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CORRELATES OF DISABILITY IN THE MAINE-SYRACUSE LONGITUDINAL
STUDY

by

Grace Marie Avakian

A Thesis Submitted in Partial Fulfillment
of the Requirements for a Degree with Honors
(Psychology)

The Honors College

University of Maine

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Abstract

The present study is designed to address disability. Disability is examined in relation to such mental health variables as depression, anxiety, and general well-being. Data is analyzed from the Maine-Syracuse Longitudinal Study (MSLS); a 38 year study conducted by Dr. Merrill Elias and Dr. Michael Robbins. In the MSLS, symptoms of depression are measured by the Center for Epidemiological Depression Scale and the Zung Depression Scale, symptoms of anxiety are measured by the Spielberger State-Trait Anxiety Inventory, and general well-being is measured by the General Well-Being Adjustment Scale. Disability is assessed by a self report questionnaire pertaining to common activities of daily living. Additional measures of quality of life available in the MSLS were also explored in relation to disability. Scores were analyzed from the age range of 50 and up.

Keywords: disability, depression, anxiety, general well-being

Dedication

I wish to dedicate this to Mama, Baba, Mezmama and Mormor. You have taught me the importance of education and perseverance. I love you, forever.

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Introduction

Correlates of Disability in the Maine-Syracuse Longitudinal Study

There are approximately 316, 128, 839 people living in the United States. According to the United States Census Bureau, 54 million is the "number of people who have a disability. They represent 19 percent of the civilian non-institutionalized population. By age: 5% of children 5 to 7 have disabilities, 10% of people 18 to 64 have disabilities, 38% of adults 65 and older have disabilities" (2013). It is therefore of great importance to explore the factors that correlate with the epidemic of disability. According to researchers of the National Institute of Disability and Rehabilitation Research in 1996, "an estimated 15.0% or 37.7 million non-institutionalized United States residents had an activity limitation. (Kraus, Stoddard, and Gilmartin, 1996). It is important to discuss such topics because as Nagi, (1969) asserts, "disability is not sufficiently publicized but it is very important as well as prevalent." One can see from statistics that disability is certainly prevalent, yet it is important to further research and better publicize it so that health officials may better understand, approach and aid those suffering with various types of disability.

With regards to depression, Bruce (2002) dramatically asserts that "evidence of the contribution of depression to disability and, conversely, of disability to depression suggests that each could initiate a declining spiral itself associated with a range of other negative outcomes, including institutionalization and death." (Bruce, 2002). Furthermore, Bryan Kemp, (2006) states that "depression is one of the most common, if not the most common, secondary conditions associated with disability. When it is left untreated,

depression can cause inordinate personal suffering, increased disability, additional health problems and stress in others" (Kemp 2006).

However, the relationship can be complex, for instance, in one study, "disease severity predicted an increase in all studied variables of disability except in depressive symptoms. Older age and depressive symptoms were associated with mortality." (Chruzander, et al, 2013). Thus severity of disease or disability does not necessarily equate to more symptoms of depression. Another article on disability examined twenty-two existing studies from 1990-2010 and found stunning results. "All studies found that persons with disabilities were at a significantly higher risk of sustaining injuries than those without. Persons with disability had a 30–450% increased odds (odds ratio 1.3–5.5) of sustaining injury compared to persons without disability. Among persons with pre-existing disability, the high risk groups of sustaining an injury are children and elderly" (Yung, 2014). Additionally, in 2011, it was estimated that 27.8 percent of those with disability, who were 21 to 64 and non-institutionalized were living below the poverty line ("Disability statistics," 2013). One can clearly see that disability is a pressing matter due to it being such a widespread problem. When an individual suffers from any disability it is likely that their circumstances will be complicated further by other health compromising factors.

According to the Americans with Disabilities Act, disability in an individual is properly defined as; "a person who has a physical or mental impairment that substantially limits one or more major life activities, a person who has a history or record of such an impairment, or a person who is perceived by others as having such an impairment." (US Department of Justice, 2009) Disability is often viewed from different perspectives; an

individual may suffer disability biologically, psychologically and/or socially. This model of viewing disability through multiple lenses can be recognized as the biopsychosocial model. Although the current study features the Nagi measure for disability, a primarily physical disability measure, it is important to note that disability (biological, psychological, or social) has the ability to influence a variety of aspects in an individual's life and functioning.

According to the Center for Disease Control, the most common causes of disability between 2005 and 1994 in the United States, in order, were arthritis, back/spinal problems, and heart problems (U.S. Census Bureau, 2005). In this study, arthritis was the most common cause of disability overall and it was also the most common cause of disability for women in particular. Back/spinal problems was the second most common cause of disability overall and was the most common cause of disability for men in particular. Heart problems was the third most common cause of disability overall and it ranked third for both genders. These results are revealing as they demonstrate that skeletal health issues tend to cause the most disability. This may be the case over the past two decades because of the growing elderly population in our society. It is possible that we may see a shift in these rankings as our population becomes younger in coming years.

Depression and Disability

Depression has been shown to be capable of strongly contributing to disability (Gurland, 1992). Depression can increase the likelihood of disability, increase the pain, and fatigue caused by disability, increase the side effects of drugs used to treat disability, and it can increase an individual's health care expenses (Koenig et al. 1999; Shaw et al.

2000). It is not always clear in which direction the link between depression and disability flows. Does depression cause a person to be more susceptible to disability or does disability cause depression? Research indicates the answer to be: both, as indicated by previously mentioned; "evidence of the contribution of depression to disability and, conversely, of disability to depression suggests that each could initiate a declining spiral itself associated with a range of other negative outcomes, including institutionalization and death." (Bruce, 2002). Given the debilitating nature of disability, it comes as no surprise that disability and depression share an interconnected relationship. Disability often results in an individual not being able to engage in the same activities or enjoy the same quality of life that they had once been able to, which may put the individual into a depressive mind-set. Viewing the relationship between disability and depression in the opposite direction, a depressed individual may not feel motivated or psychologically able to engage in health promoting behaviors due to their depression, which would increase the likelihood of disability. The occurrence of vascular disease and stroke in individuals have been shown to result often in depression in later life (Hickie & Scott, 1998).

Berkman and others have found that there is a strong association between the initial onset of disability and the eventual onset of depression (1986). In order to determine if disability can serve as a cause of the persistence of depression, researchers conducted a study in which elderly, hospitalized adults were tested for depression regularly and frequently over the course of their hospitalization (at least three years). These psychologists found that the length and severity of an individual's disability can contribute to the likelihood that their already-present depression will persist over time (Geerlings et al. 2000). Another finding produced by this study that was not the central

aspect of the study was that depression and disability seem to be causally intertwined, capable of contributing to one another simultaneously. (Geerlings et al. 2000).

According to the World Health Organization, depression is one of the leading causes of disability across the globe. It is the second greatest contributing source to the Global Burden of Disease and, by 2020, depression is predicted to be the world's second-leading cause of disability (WHO, 2012). Research regarding the association between depression and disability is clearly a pressing matter. Because of the close relationship between depression and disability it can sometimes be unclear if depression can itself be considered a disability. As mentioned previously, the American's with Disabilities Act described two criteria for defining disability: 1) an individual must have a physical or mental impairment; and 2) that physical or mental impairment must substantially limit one or more major life activities (US Department of Justice, 2009). Depression can very easily conform to these criteria depending on the degree of depression and the individual who is suffering from depression. For the purposes of this study, the aim is not to define depression as disability, but rather to investigate how symptoms of depression correlate with physical disability as seen in the Nagi score.

Major and Minor Depression

Depression has been categorized into several distinct subgroups, including major depression and minor depression.

Major depression consists of a combination of some of the following symptoms: "depressed mood, poor concentration, fatigue, changes in appetite, guilt, insomnia and thoughts of suicide" (WHO, 2012). Without treatment, major depression can lead to

physical impairment and even suicide. Major depression has been shown to not be associated strongly with disability (Beekman et al. 1995).

Minor depression has been shown to be associated strongly with disability (Phifer and Murrell, 1986). Minor depression results when depression is clearly present in an individual, but the depression does not quite meet specified diagnostic criteria. According to the DSM IV, minor depression requires that an individual have at least two symptoms of depression, but less than five symptoms within a two-week period (APA, 1994). The fact that minor depression is associated with disability is of note, as it suggests that depression need not contain a large number of symptoms for it to be related to disability. Perhaps it is the symptoms that are present, rather than the number of symptoms that truly establish the relationship between minor depression and disability.

Depression and Physical Disability

Psychological research focusing on how depression may influence physical disability is widespread and thorough, touching on many different aspects of physical disability and proposing many different theories to account for the connection between depression and physical disability.

