NOSOLOGY OF DEPRESSION: NEUROTICISM AS A HIGHER ORDER FACTOR IN A DIMENSIONAL APPROACH TO DEPRESSION

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By

Adam David Hicks

Director: Dr. David M. McCord
Professor and Head of Psychology
Psychology Department

Committee Members: Dr. Kia K. Asberg, Psychology
Dr. Bruce B. Henderson, Psychology

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NOSOLOGY OF DEPRESSION: NEUROTICISM AS A HIGHER ORDER FACTOR IN A DIMENSIONAL APPROACH TO DEPRESSION

Adam David Hicks, M. A.

Western Carolina University (March 2011)

Director: Dr. David M. McCord

The purpose of the current study is to examine the association between personality and depression. The current climate of psychology suggests that a shift may be forthcoming in the area of diagnostics and nosology. This shift is mostly due to arguments being aimed at the current diagnostic model which places all recognized mental disorders into separate categories. The dimensional model is considered the most likely replacement to the categorical model, if and when a change occurs. One of the foundations of this shift has been rooted in personality research, especially research involving the five factor model (FFM) of personality. Much of this research has revealed a distinct association between many different mental disorders and personality qualities, including the personality domain of Neuroticism and depression. There are few studies that delve further than just describing this association in terms more complex than correlational coefficients; though recently there have been efforts to create a personality inventory specifically for use in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-V). The current study attempted a more thorough investigation of the association between Neuroticism and depression. The Center for Epidemiologic Studies

Depression Scale (CES-D) was used to measure the level of depression within participants, and the M5-N-100, which is based on the FFM of personality, was used to gather information on participant's personality. Through the comparison of personality and depression it was found that the Neuroticism domain and its underlying facets correlated very highly (many at a .6 or higher level) with depression. A hierarchical multiple regression was also used to analyze the amount of variance within the participants' CES-D score that could be accounted for by their personality traits while controlling for gender. Results show that about 60% of the variance can be accounted for, mainly by the Depression facet. This study, as well as others, suggests that personality may play a more integral role in the detection and diagnosis of psychopathology than once thought.

CHAPTER ONE: INTRODUCTION

Depression has had somewhat of a checkered history. Once, it was believed to be caused by an excess of black bile (Ingram & Smith, 2008), then it was believed to be a defense mechanism (Feist & Feist, 2006), and then it was believed to be caused by a process of maladaptive behavior reinforcement (Austad, 2009; Feist & Feist, 2006). Currently, depression is believed to be influenced by certain neurotransmitters in the brain, which can be triggered by environmental, biological, and/or psychological events (Ingram & Smith, 2008). Depression is usually diagnosed in a clinical setting through a structured interview. Clients are diagnosed based on the number of criterion symptoms they meet, while ruling out other possible root causes, such as medical illness or drug abuse (Ingram & Smith, 2008). The diagnostic process can be challenging because many disorders in the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision, (DSM-IV-TR) have high comorbidity rates and it is often difficult to make a differential diagnosis (American Psychiatric Association, 2000).

In response to such diagnostic difficulties there is currently a struggle within the psychological and psychiatric community concerning the most appropriate method for diagnosing mental disorders. There are two proposals: the current categorical model or a broader dimensional model. A categorical model adheres to strict criteria that must be met before a diagnosis can be positively given. If an individual meets criteria, they are diagnosed with a disorder, and, if they do not meet criteria, then they are not diagnosed with a disorder. Though this approach is very simple to apply, it must assume that no two disorders are alike and that each disorder is distinct enough to stand alone (Kamphuis

& Noordhof, 2009). These assumptions are easily shaken when reading the DSM-IV-TR. Indeed, it is astounding how many different disorders in the DSM-IV-TR share symptoms and even more astounding that the comorbidity rates among disorders are extremely high (American Psychiatric Association, 2000).

In response to these challenged assumptions, others have proposed a dimensional approach to mental disorders that takes a more integrative stance on diagnostics by incorporating multiple measures into the diagnostic process (Brown & Barlow, 2005). It has been proposed that these measures be merged into one interpretable profile, and then studied for cut-off criteria, thus increasing the diagnostic utility of a dimensional approach (Barlow, 2010). Though the dimensional approach seems to be more holistic when compared to the categorical approach, it is not without criticism. Some have argued that dimensional methods will require the psychological community to reevaluate psychological disorders by creating new cut-off points to separate the diagnosed from those not diagnosed (Trull, 2005). Trull (2005) further comments that the dimensional method will only be as useful as it is practical, but that more research is needed to convince the psychological community that such a change is worthwhile (Kamphuis & Noordhof, 2009). This criticism has been rebutted by the fact that there have been extensive preliminary studies showing that currently understood constructs can be used to "dimensionalize" disorders (Barlow, 2010; Brown & Barlow, 2005; Hicks & McCord, 2010; McGlinchey & Zimmerman, 2007).

One familiar construct that has been studied in conjunction with many different DSM-IV-TR diagnoses and is dimensional in nature is personality. The idea of what personality is has changed dramatically through the years, from Freud's theory of

personality being shaped by early childhood events and defense mechanisms, to the more recent and psychometrically based five factor model (FFM). This theory of personality, advanced by Costa and McCrae (1995), breaks human personality into five overarching domains, each domain being made up of six distinct facets. The FFM has been widely studied, and has been acknowledged by most researchers and experts as providing the basic elements of human personality (e.g., Unruh & McCord, 2009). As mentioned earlier, there have been many studies comparing psychopathology and the FFM, of which many found significant, correlative results (Hicks & McCord, 2010; Proctor & McCord, 2009a; Shelton, Payne, & McCord, 2004). These significant correlations may suggest the existence of higher order constructs within mental disorders, thus providing evidence for their dimensional roots (Barlow, 2010).

When considering the clinical applicability of this categorical versus dimensional debate, it is clear that certain disorders in the DSM-IV-TR are more easily viewed in one diagnostic approach than in the other. For instance, it is easy to view substance abuse disorders in a categorical model, because the diagnosis is simply based on the behavior involved, whereas the Axis II personality disorders are more easily viewed as being dimensional and have recently been converted from the categorical model to a dimensional model in the DSM-V (Widiger, Livesley & Clark, 2009). This transition has indicated to some in the psychological community that in subsequent editions of the DSM there will be dimensional approaches to Axis I disorders as well (Barlow, 2010).

One specific group of Axis I disorders that have proven to be problematic for the categorical model are the mood disorders, specifically the depressive disorders. There are several reasons why depressive disorders are difficult to classify using a categorical

approach. First, the symptoms of depressive disorders are shared by a variety of other allegedly distinct disorders, such as anxiety disorders, and depression is even viewed as a symptom of other disorders in the DSM-IV-TR (American Psychiatric Association, 2000). Also, depression has such a high comorbidity with other disorders that it sometimes becomes impossible to accurately depict which disorder is primary and which is secondary (Kamphuis & Noordhof, 2009).

In response to this diagnostic difficulty, many researchers have searched for evidence to support a dimensional approach to depressive disorders (Brown & Barlow, 2009; Hicks & McCord, 2010; McGlinchey & Zimmerman, 2007). These researchers have used a variety of well-studied, dimensional constructs to correlate to quantified measures of depression. Only through continued research can we provide evidence for the dimensional nature of mental disorders, and only through continued research can we determine the most appropriate measures to use in our diagnostic endeavors. It is for these reasons that the current study was undertaken. This study specifically uses the construct of Neuroticism, as described by the five factor model of personality, and correlates it with a clinical measure of depression in order to provide evidence for using Neuroticism as one of the measures on a diagnostic dimensional profile for depression. This study will also look at the underlying facets of the Neuroticism domain in order to determine which, if any, facets account for a significant amount of the variance in the scores on the depression assessment.

CHAPTER TWO: LITERATURE REVIEW

Brief History of Depression

There are few mental disorders that have such a pronounced written history as that of depression. Hippocrates was one of the first to document a disorder with symptoms very similar to our current diagnoses of depression (Ingram & Smith, 2008). He referred to it as melancholia, and it was believed to be caused by an excess of black bile (2008). This belief in the four humours and associated physical disorders continued for centuries, and though we no longer believe the theory of the four humours today, Hippocrates was correct in assuming that depression has a physical basis (2008). The major problem with the Hippocratic approach to depression is the omission of psychological and environmental factors involved in the formation of depressive symptoms.

Centuries later, depression went through a conceptual shift where it was no longer thought to be caused by some physical imbalance; instead, it was thought to occur in reaction to some perceived stress (Feist & Feist, 2006). In other words, depression was the psychological distress byproduct of defense mechanisms. This conceptual framework was highly dependent on psychoanalytical theories and was discarded around the same time psychoanalysis began to receive serious challenges from other theoretical schools of thought.

Theorists next ascribed depression to be a reaction to both environmental events and cognitive mediation (Austad, 2009). In particular, the cognitive and cognitive-behavioral movements stress that an individual's thoughts exert a strong force on their

emotions, and that individuals must take active roles in changing these cognitions in order to alleviate their symptoms (Austad, 2009; Clark & Beck, 1989). Often times, cognitive-behavioral approaches to depression, especially those in line with Beck's ideas, also ascribe biological bases to depression. These biological aspects have been identified as neurotransmitters, and there have been countless studies showing that depressed brains often have aberrant levels of these specific neurotransmitters, such as serotonin and norepinephrine (Austad, 2009; Ingram & Smith, 2008). Thus, the cognitive-behavioral approach to depression is currently considered the most useful by most mental health practitioners, because it addresses depression from all angles (Austad, 2009; Ingram & Smith, 2008).

