-III-R; APA, 1987a). Specifically, the five-factor model may be used by researchers to explore "Big Five" personality patterns variables in various types of psychopathology. In this way, clinicians can advance their understanding of the relationship between personality dimensions and specific mental and emotional disorders, as well as discriminate between various psychological disorders via personality factors.

Because depressed and anxious individuals are similar in various ways, the ability to differentiate them is of particular theoretical importance (for reviews on the
research examining the similarities and differences between anxiety and depression, see Brier et al., 1985; Stavrakaki & Vargo, 1986). The utilization of personality variables to differentiate among depression and anxiety may contribute to the understanding of the discrimination of these disorders.

Many researchers have tried to determine the specific differences between depression and anxiety. Anxiety and depression have high rates of comorbidity (Hiller, Zaudig, & Bose, 1989; Sanderson, DiNardo, Rapee, & Barlow, 1990; Stein, Tancer, & Uhde, 1990; Thompson, Bland, & Orn, 1989; Winokur, 1988; Zung, Magruder-Habib, Velez, & Alling, 1990), similarities in genetic vulnerability (Cohen & Biederman, 1988; Marks, 1986), and similarities in responses to rating scales (Lipman, 1982; Tanaka-Matsumi & Kameoka, 1986).

However, researchers have shown that depressed and anxious affect can be discriminated to a certain extent with self-report measures (Riskind, Beck, Brown, & Steer, 1987; Steer, Beck, Riskind, & Brown, 1986), structured interviews (Riskind, Beck, Berchick, Brown, & Steer, 1987), and analyses of cognitive content (Beck, Brown, Steer, Eidelson, & Riskind, 1987; Clark & De Silva, 1985; Greenberg & Beck, 1989; Mitchell & Campbell, 1988; Rholes, Riskind, & Neville, 1985; Riskind, Castellon, & Beck, 1989). The ability to further distinguish between depressed and anxious affect with personality variables could provide a significant contribution to the field of study.
Although to date there have been no studies that consider the patterns of the "Big Five" with depressed or anxious individuals, a few studies have looked at the relation of the "Big Five" to the most general level of affective categorization (general positive and negative affect; Watson & Tellegen, 1985). These studies converged to suggest that negative affect was substantially related to neuroticism but not extraversion, while positive affect was significantly related to extraversion but not neuroticism (Costa & McCrae, 1980; Emmons & Diener, 1985; Meyer & Shack, 1989; Warr et al., 1983; Watson & Clark, 1984; Watson & Clark, 1992).

McCrae and Costa (1991) examined all five dimensions of the "Big Five" in their relation to general positive and negative affect. They also found that neuroticism was positively associated with negative affect and extraversion was positively associated with positive affect. Furthermore, agreeableness and conscientiousness were positively associated with positive affect and negatively associated with negative affect, while openness to experience was positively associated with both positive and negative affect. Neuroticism was found to be the most robust predictor of negative affect.

Thus, it appears that neuroticism is the "Big Five" variable most strongly related to general negative affect. This makes intuitive sense, because the traits that comprise
the neuroticism subscale are generally terms that describe a broad realm of negative affect. However, the role of the remaining four "Big Five" variables is unclear. This is possibly due to the fact that negative affect is such a diverse category that is comprised of a wide range of various temperaments that are differentially related to the variables of the "Big Five."

Watson and Clark (1992) examined this possibility by analyzing the relationship between the "Big Five" constructs and specific affects (fear, sadness, guilt, and hostility). At this level, results were easier to interpret. The two dimensions most closely associated with depression and anxiety are sadness and fear, respectively. It appears that neuroticism is the best predictor of high levels of fear, while conscientiousness may be a very weak contributor. Neuroticism is also the best predictor of high levels of sadness, while extraversion is a definite second factor. One sample suggests that openness to experience may be a third predictor in accounting for variance in sadness.

Even though Watson and Clark (1992) did not use clinically anxious and depression individuals, they set the precedent for such a study. The field is prepared for a research effort to measure "all five factors rather than confining the research to only one or two of the dimensions or to a construct that may confound two or more of the factors" (Widiger & Trull, 1992, p. 388).
"Big Five" factors and depression. To date there have been no studies that simultaneously use all Big Five variables to understand depression or anxiety. It should be noted that depression and anxiety are often ubiquitous terms whose definition is not clearly circumscribed. Depression and anxiety can refer to mood states, symptoms, or clinical syndromes. While the present study uses individuals with clinical syndromes of "mood" or "anxiety" disorders (APA, 1987a), the review of the literature includes studies that defined depression and anxiety more liberally.

Both "depression" and "anxiety" can refer to the emotive experience of sadness and fear, respectively. Studies of this type generally use convenience samples and alter affect through some form of mood-induction technique. "Depression" and "anxiety" can also refer to certain symptoms beyond affective experience that are typically associated with sad and anxious mood. For instance, depressed individuals typically exhibit symptoms such as decreased interest in enjoyable activities, decreased energy, and increased hopelessness, while those experiencing anxiety typically have symptoms such as avoidance behavior, hypervigilance, and increased physiological reactivity. Studies that consider depression and anxiety on the symptom level generally use convenience samples (often college students) and administer a self-report measure of depressed and anxious symptomatology.
Finally, "depression" and "anxiety" can be defined as clinical syndromes that sufficiently meet the criteria of a given nosological system to be considered a mental disorder. The use of depression and anxiety as syndromes requires consideration of the type, severity, and duration of symptoms. Studies that define depression and anxiety as clinical syndromes use trained raters to diagnose the person with a mood or anxiety disorder. The distinction of depression and anxiety as moods, symptoms, or clinical syndromes is crucial, since a study with findings based on college students scoring highly on a depression inventory does not generalize to persons experiencing a major depressive episode. This review will specify the particular operational definition of "depression" and "anxiety" in order to avoid confounding studies that are based on qualitative differences among subjects that are designated "depressed" and "anxious."

Studies have been conducted that have explored the association between individual factors of the "Big Five" and depression. There is some evidence to suggest a link between "openness to experience" and depression. High depression scores are associated with decreased curiosity in aging adults (Camp, 1986) and mood induction studies (Rodrigue, Olson, & Markley, 1987), lower performance IQ in clinically depressed outpatients (Pernicano, 1986), and decreased desire for further knowledge and ratings of the
perceived value of information after induced sadness (Rodrigue et al., 1987). Other studies suggest that clinical depression does not affect intellectual functioning (Weiner & Pfeffer, 1986) and mild depression in college students does not significantly alter cognitive speed (Ross, 1989). The relationship between "conscientiousness" and depression has not yet been determined.

Some research supports the negative association between "extraversion" and depression in both clinically depressed individuals (Boyce et al., 1990) and higher scorers on depression inventories (Lester, 1989), while others do not find a significant association for clinically depressed or high scorers on depression inventories (Clark, Watson, & Leeka, 1989; Dritschel & Teasdale, 1991; Hirschfeld et al., 1989; Levenson, Aldwin, Bosse, & Spiro, 1988; Lolas, Gomez, & Suarez, 1991) or only a mild association among nonclinical samples after accounting for neuroticism (Hill & Kemp-Wheeler, 1986).

"Agreeableness" consistently shows a negative association to depression in clinically depressed (Hokanson, Hummer, & Butler, 1991; Levenson et al., 1988) and high scorers on depression measures (Brown & Zeichner, 1989; Finman & Berkowitz, 1989; Motowidlo, Packard, & Manning, 1986). Finally, the relationship between neuroticism and depression is mostly confirmatory among both clinically depressed and nonclinical samples (Davidson et al., 1988;
Dritschel & Teasdale, 1991; Frank, Kupfer, Jacob, Blumenthal, & Jarrett, 1987; Hill & Kemp-Wheeler, 1986; Teasdale & Dent, 1987), while others disconfirm the link at least for college students with high depression scores (Clark et al., 1989; Rich & Scovel, 1987).

"Big Five" factors and anxiety. Individual "Big Five" factors have also been examined in relation to anxiety. However, there is little evidence linking anxiety to either "openness to experience" or "conscientiousness." There is some support that high anxiety is associated with decreased creativity among those reporting high anxiety levels (Matthews, 1986) and that anxiety and conscientiousness may be linked (Mavissakalian, 1990).

On the other hand, there has been a substantial amount of research on the association between "extraversion" and anxiety. These results have generally been mixed. For example, several studies can be found to confirm a significant negative association between extraversion and anxiety among clinically anxious (Pitman & Orr, 1986) and nonclinical samples high in anxiety (Wilson & Mutero, 1989), while others do not support the link for samples scoring high on anxiety measures (McCown & Johnson, 1991; Lolas, 1991; Lau, 1990) or among clinical samples (Levenson et al., 1988).

Evidence supporting a negative link between "agreeableness" and anxiety is much more sparse (Levenson et
al., 1988). Finally, almost all the studies considering the relationship between anxiety and "neuroticism" find a strong, positive association for clinical (Turner, Beidel, Borden, Stanley, & Jacob, 1991) and nonclinical samples (Houtman & Bakker, 1991; McCown & Johnson, 1991). However, some evidence suggests that the link may only be significant for certain age groups of agoraphobic patients (Kenardy, Oei, & Evans, 1990) or that there is no significant link among high scorers on an anxiety measure (Lolas, 1991).

In conclusion, it can be seen that the "Big Five" personality profile of depressed and anxious outpatients has not been established. It appears that neuroticism is significantly linked to both emotions, while the evidence that links extraversion with both emotions is mixed. While the link between conscientiousness and depression appears to be well established, the rest of the "Big Five" variables have not been studied in relation to depression and anxiety. Therefore, there remains a lack of research that attempts to differentiate between depressed and anxious syndromes with the "Big Five" personality variables. This research will potentially make a significant contribution to the dilemma by further differentiating between persons with anxiety and depressive disorders via personality variables.
Purpose

The general purpose of this research effort is to examine the patterns and discriminant utility of the five-factor model of personality with clinically depressed and anxious individuals. Specifically, this study represents an attempt to differentiate anxious and depressed outpatients using the "Big Five" personality variables. The identification of the factor(s) that are differentially rated by clinically depressed and anxious individuals will provide insight into the ongoing search for variables that effectively differentiate between the two disorders. However, if none of the five factors differentiates between anxiety and depression, the evidence from this study will provide further support to the accumulating research that suggests that these two diagnostic categories are increasingly difficult to effectively differentiate. The present study will compare mean scores on each of the five personality variables between a clinically depressed outpatient group, a clinically anxious outpatient group, a mixed clinical control group, and a normative sample control group in order to determine patterns of responses between the groups. The study will also specify which of the personality variables are most useful in differentiating depressed and anxious outpatients, as well as illuminating those with minimal discriminatory utility.
Thus, the proposed research is designed to address three basic questions: (a) what is the pattern of responses for each group on the five personality variables; (b) which variables are significantly different among the three clinical groups; and (c) which combination of "Big Five" variables best discriminates between the anxious and depressed groups?
CHAPTER III

METHOD

Design

This study used what is referred to by Kazdin (1992) as a passive-observational design. Passive-observational designs have typically been placed in the category of correlational studies to distinguish them from experimental designs which control and/or manipulate independent variables, randomly assign groups, and use control groups for comparative purposes (Borg & Gall, 1989). The essence of a passive-observational design is observation without intervention, control, or manipulation of independent variables (Kazdin, 1992). This study did not attempt to directly manipulate the independent variables and did not randomly assign group membership. A control group was used, yet the purpose of the control group was to distinguish pre-existing traits rather than demonstrate treatment effectiveness as is the case in experimental and quasi-experimental designs. However, a variety of statistical procedures other than correlations was used in this study, so the classification of this nonexperimental design as a correlational study is incomplete.

This study can be further specified as subject-selection research (Kazdin, 1992). The unique feature of subject-selection research is the experimenter’s ability to vary the independent variable by differential assignment to
groups based on preselected criteria. In this study, the selection of persons based on their clinical syndrome allowed this investigator (KWA) to influence a variable (type of psychopathology) through the selection process. The use of a mixed control sample as a comparative group is another example of the use of experimenter control on subject selection in order to more clearly isolate the domains of interest (clinical depression and clinical anxiety) by attempting to rule out moderate levels of distress typically associated with being a mental health patient.

This study used a group design, and inferential statistics were selected that would accommodate a research design that included three levels of a categorical variable (type of psychopathology) and five levels of a continuous variable (personality scores). All subjects received the same "treatment" (NEO-FFI) on a single occasion. There was no repeated measurement nor pre- or postcomparisons since the design was not experimental in nature. The design was double-blind since neither the raters nor the subjects knew which group a subject represented. Every effort was made to have the clients (subjects) fill out the NEO-FFI as soon after intake as possible.

**Subjects**

Subjects were 102 outpatients seeking psychological services at Bear River Mental Health Services in Logan,
Utah. Women made up 73.5% of the sample \((n = 75)\), while the remaining 26.5% were men \((n = 27)\). The age range for the sample was from 18 to 74, with a mean sample age of 33.9 years (see Table 1).