Research seems to suggest a very strong connection between depression and diabetes (Gavard, Lustman, & Clouse, 1993). While diabetes mellitus is not to be considered a disability, it can be disabling on an individual basis. For example, an individual with diabetes mellitus who does not take adequate care of herself or himself is more likely to develop organ or peripheral body damage. These include blindness, kidney dysfunction and neuropathy of hands and feet that may keep them from enjoying major life activities. In this sense diabetes mellitus would meet the criteria of disability as set

forth by the Americans with Disabilities Act mentioned previously. However, an individual with diabetes mellitus who takes very good care of herself or himself may not become impaired to the point where they can no longer enjoy their major life activities and therefore they would not meet the criteria for having a disability. So it is not diabetes mellitus itself that is a disability, rather diabetes mellitus can cause disability under certain circumstances. According to Gavard's study "The pervasive impact of depression on quality of life and its potential negative effect on diabetes management warrant recognition and treatment of the affective disorder in diabetic individuals" (Gavard, Lustman & Clouse, 1993). Patients suffering from both depression and disability whose depression has been treated have exhibited improved blood glucose levels (Fakhri, Fadhli, & Rawi, 1980), thus suggesting a link between the two conditions. There are two leading theories attempting to explain the relationship between diabetes and depression. The first theory suggests that the biochemical factors brought about by depression directly cause diabetes (Lustman, Griffith, & Clouse, 1997). The second theory suggests that the social burden brought on by having a condition such as depression depletes the immune system of its typical resources, thus leaving an individual more susceptible to illnesses such as diabetes (Lustman, Griffith, & Clouse, 1997).

A great deal of research has focused on the connection between depression and physical pain. Research into this area is of great importance for many reasons, among which is that it may shed light on the notion that depression is capable of causing physical pain. This capability of a condition like depression to cause pain would encourage physicians and patients to look into the treatment of depression in order to relieve the physical symptom of pain. Many researchers have come to call the connection

between depression and physical pain the *depression-pain syndrome* (Lyndsay & Wyckoff, 1981) or the depression-pain dyad. The reasoning behind grouping these two conditions together is that researchers believe they share common treatments, often occur together, share similar biological pathways and neuropathways, and cause more severe disability when they occur together (Gallagher & Verma, 1999; Blier & Abbot, 2001). Patients who complain of pain while they suffer from depression are even more likely to be misdiagnosed than are individuals with either condition alone (Bridges & Goldberg, 1985). Studies indicate that pain occurs in an estimated 65% of patients who are hospitalized with depression (Lyndsay & Wyckoff, 1981; Kroenke et al. 1994). Patients who suffer from both depression and pain have reported more severe pain (Lamb et al. 2000), more episodes of pain (Betrus, Elmore, & Hamilton, 1995), longer lasting pain (Burton et al. 1995), and more persistent pain (Burton et al. 1995). Perhaps most relevant to the present study, depression has been used by some researchers to predict future pain (Leino & Magni, 1993; Croft et al. 1998). This research provides a foundation for the theory that depression may be able to cause future pain. This foundation serves as a stepping stone toward establishing a causal relationship between depression and physical disability in general. The relationship between pain and disability is so entwined that it is sometimes difficult to distinguish the two. Pain is both disability and a common element of disability. For instance, a person who suffers chronic pain may be disabled as a direct result of the pain, however an individual who suffers from multiple sclerosis may exhibit symptoms of pain that would prohibit them from being able to exercise or walk that are derived from their multiple sclerosis.

Depression and Psychological Disability

Depression is often viewed as a psychological condition. As extrapolated upon in the previous section, depression's effects have clearly been shown to be capable of crossing over into the realm of physical disability. Depression can also contribute to many other psychological conditions, consistent with the biopsychosocial model. Depression's effects can influence an individual's behaviors, mood, and resistance to stress, all of which may contribute to disability.

Depression can lead to a number of health-compromising behaviors, such as alcohol consumption. Alcohol abuse can have a very wide-range of psychological, social, and biological effects, *all of which* can contribute to disability. Alcohol abuse is viewed here in its relationship with the psychological condition of depression. While alcohol abuse is listed in the DSM IV (APA, 1994) it is not the purpose of this study to classify alcohol abuse as a psychological disorder, rather alcohol abuse is mentioned here only to examine the effects of depression and alcohol abuse as they relate to disability. The relationship between depression and alcohol-use is two-way in which depression often leads an individual to consume alcohol in an attempt to self-medicate their negative feelings and the abuse of alcohol may contribute further to the individual's depressed state. Large community-based studies involving diagnosed abusers of alcohol have led to the finding that alcohol abusers are two to three times more likely to suffer from depression than are individuals who do not abuse alcohol (Swendsen et al. 1998). This being said, it is also important to address that alcohol abuse, or even usage, can increase the risk of an individual experiencing situations that could lead to disability.

The comorbidity of depression and anxiety is also very well known. In a study involving individuals suffering from depression, nearly 59.2% of the individuals suffered from at least one other anxiety disorder (Hranov, 2007). The physiological response humans typically have when experiencing both depression and anxiety are remarkably similar. Among other things, anxiety and depression typically result in disturbances of an individual's serotonin, dopamine, and noradrenaline networks, which often work to regulate interconnected regulatory systems (Mombereau, 2005). When anxiety and depression occur together, they can form a more severe illness falling under the spectrum of psychological disorders called *mixed anxiety-depression disorders* (Hranov, 2007). Mixed anxiety-depression disorders are characterized by a number of symptoms characteristic of both anxiety and depression disorders separately. These symptoms include: difficulties concentrating, difficulties with memory, lack of energy, irritability, excessive worry, hypervigilance, hopelessness, pessimism, low self-esteem, and feelings of worthlessness (Hranov, 2007). The high likelihood that depression will result in a number of comorbid psychological disorders only compounds the chance of an individual becoming disabled as a result of their depression and likely lengthens the recovery period, thus demonstrating the theme of interconnectedness seen in the biopsychosocial model.

Depression and Disability in Elderly Adults

Depression is one of the most common causes of disability among elderly adults (Blazer 1994). Specifically, it has been demonstrated that major depressive disorder is not very common among elderly individuals (Blazer, 1994), but that minor depressive episodes, which require less strict guidelines for diagnosis, are very common among the

elderly (Beekman et al. 1995). Rates of onset of depression in studies utilizing elderly populations indicate that between 7 and 12% of the elderly population suffer from depression and that rates of persistence of depression among the elderly range from 38 and 64% (Prince et al. 1998; Henderson et al. 1997). Clearly once depression sets in to an elderly individual it can be very difficult to overcome its effects and reestablish a pre-depression state. Like many illnesses that occur among the elderly, depression can be very hard to diagnose (WHO 2012). Diagnosing depression in the elderly can be difficult given the number of other symptoms associated with aging, such as backaches, lack of energy, and lack of interest that can also be signs of depression. Many elderly individuals suffering from other diseases may also have symptoms that conceal indicators of depression. Depression in elderly individuals with cardiovascular disease may increase their risk of mortality (Carney et al. 1999). The relationship between physical disability and depression has been explained in different ways. Depression may lead to a lack of physical activity because of little motivation, which may in turn lead to negative health outcomes, thus resulting in an increased risk of disability. Another theory postulates that disability may result in feelings of dependence and lack of control and thus cause depression in elderly adults. Both theories likely have merit depending on the situation and the individual in question.

Given the sensitivity of the elderly in particular, to both depression and disability, future research into the relationship between depression and disability should focus on this population. The Nagi Scale is used in this study as the primary measure of disability. The Nagi Scale deals primarily with physical disability, as it entails specific physical movements such as standing, lifting, stairs, walking, stooping, bending, kneeling, using

hands, and reaching (Nagi, 1976). The Nagi Scale is used primarily for older people to assess their physical capabilities. Although the Nagi Scale is focused primarily on physical activities, psychological conditions, such as depression, can also effect an individual's ability to perform these activities. For example, if an elderly individual is suffering from depression they may be less able to walk up several stairs due to the lack of energy, interest, and self-efficacy necessary to initiate the action.

Depression and the Biopsychosocial Model

As referenced above, depression has been researched from a variety of approaches including biological and psychological approaches. A more holistic and all-encompassing approach to understanding depression can also be taken via the biopsychosocial method. The biopsychosocial method is a means of approaching the causes and effects of a health issue through the interconnected disciplines of studying health: biological, psychological, and social.

By analyzing depression using the biopsychosocial model, a more complete picture is granted of the condition and the individual suffering from depression. Perhaps an individual suffers a debilitating injury forcing them to be bed-ridden and disabled for a number of months. The individual falls into a depressive state as a result of their disability. Their depression takes a toll on them psychologically as they lose hope that they will recover and engage in negative thinking throughout the day, thus worsening their depression. Their depression takes a toll on them biologically, as they stop taking medication or engaging in routine exercises for their disability because of their bleak outlook on their situation and their prospects of improvement. Their depression also takes a toll on them socially, as they no longer have the patience and desire to contact their

friends and family electronically to sustain the close social ties that could support them through their difficulties. This individual's depression and disability have caused a downward spiral in their overall health as seen through the biopsychosocial model. The health-compromising cycle caused by the biopsychosocial model (the individual's psychological state leads them to discontinue medication, which causes them not to get better, which discourages them and keeps them from maintaining social ties, thus further impairing them psychologically, biologically, and socially) displays the complexity of the effects of a given condition. The biopsychosocial model can demonstrate the true potency of the disability-depression relationship.