Diagnosing Depression

Consider for a moment that symptoms of depression have been present in historical documents since the time of Elijah the prophet (1 and 2 Kings, New King James Version), and it becomes evident that the observational description of depression has not changed that much over the years. However, our approach to diagnosing depression has changed dramatically over the past 50 years. For instance, in the Diagnostic and Statistical Manual of Mental Disorder, First Edition (DSM-I), depression was conceived as a type of defense mechanism in reaction to anxiety (American Psychiatric Association, 1952) and was not considered to be a stand-alone diagnosis. Depression eventually became recognized as its own specific diagnosis in the DSM-II (American Psychiatric Association, 1968), but was still modeled on psychoanalytical theories.

Currently, depression is diagnosed based on a categorical model, which requires a certain number of symptoms to be present for a certain period of time in order for a positive diagnosis to be made. DSM-IV-TR criteria for both Major Depressive Episode (MDE) and Major Depressive Disorder (MDD) can be found in Table 1 and Table 2 respectively.

Measuring Depression

The diagnostic process does not require depression to be quantified by an instrument, but researchers studying depression need such an instrument in order to carry out clinical research. One such instrument is the Beck Depression Inventory, Second Edition (BDI-II; Beck, Steer, & Brown, 1996). The BDI-II was created based on Beck's theory that cognitive factors are involved in an individual's depressive emotions (Clark & Beck, 1989). Most of the items on the BDI-II are associated with specific criteria found in the DSM-IV-TR, and therapists often use other measures created by Beck when assessing their clients, such as the Beck Anxiety Inventory (BAI), the Beck Hopelessness Scale (BHS), and the Beck Scale for Suicide Ideation (BSS) (Austad, 2009).

Another popular measure, especially among researchers, is the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977). When compared to the BDI-II, the item content of the CES-D is very similar, with the major difference being the lack of a specific question about suicide (Radloff, 1977). While the BDI-II may be more appropriate in clinical settings that are capable of handling possible suicide ideation, the CES-D is more convenient for more basic research because asking questions about suicide often enhances the perceived risk associated with research, making it more

Table 1

Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision,

Criteria for Major Depressive Episode

Major Depressive Episode

A. Five (or more) of the following symptoms have been present during the same 2-week period and represent a change from previous functioning; at least one of the symptoms is either (1) depressed mood or (2) loss of interest or pleasure.
Note: Do not include symptoms that are clearly due to a general medical condition, or mood-incongruent delusions or hallucinations.
(1) depressed mood most of the day, nearly every day, as indicated by either subjective report (e.g., feels sad or empty) or observation made by others (e.g., appears tearful).
Note: In children and adolescents, can be irritable mood.
(2) markedly diminished interest or pleasure in all, or almost all, activities most of the day, nearly every day (as indicated by either subjective account or observation made by others)
(3) significant weight loss when not dieting or weight gain (e.g., a change of more than 5% of body weight in a month), or decrease or increase in appetite nearly every day.
Note: In children, consider failure to make expected weight gains.
(4) insomnia or hypersomnia nearly every day
(5) psychomotor agitation or retardation nearly every day (observable by others, not merely subjective feelings of restlessness or being slowed down)
(6) fatigue or loss of energy nearly every day
(7) feelings of worthlessness or excessive or inappropriate guilt (which may be delusional) nearly every day (not merely self-reproach or guilt about being sick)
(8) diminished ability to think or concentrate, or indecisiveness, nearly every day (either by subjective account or as observed by others)
(9) recurrent thoughts of death (not just fear of dying), recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide
B. The symptoms do not meet criteria for a Mixed Episode.

C. The symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.

D. The symptoms are not due to the direct physiological effects of a substance (e.g., a drug of abuse, a medication) or a general medical condition (e.g., hypothyroidism).

E. The symptoms are not better accounted for by Bereavement, i.e., after the loss of a loved one, the symptoms persist for longer than 2 months or are characterized by marked functional impairment, morbid preoccupation with worthlessness, suicidal ideation, psychotic symptoms, or psychomotor retardation.

Table 2

Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision,

Criteria for Major Depressive Disorder

Major Depressive Disorder

Single Episode

A. Presence of a single Major Depressive Episode

B. The Major Depressive Episode is not better accounted for by Schizoaffective Disorder and is not superimposed on Schizophrenia, Schizophreniform Disorder, Delusional Disorder, or Psychotic Disorder Not Otherwise Specified.

C. There has never been a Manic Episode, a Mixed Episode, or a Hypomanic Episode.
Note: This exclusion does not apply if all the manic-like, mixed-like, or hypomanic-like episodes are substance or treatment induced or are due to the direct physiological effects of a general medical condition.

Recurrent

A. Presence of two or more Major Depressive Episodes.

Note: To be considered separate episodes, there must be an interval of at least 2 consecutive months in which criteria are not met for a Major Depressive Episode.

B. The Major Depressive Episodes are not better accounted for by Schizoaffective Disorder and are not superimposed on Schizophrenia, Schizophreniform Disorder, Delusional Disorder, or Psychotic Disorder Not Otherwise Specified.

C. There has never been a Manic Episode, a Mixed Episode, or a Hypomanic Episode.
Note: This exclusion does not apply if all the manic-like, mixed-like, or hypomanic-like episodes are substance or treatment induced or are due to the direct physiological effects or a general medical condition.

Specify (for current or most recent episode):

Severity/Psychotic/Remission Specifiers
Chronic
With Catatonic Features
With Atypical Features
With Postpartum Onset

Specify:

Longitudinal Course Specifiers (With and Without Interepisode Recovery)
With Seasonal Pattern

difficult to obtain approval from the Institutional Review Board (Hicks & McCord, 2010). Also, the CES-D has been studied on more diverse populations than the BDI-II, which increases confidence in generalizing results (Austad 2009; Radloff, 1991; Thomas & Brantley, 2004).

In addition to the models and diagnoses mentioned above, researchers and theorists have suggested other nosological approaches to depression. One such diagnostic approach, depressive personality disorder, is included in Appendix B: Criteria Sets and Axes Provided for Further Study of DSM-IV-TR (American Psychiatric Association, 2000). This appendix is composed of various disorders that did not have sufficient empirically based evidence for full inclusion in the DSM-IV-TR (2000). The major difference between the recognized depressive disorders and depressive personality disorder is that depressive disorders are considered to be states of being, while depressive personality disorder is considered to be a system of stable personality traits (American Psychiatric Association, 2000; Feist & Feist, 2006; Ingram & Smith, 2008). Before delving further into the current nosological debate, a more thorough understanding of past and present theories of personality is required.

Brief History of Personality

The history of personality theory is as checkered as the conceptualization of depression. Freud was one of the first psychiatrists to propose a personality theory that became well known throughout the world (Feist & Feist, 2006). His ideas revolved around infant and adolescent experiences and how they shaped our personality in adulthood. Freud suggested that human personality existed of three separate parts known as the ego, super-ego, and id. The ego is the main part of our personality, and is the only

fully conscious part of our personality. The super-ego is best described as the conscience, it is primarily unconscious, and works in contradiction to the id, which is the unconscious, animal instinct, driving force of our personality.

Freud's theory effectively intertwined personality and mental disorders because it postulated that all mental disorders were caused by defense mechanisms, or ego defenses, in order to keep the ego intact (Feist & Feist, 2006). Freud basically states that if a person has an overdeveloped super-ego they will always feel anxiety due to the constant pressure to properly conform to society; while someone with an unrestrained id will suffer anxiety from societal repercussions caused by their behavior (Feist & Feist, 2006).

Freud's theories remained popular for many years, but other theories soon followed. Behaviorism was one of the major opponents to Freud's theories, mainly because specific components of Freud's theories were not as easily operationalized as the components of Behaviorism. Even though behaviorist views stand at opposition to Freud's in many different ways, there remains the one similarity in that both intertwine their beliefs of personality with their beliefs of abnormal behavior (Feist & Feist, 2006). Behaviorism concludes that our personality and behavior are both solely the product of reinforcement and modeling (Feist & Feist, 2006). Though applications of Behaviorism are more simply defined and measureable than Freud's, Behaviorism has been criticized for its lack of interest in internal factors, which makes quantifying a construct like personality rather difficult (Austad, 2009).

Introduction of Factor Analysis and the Five Factor Model

Up to this point, no theory of personality had ever been successful in objectively quantifying personality; however, a statistical procedure emerged in the early to mid

1900s to answer this quantifying quandary. Factor analysis, a cornerstone of psychometric personality measurement, began to become popular through research conducted by such scientists as Cattell, Eysenck, Costa, and McCrae. Factor analysis basically examines the relationship between different items and groups items that are very highly correlated into factors. These factors are then examined and named based on a thematic pattern among the items (Hinkle, Wiersma, & Jurs, 2003). Through the use of factor analysis, personality began to be studied and described by a multitude of individuals, each suggesting the optimal number of factors associated with personality (Cattell, 1947; Costa & McCrae, 1995; Eysenck, 1995).

Of these conceptual models, the one that became the most notable was Costa and McCrae's, which originally consisted of three factors: Neuroticism, Extraversion, and Openness. After being presented with research conducted by Goldberg, Costa and McCrae were persuaded to add two more factors: Agreeableness and Conscientiousness; and after conducting further research they were convinced to keep all five factors, dubbed domains, and also found evidence for underlying factors within each broad domain, dubbed facets(Costa & McCrae, 1985, 1995; Wiggins, 1996). A complete list of Costa and McCrae's domains and facets are presented in Table 3.