Subjects were recruited from three diagnostic groups: (a) clinically depressed outpatients, (b) clinically anxious outpatients, and (c) a mixed clinical control group of outpatients whose primary diagnosis was neither depression nor anxiety. None of the groups included individuals with a diagnosis of thought disorder or substance dependence or abuse. All clients with axis II diagnoses (personality and developmental disorders) were excluded from this study.

The depressed group consisted of 41 outpatients with a primary diagnosis of major depression or dysthymia without a concomitant diagnosis of an anxiety disorder. The anxious group consisted of 31 outpatients whose primary diagnosis was panic disorder, social or simple phobia, or generalized anxiety disorder, without a concomitant diagnosis of major depression or dysthymia. The control group was comprised of 30 clients with diagnoses other than depression and anxiety (adjustment disorders and V codes). The diagnoses are categorized according to the taxonomy in the revised third edition of the Diagnostic and Statistical Manual of Mental Disorders (APA, 1987a).
Table 1

Subject Characteristics by Age, Sex, and Diagnostic Category

<table>
<thead>
<tr>
<th>Age</th>
<th>MDR</th>
<th>MDS</th>
<th>DYS</th>
<th>PAN</th>
<th>PHO</th>
<th>GAD</th>
<th>CTL</th>
<th>Sum</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-24</td>
<td>1F/1M</td>
<td>5F/1M</td>
<td>5F/1M</td>
<td>0F/0M</td>
<td>3F/3M</td>
<td>6F/1M</td>
<td>3F/1M</td>
<td>23F/8M</td>
</tr>
<tr>
<td>25-29</td>
<td>2F/2M</td>
<td>1F/1M</td>
<td>0F/2M</td>
<td>0F/0M</td>
<td>1F/0M</td>
<td>1F/0M</td>
<td>6F/1M</td>
<td>11F/6M</td>
</tr>
<tr>
<td>30-34</td>
<td>2F/0M</td>
<td>0F/1M</td>
<td>2F/0M</td>
<td>1F/0M</td>
<td>1F/0M</td>
<td>1F/0M</td>
<td>2F/1M</td>
<td>9F/2M</td>
</tr>
<tr>
<td>35-39</td>
<td>0F/0M</td>
<td>0F/0M</td>
<td>3F/0M</td>
<td>1F/0M</td>
<td>0F/0M</td>
<td>1F/0M</td>
<td>6F/3M</td>
<td>11F/3M</td>
</tr>
<tr>
<td>40-44</td>
<td>0F/1M</td>
<td>0F/0M</td>
<td>3F/0M</td>
<td>0F/0M</td>
<td>1F/0M</td>
<td>2F/2M</td>
<td>4F/1M</td>
<td>10F/4M</td>
</tr>
<tr>
<td>45-54</td>
<td>0F/2M</td>
<td>1F/0M</td>
<td>0F/0M</td>
<td>0F/0M</td>
<td>1F/0M</td>
<td>2F/1M</td>
<td>6F/0M</td>
<td>2F/3M</td>
</tr>
<tr>
<td>55-64</td>
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<td>1F/0M</td>
<td>1F/0M</td>
<td>1F/0M</td>
<td>2F/0M</td>
<td>0F/0M</td>
<td>6F/0M</td>
</tr>
<tr>
<td>65+</td>
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<td>1F/0M</td>
<td>0F/1M</td>
<td>0F/0M</td>
<td>1F/0M</td>
<td>1F/0M</td>
<td>3F/1M</td>
<td>7F/3M</td>
</tr>
<tr>
<td>Total</td>
<td>6F/6M</td>
<td>8F/3M</td>
<td>14F/4M</td>
<td>3F/0M</td>
<td>7F/3M</td>
<td>14F/4M</td>
<td>23F/7M</td>
<td>75/27</td>
</tr>
</tbody>
</table>

Note. F = Female; M = Male; MDR = Major Depression, Recurrent; MDS = Major Depression, Single episode; DYS = Dysthymia; PAN = Panic Disorder; PHO = Phobic Disorder; GAD = Generalized Anxiety Disorder; CTL = Control Group; Sum = Sum total of females and males at each age category.

Both the depressed and anxious groups can be broken down into three subgroups based on diagnostic categories. The depressed group was comprised of clients with: (a) major depression, recurrent; (b) major depression, single episode; or (c) dysthymia. Anxious subjects included clients with: (a) panic disorder; (b) phobic disorder (simple or social phobia); or (c) generalized anxiety disorder. The control group was comprised of 12 clients diagnosed with adjustment disorders, 12 with parent-child problems, and 6 with marital problems. The number, age, and gender of persons in each diagnostic group are listed in Table 1.
Measure

The five-factor model of personality was quantified with the "Neuroticism-Extraversion-Openness to Experience Five-Factor Inventory" (NEO-FFI; Costa & McCrae, 1992). This five-factor, self-rating inventory has 60 items composed of short phrases, and each of the five personality scales comprises 12 items. Each item is rated on a five-point scale ranging from "strongly disagree" to "strongly agree." Various items are worded for reverse scoring in order to reduce the influence of response sets.

The Five-Factor Inventory is an abbreviated version of a larger personality inventory designed to measure the "Big Five": the "Neuroticism-Extraversion-Openness to experience Personality Inventory (NEO-PI; Costa & McCrae, 1985). Costa and McCrae used principal components analysis with a "validimax" rotation strategy (Costa & McCrae, 1992, p. 53) to make item assignments to the five factors on the NEO-PI. The 12 items that loaded highest on the five factors of the NEO-PI are used as the items on the NEO-FFI. Although the NEO-FFI is only one-third the size of the NEO-PI, it accounts for approximately 85% of the variance in convergent criteria (Affect Balance Scales, Adjective Check List, and the Myers-Briggs Type Indicator) when compared with the full NEO-PI (Costa & McCrae, 1992). The NEO-FFI scales correlate .77 to .92 with the NEO-PI-R scales.
The reliability of the NEO-FFI has also been assessed. Internal consistency values for the five subscales range from .68 to .86 (Costa & McCrae, 1989). The stability of the factors was demonstrated by administering the NEO-FFI to a group of 375 subjects who had completed an adjective self-report measure of the five factors 3 years previously (Costa & McCrae, 1992). Convergent correlations ranged from .56 to .62 (Mean = .59), while the divergent correlations ranged from .00 to .20 (Mean = .09). In spite of the use of different instruments and the passage of several years, the convergent and discriminant validity of the factors held over time.

The NEO-FFI comes with a profile form that places scores on a t-score grid which is divided into "very low," "low," "average," "high," and "very high" placements on each "Big Five" variable. Data to create the cutoff scores came from a normative sample of 500 men and 500 women. These 1,000 participants were initially screened from a larger sample for "validity and random responding" (Costa & McCrae, 1992, p. 43). Subjects were then chosen in order to match projected U.S. census estimates for 1995 on age and race. Educational level of subjects was reported as "not much higher" than that of the U.S. population (Costa & McCrae, 1992, p. 43). The manual provides means and standard deviations separately for men and women, as well as combined statistics.
Procedures

The research proposal was designed to comply with the American Psychological Association’s guidelines for research with human subjects (APA, 1987b), the policies of Utah State University, and the policies of Bear River Mental Health (BRMH). A brief version of this proposal was presented to the research committee at BRMH (a copy of this proposal is found in Appendix A), and a human subjects form was submitted to the Human Subjects Committee (HSC) at USU (see Appendix B). Approval was granted from the HSC of the USU Institutional Review Board (see Appendix C) and from the research committee at BRMH (see Appendix D) prior to commencement of the study.

Potential participants were all individuals seeking psychological services at BRMH. The intake worker listed those clients who were judged to have either a primary depressive disorder, a primary anxiety disorder, or adjustment disorder or V code diagnosis appropriate for the control group on three separate sheets. The lists were used to initially screen potential participants. The intake worker has a bachelor’s degree in psychology and 10 years experience conducting intakes at BRMH. She is supervised twice weekly by two licensed clinical psychologists and monthly by a staff psychiatrist.

After the intake interview, clients were assigned to a primary therapist. Once the assigned therapists formulated
a diagnosis for their clients, the diagnosis of the principal therapist was compared with the diagnosis of the intake worker. If the two raters converged on the diagnosis, that client was considered eligible to participate. Clients were asked to participate upon their next scheduled appointment. This investigator (KWA) was responsible to coordinate the clients’ appointment times so inventories could be distributed to them.

Meetings were held with each receptionist to present rationale for the study, rehearse presentation of inventories to clients, and answer any questions they might have. Each receptionist was encouraged to read the items (or complete the inventory themselves) in order to familiarize themselves with the nature of the questions. Receptionists did not know the particular clinical diagnosis of any of the clients who participated in the study.

Each packet consisted of a consent form (see Appendix E) paper-clipped to the NEO-FFI. A removable note was attached to each packet with the client’s name, time, and date of appointment. An effort was made to contact clients by telephone prior to their appointments to inform them of the study and allow them to appropriately schedule time to fill out the inventory. If the client was not able to be reached by telephone, he/she was informed of the study at the time of his/her appointment.
The receptionist gave the client the packet with the consent form and the NEO-FFI. The individual was asked to sign the consent form and then complete the NEO-FFI. A total of 85% of clients who were asked to participate actually filled out the inventory. The inventory was identified by number only, and subjects were encouraged not to place their name on the inventory. The majority of subjects completed the inventory in the waiting room at BRMH. Some took the inventory home, and brought it with them to their next session. Those who took the inventory home were asked to complete the inventory in one setting. The completed inventories and (separately) signed consent forms are stored by this researcher (KWA) in a locked file cabinet.

**Statistical Analyses**

The results section of this research is divided into three sections that correspond with the following questions: (a) what is the pattern of responses for each group on the five personality variables; (b) which personality variables are significantly different among the three clinical groups; and (c) which combination of "Big Five" variables best discriminates between anxious and depressed groups? Each section utilizes different statistical tools to fully address the particular question.

*Bar graphs and mean effect sizes.* The first question is concerned with the variation in response patterns among
the clinically depressed, clinically anxious, mixed clinical control, and normative control groups. Group differences are illustrated by a bar graph that displays mean scores on each of the five personality variables. Mean scores for the three clinical groups are also plotted on a $t$-score grid that illustrates the magnitude of differences between the obtained mean score and the mean of the normative sample. Further, standardized mean difference effect sizes are presented to quantify the magnitude of mean differences in terms of standard deviation units. The overall purpose of this first section is to visually present the data that will undergo subsequent statistical analysis, as well as quantify the magnitude of group differences.

**Analysis of variance statistics.** ANOVA procedures were used to determine if mean scores of the five scales are significantly different among the three clinical groups (depressed, anxious, and mixed control). This section identifies whether there are overall group differences on a global "personality" variable (all five personality variables pooled together). If the multivariate $F$ test is significant, univariate $F$ tests on each of the five personality variables are examined to determine which variables have significantly different mean scores between groups. Finally, variables with significant $F$ values are followed up with multiple comparison procedures to determine directionality of mean differences.
While it can be argued that the development of the NEO-FFI was largely based on the creation of orthogonal factors and the typical correlations between the five scales is rather small (including scale correlations in this sample; see Table 2), a more conservative statistical approach is to first determine if there is an overall significant difference between the three clinical groups on global "personality." This approach minimizes the risk of experiment-wise error that is more probable if five one-way ANOVAs were used (one for each of the "Big Five" personality variables; Glass & Hopkins, 1984). In order to determine if there is a significant difference between mean scores on a global personality variable, a multivariate analysis of variance (MANOVA) statistical procedure is used with three nominal variables (groups) and five continuous variables ("Big Five" scores). Wilks' lambda is used as the criterion measurement, which measures the ratio of between-groups sum of squares to total sum of squares (Norusis, 1988). If the multivariate $F$ test is significant at or below the $p = .05$ level, subsequent univariate $F$ tests will be conducted to determine which of the five personality variables contributed to the significant multivariate $F$. If the multivariate $F$ is not large to allow confident rejection of the null hypothesis, no subsequent univariate analyses will be conducted.
Table 2
Correlational Matrix of "Big Five"

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>E</th>
<th>O</th>
<th>A</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>-.43**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>O</td>
<td>-.04</td>
<td>.07</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>-.27*</td>
<td>.25*</td>
<td>-.01</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>-.28*</td>
<td>.24</td>
<td>-.18</td>
<td>.29*</td>
<td>1.00</td>
</tr>
</tbody>
</table>

N = 102  
2-tailed significance  
*<i>p</i> = .01  **<i>p</i> = .001

In the case that the multivariate F ratio is significant, those personality variables with statistically significant univariate F values will be submitted to fixed-effects one-way analyses of variance (ANOVA) procedures. Each personality variable that has a statistically significant F ratio is followed up with the Newman-Keuls multiple comparison procedure in order to determine which group means are significantly different. The Newman Keuls method was selected for several reasons: (a) it allows for post hoc comparisons with a standard alpha set for each comparison; (b) it is ideal for ANOVA designs concerned with only simple comparisons; and (c) it has greater power than the closely related Tukey test (Glass & Hopkins, 1984). Since a Type II error is more likely than Type I error with the small sample size used in this research (Glass & Hopkins, 1984), a multiple comparison procedure with greater power is preferable.
Discriminant analysis statistics. The final results section presents the degree that "Big Five" variables significantly discriminate between clinically depressed and clinically anxious groups. The ability of the discriminant function to effectively assign participants to the correct group is also presented. A two-group discriminant analysis is used on the clinically depressed and clinically anxious groups. The utility of the discriminant function to correctly assign persons to their appropriate group is presented in a classification matrix, which presents the number of cases and percentage of subjects correctly and incorrectly classified into either the depressed or anxious group. Standardized discriminant function coefficients, used in the discriminant function to determine the weight of each variable, are listed, as well as structure coefficients that indicate the correlation between function values and the values of the variables.