Anxiety and Disability

Anxiety is defined by the DSM IV as: "the apprehensive anticipation of future danger or misfortune accompanied by a feeling of dysphoria or somatic symptoms of tension. The focus of anticipated danger may be external or internal" (American Psychiatric Association, 2000). There has been a great deal of research conducted regarding the association between anxiety, disability, and negative health outcomes. The totality of this research demonstrates the need for further investigation into the relationship between anxiety and disability. Those who suffer from anxiety disorders tend to use medical care services more than others (van Balkom, et al., 2000), tend to visit the emergency room more often (Leon, Portera, & Weissman, 1995), have increased rates of disability (Leon, Portera, & Weissman, 1995), and have impaired everyday functioning (Sullivan, LaCroix, Baum, Grothaus, & Katon, 1997). This research demonstrates both the health burden and the economic burden imposed by anxiety. Anxiety and depression have also been associated with worse control over blood glucose and more severe complications with diabetes mellitus, (Peyrot & Rubin, 1997). Doctors Wu, Parkerson,

Doraiswamy, (2002) conducted a study to examine the possible connection between illness severity and anxiety. Specifically, the doctors sought to establish whether or not illness severity could serve as an indicator of anxiety. Utilizing a patient population, these doctors found that patients with higher levels of anxiety were more likely to be diagnosed with insomnia, anxiety state, depressive order, as well as other mental disorders. The doctors also found that patients with higher levels of anxiety were more likely to be diagnosed with the physical ailments of headaches, osteoarthritis, abdominal pain, and diabetes mellitus. The findings of this study are relevant as they display a possible correlation between anxiety and mental as well as physical ailments. These findings also contribute to the general body of research concerning the relationship between the mind and the body. Anxiety has been clearly demonstrated to be capable of having a physical effect on an individual's body and/or health. It seems this relationship may also occur in the opposite direction with physical conditions being capable of having an influence on the mind. The inter-relationship between the mind and the body as suggested by this research supports the practice of treating a patient in a more holistic sense by treating multiple aspects of the patient's health.

Gender-Based Differences of Anxiety

There are a number of gender-based differences in regards to how anxiety effects individuals. Research has shown that women are twice as likely to suffer from anxiety as opposed to men (Witchen et al., 1994). Women are also twice as likely to be diagnosed with phobic disorders, which often result in chronic anxiety (Magee, 1996). These gender-based differences in the prevalence of anxiety have held constant among boys and girls as well (Kendler et al., 1992). There have been two very broad theories proposed to

explain the differences among rates of anxiety between men and women. The first theory states that the physiological and hormonal differences between men and women cause women to experience more anxiety than men. The second theory is based on the social differences between men and women. This theory suggests that women are more likely to express and accept their feelings of anxiety because it is more socially acceptable for them to do so as opposed to men (Lewinsohn et al., 1997). Regardless of which theory, or both, is true, this research presents a very clear need to view men and women differently when it comes to anxiety treatment and therapy. By doing so, doors are opened to providing more effective care to individuals.

Anxiety and Physical Disability

Anxiety is known to be capable of causing a number of physical symptoms including dry mouth, difficulty swallowing, sweating, heart palpitations, tremors, hyperventilation, chest pain, chest tightness, headache, backache, fatigue, muscle tension, diarrhea, increased frequency of urination, paresthesia (tingling of the hands and feet), more sensitive startle response, and insomnia (Cooray & Bakala, 2005). For diagnostic purposes, understanding the physical symptoms that can be caused by anxiety is very important, but these symptoms are also important as they demonstrate a very clear link between the largely psychological phenomenon of anxiety and the state of a person's physical health. Anxiety disorders, such as obsessive-compulsive disorder, bipolar disorder, and schizophrenia have also been found to be able to cause physical disability. (Murray & Lopez, 1996). Murray and Lopez assessed disability as a disease or injury that could have multiple disabling effects, or sequelae; e.g. "diabetes may result in diabetic foot, retinopathy, neuropathy or amputation," (1996). Research conducted by (Cantor &

Foxe, 2005) has revealed that detrimental levels of anxiety can also impede with physical recovery following surgery and can lead to longer rehabilitation periods. It has been found that adult, hospitalized patients who report anxiety have a greater likelihood of suffering from ulcer disease, angina, and thyroid disease, (Rogers, White, & Warshaw, 1994). Chronic anxiety has been found to increase the risk of coronary heart disease and potentially lead to early death (Kubzansky & Kawachi, 2000). Two major theories have been asserted to explain the potential mechanism between anxiety and death. The first theory suggests that anxiety and other negative emotions encourage behaviors that are detrimental to health, such as smoking or drinking alcohol. The second major theory suggests a direct relationship between anxiety and early death, stating that the emotional stress brought about by anxiety can reduce a person's immune functioning and increase their risk for physical diseases (Kubzansky & Kawachi, 2000). Two studies involving men only, found that chronic anxiety led to a heightened risk of death from coronary heart disease, but no heightened risk of non-fatal myocardial infarction (Haines, Imeson, & Meade, 1987; Kawachi et al., 1994). A follow-up study revealed that the risk of death among these male patients was confined to sudden coronary heart disease and did not apply to non-sudden death from coronary heart disease. Perhaps the most severe physical impact a condition can have on an individual's health is death. Research suggesting a link between anxiety and early death is also suggesting that the body's biological and psychological health mechanisms are connected. This line of inquiry is clearly consistent with the biopsychosocial approach, in that it suggests that neither dimension of health (biological or psychological) exists entirely independent of the other. It has been postulated that anxiety may contribute as much toward physical disability as it does to

psychological disability, but there is little research to support this conclusion and the real answer may be more complicated, as anxiety may be contributing to both psychological disability and physical disability, while they also contribute to one another.

Anxiety and Psychological Disability

Anxiety has close ties not only with physical disability, but psychological disability as well. Nearly 75% of individuals suffering from an anxiety disorder also meet the criteria at least one other comorbid psychological disorder (Kessler et. al, 1994).

Anxiety is known to cause the psychological symptoms of anticipation, irritability, difficulty concentrating, memory problems, excessive worry, fear, and panic (Cooray & Bakala, 2005).

There is a vast wealth of research literature attesting to the apparent association between anxiety and substance abuse disorders (Grant & Harford, 1995; Merikangas & Swendsen, 1997). Individuals dealing with both a substance abuse disorder and anxiety are at a heightened risk of suicide, negative health outcome, and disability (Hirschfeld et. al, 1990). Researchers have proposed a number of theories to explain the comorbidity of anxiety and substance abuse disorders. Some researchers assert that substance abuse disorders cause anxiety in a direct manner (Schuckit & Hesselbrock, 1996), while other researchers claim that anxiety may lead individuals to abuse substances in order to cope with their anxiety or to self-medicate (Cox et. al, 1993). The theory most generally accepted today is that there are causal effects moving in both directions between anxiety and substance abuse disorders, while each condition reinforces the other (Wittchen, Perkonig, & Reed, 1996). Substance abuse disorders can very clearly demonstrate the biopsychosocial method, in that substance abuse can directly impact a person's

physical/biological health (especially the liver); impact a person's psychological health by lowering their sense of self-worth, feelings of competency, and happiness; and impact a person's social health by straining a person's relationships with others. Anxiety can fit nicely into this cycle of health-compromising behaviors that are being exacerbated by substance abuse.

In a clinical study of patients suffering from schizophrenia, Bayle et al. (2001) concluded that 31.2% of the patients had suffered from panic disorder prior to the onset of their schizophrenia and that 47.5% of the patients experienced panic attacks throughout their lives. Schizophrenic patients who have anxiety are at a higher risk of suicide (Taiminen et. al, 2001), exhibit decreased social functioning, and are at a higher risk of relapsing upon improvement (Blanchard, Mueser, & Bellack, 1998). Further research has demonstrated that, when treated for their anxiety, patients with schizophrenia tended to improve both clinically and socially (Bayle et al., 2001).

Data obtained from patients with bipolar disorder revealed increased rates of anxiety disorders (McElroy et al., 2001). Researchers have also found that patients with bipolar disorder who suffered from anxiety were less likely to attain favorable outcomes (Feske et. al, 2000). Specifically, research suggests that comorbid anxiety symptoms are worse in individuals with bipolar I disorder as opposed to bipolar II disorder (Simon et. al, 2004). Further, individuals suffering from lifelong anxiety have been found to show signs of bipolar disorder earlier on in life than those without lifelong anxiety (Kessler et. al, 1997).

Anxiety has also been found to be more prevalent in individuals with learning disabilities than it is in the general population (Deb et al., 2008). Anxiety and anxiety

disorders are also particularly difficult to diagnose in individuals with learning disabilities (Fryers, 1997) and therefore may be underreported (Reiss et al., 1982).