Measuring Personality Using the Five Factor Model

The most widely used instrument in assessing personality based on the five factor model (FFM) is Costa and McCrae's NEO Personality Inventory Revised (NEO-PI-R; 1992a). Considered the gold standard of FFM personality inventories, the NEO-PI-R is not without its criticism, mainly of its cost. The NEO-PI-R is under copyright, and thus is not available to the public at large, and when one considers that a large amount of

Table 3

Costa and McCrae's 5 Domains and 30 Facets of the Five Factor Model of Personality

1) Neuroticism
   - Anxiety
   - Angry Hostility
   - Depression
   - Self-Consciousness
   - Impulsiveness
   - Vulnerability

2) Extraversion
   - Warmth
   - Gregariousness
   - Assertiveness
   - Activity
   - Excitement-Seeking
   - Positive Emotions

3) Openness to Experience
   - Fantasy
   - Aesthetics
   - Feelings
   - Actions
   - Ideas
   - Values

4) Agreeableness
   - Trust
   - Straightforwardness
   - Altruism
   - Compliance
   - Modesty
   - Tender-Mindedness

5) Conscientiousness
   - Competence
   - Order
   - Dutifulness
   - Achievement Striving
   - Self-Discipline
   - Deliberation

research is conducted on university campuses; it is not surprising that the cost issue is extremely inhibitory of research.

In response to these criticisms, Goldberg created an inventory from a vast collection of items, 2000 plus, that have been correlated to other personality inventories, including the NEO-PI-R. This collection is known as the International Personality Item Pool (IPIP; 1999). Goldberg's setup is most helpful because each item is available for public use, and not just the instrument as a whole. Researchers can create tailor made instruments to suit their research purposes (Proctor & McCord, 2009b).

One such proxy instrument is the M5 Questionnaire (McCord, 2002). This questionnaire uses items from the IPIP that have the highest correlations to the corresponding items on the NEO-PI-R. The M5 Questionnaire has proven to be useful in comparing personality constructs to other areas of psychology, including mental disorders (Hicks & McCord, 2010; Proctor & McCord, 2009a; Shelton, Payne, & McCord, 2004). Also, the M5 Questionnaire is comparable to the NEO-PI-R, in that it measures the same five domains and 30 facets, though some facets are differently named. Table 4 contains all the domains and facets of the M5 Questionnaire, with differing NEO-PI-R facet names appearing in parenthesis.

Approach to Diagnoses: Categorical and Dimensional

As mentioned above, there is currently a debate within the psychiatric and psychological communities regarding the best nosological approach to mental disorders, specifically the depressive disorders. This nosological debate runs far deeper than the aforementioned depressive personality disorder. The debate is dominated by two opposing views to diagnosing mental disorders: the current, categorical approach, and a

Table 4

M5 Questionnaire Domains and Facets, with Corresponding NEO-PI-R Facets in Parenthesis

1) Extraversion
   - Friendliness (Warmth)
   - Gregariousness
   - Assertiveness
   - Activity
   - Excitement-Seeking
   - Cheerfulness (Positive Emotions)

2) Agreeableness
   - Trust
   - Morality (Straightforwardness)
   - Altruism
   - Cooperation (Compliance)
   - Modesty
   - Tender-Mindedness

3) Conscientiousness
   - Self-Efficacy (Competence)
   - Order
   - Dutifulness
   - Achievement Striving
   - Self-Discipline
   - Cautiousness (Deliberation)

4) Neuroticism
   - Anxiety
   - Anger (Angry Hostility)
   - Depression
   - Self-Consciousness
   - Immoderation (Impulsiveness)
   - Vulnerability

5) Openness to Experience
   - Imagination (Fantasy)
   - Artistic Interests (Aesthetics)
   - Emotionality (Feelings)
   - Adventurousness (Actions)
   - Intellect (Ideas)
   - Liberalism (Values)

broad, continuum-based dimensional approach.

In a categorical model, all disorders are viewed as having a unique set of symptoms and as being completely separate from one another. A diagnosis is made only if an individual meets a certain number of symptoms and criteria, and only if their disorder can be properly differentiated from others (Kamphuis & Noordhof, 2009). Some examples of true categories include most medical diseases, gender, and eye color.

The major strength of a categorical model for mental disorder diagnosis is that it is simple and easy to understand. Almost all of the criteria sets in the DSM-IV-TR are answered by a simple "yes" or "no" and there is very little room for clinical judgment to enter the diagnosis, except in situations when the client is suffering some form of psychosis or when they are known to lie or over exaggerate (American Psychiatric Association, 2000).

The major criticism of the categorical approach is that some disorders in the DSM-IV-TR tend to have a large number of symptoms in common and also have high comorbidity, especially depressive disorders and anxiety disorders (Barlow, 2010; Brown, 2007; Brown & Barlow, 2009; Kamphuis & Noordhof, 2009; McGlinchey & Zimmerman, 2007). Another major criticism of the categorical approach is its simplistic nature. If disorders were truly categories, then individuals suffering from the same disorder would be expected to present in nearly the exact same way. While it is true that most disorders follow similar patterns, research has shown that there are more differences involved than would be expected in a categorical model (Brown & Barlow, 2009).

In response to many of these criticisms, opponents of the categorical model have suggested a continuum based dimensional model. A dimensional model does not focus

on symptoms or criterion lists. Instead, it focuses on multiple dimensional measures, varying from disorder to disorder. For example, a dimensional method of diagnosing depressive and anxiety disorders may include measurements of an individual's stress level, environmental factors, negative emotions, positive emotions, and so forth (Barlow, 2010). This diagnostic profile creates a logical basis for diagnosing because it allows the treating clinician to view all dimensional areas simultaneously and then make a diagnosis based on the total score profile (Brown & Barlow, 2009). The accuracy of such a profile cannot be suggested at this time; however, other dimensional style instruments, such as the Minnesota Multiphasic Personality Inventory – 2 – Restructured Form (Ben-Porath & Tellegen, 2008), are recognized as being highly reliable and valid. Interestingly enough, the best examples of a dimensional profile are personality measures, such as the M5 Questionnaire, and it should come as no surprise that personality disorders are being converted into dimensional models in the upcoming DSM-V (Krueger, Derringer, Markon, Watson, & Skodol, 2011; Widiger et al., 2009).

The major strength of a dimensional approach is its comprehensive nature. Instead of examining symptoms one at a time, it assesses the entire diagnostic picture. This makes it easier to differentiate between disorders, and usually provides much more useful information than would be gained through normal clinical interviews. Also, a dimensional approach would reduce the instances of comorbid disorders, which may lead to more appropriate descriptions of disorders, not to mention more effective treatment plans (Barlow, 2010).

The major criticism against a dimensional approach to mental disorders is that changing from a categorical approach would completely rock the current foundations of

mental disorders to the point that any benefits gained would not be worth the cost (Trull, 2005). It has also been suggested that dimensional approaches to disorders are worthless if they are unable to measure disorders as they are currently understood, or if they are unable to determine a cut-off point to separate the diagnosed from the un-diagnosed (Kamphuis & Noordhof, 2009). Many of these criticisms have been rebuffed by recent research (Brown & Barlow, 2005; Hicks & McCord, 2010), and the dimensional model seems to be gaining support within the DSM community, to the point that within the next couple of editions many Axis I disorders will join the Axis II Personality Disorders in becoming dimensional (Barlow, 2010; Krueger, 2011).

Statement of the Problem

The nature of depression has been debated throughout the centuries. Currently, depression is viewed as having multiple contributing causes, and is usually treated through a combination of therapy and medication (Ingram & Smith, 2008). The current diagnosis of depression is problematic because many symptoms are shared with other disorders and the depressive disorders have some of the highest comorbidity rates in the DSM-IV-TR (American Psychiatric Association, 2000).

Following a push to adopt a dimensionally based diagnostic process, research has shown that there are many underlying constructs that contribute to multiple mental disorders, especially depression and anxiety disorders (Brown, 2007; Brown &Barlow, 2005). Some have suggested that these underlying constructs, usually referred to as higher order factors, need to be combined into one profile to better diagnose and understand depression and anxiety (Barlow, 2010). But, before such a profile is

constructed there needs to be more research related to these higher order factors to see if they are replicable.

The purpose of this study is to provide supportive data for a dimensional approach to diagnosing depression, specifically providing support for the association between the higher order factor of Neuroticism and depression. This study also provides relevant information as to what role, if any, personality, as defined by the five factor model, plays in the symptomatic manifestation of depression, especially the Neuroticism domain and its six underlying facets. Finally, this study provides information as to the ability of personality measures, specifically the Neuroticism domain, to predict the presence of depression, as well as differentiate between depressed and non-depressed individuals.

Hypotheses and Research Questions

Past studies have found correlations in some of the Openness to Experience facets and depression (Carrillo, Rojo, Sanchez-Bernardos & Avia, 2001); however, they have not shown a significant correlation between depression and the overall domain of Openness to Experience. Since this study is only focusing on the overall domain of Openness to Experience and is not measuring all of its underlying facets, it is likely that no significant correlation between CES-D score and Openness to Experience will be found.

Other studies have looked at the construct of Neuroticism and correlated it with depression (Griffith et al., 2010; Hicks & McCord, 2010; Kotov, Gamez, Schmidt, & Watson, 2010). Brown (2007) conducted research using different measures of Neuroticism and compared them to the Beck Depression Inventory (BDI) and found they were highly correlated. These finding were very similar to a pilot study by Hicks and

McCord (2010) that used both the Beck Depression Inventory II (BDI-II) and CES-D, and found they both correlated very highly to each other as well as to the Neuroticism domain and the N3 (depression) facet of the M5-N-100. It should be noted that items on the M5-N-100 Questionnaire are highly correlated to the NEO-PI-R (see Appendix E), so any research conducted with that instrument should be comparable to the current study. Also, the results of a pilot study found that depression correlated negatively with Extraversion, Agreeableness, and Conscientiousness; however, due to a limited sample size only Agreeableness and Conscientiousness were significant (Hicks & McCord, 2010).