Further, a stepwise discriminant analysis using Wilks' Lambda as the criterion for variable selection is utilized to determine which "Big Five" variables are most useful in maximizing differences in scores between the two groups. Wilks' lambda is the ratio of between-groups sum of squares to the total sum of squares (Norusis, 1988). Stepwise selection procedures are used since they combine the advantages of forward and backward selection procedures (Kleinbaum, Kupper, & Muller, 1988). Variables that
contribute to the largest reduction of lambda are entered first, and those that contribute to additional significant reductions in lambda are subsequently entered.

In addition to the stepwise discriminant analysis, a forward selection procedure with direct entry of variables will be used to select variables to remain in the equation, while a backward selection procedure will be used to determine the ordering of variables (Huberty, 1989). The reason to cross-validate the findings of the stepwise analysis is to help correct some of the specified shortcomings of stepwise procedures (Huberty, 1989). For instance, the stepwise equation only considers variables one at a time in a linear fashion while ignoring the contribution of variables considered jointly (McKay & Campbell, 1982). Also, the solution rendered in a stepwise equation is not necessarily the "best" solution possible, and does not always constitute the "importance" of variables by their position in the discriminant function (Huberty, 1989). Stepwise procedures are similarly not well fitted to determine both variable selection and variable ordering. Finally, the meaning of the F test is complex, with the same limitations as any statistical procedure that involves multiple tests of statistical significance (Huberty, 1989).

For these reasons, analyses that extend beyond the stepwise procedure will be used. These analyses will cross-validate the initial findings since Wilks' lambda will not
be used for the criterion of inclusion. Rather, change in classification rate will be the measure of variable importance, and separate analyses will be used for variable selection and variable ordering.

The procedure will involve a direct entry method in which the F-to-enter and F-to-remove are set at very small criterion levels to assure that each variable is entered into the equation. The criterion for variable inclusion depends on the increment of the group hit rates rather than on a minimization of Wilks lambda. Thus, the procedure offers a cross-validation of the findings from the stepwise procedure while eliminating some of the shortcomings of stepwise analyses (Huberty, 1989).

The direct entry method of cross-validation consists of two steps. First, variable selection is performed with forward selection procedures to determine which variables contribute enough to group hit rate to be considered viable variables. Second, variable ordering will be determined by backward selection procedures to determine the comparative contribution of the variables that remained after variable selection.

The first step, variable selection, will be determined by examining which subsets of the five personality variables best maximize the correct classification rates (Huberty, 1989). A total of $p(p+1)/2$ runs will be made to determine which combination of variables maximizes hit rate. The
first step considers the classification rates for each variable entered individually. The variable with the highest hit rate is considered the best single variable. Pairs of variables are next considered, combining the best single variable with all remaining variables. The pair with the highest hit rate is considered the best subset of two. This pair is combined with all possible combinations of three variables by using the remaining variables in combination with the best subset of two. The procedure is continued until p - 1 subsets have been considered. All variables that contribute to any increment in hit rate will be included in the analysis of variable ordering.

Once the variables that adequately contribute to the discrimination of anxious and depressed subjects have been specified, the next step is to determine the order of the variables. In order to accomplish this, a backward selection procedure is used. All variables that remain from the variable selection procedure will be entered simultaneously to determine the overall classification rate. The next step is to use the leave-one-out method (Huberty, Wisenbaker, & Smith, 1987). Several runs are made, each excluding one of the variables under consideration. The variable that contributes to the largest drop in classification rate, when excluded, is considered the best discriminating variable. The next step involves
systematically removing each variable, one at a time, to determine which variable contributes to the largest drop in the remaining classification rate. This procedure is continued until only one variable remains. That last variable is considered the variable that contributes the least to accurate group discrimination.
CHAPTER IV
RESULTS

This research study was designed to address three basic questions: (a) what is the pattern of responses on the "Big Five" personality scales among the clinically depressed group, the clinically anxious group, the mixed clinical group, and the normative control group; (b) which personality variables are significantly different between the three clinical groups; and (c) which, if any, of the personality factors that comprise the "Big Five" effectively discriminate between anxiety and depression? The effectiveness of the discriminant function to correctly classify subjects to their appropriate diagnostic group will also be investigated.

**Personality Patterns Among Groups**

This first results section presents the data in graphical form to present an initial pictorial representation of the findings that will be statistically examined in subsequent sections. The first graph presents the mean "Big Five" scores of four different groups: (a) the clinically depressed group, (b) the clinically anxious group, (c) the mixed clinical group, and (d) the normative control group (see Figure 1). The specific values of the means and standard deviations are found in Table 3.
Figure 1. Bar graph comparison of means.

Table 3

Mean Comparison Between Groups

<table>
<thead>
<tr>
<th></th>
<th>X (SD) N</th>
<th>X (SD) E</th>
<th>X (SD) O</th>
<th>X (SD) A</th>
<th>X (SD) C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depressed</td>
<td>34.10</td>
<td>24.15</td>
<td>28.93</td>
<td>30.59</td>
<td>31.22</td>
</tr>
<tr>
<td></td>
<td>(7.59)</td>
<td>(7.19)</td>
<td>(6.51)</td>
<td>(5.27)</td>
<td>(6.52)</td>
</tr>
<tr>
<td>Anxious</td>
<td>34.77</td>
<td>24.35</td>
<td>27.94</td>
<td>30.81</td>
<td>26.45</td>
</tr>
<tr>
<td></td>
<td>(4.98)</td>
<td>(7.02)</td>
<td>(6.63)</td>
<td>(5.11)</td>
<td>(5.85)</td>
</tr>
<tr>
<td>Control</td>
<td>24.97</td>
<td>28.80</td>
<td>27.70</td>
<td>31.87</td>
<td>30.73</td>
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<td></td>
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<td>(7.00)</td>
<td>(6.52)</td>
<td>(6.38)</td>
<td>(6.12)</td>
</tr>
<tr>
<td>Normative</td>
<td>19.07</td>
<td>27.69</td>
<td>27.03</td>
<td>32.84</td>
<td>34.57</td>
</tr>
<tr>
<td></td>
<td>(7.68)</td>
<td>(5.85)</td>
<td>(5.84)</td>
<td>(4.97)</td>
<td>(5.88)</td>
</tr>
</tbody>
</table>

Note. X = Mean Score, SD = Standard Deviation. N = Neuroticism, E = Extraversion, O = Openness to Experience, A = Agreeableness, C = Conscientiousness.
In order to better conceptualize how the scores of the three clinical groups compare to the normative control group, Figure 2 presents the means on the grid established from the normative sample. Plotting the location of the mean scores of the three clinical groups (depressed, anxious, and mixed control) shows how the mean scores of these groups would be plotted on the NEO-FFI profile form. Using the profile form, mean scores can be placed into one of five ranges based on $t$-score equivalents: (a) the "very high" range, (b) the "high" range, (c) the "average" range, (d) the "low" range, and (e) the "very low" range.

A final way to illustrate the extent to which the three clinical control groups differ in mean scores on the five personality variables is to present the standardized mean difference effect sizes. Effect sizes show the magnitude of mean differences presented in standard deviation units. A mean difference effect size of .5 moves an individual from the average range into either the high or low category. Means and standard deviations from the normative sample presented in the NEO-FFI manual (Costa & McCrae, 1992) are used as the reference group. Positive effect sizes suggest that the clinical group mean is larger than the normative group mean, while negative effect sizes indicate that the clinical group mean is smaller than the normative group mean. Standardized mean difference effect sizes for each clinical group are presented in Table 4.
### Table 4

**Mean Difference Effect Sizes: Clinical Groups Compared to Normative Sample**

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>E</th>
<th>O</th>
<th>A</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depressed</td>
<td>1.96</td>
<td>-0.61</td>
<td>0.33</td>
<td>-0.45</td>
<td>-0.57</td>
</tr>
<tr>
<td>Anxious</td>
<td>2.04</td>
<td>-0.57</td>
<td>0.16</td>
<td>-0.41</td>
<td>-1.38</td>
</tr>
<tr>
<td>Mixed Control</td>
<td>0.77</td>
<td>0.19</td>
<td>0.11</td>
<td>-0.20</td>
<td>-0.65</td>
</tr>
</tbody>
</table>

**Note.**  
N = Neuroticism  
E = Extraversion  
O = Openness to Experience  
A = Agreeableness  
C = Conscientiousness.
In conclusion, it appears that the depressed and anxious groups score very similarly on three of the five personality variables: (a) neuroticism, (b) extraversion, and (c) agreeableness. Specifically, both score very highly on neuroticism, low on extraversion, and low on agreeableness. The conscientiousness variable, and to a lesser extent the openness to experience variable, appear to be the two variables that covary the least between the depressed and anxious groups. The depressed group scores slightly higher on openness to experience, while the anxious group appears to score substantially lower on the conscientiousness scale.

Analyses of Variance of Clinical Group Means

This section considers which of the five personality variables are differentially scored by the clinically depressed, clinically anxious, and mixed clinical control group. The normative control group is not used in this section since this investigator (KWA) does not have access to the raw data collected by Costa and McCrae (1992). Overall differences on a conglomerate general personality variable are first examined to determine if there are significant differences among the groups on a global personality factor. If this multivariate F value is large enough to reject the null hypothesis regarding equality of
means, univariate $F$ tests will be conducted to determine which of the five personality variables contributed to the significant multivariate $F$ test. One-way ANOVA statistics with multiple comparison procedures will be used to determine which groups have significantly different means.

**Multivariate analysis of variance (MANOVA).** Although the NEO-FFI was designed to represent five orthogonal personality dimensions, this analyses-of-variance section began with a multivariate procedure that combined the five variables into a global personality factor to avoid experimentwise errors, whose probability increases with numerous contrastwise comparisons (Glass & Hopkins, 1984).

Prior to using MANOVA, several tests were conducted to determine if the assumption of homogeneity of variance was violated for any of the five variables. Homogeneity of variance tests indicate that the variance between groups on the neuroticism variable is heterogeneous enough to violate the assumption of homogeneity. Specifically, the variance of the anxious group is significantly smaller than the other two groups. Because group sizes are not equal, a smaller variance in the group with smaller sample size will tend to yield more conservative results (Glass & Hopkins, 1984). Because the anxiety group has a smaller number of subjects than the depressed group, results on the neuroticism factor will be more conservative than they would be if the groups had homogeneous variances. However, the difference in cell
sizes between the three groups is small enough that the effects on alpha should be minimal (Glass & Hopkins, 1984).

The Box's M multivariate test for homogeneity of dispersion was used in order to determine if the heterogeneity of variance on the neuroticism factor was significantly large to affect the pooled estimate of homogeneity of variance. The Box's M multivariate test for homogeneity of dispersion matrices, based on the ratio of the variance-covariance matrices for each group to the pooled variance-covariance matrix, shows that the pooled variance does not violate the overall homogeneity of variance assumption. Results of the homogeneity of variance tests are found in Table 5.

In conclusion, the assumption of homogeneity of variance is not violated for the pooled multivariate variance nor on four of the five personality variables. The neuroticism factor has significantly heterogeneous variances among the three groups. This factor will still be included for the following reasons: (a) the expected effect will make the actual alpha more conservative than the nominal alpha; (b) the magnitude of the effect will be small since the group sample sizes are not highly different (only 10 more depressed than anxious subjects; equal n's are scarcely affected by heterogeneous variances); (c) ANOVA statistics are very robust in spite of violations of assumptions; and (d) the magnitude of the heterogeneity is not sufficiently
Table 5

Tests of Homogeneity of Variance

<table>
<thead>
<tr>
<th></th>
<th>Neuroticism</th>
<th>Extraversion</th>
<th>Openness to Experience</th>
<th>Agreeableness</th>
<th>Conscientiousness</th>
<th>Multivariate (Pooled) Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cochrans C</td>
<td>Max. Var./ Sum (Var.) = .49, p = .04 (approx)</td>
<td>Max. Var./ Sum (Var.) = .34, p = 1.00 (approx)</td>
<td>Max. Var./ Sum (Var.) = .34, p = 1.00 (approx)</td>
<td>Max. Var./ Sum (Var.) = .43, p = .23 (approx)</td>
<td>Max. Var./ Sum (Var.) = .37, p = .82 (approx)</td>
<td>Box’s M = 32.72</td>
</tr>
<tr>
<td>Bartlett-Box F</td>
<td>4.76, p = .01</td>
<td>.02, p = .98</td>
<td>.01, p = .99</td>
<td>.90, p = .41</td>
<td>.21, p = .81</td>
<td>F with (30, 27084) DF = 1.01, p = .45 (approx)</td>
</tr>
<tr>
<td>Maximum Var/ Minimum Var.</td>
<td>3.12</td>
<td>1.05</td>
<td>1.04</td>
<td>1.56</td>
<td>1.24</td>
<td>Chi-Square with 30 DF = 30.31, p = .45 (approx)</td>
</tr>
</tbody>
</table>

large to violate the multivariate test of dispersion (Glass & Hopkins, 1984; Kleinbaum et al., 1988; Norusis, 1988).