Anxiety and Disability Among Older Adults

The relationship between anxiety and disability is perhaps most apparent in older adults. Prevalence rates of anxiety disorders among older adults in the United States range from 3.5% to 10.2% (Beekman et al., 2000). Anxiety in older adults is seen most often among those living in nursing homes (Junginger et al., 1993), those who are unable to leave their home (Bruce & McNamara, 1992), patients suffering from chronic illnesses (Kunik et al., 2005), and patients in a hospital in general (Tolin et al., 2005). Although anxiety has been demonstrated to occur less often in elderly adults than in younger individuals (Flint, 1994), as people enter into old age the likelihood that they will suffer from physical disability increases (Penninx et al., 1998) and symptoms of anxiety often accompany physical disability (Penninx, et al., 1998). Fuentes & Cox (1997) have concluded that anxiety in older adults may be drastically underreported due to the fact that older adults who may be experiencing anxiety are also suffering from physical disabilities which can mask the sensation of anxiety with that of pain. Researchers have also found that medical care providers have great difficulty in accurately diagnosing older patients with anxiety (Blazer, George, & Hughes, 1991). Psychologists Lenze, Rogers, and others have gone so far as to assert that anxiety may be a risk factor for disability (2001). Researchers have concluded that 40% of older medical patients exhibit symptoms of anxiety, (Magni, et al., 1988).

Researchers have found that patients who are older than sixty-five are three-to-ten times more likely to be hospitalized for their disorder than are their younger counterparts

(Fuentes & Cox, 1997). Generalized anxiety disorder (defined as a condition in which an individual has difficulty controlling their anxiousness and often worries excessively) is one of the most common disorders among older adults (Beekman et. al, 1998). Older adults with anxiety also tend to suffer from depression disorders (Lenze et al., 2000). Given the heightened vulnerability of the elderly, research into the negative health effects of anxiety are of particular interest in proposing possible treatment and therapy for this population.

Anxiety and the Biopsychosocial Model

Similarly to depression, the relationship between anxiety and disability can also be examined via the biopsychosocial method. Anxiety is often viewed as a condition with effects that are psychological in particular, however the biopsychosocial method can be used to illustrate the complex range of effects anxiety can have on an individual suffering from disability specifically.

Perhaps a student with an upcoming assignment deadline closing in is suffering from an anxiety disorder. This anxiety causes the student to work excessively on the assignment, while neglecting sleep, proper nutrition, adequate exercise, and quality time with peers. The effects of his psychological anxiety lead him to become biologically ill and physically disabled as a result. In turn, the student has even less time to finish his assignment, thus he spends no time with his peers, impacting his social health. As his deadline draws nearer and his disability hinders his progress, the student becomes more anxious as a result. Once again the biopsychosocial model can be used to convey the health-related effects of a condition.

General Well-Being and Disability

General well-being is a broad term that can be defined as an individual's overall satisfaction with their life (Diener, 2009). Well-being is an assessment of a person's positive emotions, lack of negative emotions, life satisfaction, sense of fulfillment, and positive attitude (Frey & Stutzer, 2002). Researchers Diener, Suh, & Oishi provided that the simplified definition of general well-being is feeling good about one's self and judging life positively (1997). General well-being can encompass an individual's physical, emotional, psychological, economical, and social health. The sum of all of these factors can be viewed as an individual's entire well-being. General well-being has been used in numerous studies to assess an individual's self-perception of their life (Frey & Stutzer, 2002; Diener et al., 2009). Experimental studies have yielded results suggesting that general well-being is associated with longevity, healthy behaviors, physical illness, mental illness, self-perceived health, and productivity (Diener & Seligman, 2004; Lyubomirsky, King, & Diener, 2005). These findings provide a bridge between well-being and overall health. They may also suggest that there is a positive relationship between positive attitude and living longer, yet on the other hand may suggest that lower levels of general well-being contribute to mental and/or physical illness. For the purposes of this study, two aspects of general well-being in particular are of importance: psychological well-being and physical well-being. In regards to how general well-being was addressed in this study, scores of positive emotion and vitality were assessed.

Physical Well-Being

Physical well-being has been defined as an individual's perceptions of their own health and level of energy (CDC, 2013). Research has been conducted into the effects of

general well-being on physical health. Studies have yielded the results that higher general well-being is associated with a decreased likelihood of disease, illness, and injury (Pressman & Cohen, 2005; Ostir et al., 2000). Further findings have been made suggesting that higher levels of general well-being are associated with faster recovery from injury and illness, heightened immune function, and increased longevity (Ostir et al., 2001; Diener & Biswas-Diener, 2008). These findings could be directly applied to hospital settings where the disabled reside. The findings seem to suggest that when an individual feels positively about themselves and their situation, they recover faster and are more resistant to illness.

The ways in which well-being can influence a person's physical health are numerous. High levels of well-being may encourage or be indicative of an individual who engages in regular exercise, adheres to a healthy diet, maintains strong social connections, autonomy, self-reliance, and positive emotions (Tellegen et al., 1988). In this sense physical well-being goes hand-in-hand with health promotion, or the strengthening of these factors in order to promote health outcomes. In fact, health promotion has shown to increase physical well-being among patients (Tellegen et al., 1988). These studies advance the argument that well-being can serve as a preventative measure against illness and disability, while also aiding the ill or disabled recover from their ailments faster.

Psychological Well-Being

Huppert (2005) has described psychological well-being as the combination of feeling good and effectively functioning. Huppert continues to explain that one does not need to feel good at all times to sustain psychological well-being and that painful

experiences are part of the natural living cycle. Huppert states that psychological well-being is no longer sustained when an individual suffers from severe negative emotions over a long period of time, which interferes with their ability to function normally. Huppert's research suggests that not only is psychological well-being concerned with feeling good about one's self, but that it also has to do with the development of healthy coping mechanisms to deal with negative experiences that will inevitably arise throughout a person's life.

When an individual encounters a stressful situation, the neurochemical *cortisol* is released within the brain. Because of this, cortisol can be used to measure an individual's level of stress in a given period. Huppert asserts that higher levels of stress are associated with lower levels of general well-being (2009). Research has shown that when an individual's cortisol levels throughout the day compare fairly equally with what is considered typical levels, the individual exhibits higher levels of general well-being (Steptoe & Wardle, 2005). The release of cortisol in an individual's brain at normal levels can be seen as an example of healthy coping. Because individuals will also experience stressful situations, their brains must be equipped to handle these situations. When an individual's brain releases a healthy amount of cortisol to aid the individual with the situation it can be seen as a healthy coping mechanism consistent with psychological well-being. On the other hand, when an individual's brain releases abnormal levels of cortisol this can be seen as an unhealthy coping mechanism that is inconsistent with psychological well-being.

Further research places an emphasis on early childhood development on the fostering of psychological well-being later on in life. Research conducted by Maccoby &

Martin revealed that a positive intimate bond between a mother and her child is often associated with both positive social and cognitive behaviors, as well as resulting in increased cognitive resiliency to stressful situations (Maccoby & Martin, 1983). This resiliency and early formations of positive behaviors can promote positive emotions and dispositions within children in their most sensitive stages of development, thus promoting higher psychological well-being later in life.

Determinants of Well-Being

Knowledge of the effects of general well-being can only be applied to the daily lives of individuals if the factors determining a person's general well-being are understood. Among others, there are two very broad categories of well-being determinants that have been researched intensively: heritable factors and environmental factors.

Mental health clinicians Barry and Jenkins (2007) have reported that a substantial amount of an individual's general well-being is determined by their inherited traits and characteristics. Research suggests that positive emotions are, to an extent, heritable and therefore it is possible that individuals genetically inherit varying thresholds of both positive and negative emotions, such as happiness and sadness (Nes et. al., 2006).

Personality traits such as extroversion and optimism, which are influenced by heredity, have been demonstrated to influence general well-being (Diener et. al., 2003). This research provides a strong case in support of the notion that traits pertinent to well-being can be hereditary. This research is valuable as it could suggest that certain individuals are predisposed to either positive or negative well-being. Although genetic factors play a significant role in examining general well-being, they fall short in explaining certain

aspects, such as the differences in general well-being among citizens of different countries. This disparity is relieved, in part, by research conducted into the environmental determinants of general well-being.

Researchers have found that one of the most significant environmental factors contributing to general well-being is that an individual's basic needs be met (Veenhoven, 2008). Of course these "basic" needs vary from individual to individual based upon income, culture, and other factors. In Veenhoven's research, basic needs are subjective and range from food and shelter to electricity and transportation. This research is applicable especially to individuals living in areas where the commodities of life considered "essential" by others around them are relatively scarce. These individuals would be likely to have lower levels of general well-being based on their living situation and therefore they may be more likely to become ill or, if disabled, to recover more slowly than expected from their disability.

A study conducted by Diener and others led to the conclusion that maintaining supportive relationships were likely to produce pleasant emotions within a person and therefore lead to heightened general well-being (Diener, et al., 2009). Diener's finding provides support for the social aspect of health maintenance. Diener's research clearly demonstrates that positive social interactions can increase general well-being. Sociologist Inglehart has found that general well-being is relatively constant between genders (2002). While anxiety research suggests that perhaps a different approach should be taken when dealing with individuals of different genders, this may not be the case with general well-being.

A study conducted by Argyle led to the conclusion that there are significant differences in general well-being among age groups in the United States (1999). The results of Argyle's study indicated that, when plotted onto a line graph, the distribution of general well-being over the lifespan forms a U-shape. The results indicate that younger and older adults have relatively high levels of general well-being, while middle-aged adults display lower levels of general well-being (Argyle, 1999). This distribution could be accounted for partially by the often-seen mid-life crisis that occurs among the middle-aged. Such a crisis would undoubtedly lead to lower levels of general well-being. These results also contradict the popular notion that the elderly would have lower levels of general well-being due to their vulnerability to various ailments and thoughts of death.