The use of a college-aged population as a convenience sample for this study is somewhat problematic because past research has suggested that the stability of personality is not adequately achieved until individuals reach the age of 30 (Costa & McCrae, 1994). However, other research has shown that studies using trait based measures in college-age population samples do show a moderate amount of stability even when an individual is between the ages of 20 and 30 (Watson & Walker, 1996). Watson and Walker (1996) also studied the association between state and trait measures over the same time frame and found that state based measures varied more than the trait based measures. Finally, a college population is seen as being an appropriate sample for this study because past research has shown that the prevalence of depression within the college population is rather high (Westefeld & Furr, 1987). Thus, it is highly probable that the sample population will have a varied population of those reporting a high number of depressive symptoms and those reporting a low number of depressive symptoms.

Thus, based on previous research, the following hypotheses and research questions were made:

Testable Hypothesis #1: Pearson correlations between CES-D scores and the following domains will be significant and negative: Extraversion, Agreeableness, and Conscientiousness.

Testable Hypothesis #2: Pearson correlations between CES-D scores and the Neuroticism domain and the underlying facets (Anxiety, Anger, Depression, Self-consciousness, Immoderation, and Vulnerability) will be significant and positive.

Research Question #1: Will there be a significant difference between male and female participant's correlations (as related to the scores on the CES-D and personality domains and facets of Neuroticism)?

Research Question #2: Will personality domains and facets of Neuroticism account for a significant amount of the variance in the scores on the CES-D for both males and females, when controlling for the Depression facet?

Research Question #2: Will personality domains and the facets of Neuroticism account for a significant amount of the variance in the scores on the CES-D on the overall sample when controlling for gender and the Depression facet?

CHAPTER THREE: METHOD

Participants

There were 163 participants, of which 66 were male (40.5%) and 97 (59.5%) were female. The participants ranged in age between 18 and 25, with the majority (63.2%) of participants being 18. The majority of participants identified themselves as being Caucasian (87.1%) and most participants identified their state of residence as being North Carolina (87.1%). All the participants were undergraduate students from a small university located in the southern region of the United States; and they received course credit for participating in the research.

Measures

The following measures were administered:

Center for Epidemiologic Studies Depression Scale. The Center for Epidemiologic Studies Depression Scale (CES-D) is a commonly used measure of depression, which has been shown to be useful in quantifying depression ratings in the general population (Radloff, 1977). It is a 20 item instrument that is measured using a 4 point Likert-type Scale, with scores ranging from 0-60. There is some debate about the most appropriate cut-off scores to use on the CES-D. In the original study, Radloff (1977) found that 16 was the most appropriate score to use to differentiate non-depressed and depressed participants. Other practitioners have found that it is more helpful to use cut-off scores at multiple layers, such that a score less than 15 indicates no depression, scores between 15 and 21 indicate mild to moderate depression, and scores greater than 21 indicate the possible presence of major depression (Mulhauser, 2010). The CES-D

has been studied across many diverse populations and has shown to be both reliable and valid (Beekman et al., 1997; Radloff, 1977; Radloff, 1991; Thomas & Brantley, 2004). The reliability of the CES-D for the current study, as measured by Cronbach's Alpha, was .901, which indicates that this instrument was able to provide reliable results. To view the CES-D see Appendix C.

M5-N-100 Questionnaire. The M5-N-100 Questionnaire was created for this study and is derived from the International Personality Item Pool (IPIP; Goldberg, 1999). It is a 100-item instrument that utilizes a 5-point Likert-type Scale. A total of 10 items were used to measure the following domains and facets: Extraversion, Agreeableness, Conscientiousness, Anxiety, Anger, Depression, Self-consciousness, Immoderation, Vulnerability, and Openness to Experience. Each set of 10 items were chosen from the IPIP through analysis of the correlations between each item and the corresponding domain/facet of the NEO-PI-R (Costa & McCrae, 1992a). These 10 item sets that were selected had the highest correlations of all IPIP items. Finally, the Neuroticism domain was calculated by adding all the underlying facets (Anxiety, Anger, Depression, Self-consciousness, Immoderation, and Vulnerability). Thus, Neuroticism was composed of a total of 60 items.

Though this specific instrument has never been used before, there have been past studies using the similar item sets that have reported appropriate levels of validity and reliability in the majority of domains, including Neuroticism (Proctor & McCord, 2009; Shelton et al., 2004; Socha et al., 2009). For a full list of Cronbach's Alphas for the current study, see Table 5 below. To view the M5-N-100 see Appendix D.

Table 5

Cronbach's Alphas for M5-N-100 Domains/Facets

Domains/Facets	Cronbach's Alpha
Extraversion	.858
Agreeableness	.767
Conscientiousness	.845
Neuroticism	.945
Anxiety	.837
Anger	.869
Depression	.887
Self-consciousness	.751
Immoderation	.740
Vulnerability	.844
Openness to experience	.775

Procedure

This study was presented to participants in one of the campus computer labs using the Qualtrics computer survey program. All participants read and had a chance to print the informed consent form (see Appendix A) before data collection began. No data were collected concerning the participant's identity, thus allowing the participants to maintain their anonymity.

After the participants read and acknowledged the informed consent form, they began by answering the items on the CES-D, and then provided their responses on the M5-N-100. Participants were then asked to provide demographic information (age, gender, ethnicity, and state of residence). Participants completed the process by reading and having the opportunity to print the debriefing form (see Appendix B), which provided them with more information on depression as well as a website with the location of licensed therapists across the country. Participants were required to answer all questions in order to be considered for this study, though they were allowed to discontinue their participation at any time.

CHAPTER FOUR: RESULTS

Descriptive Statistics

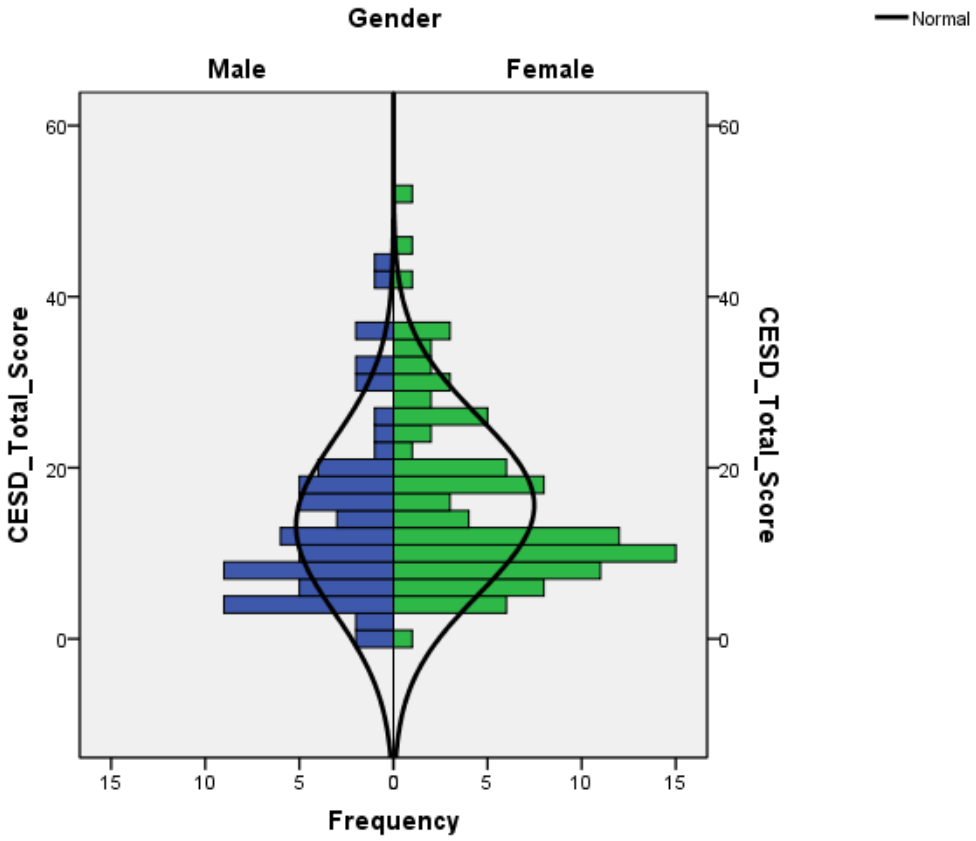
As can be seen in Figure 4.1 below, the distribution of scores on the Center for Epidemiologic Studies Depression Scale (CES-D) fell roughly within a normal distribution for both males and females. This indicates that the sample represents a varied population of individuals, the majority of whom report a moderate number of depressive symptoms, as well as a smaller number of individuals who report a high or low number of depressive symptoms. See Tables 6 and 7 for detailed information on the means and standard deviations for men and women's scores on the CES-D as well as personality domains and facets.

Of the males and females who reported a high number of depressive symptoms, there were similar percentages of each that feel in the high and low depression groups. As mentioned in the Methods chapter, there are different values that are considered to designate high levels of depression. Radloff (1977) considered a score of 16 to be a good cut-off point to differentiate between depressed individuals and non-depressed individuals; while more recently, practitioners have begun to use staggered cut-off points with 21 indicating severe depression (Mulhauser, 2010). For a break-down of the percentages of both males and females who scored higher than the cut-off score (both the more liberal and the more conservative estimates) see Tables 8 and 9 respectively.