A MANOVA procedure was implemented to determine if the multivariate F ratio was large enough to reject the null
hypothesis that group means are equal. The multivariate $F$ ratio was sufficiently large to indicate that the three clinical groups have significantly different means on the global personality variable (Wilks' lambda = .63, $p < .001$). The MANOVA procedure was also used to determine which of the five personality variables contributed to the overall significant $F$ value. This analysis indicated that three of the five personality variables had significantly different means among the three clinical groups. Specifically, neuroticism, conscientiousness, and extraversion had significantly different mean scores among the three clinical groups, while the openness-to-experience and agreeableness variables did not. Summary statistics on the univariate $F$ tests are found in Table 6.

Table 6

Univariate Analyses of Variance

<table>
<thead>
<tr>
<th>Variable</th>
<th>Hypoth MS</th>
<th>Error MS</th>
<th>$F$ value</th>
<th>Significance of $F$</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>944.05</td>
<td>53.98</td>
<td>17.49</td>
<td>.001</td>
</tr>
<tr>
<td>E</td>
<td>220.93</td>
<td>50.13</td>
<td>4.41</td>
<td>.015</td>
</tr>
<tr>
<td>O</td>
<td>15.45</td>
<td>42.90</td>
<td>.36</td>
<td>.698</td>
</tr>
<tr>
<td>A</td>
<td>15.33</td>
<td>31.09</td>
<td>.49</td>
<td>.612</td>
</tr>
<tr>
<td>C</td>
<td>226.64</td>
<td>38.51</td>
<td>5.89</td>
<td>.004</td>
</tr>
</tbody>
</table>

Degrees of Freedom (2, 99) Groups = Clinically Depressed, Clinically Anxious, and Mixed Clinical Control.

Note. N = Neuroticism, E = Extraversion, O = Openness to Experience, A = Agreeableness, C = Conscientiousness.
One-way ANOVA analyses. Results from the multivariate analysis of variance suggest that subsequent analyses are necessary for three personality variables: (a) neuroticism, (b) extraversion, and (c) conscientiousness. These variables have significantly different mean scores among the three clinical groups to warrant further investigation in order to determine which specific group means are significantly different on these three personality variables. Newman-Keuls multiple comparison procedures are used to identify specific mean differences among groups.

The neuroticism scale showed significantly different mean scores among the three clinical groups to merit further consideration \( (F = 17.49, \ p < .0001) \). A one-way analysis of variance was used to determine which of the three clinical groups were significantly different on mean neuroticism scores. Newman-Keuls multiple comparison procedures show that the mixed clinical control group is significantly different than the depressed and anxious groups, while the mean scores of the depressed and anxious groups are not significantly different. Specifically, the control group mean on the neuroticism scale is significantly lower than the other two groups. Compared to the normative sample, the control group scores higher than the normal population on neuroticism while the depressed and anxious groups score even higher than the control group. Results of this analysis are found in Table 7.
Table 7

Significant Differences in Mean Scores: Neuroticism

<table>
<thead>
<tr>
<th>Mean Score</th>
<th>Depressed</th>
<th>Anxious</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>34.09</td>
<td>Depressed</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>34.77</td>
<td>Anxious</td>
<td>N</td>
<td>--</td>
</tr>
<tr>
<td>24.97</td>
<td>Control</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>(19.07)</td>
<td>(Normative)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. Y = significant mean difference at $p = .05$ level.
N = no significant mean difference at $p = .05$ level.

A one-way analysis of variance was also used to determine which of the three clinical groups were significantly different on mean extraversion scores. As noted in the previous section, the differences among group mean scores on the extraversion scale were statistically significant ($F = 4.41, p < .02$). Newman-Keuls multiple comparison procedures show that the mixed clinical control group is significantly different from the depressed and anxious groups. There is no significant difference between the depressed and anxious groups. Specifically, the control group scores are significantly lower than the other two groups on extraversion. Comparison to the normative sample suggests that the control group scores similarly to the normal population, while both the depressed and anxious groups have significantly lower extraversion scores. Results of this analysis can be found in Table 8.
Table 8

Significant Differences in Mean Scores: Extraversion

<table>
<thead>
<tr>
<th>Mean Score</th>
<th>Depressed</th>
<th>Anxious</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>24.15</td>
<td>Depressed</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>24.35</td>
<td>Anxious</td>
<td>N</td>
<td>--</td>
</tr>
<tr>
<td>28.80</td>
<td>Control</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>(27.69)</td>
<td>(Normative)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. Y = significant mean difference at p = .05 level. N = no significant mean difference at p = .05 level.

Finally, a one-way analysis of variance was also utilized to determine which mean scores of the three clinical groups were significantly different on the conscientiousness scale. As mentioned previously, the mean conscientiousness scores were significantly different among the three clinical groups (F = 5.88, p < .004). Newman-Keuls multiple comparison procedures indicate that the clinically anxious group has a mean score that is significantly different from the clinically depressed and mixed clinical control groups. There is no significant difference between the depressed and control groups. Comparison of means shows that the anxious group is significantly lower than the other two groups on the conscientiousness scale. Both the depressed and control groups have low means in comparison to the normative sample, while the mean score of the anxious group is very low in comparison. Results can be found in Table 9.
Table 9

Significant Differences in Mean Scores: Conscientiousness

<table>
<thead>
<tr>
<th>Mean Score</th>
<th>Depressed</th>
<th>Anxious</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>31.22</td>
<td>Depressed</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>26.45</td>
<td>Anxious</td>
<td>Y</td>
<td>--</td>
</tr>
<tr>
<td>30.73</td>
<td>Control</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>(34.57)</td>
<td>(Normative)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. Y = significant mean difference at $p = .05$ level. N = no significant mean difference at $p = .05$ level.

"Big Five" Factors Differentiating Depressed and Anxious Outpatients

This final section examines which of the five personality factors differentiate between depression and anxiety. A two-group discriminant analysis was used to determine which of the "Big Five" variables maximally discriminate between the depressed and anxious groups. Box’s M test of group covariance matrices indicates that the assumption of homogeneity of covariance is not violated (Box’s M = 4.49, $p = .64$). Stepwise procedures were used to determine which of the five personality variables contribute in a linear fashion to maximize the discrimination of the depressed and anxious groups.

The stepwise discriminant analysis is followed by a direct entry method to select the variables that contribute to optimal discrimination of depressed and anxious clients. Contributing variables are determined by a forward selection
procedure. The selection of variables is followed by a backward selection procedure to order the variables based on their relative importance in discriminating among groups. The criterion used for variable inclusion is the correct allocation of cases to the appropriate group. In both phases, the tolerance level of the F test is set at zero to assure that each case will enter the equation. The criterion for removal from the equation is determined by the lack of contribution to the overall correct classification of cases.

**Stepwise discriminant analysis.** Initially, only the conscientiousness factor had a significantly low lambda value to be considered in the discriminant function equation (Wilks' lambda = .87, p > .003). After the conscientiousness variable was entered, both the openness-to-experience and agreeableness factors contributed to enough additional reduction in the lambda value to be included in the equation. Openness to experience was the second factor taken into the discriminant function equation, which significantly lowered the lambda value (Wilks' lambda = .85, p < .004). Agreeableness was the final variable to enter the equation, reducing the lambda value to .84 (p < .007). Partial F values for the remaining two variables were insufficient for inclusion in the discriminant function (F value < 1.0). A summary of the stepwise discriminant function is found in Table 10.
Table 10

**Stepwise Discriminant Analysis**

<table>
<thead>
<tr>
<th>Variables in Analysis</th>
<th>Lambda</th>
<th>Lambda if removed</th>
<th>p level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conscientiousness</td>
<td>.872</td>
<td>.994</td>
<td>.002</td>
</tr>
<tr>
<td>Openness to Experience</td>
<td>.848</td>
<td>.857</td>
<td>.0035</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>.836</td>
<td>.848</td>
<td>.0064</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variables not in Analysis</th>
<th>Lambda</th>
<th>F to enter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extraversion</td>
<td>.830</td>
<td>.455</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>.835</td>
<td>.014</td>
</tr>
</tbody>
</table>

Canonical discriminant function coefficients are listed in Table 11. The standardized coefficients are the multipliers for the discriminant function equation when the variables are converted into units with a mean of 0 and standard deviation of 1. Structure coefficients are also listed in Table 11. Structure coefficients are computed to list the correlation between the function values and the values of the variables (Norusis, 1988). Larger values suggest larger contribution of a variable to the function before considering the correlation among the variables.

The major personality factor that discriminates between the depressed and anxious groups is the conscientiousness
Table 11

Discriminant Function and Structure Coefficients

<table>
<thead>
<tr>
<th>Variables</th>
<th>Standardized</th>
<th>Structure Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conscientiousness</td>
<td>1.06</td>
<td>.85</td>
</tr>
<tr>
<td>Openness to Experience</td>
<td>.40</td>
<td>.17</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>-.32</td>
<td>-.05</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>-.11</td>
<td></td>
</tr>
<tr>
<td>Extraversion</td>
<td>-.03</td>
<td></td>
</tr>
</tbody>
</table>

factor. In fact, a discriminant analysis that excludes the conscientiousness factor did not accept any of the other four variables into the discriminant function. This fact minimizes the complaint that stepwise procedures tend to underemphasize the importance of variables entering later in the equation due to their correlation with variables already entered, since these variables meet criteria for entrance into the discriminant function equation in the absence of the conscientiousness variable. However, the openness to experience and agreeableness factors, in conjunction with the conscientiousness factor, reduced the lambda value enough to be included in the final equation.

In order to determine the utility of the three-factor stepwise discriminant equation, the percentage of subjects that were correctly classified into one of the two groups was examined. There are three criteria commonly used to select prior probability of group assignment (Norusis, 1988). First, the ratio of subjects in each group can be
used. In this study, 57% of subjects were in the depressed group. Second, the ratio from epidemiological studies can be used. One such study suggests that approximately 57% of persons with either an anxiety disorder or depressive disorder have an anxiety disorder (Regier et al., 1988). Third, when all groups appear to be equally likely, probability is set equal for each group. Since our sample has greater representation of depressed individuals (as well as demographic data at Bear River Mental Health), while a nationwide epidemiological study suggests that anxious individuals are more prevalent by an equal proportion (57%), the prior probability was set at $p = .50$ to accommodate the conflicting information.

By considering the weighted responses to items on the conscientiousness subscale, 26 of the 41 (63.4%) depressed clients and 20 of the 31 (64.5%) anxious clients were correctly categorized in their groups (see Table 12). The addition of weighted responses on the "openness to experience" and "agreeableness" subscales correctly assigns an additional 2 depressed (cumulative 68.3%) and 4 anxious (cumulative 77.4%) clients to the correct group (see Table 13). Thus, the majority of the discrimination of depressed and anxious outpatients is attributable to the conscientiousness variable, while the other "Big Five" variables are poor discriminators of the clinical groups.
Table 12

Percent Correctly Assigned to Group by "Conscientiousness" Factor

<table>
<thead>
<tr>
<th>Predicted Group Membership</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual Group</td>
</tr>
<tr>
<td>----------------------------</td>
</tr>
<tr>
<td>Depressed</td>
</tr>
<tr>
<td>Anxious</td>
</tr>
</tbody>
</table>

Mean Percent correctly classified = 63.89%

As can be seen, the "conscientiousness" scale is the most important discriminator between depressed and anxious groups. In fact, by using the mean conscientiousness score between the depressed and anxious groups (29.17) as a cutoff score, 74% of anxious clients (scores below the mean) and 59% of depressed clients (scores above the mean) are correctly placed. The conscientiousness scale is quite useful in reference to the normative sample because only one anxious client scored above the mean conscientiousness score of the normative sample (Costa & McCrae, 1992).