There is a strong correlation between employment and general well-being. Researchers have demonstrated that having a paid job results in higher general well-being, most likely due to the access to essential resources such a job provides and due to a sense of self-worth (Warr, 2003; Argyle, 1999). The same researchers also concluded that unemployment results in lower general well-being. The correlation between income level and general well-being is far more opaque than the former correlation. Research is conflicted and results can be found suggesting both that higher levels of income correlate with higher general well-being (Biswas-Diener, 2008) and that lower levels of income correlate with higher general well-being (Argyle, 1999). So it seems that having a high-paying job is less important than simply having a job regardless of the pay. This may have to do with the feelings of self-efficacy held by individuals with jobs, as compared to those who do not have jobs.

Finally, an abundance of research has been conducted concerning the varying rates of general well-being among different countries. Countries that are more developed economically and have stable governments with little corruption and the capability of providing the basic necessities of their citizens tend to have higher levels of general well-being (Frey & Stutzer, 2002). Political scientists Helliwell and Huang have concluded that cultural norms also influence a given people's rates of general well-being (2008). So in attempting to apply concepts of general well-being to disability, it may be important to consider the cultural background of the individual suffering from a disability.

General Well-Being and the Biopsychosocial Model

When applied to general well-being, the biopsychosocial model may not be as clear as it is for clearly defined conditions, such as depression and anxiety. However, the biopsychosocial model can still be used to analyze the varying effects on the general well-being of an individual with a disability. An individual with a disability who also has a biological predisposition to personality traits that are conducive to low levels of general well-being is already at a disadvantage when it comes to general well-being. This predisposition could cause the person to have a more negative outlook on life thus effecting their mood, openness to social interactions, and biological recovery time from their disability. The biopsychosocial model can be used to explain the ranging effects of general well-being on a disability.

Other Contributing Factors

Many factors interact with and play a role in a person who is disabled. Statistics show that, "over 65 percent of working-age adults with disabilities are unemployed. Of these working adults, nearly one third earn an income below the poverty level. People

with disabilities are nearly twice as likely as people without disabilities to have an annual household income of \$15,000 or less, and the unemployment rate of people with disabilities is ten times greater than the national unemployment rate..." ("Disability funders network;," 2012). Clearly disability has an astonishing burden on both personal and societal economy. In regards to age and gender, it was shown in the 2000 Census Bureau that between both groups there are significant differences depending on the age of the individual. The prevalence of disability among men and boys under 65 was higher than in women in the same age range whereas in the age range of 65 and higher the prevalence of disability was higher in women (Waldrop & Stern, 2003). Waldrop and Stern go on to discuss how, "among the racial and ethnic groups examined in this report, the highest overall estimated disability rate, 24.3 percent, was shared by two groups — people who reported Black and people who reported American Indian and Alaska Native." When looking at how social activity plays a role in disability, it seems to work as a buffer. A study investigating "Social Engagement and Disability in a Community Population of Older Adults" found that "after adjustment for age, gender, race, and physical activity, significant cross-sectional associations were found between social engagement and all three measures of disability, with more socially engaged older adults reporting less disability" (Mendes de Leon, Glass & Berkman, 2003). Because socioeconomic status (SES) is measured using occupation, education and income, SES can be used to examine how education level might play a role in disability. For example, one study on low SES and disability in old age found that when adjusting for age and sex, slower gait speed and lower Short Physical Performance Battery (SPPB) scores were seen in persons with less than or equal to 5 years of total education compared with those

persons with greater than 5 years of total education (Coppin et al., 2006). A U.S. Census Bureau report dealing with physical and mental disability, issued in May 2006 stated that "about 10.4 percent of people age 25 to 64 with no disability did not finish high school. The rate was higher for people with a disability—14.6 percent for people with a nonsevere disability and 26.6 percent for people with a severe disability. A higher proportion of people with no disability were college graduates (43.1 percent) than people with a nonsevere (32.5 percent) or severe disability (21.9 percent). Similarly, for people 65 years and older, 20.9 percent without a disability had no high school diploma, in comparison with 25.1 percent with a nonsevere disability and 38.6 percent with a severe disability" (Steinmetz, 2006). Education seems to have a significant impact on the likelihood that an individual will become disabled later on in life. This provides yet another variable for consideration in ascertaining the full scope of disability.

How This Study is Different

The current study is an archival and exploratory project that differs from most disability studies in that it encompasses a plethora of variables as opposed to a few. For example, it not only examines correlations between disability and depression, but it investigates issues and factors such as anxiety and general well-being as well. In this study, variables such as gender, age, education, and others are also looked at to further investigate a general profile of individuals with disability.

Importance

This research is important to the field of psychology because it addresses factors that could potentially be linked to disability. Significant findings can provide insight as to how these variables of interest interact. If high levels of anxiety, high levels of depression

and low levels of general well-being are associated with more disability there becomes potential to provide individuals with interventions. That is, with more information on how these factors interact, health professionals may be able to help individuals coping with disability to reduce levels of psychological distress. This study could be very important in developing coping techniques along with shedding light on the topic; something that clearly needs to be done. In the article, "Blood Pressure and Disability: Association Between Concurrent and Remote Blood Pressure and Disability in Older Adults" by Ihab Hajjar, it is demonstrated that participants who had hypertension showed increased risk for developing new disabilities (2007). By identifying such risk factors or correlations, doctors may become better equipped and able to use special preventative measures for their patients. By looking more closely at correlates of physical disability, the field of psychology could help to address and perhaps prevent institutionalization and death that may be caused from physical disability and its relation to depression and other factors.

Hypotheses

The literature review implies that disability would lead to negative correlations with variables of general well-being, and positive correlations with variables such as depression and anxiety. We will be testing to see in the Maine-Syracuse Longitudinal Study whether or not this is the result. The first hypothesis is that higher scores on scales of anxiety and depression will show a positive correlation with physical disability whereas scores of general well-being will show a negative correlation with disability.

The second hypothesis is that the associations found between disability and the outcome variables (depression, anxiety, and aspects of general well-being) will remain

when adjusted statistically for demographic variables such as age, education and gender. That is, the association between disability and mental health outcome variables is at least partially independent of these demographic variables.

The third hypothesis in this study is that the associations found between disability and the mental health outcome variables (depression, anxiety, and aspects of general well-being) will remain at least partially independent of not only demographic variables (age, education and sex), but also of social activity, measured by a social participation score.

The fourth hypothesis is that the associations between disability and mental health outcome variables (depression, anxiety, and aspects of general well-being) are at least partially independent of not only demographic variables, and social activity but also use of psychotropic medications.

Method

The current study is analyzing data from the Maine Syracuse Longitudinal Study. It will be examining how disability correlates with depression, anxiety, and general well-being and taking factors such as age, education, gender and social activity into account.

Measures and Statistical Analyses

CES-Depression Measure

The CES-D scale (Radloff, 1977) is a 20-item self-report questionnaire that assesses symptoms of depression. Items are rated on a on a Likert scale as such: "Rarely or none of the time (less than 1 day)," "Some or a little of the time (1-2 days)," "Occasionally or a moderate amount of the time (1-2 days)," or "Most or all of the time

(5-7 days)." Examples of items are as follows, "I felt depressed, I enjoyed life, I thought my life had been a failure, or I was happy"

Spielberger Trait Anxiety Measure

The Spielberger Trait Anxiety measure is a 10-item scale, (Spielberger, 1970). Each item response ranged from 1-4 (1 = none or a little of the time, 2 = some of the time, 3 = good part of the time, and 4 = most of the time). Items included to measure trait anxiety are those such as "I worry too much over something that really doesn't matter" and "I am a steady person." Internal consistency coefficients for the scale have ranged from .86 to .95; test-retest reliability coefficients have ranged from .65 to .75 over a 2-month interval (Spielberger et al., 1983).

General Well-Being Adjustment Scale

The General Well-Being Adjustment scale consists of 11 items, each item response ranging from 1-6, (Brook, 1979; Ware, 1980; Ware, 1979). Two subscales were used to assess general well-being; positive emotion and vitality. Examples of items are: "How much energy, pep, or vitality did you have or feel (during the past month)?" and "How happy, satisfied, or pleased have you been with your personal life (during the past month)?"

Social Activity Measure

The social activity measure is a 21-item self-report measure (Croog, 1994) that assesses how frequently a participant is socially active. Items are ranked from "Not at all" to "Daily" and there are options such as "1-2 times/month," "1-2 times/week," and "Several times/week." An example of a question on this measure is, "Had friends or

relatives visit your home" and "Attended group meetings or events (community, church, or senior citizens groups)."

Nagi Disability Measure

"The Nagi scale assesses changes in function caused by pathology and includes specific physical movements such as standing, lifting, stairs, walking, stooping, bending, kneeling, using hands, and reaching. It was not designed specifically for use in assessing older people, but scores tend to decline with age, and older people typically show the most impairment," (Nagi, 1976). Items are phrased in terms of how difficult a situation is for a participant. Examples are, "Either stooping, crouching or kneeling," and "Lifting or carrying weights over 10 lbs. (like a heavy bag of groceries)."