Correlations

The relationship between depression (as measured by the CES-D) and personality (as measured by the M5-N-100) was investigated using Pearson product-moment

Figure 4.1 CES-D Score Frequency Across Gender with the Normal Curve



correlation coefficients. Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity and homoscedasticity. There were significant, positive correlations between CES-D score and Neuroticism, as well as its underlying facets. Also, there were significant, negative correlations between CES-D score and Extraversion, Agreeableness, and Conscientiousness. For specific coefficients, see Table 10. For a full list of correlation coefficients, see Appendix F.

Gender specific correlations were also investigated. Similar results were found within both males and females, with identical significant relationships found between CES-D score and the above mentioned personality domains and facets. Though the exact correlation coefficients varied, there were not statistically significant differences found

Table 6

Means and Standard Deviations of CES-D and M5-N-100 scores for Male Participants

Measures	Means	Standard Deviations
CES-D	13.21	10.178
Extraversion	33.39	8.387
Agreeableness	36.11	6.723
Conscientiousness	34.05	7.293
Neuroticism	151.88	33.724
Anxiety	24.85	7.347
Anger	26.35	8.453
Depression	22.14	8.469
Self-consciousness	26.14	6.755
Immoderation	29.53	6.815
Vulnerability	22.88	6.815
Openness to Experience	34.29	7.629

between male and female correlations. For specific coefficients for both males and females, see Table 11. For a complete lists of correlations coefficients separated by gender, see Appendix G.

Hierarchical Multiple Regressions Split by Gender

Two hierarchical multiple regressions, one for male and one for female, were used to assess the ability of personality (as measured by the M5-N-100) to predict levels of

Table 7

Means and Standard Deviations of CES-D and M5-N-100 scores for Female Participants

Measures	Means	Standard Deviations
CES-D	15.59	10.350
Extraversion	36.97	6.536
Agreeableness	36.97	6.536
Conscientiousness	35.05	5.733
Neuroticism	165.16	33.822
Anxiety	30.07	7.484
Anger	27.78	7.609
Depression	22.78	8.233
Self-consciousness	27.32	6.306
Immoderation	29.60	6.372
Vulnerability	27.61	7.389
Openness to Experience	34.59	6.664

n= 163 for all cells

depression (as measured by the CES-D), after controlling for the influence of the Depression facet of Neuroticism. Preliminary analyses were conducted within each group to ensure no violation of the assumptions of normality, linearity, multicollinearity, and homoscedasticity. The Depression facet of the Neuroticism domain was entered at Step 1, and explained 73.1% of the variance in CES-D score for males and 61% of the variance in CES-D score for females.

Table 8

Males and Females CES-D Cut-off Score: 16 Point Cut-off

Gender	High Scorers (>16)	Low Scorers (<16)
Males	22 (33.3%)	44 (66.7%)
Females	40 (41.2%)	57 (58.8%)

After the other significantly correlated domains and facets were entered into Step 2 the total variance explained by the model as a whole for males was 79.4%, F (9, 56) = 23.914, $p < .001$; and 66.2% for females, F (9, 87) = 18.966, $p < .001$. The remaining personality domains and facets explained an additional 6.2% of the variance in CES-D score in males, and an additional 5.2% of the variance in CES-D score in the females after controlling for the Depression facet of Neuroticism. For males, this equated an R squared change = .062, F change (8, 56) = 2.109, $p = .050$; and for females this equated an R squared change = .052, F change (8, 87) = 1.677, $p = .115$. In the final model, only the Depression (beta = .805, p < .001) and Anxiety (beta = .445, $p = .005$) facet were statistically significant for the males, and only the Depression (beta = .946, $p < 001$) facet was statistically significant for the females. For a full list of beta values for both males and females, see Table 12.

Hierarchical Multiple Regression: Overall Sample

A hierarchical multiple regression was used to assess the ability of personality (as measured by the M5-N-100) to predict the levels of depression (as measured by the CES-D) after controlling for gender and the Depression facet of Neuroticism. Preliminary

Table 9

Males and Females CES-D Cut-off Score: 21 Point Cut-off

Gender	High Scorers (>21)	Low Scorers (<21)
Males	11 (16.7%)	55 (83.3%)
Females	23 (23.7%)	74 (76.3%)

analyses were conducted to ensure no violation of the assumptions of normality, linearity, multicollinearity, and homoscedasticity. Gender was entered in Step 1, and explained 1.3% of the variance in CES-D score, but was not statistically significant. After gender was entered, the Depression facet was entered in Step 2 and explained a total of 66.2% of the variance in CES-D score.

Finally, the remaining personality domains and facets were entered in Step 3 and explained a total of 71% of the variance in CES-D score, F (10,152) = 37.230, $p < .001$. The Depression facet explained an additional 64.9% of the variance in CES-D score, after controlling for gender, R squared change = .649, F change (1, 160) = 307.657, $p < .001$. The remaining personality domains and facets explained an additional 4.8% of the variance in CES-D score, after controlling for gender and the Depression facet, R squared change = .048, F change (8, 152) = 3.134, $p = .003$. In the final model, the Depression facet (beta = .875, $p < .001$) and the Anxiety facet (beta = .360, $p = .003$) were the only measures that were statistically significant. For a full list of beta values for the overall sample, see Table 13.

Table 10

Pearson Correlations between CES-D Scores and M5-N-100 Domain and Facet Scores

Domains/Facets	Correlations with CES-D
Extraversion	-.313**
Agreeableness	-.354**
Conscientiousness	-.352**
Neuroticism	.746**
Anxiety	.669**
Anger	.428**
Depression	.810**
Self-consciousness	.478**
Immoderation	.354**
Vulnerability	.640**
Openness to Experience	.082

n= 163 for all cells

* Indicates $p < .05$

** Indicates $p < .0005$

Table 11

Male and Female Pearson Correlations between CES-D Scores and M5-N-100 Domain and Facet Scores

Domains/Facets	Males	Females
Extraversion	-.275*	-.423**
Agreeableness	-.428**	-.332**
Conscientiousness	-.443**	-.306**
Neuroticism	.768**	.727**
Anxiety	.731**	.636**
Anger	.399**	.440**
Depression	.855**	.781**
Self-consciousness	.502**	.454**
Immoderation	.286*	.406**
Vulnerability	.671**	.623**
Openness to Experience	.187	-.001

n= 66 for all cells

* Indicates $p < .05$

** Indicates $p < .0005$

Table 12

Male and Female Hierarchical Multiple Regression Results

Coefficients[a]

Gender	Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
			B	Std. Error	Beta		
Male	1	(Constant)	-9.538	1.844		-5.173	.000
		Depression	1.028	.078	.855	13.199	.000
	2	(Constant)	-12.558	9.809		-1.280	.206
		Depression	.805	.130	.670	6.183	.000
		Extraversion	.104	.103	.086	1.016	.314
		Agreeableness	-.177	.164	-.117	-1.077	.286
		Conscientiousness	.061	.125	.044	.492	.625
		Anxiety	.445	.153	.321	2.908	.005
		Anger	-.047	.130	-.039	-.361	.720
		Self_consciousness	.124	.147	.082	.840	.404
		Immoderation	-.097	.123	-.065	-.788	.434
		Vulnerability	-.063	.203	-.042	-.310	.758
Female	1	(Constant)	-6.789	1.949		-3.483	.001
		Depression	.982	.081	.781	12.198	.000
	2	(Constant)	-26.070	11.742		-2.220	.029
		Depression	.946	.135	.753	7.024	.000
		Extraversion	.081	.161	.051	.501	.618
		Agreeableness	.051	.163	.029	.315	.754
		Conscientiousness	.206	.134	.132	1.536	.128
		Anxiety	.286	.193	.207	1.481	.142
		Anger	-.066	.145	-.048	-.454	.651
		Self_consciousness	-.015	.160	-.009	-.093	.926
		Immoderation	-.062	.132	-.038	-.469	.640
		Vulnerability	.124	.191	.089	.651	.517

a. Dependent Variable: CESD_T

Table 13

Overall Sample Hierarchical Multiple Regression Results

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	13.212	1.265		10.441	.000
	Gender	2.376	1.640	.113	1.448	.150
2	(Constant)	-8.950	1.466		-6.107	.000
	Gender	1.728	.963	.082	1.794	.075
	Depression	1.001	.057	.806	17.540	.000
3	(Constant)	-18.965	7.224		-2.625	.010
	Gender	-.578	1.074	-.028	-.538	.592
	Depression	.875	.089	.705	9.878	.000
	Extraversion	.100	.089	.073	1.125	.262
	Agreeableness	-.064	.110	-.038	-.582	.561
	Conscientiousness	.121	.089	.081	1.365	.174
	Anxiety	.360	.121	.274	2.984	.003
	Anger	-.061	.092	-.047	-.663	.508
	Self_consciousness	.054	.106	.034	.512	.609
	Immoderation	-.062	.088	-.039	-.703	.483
	Vulnerability	.031	.130	.023	.241	.810

a. Dependent Variable: CESD_T

CHAPTER FIVE: DISCUSSION

Descriptive Statistics

As seen previously in Tables 8 and 9, about 17-33% of males and 24-41% of females scored high enough on the Center for Epidemiologic Studies Depression Scale (CES-D) to be considered depressed, depending on the selected cut-off criteria (Mulhauser, 2010; Radloff, 1977). This number of depressed individuals (21-38% of the overall sample) falls within the bounds of past reported levels of depression observed on college campuses (Westefeld & Furr, 1987). Also, when comparing the rate of depression among males to females, this study's sample population indicates that for every depressed male subject there were 2 depressed female subjects. The Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR) and other independent research studies have found, in the overall population, a similar ratio of 2:1 (females to males) in the rate of diagnosing Major Depressive Disorder (American Psychiatric Association, 2000; Harkness et al., 2010). Harkness and colleagues (2010) also noted that this was especially true for ages 18 to 29, because females tended to report more stressful and traumatic events occurring during this time frame than males, and males usually reported a larger number of stressful and traumatic events after the age of 50 than females.