Table 13

Percent Correctly Assigned to Group by Discriminant Factors

<table>
<thead>
<tr>
<th>Predicted Group Membership</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual Group</td>
</tr>
<tr>
<td>----------------------------</td>
</tr>
<tr>
<td>Depressed</td>
</tr>
<tr>
<td>Anxious</td>
</tr>
</tbody>
</table>

Mean Percent correctly classified = 72.22%
In conclusion, the conscientiousness scale is the major determinant that permits differentiation between depressed and anxious groups. Specifically, anxious clients score much lower than depressed clients on this scale. The openness-to-experience and agreeableness scales minimally contribute to the differentiation between the two groups. The mean score for depressed clients is slightly higher than the mean anxious score on the openness scale, while the mean score for anxious subjects on the agreeableness scale is a fraction higher than the mean score for the depressed group. There is no significant difference between the mean scores on the neuroticism scale nor the extraversion scale, and neither scale adds significantly to the discrimination of depressed and anxious outpatients. Finally, the ability of the discriminant function to correctly place depressed and anxious clients is better than chance (probability = .50). However, the number of false placements suggests that the discrimination of depressed and anxious clients by means of the NEO-FFI is not highly accurate. Aside from the conscientiousness scale, depressed and anxious patients score remarkably similar.

**Analysis of items on conscientiousness scale.** Since the conscientiousness scale proved to be the best discriminator between depression and anxiety, it should prove interesting to consider which of the conscientiousness items are most useful in group discrimination. Group
comparisons of the means of each item shows that the anxious group had lower means than the depressed group on all 12 items that comprise the conscientiousness scale. However, mean differences are larger on some items than on others. Six of the items had mean scores for the anxious group that were significantly lower than the depressed group. A listing of the means and alpha level for each item on the conscientiousness scale is given in Table 14. Table 15 presents the content of the items in order of their probability level, along with the NEO-PI subscale that the item was drawn from. Those listed first are the items that were scored lowest by the anxiety group, and thus show the type of statements that anxious clients tend to endorse more frequently.

Table 14
Mean Comparisons: Conscientiousness Items

<table>
<thead>
<tr>
<th>Item #</th>
<th>Anxious</th>
<th>Depressed</th>
<th>p level</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>1.84</td>
<td>2.54</td>
<td>.005</td>
</tr>
<tr>
<td>10</td>
<td>2.42</td>
<td>2.90</td>
<td>.01</td>
</tr>
<tr>
<td>12</td>
<td>2.42</td>
<td>2.90</td>
<td>.02</td>
</tr>
<tr>
<td>4</td>
<td>3.00</td>
<td>3.37</td>
<td>.02</td>
</tr>
<tr>
<td>6</td>
<td>1.90</td>
<td>2.44</td>
<td>.04</td>
</tr>
<tr>
<td>8</td>
<td>2.71</td>
<td>3.12</td>
<td>.05</td>
</tr>
<tr>
<td>11</td>
<td>1.65</td>
<td>2.12</td>
<td>.08</td>
</tr>
<tr>
<td>9</td>
<td>1.68</td>
<td>2.15</td>
<td>.12</td>
</tr>
<tr>
<td>2</td>
<td>1.97</td>
<td>2.36</td>
<td>.17</td>
</tr>
<tr>
<td>7</td>
<td>2.58</td>
<td>2.88</td>
<td>.19</td>
</tr>
<tr>
<td>1</td>
<td>2.48</td>
<td>2.61</td>
<td>.60</td>
</tr>
<tr>
<td>5</td>
<td>1.81</td>
<td>1.83</td>
<td>.93</td>
</tr>
</tbody>
</table>
Table 15

Item Content: Conscientiousness Scale

<table>
<thead>
<tr>
<th>Item</th>
<th>Content</th>
<th>Subscale/Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>I am not a very methodical person (order; p = .005)</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>I am a productive person who always gets the job done (self-discipline; p = .01)</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>I strive for excellence in everything I do (achievement striving; p = .02)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>I try to perform all the tasks assigned to me conscientiously (dutifulness; p = .02)</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>I waste a lot of time before settling down to work (self-discipline; p = .04)</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>When I make a commitment, I can always be counted on to follow through (dutifulness; p = .05)</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>I never seem to be able to get organized (order; p = .08)</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Sometimes I’m not as dependable or reliable as I should be (dutifulness; p = .12)</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>I’m pretty good about pacing myself so as to get things done on time (self-discipline; p = .17)</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>I work hard to accomplish my goals (achievement striving; p = .19)</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>I keep my belongings clean and neat (order; p = .60)</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>I have a clear set of goals and work toward them in an orderly fashion (achievement striving; p = .93)</td>
<td></td>
</tr>
</tbody>
</table>

Note. Words underlined within parentheses represent the NEO-PI-R subscale from which the particular NEO-FFI item was drawn.

The 12 items on the conscientiousness scale of the NEO-FFI come from four larger scales on the NEO-PI-R (Costa & McCrae, 1992). Specifically, three items each come from the
"achievement-striving," "dutifulness," "order," and "self-discipline" scales. Through item analysis it appears that anxious individuals tend to be very low in dutifulness and self-discipline, while orderliness is less notably low. Further, it seems that anxious individuals are only minimally different than depressives in achievement striving.

**Forward selection procedures: Variable selection.** The procedure employed in this section follows the protocol outlined by Huberty (1989). The initial step considers the utility of each variable in correctly assigning cases to the depressed or anxious groups. The results of this step are shown in Table 16. Similar to the results in the stepwise

Table 16

**Classification Rates: "Big Five" Variables**

<table>
<thead>
<tr>
<th></th>
<th>Depressed Assigned Correct</th>
<th>Depressed Assigned Incorrect</th>
<th>Anxious Assigned Correct</th>
<th>Anxious Assigned Incorrect</th>
<th>Correct Assigned Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>20 (48.8%)</td>
<td>21 (51.2%)</td>
<td>20 (64.5%)</td>
<td>11 (35.5%)</td>
<td>55.6%</td>
</tr>
<tr>
<td>E</td>
<td>18 (43.9%)</td>
<td>23 (56.1%)</td>
<td>16 (51.6%)</td>
<td>15 (48.4%)</td>
<td>47.2%</td>
</tr>
<tr>
<td>O</td>
<td>24 (58.5%)</td>
<td>17 (41.5%)</td>
<td>14 (45.2%)</td>
<td>17 (54.8%)</td>
<td>52.8%</td>
</tr>
<tr>
<td>A</td>
<td>20 (48.8%)</td>
<td>21 (51.2%)</td>
<td>15 (48.4%)</td>
<td>16 (51.6%)</td>
<td>48.6%</td>
</tr>
<tr>
<td>C</td>
<td>26 (63.4%)</td>
<td>15 (36.6%)</td>
<td>20 (64.5%)</td>
<td>11 (35.5%)</td>
<td>63.9%</td>
</tr>
</tbody>
</table>
procedures, the conscientiousness variable is clearly the scale that best differentiates depressed and anxious outpatients.

The second step involves the combination of the conscientiousness variable with each remaining variable to determine which dyad has the overall highest rate of correct case assignment (Huberty, 1989). The combination of the conscientiousness and agreeableness scales has the highest hit rate (see Table 17). It should be noted that both the neuroticism and extraversion scales, when added to the conscientiousness scale, actually decrease the overall classification rate.

The third step in the forward selection procedure is to consider which variable contributes to the greatest increase in the best dyad (conscientiousness and agreeableness; see Table 17.

Table 17

Classification Rates: Paired Combinations of "Big Five" Variables

<table>
<thead>
<tr>
<th></th>
<th>Depressed Assigned</th>
<th>Depressed Assigned</th>
<th>Anxious Assigned</th>
<th>Anxious Assigned</th>
<th>Correct Assigned</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Correct</td>
<td>Incorrect</td>
<td>Correct</td>
<td>Incorrect</td>
<td>Total</td>
</tr>
<tr>
<td>NC</td>
<td>24 (58.5%)</td>
<td>17 (41.5%)</td>
<td>21 (67.7%)</td>
<td>10 (32.3%)</td>
<td>62.5%</td>
</tr>
<tr>
<td>EC</td>
<td>25 (61.0%)</td>
<td>16 (39.0%)</td>
<td>21 (67.7%)</td>
<td>10 (32.3%)</td>
<td>63.9%</td>
</tr>
<tr>
<td>OC</td>
<td>27 (65.9%)</td>
<td>15 (36.6%)</td>
<td>20 (64.5%)</td>
<td>11 (35.5%)</td>
<td>65.3%</td>
</tr>
<tr>
<td>AC</td>
<td>26 (63.4%)</td>
<td>15 (36.3%)</td>
<td>23 (74.2%)</td>
<td>8 (25.8%)</td>
<td>68.1%</td>
</tr>
</tbody>
</table>
Table 18). The openness-to-experience scale increments the percentage of correctly assigned cases by 4%. Neuroticism and extraversion do not add to the classification rate.

Table 18
Classification Rates: Three-Variable Combinations of "Big Five" Variables

<table>
<thead>
<tr>
<th></th>
<th>Depressed Assigned</th>
<th>Depressed Assigned</th>
<th>Anxious Assigned</th>
<th>Anxious Assigned</th>
<th>Correct Assigned</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Correct</td>
<td>Incorrect</td>
<td>Correct</td>
<td>Incorrect</td>
<td>Total</td>
</tr>
<tr>
<td>NCA</td>
<td>26 (63.4%)</td>
<td>15 (36.6%)</td>
<td>23 (74.2%)</td>
<td>8 (25.8%)</td>
<td>68.1%</td>
</tr>
<tr>
<td>ECA</td>
<td>27 (65.9%)</td>
<td>14 (34.1%)</td>
<td>22 (71.0%)</td>
<td>9 (29.0%)</td>
<td>68.1%</td>
</tr>
<tr>
<td>OCA</td>
<td>28 (68.3%)</td>
<td>13 (31.7%)</td>
<td>24 (77.4%)</td>
<td>7 (22.6%)</td>
<td>72.2%</td>
</tr>
</tbody>
</table>

The final step includes the addition of the remaining variables (neuroticism and extraversion) to the best three-variable subset (conscientiousness, agreeableness, and openness to experience). The addition of either of the remaining variables does not contribute to the overall classification rate of the three-variable subset. Specifically, the addition of the neuroticism variable (CAON) causes the overall hit rate to remain identical to the three-variable classification rate of 72.2%. The addition of the extraversion variable (CAOE) decreases the classification rate to 70.8%, a drop of nearly 1.5%. Similarly, the combination of all five variables drops the correct classification rate to 70.8%.
Backward selection procedures: Variable ordering. The second step in the direct entry approach is to order the variables that were extracted in the variable selection phase. The first step in the backward selection procedure is to enter all variables from the variable selection phase (Huberty, 1989). These variables are the neuroticism, agreeableness, and openness to experience scales. The overall hit rate for these three variables is 72.2%.

The most important variable is the one that causes the largest decrease in classification rate. As can be seen in Table 19, the conscientiousness variable is clearly the most crucial variable in differentiating between depressed and anxious subjects. As previously displayed in Table 16, the openness to experience variable has a higher individual hit rate (52.8%) than the agreeableness variable (48.6%). In fact, the agreeableness variable performs worse than chance assignment. Thus, the listing of personality variables in order of their discriminative utility in differentiating depressed and anxious outpatients is (a) conscientiousness, (b) openness to experience, and (c) agreeableness.

In conclusion, both the stepwise procedures and the direct entry method combine to suggest that clearly the most useful variable in differentiating depressed and anxious clients in this sample is the conscientiousness variable. In fact, the combined hit rate of the other four personality
Table 19
Classification Rates: Backward Elimination of Variables

<table>
<thead>
<tr>
<th></th>
<th>Depressed Assigned</th>
<th>Depressed Incorrect</th>
<th>Anxious Assigned Correct</th>
<th>Anxious Assigned Incorrect</th>
<th>Correct Assigned Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>OC</td>
<td>27 (65.9%)</td>
<td>14 (36.6%)</td>
<td>20 (64.5%)</td>
<td>11 (35.5%)</td>
<td>65.3%</td>
</tr>
<tr>
<td>OA</td>
<td>24 (58.5%)</td>
<td>17 (41.5%)</td>
<td>16 (51.6%)</td>
<td>15 (48.4%)</td>
<td>55.6%</td>
</tr>
<tr>
<td>AC</td>
<td>26 (63.4%)</td>
<td>15 (36.3%)</td>
<td>23 (74.2%)</td>
<td>8 (25.8%)</td>
<td>68.1%</td>
</tr>
</tbody>
</table>

variables is also worse than chance assignment (47.2%). The variable that adds both to the largest increase in hit rate and the largest decrease in the lambda value is the openness-to-experience variable. The third variable that adds to an increment in the hit rate is the agreeableness variable. However, agreeableness is only useful when considered in combination with other variables. Considered separately, it also performs worse than chance. Finally, the neuroticism variable, while inconsequential when considered with other variables, does perform better than chance in differentiating depressed and anxious subjects. However, it does not fit well into a model that involves the other four variables of the "Big Five" model.
The purpose of this study was to address three basic questions: (a) what is the pattern of responses to the "Big Five" subscales among the clinically depressed, clinically anxious, mixed clinical control, and normative control groups; (b) which personality variables are significantly different among the three clinical groups; and (c) which personality factors differentiate anxiety and depression?

**Personality Patterns Among Groups**

The first question considers the pattern of responses of the three clinical groups (depressed, anxious, and mixed control), with the normative sample (Costa & McCrae, 1992) used as a comparison group. Those personality features that appear to be substantially different from the normative mean are presented in the following sections.