Statistical Analyses

Analyses in this study were primarily correlational and used linear regression.

Table 1. *Descriptives of Social Activity and Measures of Subjective Distress*

Measure	Mean	Standard Deviation	Range
Social Activity	21.18	5.52	(3-40)
Disability (Nagi)	5.75	5.92	(0-27)
Depression (CES-D)	8.00	7.73	(0-41)
General Well-Being (Positive Emotion)	17.47	3.49	(4-24)
General Well-Being (Vitality)	17.22	3.57	(4-24)
Trait Anxiety	17.09	3.64	(12-33)

Participants

Adults in the Maine Syracuse Longitudinal Study (MSLS), ranged from 26 years of age to 96 years of age. In the present study, analysts are examining scores from participants ages 50 and above in Wave 7. In the MSLS 56.1% of participants were above the age of 50 years, 36.4% were above the age of 60 years, 16.3% were above the age of 70 years, and 3.6% were above the age of 80 years. Age ranged from 50-93 in the present study (Mean age = 67.9, standard deviation = 10.6).. Regarding sex, 450 (61.3%) of participants were female in this study and 284 (38.7%) were male. Overall in the MSLS, years of education ranged from 3 to 20 years, and the mean was 14.4 years with a standard deviation of 2.6 years. Occupation level ranged from unskilled labor to executive professional, 1-6 respectively, and the mean for this was 4.5 with a standard deviation of 1.8.

Results

Sample Characteristics

Overall this is a relatively well-educated sample. Years of education range from 4 to 20, the mean number of years is 14.6 (standard deviation; 2.80). The sample was predominantly white (90.1%) in ethnic/racial composition, 7.5% were black, 1.4% were American Indian, 0.8% were Hispanic, and 0.3% were Oriental. The majority of participants (61.7%) were married, 14.7% were widowed, 12.4% were divorced, 7.4% were single, 2.0% were separated, and 1.8% reported having a life partner. In respect to psychotropic medications such as anti-depressants, sedatives, narcotic analgesics and antipsychotics, 568 participants (77.4%) were not on psychotropic medication, yet 166 (22.6%) were on such medications. When reporting results for regressions, unstandardized Betas were examined. Correlation and linear regression are the primary statistical approaches. Four linear regression models were used to predict depression, anxiety, and general well-being scores (see Table 2).

Table 2. *Components of the Models*

Model 1	Model 2	Model 3	Model 4
Disability and measures of mental health	Model 1 + adjusting for demographics (age, education, gender)	Model 2 + adjusting for social activity	Model 3 + adjusting for psychotropic medication usage

Table 3. *Correlations Between Predictor Variables*

	Disability	Sex	Education	Age	Social Activity	Psychotropic Medications
Disability	---					
Sex	.111**	---				
Education	-.255**	-.099**	---			
Age	.141**	-.038	-.088**	---		
Social Activity	-.271**	.111**	.220**	-.027	---	
Psychotropic Medication	.301**	.055	-.120**	-.142**	-.144**	---

**Correlation is significant at the 0.01 level (1-tailed)

Correlations among the predictor variables are presented in Table 3. The Nagi measure was significantly correlated with each of the other predictor variables. Negative correlations between the Nagi and education $r(715)=-.255$, $p<.01$ and social activity $r(624)=-.271$, $p<.01$ indicated that lower levels of education and social activity were associated with higher physical disability levels. Positive correlations between education and social activity $r(636)=.220$, $p<.01$ and between psychotropic medication usage and disability $r(715)=.301$, $p<0.01$ indicated that higher levels of social activity were associated with higher levels of education, and similarly higher disability was found for participants prescribed psychotropic medications. The social activities measure showed a positive correlation with gender and gender showed a positive correlation with disability indicating that women engaged in more social activities and also reported more disability.

Other significant correlations showed that males had higher levels of education than females and that younger participants tended to have higher levels of education.

Table 4. *Associations Among Mental Health Measures*

	General Well-Being (Vitality)	General Well-Being (Positive Emotion)	Trait Anxiety	Depression (CES-D)
General Well-Being (Vitality)	---			
General Well-Being (Positive Emotion)	.706**	---		
Trait Anxiety	-.537**	-.639**	---	
Depression (CES-D)	-.646**	-.682**	.721**	---

** Correlation is significant at the 0.01 level (1-tailed)

Table 4 shows that all of the mental health measures were strongly correlated. Not surprisingly the measures of general well-being were negatively correlated with trait anxiety and depression. That is lower levels of trait anxiety and depression were associated with higher levels of general well-being, both vitality and positive emotion. Depression also increased as anxiety increased.

Testing Hypothesis 1

Table 5. *Associations Between Disability and Mental Health Measures*

	General Well-Being (Vitality)	General Well-Being (Positive Emotion)	Trait Anxiety	Depression (CES-D)	Disability (Nagi)
General Well-Being (Vitality)	---				
General Well-Being (Positive Emotion)	.706**	---			
Trait Anxiety	-.537**	-.639**	---		
Depression (CES-D)	-.646**	-.682**	.721**	---	
Disability (Nagi)	-.493**	-.366**	.298**	.402**	---

** Correlation is significant at the 0.01 level (1-tailed).

To address the first hypothesis bivariate correlation and linear regression analyses between the measure of physical disability (the Nagi measure) and the measures of subjective distress (CES-D, etc) were performed. As shown in Table 5 disability, measured by the Nagi score, has a strong positive correlation with depression, measured by the CES-D score, $r(704)=.402$, $p<.001$ and with anxiety, $r(715)=.298$, $p<.001$. Disability negatively correlated with both general well-being (positive emotion), $r(706)=-.366$, $p<.001$, and general well-being (vitality), $r(705)=-.493$, $p<.001$. The corresponding linear regression results are presented in the first column of Table 6.

Testing Hypothesis 2

A multivariate linear regression was used to examine if the associations between disability and depression, anxiety and aspects of general well-being were independent of

demographic characteristics, (age, education and sex) (See column 2 of Table 6). Results showed that disability (Nagi) had a strong positive association with depression (CES-D) ($\beta = .513, p < .001$), indicating that the association remained when adjusted for demographics. Similarly, disability had a moderate positive association with trait anxiety ($\beta = .195, p < .001$), implying this association too is independent of the effects of age, education and sex. As predicted, disability had a moderate negative association with general well-being (positive emotion) ($\beta = -.220, p < .001$) and general well-being (vitality) ($\beta = -.301, p < .001$).

Table 6. *Physical Disability (Nagi) Summary of Results*

	Model 1	Model 2	Model 3	Model 4
	Beta	Beta	Beta	Beta
Depression (CES-D)	.530***	.513***	.461***	.378***
Trait Anxiety	.183***	.195***	.166***	.131***
General Well-Being (Positive Emotion)	-.216***	-.220***	-.173***	-.147***
General Well-Being (Vitality)	-.298***	-.301***	-.265***	-.241***

*** Correlation is significant at the 0.001 level.

Testing Hypothesis 3

To address the third hypothesis of this study, that associations between depression, anxiety, aspects of general well-being and disability would remain independent of demographics and social activity, a multivariate linear regression was performed (See column 3 of Table 6). Results demonstrated that disability had a strong significant positive relationship with depression ($\beta = .461, p < .001$), therefore the association remained independent of demographics and social activity. Disability also

showed a moderate positive significant relationship with anxiety ($\beta = .166, p < .001$), therefore the association remained independent of demographics and social activity. Disability had a moderate negative association with general well-being (positive emotion) ($\beta = -.173, p < .001$), therefore the association remained independent of demographics and social activity. Lastly, disability had a moderate to strong negative relationship with general well-being (vitality) ($\beta = -.265, p < .001$), therefore the association remained independent of demographics and social activity.

Testing Hypothesis 4

A multivariate regression test was run to examine if the associations between depression, anxiety and aspects of general well-being would remain independent of demographics (age, education and sex), social activity and psychotropic medications (See column 4 of Table 6). Results demonstrated that for disability and depression the relationship remained independent with a moderately positive significant correlation ($\beta = .378, p < .001$). Anxiety and disability also remained independent of these variables ($\beta = .131, p < .001$). In regards to general well-being (positive emotion) the association also remained independent ($\beta = -.147, p < .001$) which was also seen in general well-being (vitality) ($\beta = -.241, p < .001$).

When a multivariate regression was run for depression, anxiety and aspects of general well-being, holding each constant, disability significantly related with two of the variables; depression and general well-being (vitality). For depression the association was positive and weak to moderate ($\beta = .129, p < .01$) and for general well-being it was strong and negative (vitality) ($\beta = -.649, p < .001$).