Correlations

As seen previously in Table 10, the hypothesized outcomes were indeed found. There were significant correlations found between CES-D score and all personality domains and facets, excluding the Openness to Experience domain. Extraversion,

Agreeableness, and Conscientious were negatively correlated with CES-D score, indicating that individuals who scored high on depression were: unexuberant, quiet, uncooperative, irritable, aimless, and weak-willed. Neuroticism, and its underlying facets, were all positively correlated with CES-D score, indicating that individuals who scored high on depression were likely to be worriers, nervous, emotional, insecure, feel inadequate, and be somewhat hypochondriacal. The highest correlations were found between the Anxiety and Depression facets of Neuroticism and CES-D score. People who score high on these two facets are best described as apprehensive, fearful, prone to worry, prone to feeling guilty, sad, prone to feeling hopeless, lonely, easily discouraged, and often feeling dejected.

These are not necessarily surprising findings considering that the majority of past research have found similar results, especially within the domain of Neuroticism (Barlow, 2010; Brown & Barlow, 2009). It is still interesting that all underlying facets of Neuroticism were found to correlate significantly with CES-D score, because some specific facets (such as Immoderation and Anger) are not immediately associated with depression. Also, the pilot study by Hicks and McCord (2010) revealed that Self-consciousness was not significantly correlated to CES-D score; however, this could have been an artifact from the small sample size.

One unique aspect of this research was the comparison of male and female correlations. As seen previously in Tables 11 and 12, females had larger correlation coefficients in Extraversion, Anger, and Immoderation. Males had larger correlation coefficients in Agreeableness, Conscientiousness, Anxiety, Depression, Self-consciousness, Vulnerability, and Neuroticism. None of these differences were

statistically significant, and both groups had statistically significant correlations in the same variables.

Hierarchical Multiple Regressions Split by Gender

When splitting the sample by gender, it was found that the Depression facet explained the majority of the variance in both males and females scores on the CES-D. This is not surprising, since the personality traits measured by the Depression facet are very similar to the symptoms of diagnosable depression. When entering the other personality domains and facets in Step 2, the Anxiety facet also predicted a significant additional portion of the variance for males; whereas no other personality domain or facet predicted a significant additional amount of the variance for females.

Hierarchical Multiple Regression: Overall Sample

For the overall sample, gender became a variable that needed to be controlled, because, as mentioned previously, females have higher rates of depression than males (American Psychiatric Association, 2000; Harkness et al., 2010). However, for this sample, gender was not a significant contributor to the variance in CES-D score. The Depression facet again explained the majority of the variance in CES-D score; but the Anxiety facet was also a significant contributor, once all other personality domains and facets had been entered into the model. These results are not unexpected, considering that item content on the Anxiety and Depression facets are the most similar to the symptoms of depression. It is surprising that other facets, specifically Self-consciousness and Vulnerability, are not also significant contributors since the item content on both are also relevant to the symptom presentation of depression.

General Limitations

Some notable limitations to this research, beside the statistical limitation mentioned above, include the sample composition and instrumentation issues.

Sample Composition. The sample composition is by no means heterogeneous. The ethnic make-up, while normal for most rural southern universities, is by no means a mirror of the general population. Also, the age of the participants was not representative of the general population, though most would argue that personality remains stable across the span of adulthood (McCrae et al., 2000). And although personality is not as stable for individuals between the ages of 18 and 29, there is a moderate amount of stability for trait measuring instruments (Watson & Walker, 1996). It is also possible that participants did not take their charge seriously, which would, of course, call into question the reliability of the results. However, every effort was made to create a positive environment for all participants, and to encourage them to put forth a truthful and genuine effort. Also, it should be noted that the undergraduate participants were able to self-select the studies that they participate in, and they are given descriptions of all the research projects prior to their selection. There is a possibility that the participants selected this study because of some underlying interest or association with depression. However, it should also be noted that all data collection sessions consisted of several different studies running back-to-back, so the participants could just have easily been selecting one of the other studies and not this one specifically. Also, based on the rate of participation, it appears that most participants were more motivated by time constraints than by study selection.

Instrumentation. There were also a few issues regarding the instrumentation used in this study that are limitations to its findings. To begin with, this research used

self-report instruments, and thus carries all the criticisms and limitations of such research. Also, the use of the M5-N-100, which is not a mainstream instrument, is in itself a limitation. However, as noted in the literature review, the M5 is based on and correlated highly to the NEO-PI-R (Costa & McCrae, 1995). The other limitation involving the M5-N-100 is its focus on the facets of Neuroticism and not on the other domain facets. This is a valid criticism, considering that the full M5 inventory is 336 items long (McCord, 2002) and measures all six facets of each of the five domains. One possible way to lessen this limitation would be to use the M5-120 (Johnson, 2001), which provides data on all facets and domains at a reliable and valid level, but requires fewer items and time to complete.

Also, there are several items on the M5-N-100 that are very similar to items on the CES-D. Some have argued that trait based measures are not as stable as many report, and that they vary as much as state based measures (CITE). While it is true that there is less stability within the age group of 18 to 29-year-olds, research has shown that trait based measures still show more stability than state based measures (Watson & Walker, 1996).

One defense for having item overlap on the M5-N-100 and the CES-D is the existence of depressive personality disorder as a diagnosis. Depressive personality disorder is found in Appendix B: Criteria Sets and Axes Provided for Further Study of the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR; American Psychiatric Association, 2000), and has similar symptoms as the other depressive disorders, but the symptoms are seen as constituting core trait representations of the individuals personality and not being representative of a pure state

of affect. The existence of depressive personality disorder is a testament to the difficulty in distinguishing trait and state affects. The fact that personality correlates so highly to a measure of depression, and the fact that personality can explain the majority of variance within a depressive measure may indicate that personality can be used to help differentiate between state based affect disorder and trait based affect disorder.

Finally, the CES-D can be criticized as a poor instrument choice for measuring depression. Sinclair, Horn, and Urbanek (2011) presented a seminar discussing several different measures of depression that are sometimes used within the elderly population. Some of their criticisms of the CES-D were specific to the geriatric patients with dementia; however, they did include some general criticisms as well (2011). A couple of these general criticisms were that the CES-D was not developed to measure the actual severity of depression, and the CES-D was not developed to be a sole diagnostic instrument (Radloff, 1977; Sinclair et al., 2011). It is true that the CES-D should not be the sole determinant when diagnosing a patient with depression, and it was not used as such in this study. However, the belief that it does not measure the severity of depression is arguable. It is clearly similar to the Beck Depression Inventory II (BDI-II; Beck, Steer, & Brown, 1996), which is often considered the gold standard of depression measures. The likely reason why some would argue that the CES-D does not measure the severity of depression is by the way it rates the responses. Specifically, the rating of items is measured in the number of days per week the symptom content occurs; which is not the severity of the symptoms, but the frequency. While true, it should be noted that the DSM-IV-TR measures the severity of depression through the number of symptoms present, not in terms of the severity of each individual symptom, or the severity of

symptoms as a whole (American Psychiatric Association, 2000). Thus, the CES-D provides a valid measurement of the severity of depression based on the criteria set by the DSM-IV-TR.

Implications and Future Directions

Many of the implications of this study have already been discussed in the above sections, but as a general statement, this study implicates that personality has a strong association with the presentation of depression. The fact that this study found such a strong correlation between personality and depression, it echoes some of the ideas Freud expounded about the connection between personality and psychopathology. However, Freud's explanation of the connection between personality and psychopathology (specifically that personality conflicts bring about the existence of psychopathology) cannot be affirmed through the results of this study. A more empirical view of the connection between personality and psychopathology, specifically depression, and one supported by the results of this study, is that our personality plays a role in the possibility of becoming depressed.

The current study, while not sharing Freud's opinion of personality causing depression, did not include any questionnaires or ratings that considered specific depressive conditions or triggers. Therefore, no speculation can be made as to the exact role that personality plays within the realm of depression. Perhaps future research can include such measures to see if certain types of personality differentiate depression in some meaningful way, such as differentiating between state and trait based depressive affect disorders.

Conclusions

The clear message from the current study is that personality may be more relevant in abnormal psychopathological situations than once thought. One promising sign that personality is becoming more integrative in the diagnosis of mental disorders is the creation of the Personality Inventory for DSM-5 (PID5; Krueger, Derringer et al., 2011) that will be included in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-V). This instrument is similar to both the NEO-PI-R (Costa & McCrae, 1995) and the Personality Psychopathology Five (PSY-5; Harkness & McNulty, 1994), but was specifically designed to denote individuals with personality disorders (Krueger, Eaton et al., 2011). However, further study using this instrument has shown that it may be effective in identifying individuals who have active psychopathology ranging from depression and anxiety to psychosis and personality disorders (Krueger, 2011).

The PID5 will remain in the public domain, thus will be available for researchers and clinicians to use. That may ultimately lead to a consensus instrument used in the new diagnostic process. As mentioned in the literature review, many instruments exist that can be useful in diagnosing and measuring different types of psychopathology, as well as personality. However, the vast majority of instruments remain under copyright and are very costly to implement in any large scale fashion. Because the PID5 will remain free to all users, there is the possibility that it may be adopted by the entire field of psychology, researchers and practitioners. Such an adoption would possibility facilitate to the creation of a new diagnostic system, better communication among professionals, and the ability of making one-to-one comparisons of research.