**Personality pattern of depressed patients.** The "Big Five" profile for depressed clients could be summed up as follows: Depressed subjects tend to score very high in neuroticism, low-average in extraversion, average in openness to experience, low-average in agreeableness, and low-average in conscientiousness. Neuroticism scores are nearly two standard deviations above the normative sample mean, while extraversion and conscientiousness means are over one-half standard deviation below the normative mean.
Personality pattern of anxious patients. The "Big Five" profile for anxious clients is summed up as follows: They tend to score very high in neuroticism, low-average in extraversion, average in openness to experience, low-average in agreeableness, and low-very low in conscientiousness. Similar to depressed clients, neuroticism and extraversion are important components in clients with anxiety, while conscientiousness is also a crucial variable. The mean neuroticism score was over two standard deviations above the normative mean, the mean conscientiousness score was 1 1/3 standard deviations below the norm, and the extraversion scale was over one-half standard deviation below the norm.

Personality pattern of mixed clinical patients. The personality pattern for the mixed clinical control group was examined in an attempt to parcel out personality patterns that may be associated with members of a general clinical population. The "Big Five" personality profile for the clinical control group could be summed up as follows: high-average in neuroticism, average in extraversion, average in openness to experience, average in agreeableness, and low-average in conscientiousness. Mean neuroticism scores are about three-fourths standard deviation above the norm, while conscientiousness is nearly two-thirds standard deviation below the mean normative score. It is plausible that high neuroticism and low conscientiousness may be personality aspects of mental health patients in general.
Mean Differences Among Groups

ANOVA statistics were computed to determine which of the three clinical groups had significantly different means on the five personality scales. Neuroticism, extraversion, and conscientiousness were differentially scored by the three clinical groups to the point of statistical significance. Multiple comparison procedures were used to determine which of the three means were different on each variable. On the neuroticism and extraversion scales, the clinical control group was significantly different than the depressed and anxious groups. There was no significant difference between the depressed and anxious groups on either of these variables.

Thus, while high neuroticism and low extraversion were personality patterns noted for both depressed and anxious groups, their mean scores covaried on these two variables so that they were virtually identical. The conscientiousness variable, on the other hand, was scored significantly lower by the anxious group than the other two groups. Of the five personality variables that comprise the "Big Five," it appears that the conscientiousness variable is the most obvious scale that is differentially scored by anxious versus depressed outpatients. The other four "Big Five" variables are scored remarkably similar by depressed and anxious clients.
Discrimination of Depression and Anxiety

While neuroticism and extraversion were both noted in the previous sections as important features in the profiles of depressed and anxious subjects, their degree of covariation renders them ineffective in discriminating between the two diagnostic groups. Interestingly, the three factors that have been least examined in relation to depression and anxiety (conscientiousness, openness to experience, and agreeableness) are the three discriminating variables.

Specifically, conscientiousness is by far the most important discriminating variable, allowing correct group assignment for 64% of clients. The inclusion of the openness-to-experience and agreeableness variables increases the correct assignment of patients by an additional 8%. While neuroticism and extraversion have long been investigated in relation to both depression or anxiety, this study suggests that simultaneous consideration of scores on these variables shows that the depressed and anxious groups are virtually identical.

Integration of Findings

In a nutshell, conscientiousness proves to be the crucial variable in discriminating between depressed and anxious clients. While very high neuroticism and somewhat lower extraversion are noted in both depressed and anxious clients, their covariation is so similar that their
influence as potential discriminators is completely nullified. Openness to experience and agreeableness statistically contributed to the discriminant function even though mean scores between depressed and anxious groups on these two variables are not significantly different.

Conscientiousness is particularly potent in the prediction of anxiety. Low scores occurred very frequently in anxiety disorder clients. Only one client scored above the mean normative sample score. In fact, 87% of anxious clients scored in the low or very low range of conscientiousness scores. Depression has no such unique distinguishing factor. Perhaps the most unique factor associated with the depressed group is the higher openness-to-experience score. However, this finding is noted only as a trend, and the openness-to-experience scale is not practically useful in distinguishing depressed clients in this sample.

Integration with Previous Research

"Big Five" and negative affect. Several previous studies considered the relationship of two of the "Big Five" factors (neuroticism and extraversion) with general negative affect (Costa & McCrae, 1980; Emmons & Diener, 1985; Meyer & Shack, 1989; Warr et al., 1983; Watson & Clark, 1984; Watson & Clark, 1992). Combined results suggest that neuroticism, but not extraversion, is consistently associated with negative affect.
By merging the depressed and anxious clients as persons experiencing negative affect, this study confirms the strong association between negative affect and neuroticism. The results of the study also suggest that extraversion is negatively associated with negative affect. However, extraversion and neuroticism did not hold up in multivariate discriminant analysis and were not considered a contributory factor in discriminatory ability.

McCrae and Costa (1991) simultaneously examined the association of all five personality variables with negative affect. They found that negative affect was associated with very high neuroticism, low agreeableness and conscientiousness, and high openness to experience. Extraversion showed no significant association.

The present study supports the strong positive association between neuroticism and negative affect as well as the negative association between negative affect, conscientiousness, and agreeableness. The positive association between negative affect and openness to experience was noted only for depressed subjects. Contrary to McCrae and Costa’s findings (1991), there was a negative association between negative affect and extraversion.

"Big Five" with sadness and fear. Watson and Clark (1992) considered the association of "Big Five" variables to sadness and fear, affects typically associated with depression and anxiety, respectively. They suggested that
sadness is strongly associated with neuroticism and extraversion, with openness to experience is a weakly associated variable. Fear was associated strongly with neuroticism and weakly with conscientiousness.

The present study supports the strong relationship between sadness and neuroticism. It also lends support to the relationship between openness to experience and sadness, while the association with extraversion was found to be less strongly associated than Watson and Clark postulated. The association between fear and neuroticism was also found in this study. Similarly, the association between conscientiousness and fear was supported by this study, although the present findings suggest that the association is much stronger than previously believed (Watson & Clark, 1992).

"Big Five factors with depression. Previous researchers have provided ample support confirming the link between neuroticism and depression (Davidson et al., 1988; Dritschel & Teasdale, 1991; Frank et al., 1987; Hill & Kemp-Wheeler, 1986; Teasdale & Dent, 1987), yet a couple of studies question the association (Rich & Scovel, 1987; Clark et al., 1989). This study likewise supports the strong positive association between neuroticism and depression. Clinical depression is strongly associated with very elevated neuroticism scores.
Some researchers attest to the negative association between "extraversion and depression" (Boyce et al., 1990; Lester, 1989), while others do not (Clark et al., 1989; Dritschel & Teasdale, 1991; Hirschfeld et al., 1989; Levenson et al., 1988; Lolas et al., 1991). Hill and Kemp-Wheeler (1986) found the association between depression and extraversion was mild after controlling for the covariation with neuroticism. This current result supports the findings of Hill and Kemp-Wheeler. While lower extraversion was noted in the depressed group, the association between depression and extraversion was nullified after controlling for covariation between neuroticism and extraversion.

Prior studies have suggested that there may be a negative association between depression and openness to experience (Camp, 1986; Pernicano, 1986; Rodrigue et al., 1987), while others disconfirm the link (Ross, 1989; Weiner & Pfeffer, 1986) or suggest a positive association (McCrae & Costa, 1991). In this study, openness to experience is positively associated with depression, which has rarely been found in prior research. Part of the discrepancy can be the use of dependent measures such as IQ scores and interest in activities which do not fully represent the openness-to-experience factor. The one study that actually measured the openness-to-experience variable found a positive association with negative affect (McCrae & Costa, 1991).
Agreeableness has consistently shown a negative association to depression (Hokanson et al., 1991; Levenson et al., 1988; Brown & Zeichner, 1989; Finman & Berkowitz, 1989; Motowidlo et al., 1986). While this study found that agreeableness scores were somewhat lower for depressed subjects, there was no significant difference among the mean scores for the depressed, anxious, or control groups. Agreeableness was minimally useful in contributing to the discrimination of depressed and anxious groups. Of all five personality variables, agreeableness proved the least useful in any of the analyses conducted in this study.

Conscientiousness, which has been virtually unexamined in its association with depression, has turned out to be the most crucial variable of the "Big Five" in differentiating between anxiety and depression. Further, it was the most important factor in discriminating between assignment to the depressed or anxious groups. The findings of this study show that levels of conscientiousness are low among persons who are clinically depressed.

"Big Five" factors with anxiety. Similar to studies on the association between neuroticism and depression, most studies considering the relationship between anxiety and neuroticism find a strong, positive association (McCown & Johnson, 1991; Houtman & Bakker, 1991; Turner et al., 1991). This study confirms the association between neuroticism and anxiety. In essence, persons with anxiety disorders tend to
have very high neuroticism scores. However, neuroticism is a very poor variable in discriminating between depression and anxiety because both groups score very highly on this variable.

The numerous studies on the association between extraversion and anxiety offer mixed results. Several studies confirm a significant negative association (Pitman & Orr, 1986; Wilson & Mutero, 1989), while others do not support the link (Levenson et al., 1988; McCown & Johnson, 1991; Lolas, 1991; Lau, 1990). This study found somewhat low levels of extraversion among anxious clients. However, extraversion was not useful in predicting assignment to the anxious group, nor was it helpful in discriminating between depressed and anxious groups.

There are very few prior studies exploring the relationship between openness to experience and anxiety. This study suggests that this variable is not important in the profile of anxiety-disordered clients nor in the ability to predict membership to the anxious group. While openness to experience was an important variable in discriminating between depressed and anxious groups, the difference is attributed to elevated depression scores and not from abnormal scores among the anxiety-disordered group.

Previous evidence on the link between agreeableness and anxiety is sparse, with some evidence of support (Levenson et al., 1988). This study suggests that agreeableness tends
to be somewhat lower among anxious clients. However, the variable is not an important predictor of anxiety, and only mildly contributes to the discrimination among depression and anxiety.

Finally, conscientiousness has not been extensively researched in relation to anxiety. However, this variable was by far the most useful variable in predicting membership to the anxious group and in differentiating between depression and anxiety. In this sample of clients with anxiety disorders, very low conscientiousness was the single most important factor associated with this group. In fact, the finding on the negative association between anxiety and conscientiousness is perhaps the most important finding of this study.

**Improvements over Previous Research**

*Use of clinical population.* This study presents several major advantages over previous research. One improvement is the simultaneous use of clinically depressed, anxious, and mixed control outpatients seeking psychological services instead of the use of college students who simply have high scores on depression and anxiety inventories. While classifying research subjects with the use of self-report inventories provides useful information, it should not be assumed that high scores on affective measures are equivalent to a diagnosed psychological disorder. This study provides information about actual clinical cases with
depressive and anxiety disorders. Use of actual clients has more generalizability to clinical populations than the use of college students who score highly on affective measures.

Further, the specification of the clinical groups was also an important aspect of this study. Ruling out cases with comorbid disorders served to make the diagnostic groups as homogeneous as possible. Excluding such disorders as personality disorders, drug and alcohol abuse disorders, thought disorders, and dual diagnoses (both a depressive and anxiety disorder) helped to eliminate possible confounding variables. Specification of inclusion and exclusion criteria increases the probability that observed differences are attributed to actual differences in the populations under study.

**Simultaneous use of depressed and anxious clients.**

This study elucidates the importance of considering depressed and anxious clients simultaneously. If either of these groups had been studied independently, results would have emphasized that the distinguishing personality features were very high neuroticism, low extraversion, low agreeableness, and low conscientiousness. Openness to experience would have been considered a variable in which scores are in the average range. While all of these conclusions are true about depressed and anxious groups, they are not necessarily unique features of either. In fact, neuroticism, extraversion, and agreeableness scores
are virtually identical for both depressed and anxious groups. Failure to examine both groups simultaneously may not answer important questions about unique features associated with a particular disorder. Further, examining these groups together allows the researcher to determine overlapping and unique features.

**Clinical control group.** The inclusion of a control group of clients with adjustment disorders, parent/child problems, and marital problems increases the numbers of comparisons that can be made in this study. The major benefit of using a clinical control group is to partial out levels of depression and anxiety common among people seeking psychological services. Using a clinical control group instead of the normative sample provided in the NEO-FFI manual (Costa & McCrae, 1992) provides a better comparison group for the two clinical groups being studied. Differences from the clinical control group can be more accurately attributed to the specific diagnostic group and not as artifacts of being a mental health patient.

**Simultaneous consideration of all "Big Five" factors.** Since the inventory to quantify the "Big Five" was only recently developed (Costa & McCrae, 1985), and the establishment of the five-factor model has only recently emerged as a legitimate model over the last decade, there are few studies that include all five personality variables simultaneously. Prior to the development of the NEO-PI
(Costa & McCrae, 1985), Eysenck's personality inventory was used extensively (Eysenck & Eysenck, 1964; 1975). Since the Eysenck Personality Questionnaire only contains scales for two of the five "Big Five" factors (neuroticism and extraversion), research on clinical samples has mostly investigated these two aspects.