Percentage of Common Variance

When analyses were performed to examine the percent common variance, results demonstrated that shared variance between disability and depression in Model 1 was 16%, and in Model 2 decreased to 14.4%, decreased further to 11.5% in Model 3 (See Graph 1) then to 7.84% in Model 4. A somewhat similar pattern was seen for disability and anxiety. The shared variance started in Model 1 at 8.88%, shifted upwards in Model 2 to 9.48% then decreased to 6.81% in Model 3 (See Graph 2) and further decreased to 4.16% in Model 4. Results similar to those found in the relationship with disability and depression were seen in the shared variance between disability and general well-being (positive emotion). Model 1 showed a percent common variance of 13.39%, which decreased to 13.03% in Model 2, and further decreased in Model 3 to 8.70% (See Graph 3) and 6.10% in Model 4. Lastly, when examining the pattern of disability and general well-being (vitality), the percent shared variance started in Model 1 at 24.3%, decreased in Model 2 to 23.6%, decreased in Model 3 to 19.18% (See Graph 4) and 15.60% in Model 4.

Discussion

Addressing Hypothesis 1

Positive associations witnessed between disability and depression and disability and depression when adjusting for education imply that as scores of disability increased, so did scores of depression. This may suggest that those who suffer from more disability feel hopeless and are unable to perform their usual daily life activities, which leads them to depression. Another way to view the relationship may even be that individuals suffering from depression take less care of themselves (e.g. may not attend medical

appointments) thereby increasing their susceptibility to disability. Regarding education level adjustments, results may suggest that individuals who are less educated may not have well-paying jobs, therefore they may struggle with depression that accompanies low levels of self-efficacy, or financial strain, therefore putting them at higher risk for disability. Similarly as disability increased anxiety levels increased as well. This might suggest that people who are disabled suffer from the stresses that accompany disability. Associated stressors may include financial costs that are associated with disability, fear of death or further physical or mental deterioration, or even fear that the individual will never regain a satisfying quality of life. It is also vastly important to mention, however, that a range of factors play a role in this complex relationship. For example, an individual's anxiety may stem from unknown factors. While considering general well-being positive emotion and vitality however, the relationship is inverse, suggesting that a person exhibiting disability has lower levels of life satisfaction. Research previously mentioned stated that when disability is examined, general well-being levels decline. One might take this a step further to assert that people who have higher levels of general well-being take better care of themselves thus reducing certain risk factors that lead to disability. Despite which way the relationship leans, it is crucial for health professionals to address such mental health outcomes in order to more fully care for their patients struggling with a disability, perhaps approaching the situation with a biopsychosocial perspective.

Addressing Hypothesis 2

Because depression, anxiety, and aspects of general well-being all remained independent of demographic variables, one may assume that two individuals of different

age, education and gender would exhibit a similar association between disability and depression, anxiety or aspects of general well-being. For example, researchers would be able to determine the degree to which disability correlates with aforementioned mental health measures in a 20 year old male with 12 years of education just as well as a 50 year old female with 16 years of education despite their demographic differences. Although the research conducted in Model 2 suggests that there is a relationship between disability and mental health measures, while controlling for demographics, this research is not suggesting that demographics are not correlated with mental health measures.

Addressing Hypothesis 3

Similar to results found in Model 2, all mental health measures, depression, anxiety and aspects of general well-being, remained independent of not only demographics, but also social activity. This implies that despite a persons' demographics, or whether he or she is socially active, the relationship between mental health measures and disability remains significant. Once again, these findings do not suggest that demographics and social activity are not correlated with mental health measures.

Addressing Hypothesis 4

Because associations between mental health measures and disability continued to remain independent from demographics, social activity, and use of psychotropic medications, researchers can assume that a relationship between mental health and disability still occurs. This does not necessarily allow health care professionals to rule out such variables, but it does help address what may not contribute to the relationship. This research is important as it narrows the focus of the various correlates of disability by making a case that depression, anxiety and aspects of general well-being have

independent relationships with disability. For example in a medical evaluation of a patient with disability, a doctor could use this knowledge to focus more directly on the mental health variables of his patient.

Addressing Percent Common Variance

The relationship between disability and depression remained independent of the variables seen across all four models. However, the percentage to which shared variance remained, decreased as each new model was incorporated. In Model 2, demographics accounted for part of the association, suggesting that age, education and gender had some influence on the relationship between disability and depression thereby attenuating the percent common variance seen in Model 2. The same result was noted when social activity was added (Model 3), implying that social activity accounts for a portion of the relationship between disability and depression, as was also seen when psychotropic medication usage was added. This finding suggests that while disability and depression are still significantly related, something about using psychotropic medications weakens the degree to which they are related. Perhaps when an individual is taking such medication there are protective factors that thereby decrease symptoms of depression. This might explain why the relationship between depression and disability weakened.

Once again, the relationship between disability and anxiety also remained independent of demographics, social activity and use of psychotropic medications, however a different pattern of percent common variance was seen across models. In the first model the association was 8.8%, yet when demographics were controlled for, there was a small increase of percent shared variance. This may suggest that one of the demographic variables (age, education or gender) or a combination of them has an

important role in the relationship between disability and anxiety. However, when social activity was incorporated, the shared variance decreased. People who report more social activity report less disability and also less anxiety. These joint associations with social activities account for part but not all of the relationship between disability and anxiety. When psychotropic medication usage was incorporated the relationship further attenuated. This may be due to protective factors. For example, "most current anti-anxiety medications work by suppressing activity in the brain circuitry that generates anxiety or increases anxiety levels." (Goldman, 2011). These anti-anxiety medications may be weakening the relationship between anxiety and disability by weakening the impact of anxiety on the individual. If the severity of anxiety is reduced it would follow that the disabling effect of anxiety would also be reduced.

In both aspects of general well-being, the relationship with disability remained independent from predictor variables, yet attenuation was seen across models. This could implicate that psychotropic medication usage, social activity and perhaps a combination of age, education and gender, account for a good portion of the relationship between general well-being and disability. Perhaps a person with disability that is more socially active will feel better about his or her life thereby decreasing the strength to which a person feels lower levels of general well-being and higher levels of disability. Another implication could be that psychotropic medications have positive effects on aspects of general well-being, which in turn weakens the negative relationship that was seen between disability and aspects of general well-being.

Addressing Relationships Between Predictor Variables

The negative relationship between disability and education may indicate that individuals who lack higher levels of education are unable to afford the types of health care aiming to prevent or take care of health issues. It is generally known that people of low socioeconomic status usually lack proper health care. This absence may be the reason that we see an inverse relationship between disability and education level. It is these gaps in healthcare coverage that are the driving force behind the current healthcare reform effort underway in the United States. Providing populations of low socioeconomic status access to healthcare services may be one way in which health can be improved among individuals without higher levels of education. On the other hand, the relationship implies that more educated persons are less disabled, perhaps because they possess more knowledge about preventing disability or have sufficient financial means to address existing disability.

Social activity has the ability to make a person feel connected or better about himself. One could argue if this is true, that the individual may be inclined to care more about his health because he feels that there is something greater to live for. The negative relationship between disability and social activity may suggest that people with more social support also exhibit less disability because they feel happier and connected, thereby emphasizing healthier lifestyle. On the other hand social activity can lead to social support. If one has higher levels of social support he may find help financially from friends and family, or have access to people that are knowledgeable about preventing disability.

People who were more educated in the study engaged in more social activity, whereas those with less education engaged in less social activity. Perhaps people who were more educated had clearer understanding of the importance of social contact, opposed to less educated counterparts. One may also imply that people with lower levels of education may feel embarrassed or lack the confidence needed to engage in social activities. Generally, lower education correlates with lower income, which could suggest that a person with less education, lacks financial resources to go out and have social time with friends. Less education could also result in financial strain, which leads to an individual having to work longer hours. If one works longer hours, there is less time to engage in social activity.

The finding that use of psychotropic medication related positively with disability suggests that individuals suffering with disability have higher need for pharmaceutical interventions. Pain, as well as correlates such as anxiety and depression could lead an individual to seek medical help thereby receiving medications to address those issues. This may very well be why people with disability use more psychotropic medications.

Addressing Relationships Between Mental Health Measures

General well-being (positive emotion) addressed how a participant felt in regards to emotion whereas (vitality) addressed how energetic or active they felt. The findings suggest that as positive emotion increased so did vitality, which implies that a person who reports positivity is more likely to be in a state of strength and energy. Counterparts would perhaps feel less positive emotion because they lack such strength, activity and energy. It may be that when a person lacks vitality they also lack the ability to do usual

daily activities. If this is so, that person may feel unhappy or upset, thereby explaining a lower level of positive emotion.

Anxiety and depression are certainly multifaceted, meaning that many factors play a role in why an individual may suffer from either. However anxiety and depression showed strong positive associations. To demonstrate the multifaceted nature of anxiety one might imagine a woman of low socioeconomic status anxious about making ends meet for a family of six. Now to further complicate her situation she is a single mother also taking care of an ill parent. If she suffers from this anxiety she is more likely to suffer from depression as well according to the findings of this study. On the other hand, a counterpart that exhibits low levels of anxiety, would likely exhibit less depression, perhaps because he or she has less to worry about possibly due to financial security or buffers.

Depression and aspects of general well-being (positive emotion) and (vitality), demonstrated an inverse relationship, implicating that people who are highly depressed do not show high levels of positive emotion or signs of vitality. Usually depression involves a slew of symptoms that "attack" vitality, so a person who feels depressed will most likely not be very positive or energetic thus furthering their depression and susceptibility to its various correlates, which could include anxiety, disability, and lower general well-being.