Regardless of the eventual fate of the PID5, it is important for research involving the interaction of psychopathology and personality to continue. The current strand of research seems to indicate that there is a much stronger association between personality and psychopathology, and that this association may in fact prove to be much more practical in use than only being a strong correlation.

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Appendices

APPENDIX A

Informed Consent Form
Project Title: Nosology of Depression:
Neuroticism as a Higher Order Factor in a Dimensional Approach to Depression

What is the purpose of this research?

The purpose of this research is to compare the scores on a clinical depression scale to scores from a personality test; in order to determine if there is a relationship between the trait neuroticism (the tendency to experience negative emotional states) and depression.

What will be expected of me?

You will be asked to give some demographic information (age, sex, and ethnicity) and then complete two questionnaires: the Center for Epidemiological Studies Depression Scale (CES-D) and a modified version of the Five-Factor Model of Personality (M5-N-100). The CES-D consists of 20 statements and measures your level of depression. The M5-N-100 consists of 100 statements and measures different aspects of your personality (level of extroversion, neuroticism, etc.). Please respond to each question as thoroughly and accurately as possible

How long will the research take?

The questionnaires should take approximately 20 minutes to complete.

Will my answers be anonymous?

Yes, you will not be required to provide any identifying information.

Will Confidentiality Ever Be Broken?

No, your confidentiality will never be broken.

Can I withdraw from the study if I decide to?

Yes, you may withdraw from this study at any time for any reason.

Is there any harm that I might experience from taking part in the study?

There is no inherent risk of harm when participating in this study.

How will I benefit from taking part in the research?

If you are a student at WCU, you will be able to redeem your participation in this study for credit in a class that requires participation in research. Your responses will also aid in the future diagnostic process, and will contribute to our understanding of depression.

Who should I contact if I have questions or concerns about the research?

Contact me (Adam Hicks) via email at adhicks3@catamount.wcu.edu . You can also contact the IRB Chair at (828) 227-7212.

I have read the above and consent ___

APPENDIX B

Debriefing

Detailed Explanation of Study

Currently, we view depression as an "all-or-nothing" diagnosis, which is to say that you either have depression or you do not. In order to be diagnosed with most depressive disorders you must meet around five out of nine symptoms, and those symptoms must have been present for a certain length of time. This approach to depression is known as a categorical approach.

There is another approach to depression known as a dimensional approach. The dimensional approach views depression as varying from person to person, and measures depression using multiple variables. Basically, a dimensional approach does not put the emphasis on the presence of a certain number of symptoms, but instead assesses each symptom individually.

The research you just participated in focused on the relationship between depression and a specific component of normal personality as described by the Five Factor Model of Personality. The Five Factor Model of Personality divides personality into five basic areas: Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to Experience. Of these areas, Neuroticism is the one related most to depression and was the major focus of this research.

Treatment Options for Depression

According to the *Diagnostic and Statistical Manual of Mental Disorder, Fourth Edition, Text* Revision, depression is estimated to affect around 20% of the entire US population. There are many different treatment options available, so if you, or anyone you know, are suffering from symptoms of depression there are many places to seek help such as: your family doctor, a private practice psychologist/psychiatrist, or counseling center.

If you are having problems finding a licensed therapist near you, go to http://www.networktherapy.com/ and you will be able to locate one.

If you are a student at Western Carolina University, the contact information for the counseling center can be found on their website http://www.wcu.edu/7946.asp.

I have read/printed the above form __

APPENDIX C

CES-D

The 20 items below refer to how you have felt and behaved during the last week. Choose the appropriate button.

1. I was bothered by things that don't usually bother me.

- Rarely or none of the time (<1 day)
- Some or a little of the time (1-2 days)
- Occasionally or a moderate amount of the time (3-4 days)
- Most or all of the time (5-7 days)

2. I did not feel like eating; my appetite was poor.

- Rarely or none of the time (<1 day)
- Some or a little of the time (1-2 days)
- Occasionally or a moderate amount of the time (3-4 days)
- Most or all of the time (5-7 days)

3. I felt that I could not shake off the blues even with the help of my family or friends.

- Rarely or none of the time (<1 day)
- Some or a little of the time (1-2 days)
- Occasionally or a moderate amount of the time (3-4 days)
- Most or all of the time (5-7 days)

4. I felt that I was just as good as other people.

- Rarely or none of the time (<1 day)
- Some or a little of the time (1-2 days)
- Occasionally or a moderate amount of the time (3-4 days)
- Most or all of the time (5-7 days)

5. I had trouble keeping my mind on what I was doing.

- Rarely or none of the time (<1 day)
- Some or a little of the time (1-2 days)
- Occasionally or a moderate amount of the time (3-4 days)
- Most or all of the time (5-7 days)

6. I felt depressed.

- Rarely or none of the time (<1 day)
- Some or a little of the time (1-2 days)
- Occasionally or a moderate amount of the time (3-4 days)
- Most or all of the time (5-7 days)

7. I felt everything I did was an effort.

- Rarely or none of the time (<1 day)
- Some or a little of the time (1-2 days)
- Occasionally or a moderate amount of the time (3-4 days)
- Most or all of the time (5-7 days)

8. I felt hopeful about the future.

- Rarely or none of the time (<1 day)
- Some or a little of the time (1-2 days)
- Occasionally or a moderate amount of the time (3-4 days)
- Most or all of the time (5-7 days)

9. I thought my life had been a failure.

- Rarely or none of the time (<1 day)
- Some or a little of the time (1-2 days)
- Occasionally or a moderate amount of the time (3-4 days)
- Most or all of the time (5-7 days)

10. I felt fearful.

- Rarely or none of the time (<1 day)
- Some or a little of the time (1-2 days)
- Occasionally or a moderate amount of the time (3-4 days)
- Most or all of the time (5-7 days)

11. My sleep was restless.

- Rarely or none of the time (<1 day)
- Some or a little of the time (1-2 days)
- Occasionally or a moderate amount of the time (3-4 days)
- Most or all of the time (5-7 days)

12. I was happy.

- Rarely or none of the time (<1 day)
- Some or a little of the time (1-2 days)
- Occasionally or a moderate amount of the time (3-4 days)
- Most or all of the time (5-7 days)

13. I talked less than usual.

- Rarely or none of the time (<1 day)
- Some or a little of the time (1-2 days)
- Occasionally or a moderate amount of the time (3-4 days)
- Most or all of the time (5-7 days)

14. I felt lonely.

- Rarely or none of the time (<1 day)
- Some or a little of the time (1-2 days)
- Occasionally or a moderate amount of the time (3-4 days)
- Most or all of the time (5-7 days)

15. People were unfriendly.

- Rarely or none of the time (<1 day)
- Some or a little of the time (1-2 days)
- Occasionally or a moderate amount of the time (3-4 days)
- Most or all of the time (5-7 days)

16. I enjoyed life.

- Rarely or none of the time (<1 day)
- Some or a little of the time (1-2 days)
- Occasionally or a moderate amount of the time (3-4 days)
- Most or all of the time (5-7 days)

17. I had crying spells.

- Rarely or none of the time (<1 day)
- Some or a little of the time (1-2 days)
- Occasionally or a moderate amount of the time (3-4 days)
- Most or all of the time (5-7 days)

18. I felt sad.

- Rarely or none of the time (<1 day)
- Some or a little of the time (1-2 days)
- Occasionally or a moderate amount of the time (3-4 days)
- Most or all of the time (5-7 days)

19. I felt that people disliked me.

- Rarely or none of the time (<1 day)
- Some or a little of the time (1-2 days)
- Occasionally or a moderate amount of the time (3-4 days)
- Most or all of the time (5-7 days)

20. I could not get "going".

- Rarely or none of the time (<1 day)
- Some or a little of the time (1-2 days)
- Occasionally or a moderate amount of the time (3-4 days)
- Most or all of the time (5-7 days)

APPENDIX D

M5-N-100

M5-N-100 Questionnaire
David M. McCord, Ph.D., Western Carolina University

Name: _____ Age: _____
Gender: _____ Date: _____
Email: _____ Ethnic identity: _____

This is a personality questionnaire, which should take about 10-15 minutes. There are no right or wrong answers to these questions; you simply respond with the choice that describes you best.

If you feel that you cannot see the pages appropriately because of sight difficulties, cannot use a pencil well because of hand-motor problems, or know of any other physical, emotional, or environmental issues which would affect your performance on this test, please notify the testing administrator now.

If you feel extremely nervous about this testing process and feel that your nervousness will affect your performance, please notify the testing administrator so that they can answer any questions about this process and alleviate any fears. Please recognize that a degree of nervousness is normal for most testing.

The *M5 Questionnaire* is used primarily for research purposes, though in certain cases individual results may be shared with the test-taker through a professional consultation. In general, results are treated anonymously and are combined with other data in order to develop norms, establish psychometric properties of these scales and items, and to study various theoretical and practical issues within the field of personality psychology.

By proceeding with the process and responding to these questionnaire items, you are expressing your understanding of these terms and your consent for your data to be used for research purposes. You are also agreeing to release and forever discharge *Western Carolina University* and *David M. McCord, Ph.D.*, from any and all claims of any kind or nature whatsoever arising from the assessment process.

- Without spending too much time dwelling on any one item, just give the first reaction that comes to mind.
- In order to score this test accurately, it is very important that you answer *every* item, without skipping any. You may change an answer if you wish.
- It is ultimately in your best interest to respond as honestly as possible. Mark the response that best shows how you really feel or see yourself, not responses that you think might be desirable or ideal.