The five-factor model has taken years to develop, and now personality researchers are calling for studies that apply the model to a variety of domains (John, 1990; McCrae & John, 1992). Considering the five factors simultaneously allows researchers to more fully understand the complexities of personality traits of depressed and anxious clients. In fact, the three variables that remained in the stepwise discriminant analysis were the three "Big Five" variables that are not part of the Eysenck inventory and that have been least rigorously investigated in association with depression and anxiety.

**Use of multivariate analyses.** The use of multivariate analyses considers the effects of covariation among the variables. Variables that seem to be quite important in univariate mean comparisons may be insignificant in multivariate investigation. Furthermore, variables that do not appear significant in univariate analyses emerge as important discriminant factors in multivariate analyses. For instance, in this study extraversion seemed to be a crucial variable in the profiles of depressed and anxious
clients. However, extraversion was an insignificant factor in the discriminant function. While conscientiousness was deemed one of several important variables in univariate statistics, it emerged as the most critical variable in the discriminant analysis. Other factors, such as openness to experience and agreeableness, emerged as important variables only during multivariate discriminant analyses. Thus, the use of multivariate techniques in this study allowed the association between the "Big Five" and various clinical populations to be clarified.

Use of double-blind design. The use of receptionists naive to the diagnosis of the client, and the use of clients who did not know the particular reason they were selected to participate, contribute to the internal validity of the study. Experimenter bias was controlled since no expectation could be communicated to the client by a receptionist who did not know the reason why the person was selected. Clients also could not perform according to expectations of the group they represented, since they were completely uninformed of the reason for their selection. Double-blind methodology helps assure that the observed differences can be attributed to actual group differences without contamination by researcher or client expectation.
Limitations of Study

Failure to limit age range. One flaw of this study is the failure to delimit age range. The major reason for the expanded age range was to find enough clients with the appropriate diagnoses to meet the specified quota (n = 30 for each group). However, the risk of not circumscribing age is that several variables associated with the wide age range may confound the results.

Lack of equal representation among groups. The study also would have been more interesting if there had been equal representation of the three diagnostic categories of depression, and the three diagnostic categories of anxiety. For instance, only three subjects with a diagnosis of panic disorder were used, while generalized anxiety disorder was represented by 18 subjects. Equal representation would have made the results more generalizable (externally valid) to the general categories of depressive and anxiety disorders. Equal representation did not occur due to lack of availability of clients in the various categories. Essentially every client that met the diagnostic categories was used, and numbers were sparse enough that specification for age and diagnostic category was not possible.

Heterogeneity of control group. Another weakness of the study was the heterogeneous nature of the control group. The philosophy behind the selection of the control group was to choose those who were involved in psychotherapy but had
more mild problems. This selection criterion for the control group was made intuitively and not modeled after a similar control group from another research effort. It can be argued that the clinical control group used in this study represented a "garbage can" category that lacked specificity or was not adequately delimited.

**Minimal demographic variables.** The study would have also been better if more demographic variables had been collected. Possible influential variables such as marital status, years of education, type of occupation, and so forth, could have been solicited. This information was not solicited in order to help insure the confidentiality of clients and to minimize the time requirement for participation. It was deemed more important to get the information on the NEO-FFI, and petitioning additional information increased the chances that potential subjects would refuse to participate or be hesitant to disclose honestly for fear of being identified.

**Threats to internal validity.** There are two possible threats to internal validity: (a) instrumentation and (b) attrition. Subjects were allowed to take the inventory home and return it on their next visit. Once again, this allowance was made in order to maximize client convenience in completing the inventory in order to obtain an adequate number of participants. While the majority of subjects completed the inventory in the waiting room at BRMH, a few
opted to take the inventory home (Note: All inventories are accounted for. Those who took the inventory home were required to return the inventory whether or not they filled it out. Follow-up calls were placed to those who failed to return the inventory upon their next visit). Although the constructs being measured are relatively stable personality traits, completion of all inventories ideally would have taken place in the same setting under the same conditions.

Attrition also is considered a possible threat to internal validity. Although 85% of those asked to participate actually filled out the inventory, there remains the possibility that those who opted not to participate may differ from those who did volunteer. Given the lack of incentives provided for participation, the return rate was considered to be quite high.

**Recommendations for Future Research**

Perhaps the most important prospective study would be a replication of these findings to establish or disconfirm the reliability of these findings. Future efforts to replicate this study should make efforts to correct the limitations of this effort. For instance, equal representation of diagnostic groups could be achieved in a facility with a larger referral base. A larger referral base could also allow specification of age, equal representation by sex, marital status, or other demographic variables.
This study has emphasized the need to consider depression and anxiety simultaneously. Since the two disorders share so many similar features (Brier et al., 1985; Cohen & Biederman, 1988; Hiller et al., 1989; Lipman, 1982; Marks, 1986; Sanderson et al., 1990; Stavrakaki & Vargo, 1986; Stein et al., 1990; Tanaka-Matsumi & Kameoka, 1986; Thompson et al., 1989; Winokur, 1988; Zung et al., 1990), investigations that analyze depression or anxiety in isolation run the risk of stating that a particular variable is unique to the one diagnostic group, while the other disorder may be very similar on that particular variable. The findings in this study lend further support to the similarities between depressed and anxious patients, who scored remarkably similar on three of the five personality variables considered in this study. Future studies should seriously consider the need to study depression and anxiety collaboratively.

Use of the "Big Five" can also be expanded to other populations, including other diagnostic groups. Findings from these research efforts may provide valuable insight into the unique personality constellation of individuals with various diagnoses. This insight may carry etiological, diagnostic, and treatment implications as psychologists further understand the personality factors unique to various conditions.
Finally, use of the five-factor model can be used by health psychologists to determine personality variables that contribute to the development, chronicity, or improvement of various medical conditions. These investigative efforts may prove particularly useful for those disorders that are typically viewed as having a predominant psychological aspect, such as hypertension. The "Big Five" model may also be used in general medical patients to determine personality factors that are associated with a number of medical questions, including postoperative recovery, cancer survivors, noncompliant patients, etc.
REFERENCES


APPENDICES
APPENDIX A

Research Proposal to Bear River Mental Health
RESEARCH PROPOSAL

SUBMITTED TO: Bear River Mental Health Research Committee
FROM: Kent W. Anderson, M.S.

PURPOSE

The general purpose of this research effort is to examine the association between personality and two groups of affective pathology (depressed and anxious individuals). Specifically, the five-factor model of personality will be used in an attempt to differentiate anxious and depressed outpatients. Three research questions will be considered in this study: (a) which, if any, of the personality factors that comprise the "Big Five" differentiate between anxiety and depression; (b) what is the "Big Five" personality profile of depressed outpatients; and (c) what is the "Big Five" personality profile of anxious outpatients. The examination of these three questions will allow us to better understand the complex relationship between the nebulous categories of depression and anxiety.

Subjects: Subjects will be a minimum of 90 outpatients seeking psychological services at Bear River Mental Health Services in Logan, Utah. Thirty subjects will be in each of the three diagnostic groups: (a) clinically depressed outpatients, (b) clinically anxious outpatients, and (c) outpatients whose primary diagnosis is neither depression or anxiety. The depressed group will consist of outpatients
with a primary diagnosis of major depression or dysthymia without a concomitant diagnosis of an anxiety disorder. The anxious group will consist of outpatients whose primary diagnosis is panic disorder with or without agoraphobia, agoraphobia without panic disorder, social phobia, simple phobia, and generalized anxiety disorder, without a concomitant depressive disorder. The control group will be diagnoses other than the affective disorders (depression and anxiety).

None of the groups will use individuals with a diagnosis of thought disorder, personality disorder, or substance abuse. Thought disorders will be eliminated in order to limit this research to neurotic disorders. Personality disorders will be eliminated since chronic personality disturbances will confound research whose dependent variable is a measure of personality. Substance abuse disorders will not be included since variations in personality due to chemical alteration of the individual will likewise confound the results of this study. Thus, the control group will include all axis I disorders and V codes except for anxiety disorders, depressive disorders, substance abuse disorders, and psychotic disorders. All axis II diagnoses will be excluded from this study.

**Measures:** The five-factor model of personality is the dependent measure in this study. It will be quantified with the NEO-FFI (Costa & McCrae, 1989). This five factor self-
rating inventory has 60 phrase-based items. The estimated time requirement to complete this inventory is 10-15 minutes.

**Procedure:** Potential participants are all individuals seeking psychological services at BRMH. The intake worker will be provided with three sheets: (a) a paper with the heading of "depressive disorders", (b) a paper with the heading of "anxiety disorders", and (c) a paper with the heading of "other axis I disorders and V codes." Specific diagnostic categories will be listed on each sheet. The intake worker, after her routine intake interview, will simply write down the client number on the list that conforms to her tentative diagnosis. The added time burden per intake interview for the intake worker is estimated to be less than one minute.

After the assigned therapist has had their first diagnostic interview with the client, the diagnosis of the principal therapist will be compared to the diagnosis of the intake worker (by the researcher, using the client number). If the two raters converge on the diagnosis, the person will be eligible to participate.

At this point, the receptionist will be given the questionnaire and a consent form to be distributed to the identified clients (see attached consent form). The individual will be allowed to take the forms home and return them to the receptionist when they come for their next
session, or may complete the inventory prior to his/her session. The researcher will coordinate the distribution of the forms with the daily schedule. The researcher will never meet the participants and thus will maintain client confidentiality. A box will be provided for the receptionist to place returned questionnaires. All forms will be kept in a locked file cabinet in the researcher's custody after completion. Estimated time requirement for the receptionist is approximately two minutes to distribute the questionnaire per client, and less than one minute to collect completed forms.
APPENDIX B

IRB Proposal
Statement of the PI to the IRB for Proposed Research Involving Human Subjects

Proposal Title: Personality Factors Associated with Negative Affect: Application of the "Big Five" Taxonomy to Depression and Anxiety.

Principal Investigator: Jay R. Skidmore, Ph.D.  Dept. Psy.  UMC 2810  Ext. 1651
Student Investigator: Kent W. Anderson, M.S.  Dept. Psy.  UMC 2810  Ext. 1660

A. Human subjects will participate in this research and be asked to do the following: Fill out a 60-item personality questionnaire. It is estimated that each participant will need 10-15 minutes to complete the personality measure.

B. The potential benefits to be gained from the proposed research are: Increased ability to differentiate between depressed and anxious individuals on the basis of personality correlates associated with these conditions.

C. The risk(s) to the rights and welfare of human subjects involved are: Minimal. Potential discomfort from disclosing personal information. Potential discomfort from self-analysis. Use of a group preselected due to their particular status (outpatient psychotherapy clients).

D. The following safeguards/measures to mitigate/minimize the identified risks will be taken: Questionnaires will be completed at home; questionnaires identified by number only; researcher will not meet the client; subjects will sign consent form prior to participation which details risks.

E. The informed consent procedures for subjects will be as follows: (Explain procedures to be followed and attach an example of the informed consent instrument) Potential subjects will be given consent form by receptionist prior to participation, must sign form before they are given the questionnaire.

F. The following measures regarding confidentiality of subjects will be taken: Questionnaires identified by number only, and the researcher will not meet participants nor any identifying information.

G. Other: (If, in your opinion no, or minimal, risk to subjects exists, please explain in this section) Only potential risk is self-disclosure on a confidential questionnaire. This risk is considered minimal.

Principal Investigator Signature: ___________________________  Student Investigator Signature: ___________________________

* A student researcher should name his/her advisor or chairman as the principal investigator. Both are required to sign this form.

Return to: Sydney Peterson, UMC 9600
APPENDIX C

Bear River Mental Health Approval
August 11, 1993

Dr. Jay Skidmore,

We received the proposal submitted by Mr. Kent Anderson, and granted him permission to conduct research at Bear River Mental Health.

Sincerely,

R. Trent Wentz, Ph.D.
Director of Services

/jw
APPENDIX D

IRB Approval
TO: Jay R. Skidmore and Kent W. Anderson
FROM: Sydney Peterson
DATE: January 21, 1993
SUBJECT: Proposal titled, "Personality Factors Associated with Negative Affect: Application of the 'Big Five' Taxonomy to Depression and Anxiety"

The above-referenced proposal has been reviewed and approved by the Institutional Review Board. If you have any questions, please call me at 750-6924.
APPENDIX E

Consent Form
CONSENT FORM

DESCRIPTION OF STUDY

The purpose of this study is to examine the variation of different peoples' attitudes and feelings. Interested persons will complete a questionnaire that will provide important information for the study. Participation requires the completion of a single questionnaire. All participants will be allowed to take the questionnaire home and bring it with them for their next appointment. It will take approximately 10 to 15 minutes to complete the inventory.

This experiment does NOT involve deception, nor risk of any kind. However, the questionnaire requires self-analysis. Some people may find it uncomfortable to disclose information about their feelings about themselves.

Participation is voluntary and participants may discontinue at any time. However, your participation is important since the field of psychology depends on volunteers, like yourself, to provide information that is vital to our understanding of the similarities and differences between people. Without the participation of people like you, it would be impossible for psychologists to further the study of human nature. Although your participation is greatly appreciated, it is not required.

All information is confidential and will be seen only by a single investigator. Your name or other personal identifiers (e.g., social security number) will NOT be used in this study. Your completed questionnaire will be identified by a number only. After information is gathered from the questionnaires for research purposes, the questionnaires will remain with the researcher in a locked file cabinet. Once again, the questionnaire is identified by number only, so that your identity is kept confidential.

This research project has been approved by the Institutional Review Board at Utah State University and the Review Board at Bear River Mental Health Services. If you have any questions, feel free to contact Dr. J. R. Skidmore, Assistant Professor of Psychology and Principle Investigator (801-750-1451).

If you wish to participate in this study, sign below.

I HEREBY AGREE TO VOLUNTARILY PARTICIPATE UNDER THE CONDITIONS DESCRIBED ABOVE.

Print Name Here                Participant's Signature                Date
APPENDIX F

Raw Data
Raw Data.
ID Number 1-3, Group 4 (1=depressed, 2=anxious, 3=control), Sex 5 (0=Female, 1=Male), Age 6-7, Category 8 (1=Major Depression, Recurrent, 2=Major Depression, Single Episode, 3=Dysthyrnia, 4=Panic Disorder, 5=Phobic Disorder, 6=GAD, 7=Other.

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CURRICULUM VITAE

KENT W. ANDERSON

PERSONAL DATA

Business Address: Dept of Psychiatry & Behavioral Sciences
P.O. Box 26901
Univ of Oklahoma Health Sciences Center
Oklahoma City, OK 73190
Tel. (405) 271-5251

Home Address: 2301 N. W. 122nd, #4106
Oklahoma City, OK 73120
Tel. (405) 751-0357

EDUCATION

University of Oklahoma Health Sciences Center 1993-Present
APA-Approved Clinical Internship
Emphasis: Adult Clinical & Health Psychology

Utah State University, Logan, Utah
Degree: Ph.D.
Major: Professional-Scientific Psychology
Emphasis: Clinical Psychology (APA Approved)
Cumulative GPA: 3.93

Utah State University, Logan, Utah
Degree: M.S.
Major: Clinical Psychology (Pre-doctoral Track)
Cumulative GPA: 3.91

Weber State University, Ogden, Utah
Degree: B.S. (Summa Cum Laude)
Majors: Psychology and Sociology
Minor: Spanish
Cumulative GPA: 3.96

HONORS

Intern Representative: Intern Selection Committee
Clinic Assistant
Presidential Scholarship
Summa Cum Laude graduate
Scholar of the Year recipient
University’s Phi Kappa Phi representative
Outstanding Graduating Student Award-Psychology
Outstanding Graduating Student Award-Sociology
Who’s Who Among America’s College Students
Foreign Language Honors Society-Phi Sigma Iota
Psychology Honors Society-Psi Chi
CLINICAL PSYCHOLOGY INTERNSHIP

Intern: University of Oklahoma Health Sciences Center
Dept of Psychiatry and Behavioral Sciences

1st Rotation (July 1993-Oct 1993)

Major: Neuropsychology Service
Neuropsychological Assessment Laboratory
Oklahoma Memorial Hospital
Duties: Neuropsychological test administration
Test interpretation, scoring, & report writing
Patient & family interviews
Provision of patient feedback
Review of medical charts
Rotation Hours: minimum 25 hours/week
Supervisor: Russell L. Adams, Ph.D., ABPP
Supervision Hours: 2-3 hours/week-individual

Minor: Pediatric Psychology
Pediatric Consultation & Liaison Services, Inpatient
Pediatric Psychology Unit, Pediatric Oncology Unit
Children's Hospital of Oklahoma
Duties: Consultation services
Inpatient treatment planning & implementation
Outpatient psychological services
Group therapy-Inpatient Psychiatry Unit
Psychological & neuropsychological assessment
Rotation Hours: minimum 15 hours/week
Supervisors: C. Eugene Walker, Ph.D., ABPP
Sandy Netherton, Ph.D.
Debi Holmes, Ph.D.
Kevin Krull, Ph.D.
Supervision Hours: 2 hours/week-group
1-2 hours/week-individual

2nd Rotation (Nov 1993-Feb 1994)

Major: Adult Outpatient Psychology
Adult Mental Health Services, Health Psychology Program
The University Hospitals
Duties: Participation on Intake & Evaluation team
Psychological testing & report writing
Outpatient psychotherapy: affective, anxiety, & psychophysiological disorders
Monthly case presentations for required seminar for medical students & psychiatry residents
Rotation Hours: minimum 25 hours/week
Supervisor: Jay R. Skidmore, Ph.D.
Supervision Hours: 1-2 hours/week-individual
2 hours/week-group
CLINICAL PSYCHOLOGY INTERNSHIP (CONT)

Minor: Outpatient Child Psychology, Child Prevention
The University Hospitals
Duties: Participation on intake and evaluation team
Writing evaluation reports
Outpatient child play therapy
Treatment planning, coordination, & implementation
Participation in Self-Esteem Enhancement curriculum in the school system
Curriculum implementation with hispanic population
Rotation Hours: minimum 15 hours/week
Supervisors: Sandy Allen, Ph.D.
Eric Dlugokinski, Ph.D.
Supervision Hours: 1 hour/week-group
1-2 hours/week-individual

3rd Rotation (Mar 1994-June 1994)

Major: Adult Outpatient & Inpatient Psychology
Adult Mental Health Services, Health Psychology Program, Inpatient Psychiatric Unit
The University Hospitals
Duties: Participation on Intake & Evaluation team
Psychological testing & report writing
Outpatient psychotherapy: affective, anxiety, & psychophysiological disorders
Monthly case presentations in required seminar for medical students & psychiatry residents
Group psychotherapy: Inpatient Unit
Group psychotherapy: Health Psychology Program
Participation in multidisciplinary team meetings
Inpatient psychological consultation
Rotation Hours: minimum 25 hours/week
Supervisor: Jay R. Skidmore, Ph.D.
Supervision Hours: 2-3 hours/week-individual

Minor: Adult Behavioral Medicine
Veteran’s Administration Hospital
Duties: Inpatient psychological consultation
Collaborative treatment planning
Treatment implementation/psychotherapy
Psychological testing and evaluation
Psychological intervention with families
Participation with multidisciplinary staff
Rotation Hours: minimum 15 hours/week
Supervisor: John Tassey, Ph.D.
Supervision Hours: Yet to be specified
PRACTICUM TRAINING

Clinical Psychology Practicum Therapist
USU Psychology Department Community Clinic
Date: Jan 1992-June 1992 (10 hours/week)
Duties: individual, couples, & family therapy
  intake interviews
  psychological assessment & report writing
  case presentations
  supervision of beginning therapists
Supervisors: Jay Skidmore, Ph.D.
Total Hours: 200 supervised hours (2 quarters)

Clinical Psychology Practicum Therapist
Behavioral Health Unit, Logan Regional Hospital
Dates: June, 1991 to September, 1991 (20 hours/week)
  October, 1991 to January, 1992 (10 hours/week)
  January, 1992 to March, 1992 (1 day/week)
Duties: Inpatient individual & group psychotherapy
  Psychological testing & evaluations
  Participation in staff meetings
  Emergency room consultation
  Hospital privileges as allied health professional
Supervisor: Bruce Johns, Ph.D.
Total Hours: 500 supervised hours (1 quarter and voluntary time)

Counseling Psychology Practicum Therapist
Utah State University Counseling Center
Dates: August, 1990 to August, 1991 (10 hours/week)
Duties: Individual, group, & couples therapy
  Intake interviews
  Case presentations
  Inservice presentations
Supervisors: Mark Nafziger, Ph.D.
  Mary Doty, Ph.D.
  Gwena Couilliard, Ph.D.
Total Hours: 400 supervised hours (4 quarters)

Child Clinical Psychology Practicum Therapist
Developmental Center for Handicapped Persons
Dates: March, 1990 to August, 1990 (10 hours/week)
Duties: Testing & evaluation of children & disabled adults
  Provision of services with team
  Participation in staff meetings
  Wrap-up sessions with parents
Supervisors: Phyllis Cole, Ph.D.
  Patricia Truan, Ph.D.
Total Hours: 200 supervised hours (2 quarters)
PRACTICUM TRAINING (CONT)

Clinical Psychology Practicum Therapist
USU Psychology Department Community Clinic
Dates: January, 1989 to March, 1990 (10 hours/week)
Duties: Individual, couples, & family therapy
  Intake interviews
  Psychological testing & evaluations
  Case presentations
Supervisors: Damian McShane, Ph.D.
  Jay R. Skidmore, Ph.D.
Total Hours: 500 supervised hours (5 quarters)

Total Practicum Hours: 1800 hours

PAID CLINICAL POSITIONS

Clinical Psychology Assistantship
Bear River Mental Health Services
Dates: October 1991 to June 1993 (25 hours/week)
Duties: Individual, couples, family, & group therapy
  Weekly crisis rotation/crisis intervention
  Participation in staff meetings
  Psychological services for Hispanics
  Voluntary and involuntary hospitalizations
  Medication consultation with psychiatric staff
Supervisor: Leland J. Winger, Jr., Ph.D.
Total Hours: 2500 supervised hours to date

Assessment Therapist
Vocational Rehabilitation Center
Dates: December, 1989 to August, 1991 (as needed)
Duties: Semi-structured diagnostic interviews
  Psychoeducational testing
  Psychoeducational evaluation reports
Evaluations Completed: 55
Supervisor: David M. Stein, Ph.D.
Total Hours: 330 supervised hours

Youth Counselor/Intake Counselor
Moweda Youth Detention Center
Dates: June, 1987 to August, 1987 (30 hours/week)
  Sept, 1988 to Jan, 1989 (10 hours/week)
Duties: Intake & admission of adolescents
  Crisis intervention
  Recreational coordination
  Individual & group therapy
  Consultation with juvenile court
  Court-appointed translator for Hispanic youth
Supervisor: Pat Larsen, M.S.W.
Total Hours: 1200 supervised hours
### SUMMARY OF CLINICAL EXPERIENCE

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<td>Crisis Intervention</td>
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<td><strong>Total through Jan 1994</strong></td>
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Total Supervised Hours (through Jan 1994) = 7050
Total Projected Hours by Internship Completion = 7850

### Assessment:

Tests administered and interpreted

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<td>Mattis Dementia Rating Scale</td>
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<td>Wide Range Achievement Test-Revised</td>
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<td>Matching Familiar Figures Test</td>
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<td>Rey-Osterrieth Complex Figure Test</td>
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<td>Self Rating Scale of Memory Functioning</td>
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<td>Wechsler Memory Scale-Revised</td>
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Vocational Interest:

- Strong-Campbell: 3
- Vocational Preference Inventory: 55
### Assessment (cont)

#### Tests administered and interpreted

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<td>Cognitive Triad Inventory</td>
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<td>Multi-Score Depression Inventory</td>
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<td>Spielberger State-Trait Anxiety Inventory</td>
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<td>Achenbach Child Behavior Checklist (Self, Parent, and Teacher forms)</td>
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<td>Vineland Adaptive Behaviors Scale</td>
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OTHER PROFESSIONAL POSITIONS

Clinic Assistant
USU Psychology Department Community Clinic, Logan, Utah
Dates: June, 1989 to June, 1991 (20 hours/week)
Duties: Individual therapy
Intake interviews
Psychological testing
Database management
Quarterly reports of clinic activity
Acquisition of new testing materials
Train students on test usage
Supervisor: David M. Stein, Ph.D.

Research Assistant
Utah State University, Logan, Utah
Dates: September, 1988 to June, 1989 (10 hours/week)
Duties: Literature review
Home interviews of 100 adolescents
Data entry
Participation in team research meetings
Supervisor: Carol Adams, Ph.D.

PUBLICATIONS


MANUSCRIPTS IN REVISION


MANUSCRIPTS SUBMITTED FOR PUBLICATION


MANUSCRIPTS IN PREPARATION


CURRICULUM DEVELOPMENT


RESEARCH IN PROGRESS


PRESENTATIONS AT PROFESSIONAL CONVENTIONS


PAPERS SUBMITTED FOR PRESENTATION

Anderson, K. W., & Skidmore, J. R. Discrimination of depressed and anxious outpatients with the "Big Five" taxonomy. Submitted to present at the annual meeting of the Association for Advancement of Behavior Therapy, San Diego, CA.

DISSERTATION AND THESIS

Anderson, K. W. Personality factors associated with negative affect: Application of the "Big Five" taxonomy to depression and anxiety. Unpublished doctoral dissertation, Utah State University, Logan, UT.


INVITED IN-SERVICE & COMMUNITY LECTURES


MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

Association for Advancement of Behavior Therapy
American Psychological Association
  Division 12: Clinical Psychology
  Division 49: Health Psychology

OTHER

Bilingual- Speak English and Spanish fluently
REFERENCES

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