M5-N-100 Questionnaire						Page 2
		Innacurate	Moderately Innacurate	Neither	Moderately Accurate	Accurate
1	Worry about things	O	O	O	O	O
2	Have a vivid imagination	O	O	O	O	O
3	Get angry easily	O	O	O	O	O
4	Believe in the importance of art	O	O	O	O	O
5	Seldom feel blue	O	O	O	O	O
6	Am easily intimidated	O	O	O	O	O
7	Have a sharp tongue	O	O	O	O	O
8	Rarely overindulge	O	O	O	O	O
9	Am not interested in abstract ideas	O	O	O	O	O
10	Find it difficult to get down to work	O	O	O	O	O
11	Panic easily	O	O	O	O	O
12	Tend to vote for liberal political candidates	O	O	O	O	O
13	Am not easily bothered by things	O	O	O	O	O
14	Make friends easily	O	O	O	O	O
15	Get irritated easily	O	O	O	O	O
16	Often feel blue	O	O	O	O	O
17	Am not embarrassed easily	O	O	O	O	O
18	Often eat too much	O	O	O	O	O
19	Get chores done right away	O	O	O	O	O
20	Remain calm under pressure	O	O	O	O	O
21	Fear for the worst	O	O	O	O	O
22	Suspect hidden motives in others	O	O	O	O	O
23	Rarely get irritated	O	O	O	O	O
24	Do not like art	O	O	O	O	O
25	Dislike myself	O	O	O	O	O
26	Keep in the background	O	O	O	O	O
27	Am comfortable in unfamiliar situations	O	O	O	O	O
28	Do just enough work to get by	O	O	O	O	O
29	Don't know why I do some of the things I do	O	O	O	O	O
30	Am always prepared	O	O	O	O	O
31	Can handle complex problems	O	O	O	O	O
32	Tend to vote for conservative political candidates	O	O	O	O	O
33	Am afraid of many things	O	O	O	O	O
34	Seldom get mad	O	O	O	O	O
35	Feel comfortable with myself	O	O	O	O	O
36	Am afraid that I will do the wrong thing	O	O	O	O	O
37	Easily resist temptations	O	O	O	O	O
38	Avoid philosophical discussions	O	O	O	O	O
39	Waste my time	O	O	O	O	O
40	Become overwhelmed by events	O	O	O	O	O
41	Am relaxed most of the time	O	O	O	O	O
42	Believe that others have good intentions	O	O	O	O	O
43	Get upset easily	O	O	O	O	O
44	Am very pleased with myself	O	O	O	O	O
45	Have little to say	O	O	O	O	O
46	Find it difficult to approach others	O	O	O	O	O
47	Do things I regret later	O	O	O	O	O
48	Feel that I'm unable to deal with things	O	O	O	O	O
49	Am not easily disturbed by events	O	O	O	O	O
50	Feel comfortable around other people	O	O	O	O	O
		Innacurate	Moderately Innacurate	Neither	Moderately Accurate	Accurate

M5-N-100 Questionnaire						Page 3
		Innacurate	Moderately Innacurate	Neither	Moderately Accurate	Accurate
51	Am often in a bad mood	O	O	O	O	O
52	Am often down in the dumps	O	O	O	O	O
53	Am afraid to draw attention to myself	O	O	O	O	O
54	Am able to control my cravings	O	O	O	O	O
55	Know how to cope	O	O	O	O	O
56	Get stressed out easily	O	O	O	O	O
57	Am not easily annoyed	O	O	O	O	O
58	Do not enjoy going to art museums	O	O	O	O	O
59	Have a low opinion of myself	O	O	O	O	O
60	Am not bothered by difficult social situations	O	O	O	O	O
61	Go on binges	O	O	O	O	O
62	Can't make up my mind	O	O	O	O	O
63	Don't worry about things that have already happened	O	O	O	O	O
64	Keep my cool	O	O	O	O	O
65	Have frequent mood swings	O	O	O	O	O
66	Don't like to draw attention to myself	O	O	O	O	O
67	Only feel comfortable with friends	O	O	O	O	O
68	Insult people	O	O	O	O	O
69	Never spend more than I can afford	O	O	O	O	O
70	Readily overcome setbacks	O	O	O	O	O
71	Get caught up in my problems	O	O	O	O	O
72	Lose my temper	O	O	O	O	O
73	Feel desperate	O	O	O	O	O
74	Have a good word for everyone	O	O	O	O	O
75	Stumble over my words	O	O	O	O	O
76	Get back at others	O	O	O	O	O
77	Love to eat	O	O	O	O	O
78	Carry out my plans	O	O	O	O	O
79	Get overwhelmed by emotions	O	O	O	O	O
80	Adapt easily to new situations	O	O	O	O	O
81	Rarely complain	O	O	O	O	O
82	Feel that my life lacks direction	O	O	O	O	O
83	Am able to stand up for myself	O	O	O	O	O
84	Never splurge	O	O	O	O	O
85	Am calm even in tense situations	O	O	O	O	O
86	Would describe my experiences as somewhat dull	O	O	O	O	O
87	Carry the conversation to a higher level	O	O	O	O	O
88	Don't see things through	O	O	O	O	O
89	Am skilled in handling social situations	O	O	O	O	O
90	Respect others	O	O	O	O	O
91	Pay attention to details	O	O	O	O	O
92	Am the life of the party	O	O	O	O	O
93	Enjoy hearing new ideas	O	O	O	O	O
94	Accept people as they are	O	O	O	O	O
95	Don't talk a lot	O	O	O	O	O
96	Cut others to pieces	O	O	O	O	O
97	Make plans and stick to them	O	O	O	O	O
98	Know how to captivate people	O	O	O	O	O
99	Make people feel at ease	O	O	O	O	O
100	Shirk my duties	O	O	O	O	O
		Innacurate	Moderately Innacurate	Neither	Moderately Accurate	Accurate

APPENDIX E

Correlations and Corrected Correlations Between a 20 Item IPIP Scale and the NEO-PI-R

Domains/(Facets)	Correlations	Corrected Correlations
Neuroticism	.86	.93
N1 (Anxiety)	.75	.90
N2 (Anger)	.76	.91
N3 (Depression)	.80	.92
N4 (Self-Consciousness)	.72	.94
N5 (Immoderation)	.73	.98
N 6(Vulnerability)	.77	.96
Extraversion	.79	.88
Openness to Experience	.83	.92
Agreeableness	.78	.90
Conscientiousness	.80	.88
Total Correlation	**.81**	**.90**

APPENDIX F

Correlation Table for All Variables Overall Sample

	CES-D	E	A	C	N	Anx	Ang	Dep	Self-cons	Immod	Vuln	O
CES-D	1	**-.313**	**-.354**	**-.352**	**.746**	**.669**	**.428**	**.810**	**.478**	**.354**	**.640**	.082
E		1	**.339**	**.389**	**-.384**	**-.228**	-.077	**-.453**	**-.597**	**-.164**	**-.275**	.126
A			1	**.301**	**-.478**	**-.270**	**-.633**	**-.456**	**-.201**	**-.394**	**-.209**	.146
C				1	**-.497**	**-.267**	**-.179**	**-.530**	**-.417**	**-.411**	**-.497**	.131
N					1	**.861**	**.691**	**.825**	**.685**	**.663**	**.847**	-.049
Anx						1	**.549**	**.619**	**.536**	**.393**	**.854**	.007
Ang							1	**.459**	**.243**	**.471**	**.394**	-.011
Dep								1	**.541**	**.448**	**.671**	.019
Self-cons									1	**.331**	**.559**	.004
Immod										1	**.469**	-.073
Vuln											1	.016
O												1

Values bolded represent significant values.

n = 163 per cell.

APPENDIX G

Correlation Table for All Variables Separated by Gender

	CES-D	E	A	C	N	Anx	Ang	Dep	Self-cons	Immod	Vuln	O
CES-D	1	**-.423**	**-.332**	**-.306**	**.727**	**.636**	**.440**	**.781**	**.454**	**.406**	**.623**	-.001
E	**-.275**	1	**.350**	**.466**	**-.563**	**-.439**	**-.230**	**-.582**	**-.697**	**-.204**	**-.475**	-.064
A	**-.428**	**.296**	1	**.215**	**-.514**	**-.391**	**-.678**	**-.458**	-.192	**-.320**	**-.310**	**.216**
C	**-.443**	**.300**	**.390**	1	**-.469**	**-.251**	-.156	**-.526**	**-.371**	**-.367**	**-.511**	.139
N	**.768**	**-.326**	**-.516**	**-.595**	1	**.879**	**.693**	**.852**	**.669**	**.703**	**.847**	-.049
Anx	**.731**	-.212	**-.253**	**.388**	**.833**	1	**.588**	**.633**	**.530**	**.506**	**.811**	-.006
Ang	**.399**	.032	**-.620**	**-224.**	**.687**	**.506**	1	**.535**	**.233**	**.424**	**.386**	-.147
Dep	**.855**	**-.362**	**-.474**	**-.546**	**.807**	**.658**	**.360**	1	**.561**	**.508**	**.679**	-.022
Self-cons	**.502**	**-.579**	-.239	**-.497**	**.703**	**.551**	**.243**	**.512**	1	**.347**	**.510**	.098
Immod	**.286**	-.135	**-.490**	**-.470**	**.637**	**.285**	**.532**	**.368**	**.313**	1	**.542**	-.060
Vuln	**.671**	**-.265**	-.198	**-.605**	**.862**	**.768**	**.394**	**.720**	**.641**	**.418**	1	-.049
O	.187	**.313**	.065	.119	.069	.144	.142	.070	-.114	-.090	.128	1

Values above the diagonal represent females.

Values below the diagonal represent males.

Values bolded represent significant values.

n = 163 per cell.