Implications of this Research

The multitude of findings produced by this study offer a number of opportunities to apply this research to practical, real-world situations. This research can be applied to

both the healthcare environment and the personal lives of all individuals seeking to promote their health.

Healthcare providers must constantly be aware of the evolving nature of their patient's conditions. Some medical conditions can be simpler than others and some conditions can promote the onset of additional conditions. Examples of this phenomenon can be seen in the research of Hickie and Scott which showed that vascular disease and stroke often lead to depression (1995). Further, Wu, Parkerson, & Doraiswamy found that anxiety can often lead to other symptoms and conditions such as headaches, stomachaches, fatigue, and diabetes mellitus (2002). Based upon the results of the study at hand (Correlates of Disability in the Maine-Syracuse Longitudinal Study), it may be equally important to treat depression as it is to treat vascular disease in the aforementioned research of Wu (2002) and as important to treat anxiety as it is to treat diabetes mellitus in the aforementioned research of Hickie (1995). This idea is consistent with the biopsychosocial model by placing an emphasis on health across the biopsychosocial spectrum in order to limit the damaging and interrelated effects of poor health in any one aspect of health. If physicians are aware of which medical conditions can serve as correlates of further medical conditions they can better assess and treat a patient before they become over-burdened by multiple conditions. This study displayed an association between depression and anxiety. If a patient is admitted into a healthcare facility suffering from depression, the healthcare personnel attending to this patient can be more aware of the relationship between depression and anxiety and can perhaps take preventive measures to curb the onset of anxiety in the first place. This study also found a relationship between anxiety and disability. An individual who is admitted into a

healthcare facility suffering from disability might be at heightened risk for anxiety, therefore physicians may anticipate this anxiety or treat the patient's disability in a way that will limit the likelihood of anxiety occurring. Further, this study found that general well-being has a strong relationship with disability. This finding supports the idea that healthcare professionals should seek to treat their patients using a more holistic approach to address their condition using the biopsychosocial method. Such a method would support the patient's overall health and would contribute to their general well-being, thus reducing their risk of disability. The cognitive-behavioral approach to health emphasizes reducing behaviors and thoughts that compromise health (Beck, 2011). By focusing on the cognitive-behavioral model of health, physicians can address both physical and psychosocial symptoms of a patient's conditions, which this study suggests are interrelated.

This research is applicable to every individual seeking to promote their health as it suggests that many health conditions are related and can often lead to one another. The finding that general well-being is correlated with disability should encourage individuals who are suffering from a disability to try to have a more positive outlook and to attempt to engage in activities that promote a positive mood, as it is possible that this could reduce the level of impairment caused by the disability. This finding is consistent with that of Pressman & Cohen indicating that higher levels of general well-being can be conducive to faster recovery time from an illness, heightened immune functioning, and decreased risk of disease (2005). The relationships found in this study between anxiety and disability and depression and disability should increase awareness among all individuals of the interconnected nature of many health conditions. Disability, a largely

physical condition, was shown to be significantly related with depression and anxiety even when controlling for a number of other factors. Many people are unaware or skeptical of the importance of promoting psychological and social health as a means of promoting physical health. This idea is central to the biopsychosocial model in which all three domains of health are interrelated and contribute to one another. The findings of this study support the biopsychosocial approach to health by demonstrating the contributory nature of depression, anxiety, general well-being, and disability. Consumers of health information should take from this study the importance of nurturing psychological, social, and biological/physical health as a means of attaining complete health regardless of the nature of the condition they have been diagnosed with.

Limitations of this Research

At the onset of this study, two additional measures were intended to accompany those included: the Zung Depression Scale and the Rosow Score for Disability. Due to time constraints however, these measures were not included in the study. Had these measures been included they may have added support to the body of findings or perhaps yielded different findings. The analysis seen in Model 4 (psychotropic medication prescription) was performed after the completion of the graphs illustrated in this study. If research had been continued, graphs incorporating Model 4 would have been included, offering more accessible comparison of Model 4 to the first three models. Given the extensive data collected in the Maine Syracuse Longitudinal Study from which the data involved in this research was taken, there remains an abundance of additional opportunities to analyze disability and other related variables.

It should be noted that both disability and the mental health measures involved in this study are complex and cannot be viewed individually to support these findings. In their totality, the measures give us a better picture of the roles played by depression, anxiety, and general well-being concerning disability. This picture is still very limited however and with a variable as complicated as disability researchers can only hope to gain a general understanding of its underlying mechanisms.

Further Directions

While several different potential correlates of disability were analyzed in this study, this research has only scratched the surface in this expansive area. Future research could focus on the potential relationship between disability and the healthcare institution in which the disabled individual has been admitted. Research conducted by Rochon et al., (1996) concluded that comorbidity was positively correlated with the length of hospital admission. This means that individuals with multiple medical conditions are more likely to remain in the hospital longer than individuals with only a single condition. The results of the present study indicated that disability was correlated with multiple other conditions, so disabled individuals may be more likely to suffer from other conditions. If disabled individuals are more likely to spend more time in hospitals or other healthcare institutions it would make sense to know what effect, if any, these different institutions have on the course of a patient's disability. This research could reveal that certain healthcare institutions are more conducive to recovery opposed to other health care institutions. Such a finding would perhaps be most useful to the elderly population. Due to declining health and physical fragility the elderly are already at an increased risk of disability. Aforementioned research conducted by Junginger supported the notion that

anxiety among the elderly is seen most often among those living in nursing homes (Junginger et. al, 1993). This research may indicate that certain nursing homes or certain factors within nursing homes are conducive to heightened anxiety. Previously-mentioned research conducted by Tolin indicated that heightened anxiety was also seen among patients in hospitals (Tolin et. al, 1995). This research, when taken in conjunction with the previous research, may suggest that staying in a healthcare or unfamiliar setting for a prolonged period of time may result in increased anxiety. Additional research into this area may provide insight. Additional research could focus on the potential relationship between disability and degree of personal control perceived by the disabled patient. Past research has indicated that elderly patients with higher perceptions of self-control were able to function physically more so than other elderly patients with lower perceptions of self-control (Clarke & Smith, 2011). This study focused on physical functioning among elderly patients and not disability specifically. A negative association between self-control and disability would indicate that patients with lower senses of self-control would be more likely to exhibit more disability. Such a finding would be consistent with the research conducted in *this* study suggesting an inverse relationship between general well-being and disability. Based on past research conducted by Pressman & Cohen, higher levels of general well-being can prevent disease, illness, and injury (2005). If there is a relationship between general well-being and self-control, then increasing perceptions of self-control may be capable of preventing disease, illness, and injury as well. Further research has demonstrated that physical activity, proper diet, and maintenance of social ties can lead to higher general well-being (Tellegen et. al, 1998). If self-control and general well-being are related then it may be possible to increase perceptions of self-

control by promoting exercise, diet, and social activity among individuals with low levels of self-control. Individuals with lower levels of self-control may also experience lower general well-being, which was found in this study to be correlated with a higher chance of disability. Sense of control may have a more direct relationship with disability. Such a finding would also be consistent with the biopsychosocial model, suggesting that the psychosocial aspect of perceptions of control could also contribute to the biological condition of disability.

Extending this research to other areas within the wide field of disability can better inform healthcare personnel and the general population of how best to address and cope with disability, thus promoting health in an all-encompassing, holistic sense.

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Tables**Table 1.** Descriptives of Social Activity and Measures of Subjective Distress

Measure	Mean	Standard Deviation	Range
Social Activity	21.18	5.52	(3-40)
Disability (Nagi)	5.75	5.92	(0-27)
Depression (CES-D)	8.00	7.73	(0-41)
General Well-Being (Positive Emotion)	17.47	3.49	(4-24)
General Well-Being (Vitality)	17.22	3.57	(4-24)
Trait Anxiety	17.09	3.64	(12-33)

Table 2. Components of the Models

Model 1	Model 2	Model 3	Model 4
Disability and measures of mental health	Model 1 + adjusting for demographics (age, education, gender)	Model 2 + adjusting for social activity	Model 3 + adjusting for psychotropic medication usage

Table 3. Correlations Between Predictor Variables

	Disability	Sex	Education	Age	Social Activity	Psychotropic Medications
Disability	---					
Sex	.111**	---				
Education	-.255**	-.099**	---			
Age	.141**	-.038	-.088**	---		
Social Activity	-.271**	.111**	.220**	-.027	---	
Psychotropic Medication	.301**	.055	-.120**	-.142**	-.144**	---

**Correlation is significant at the 0.01 level (1-tailed)

Table 4. Associations Among Mental Health Measures

	General Well-Being (Vitality)	General Well-Being (Positive Emotion)	Trait Anxiety	Depression (CES-D)
General Well-Being (Vitality)	---			
General Well-Being (Positive Emotion)	.706**	---		
Trait Anxiety	-.537**	-.639**	---	
Depression (CES-D)	-.646**	-.682**	.721**	---

** Correlation is significant at the 0.01 level (1-tailed)

Table 5. Associations Between Disability and Mental Health Measures

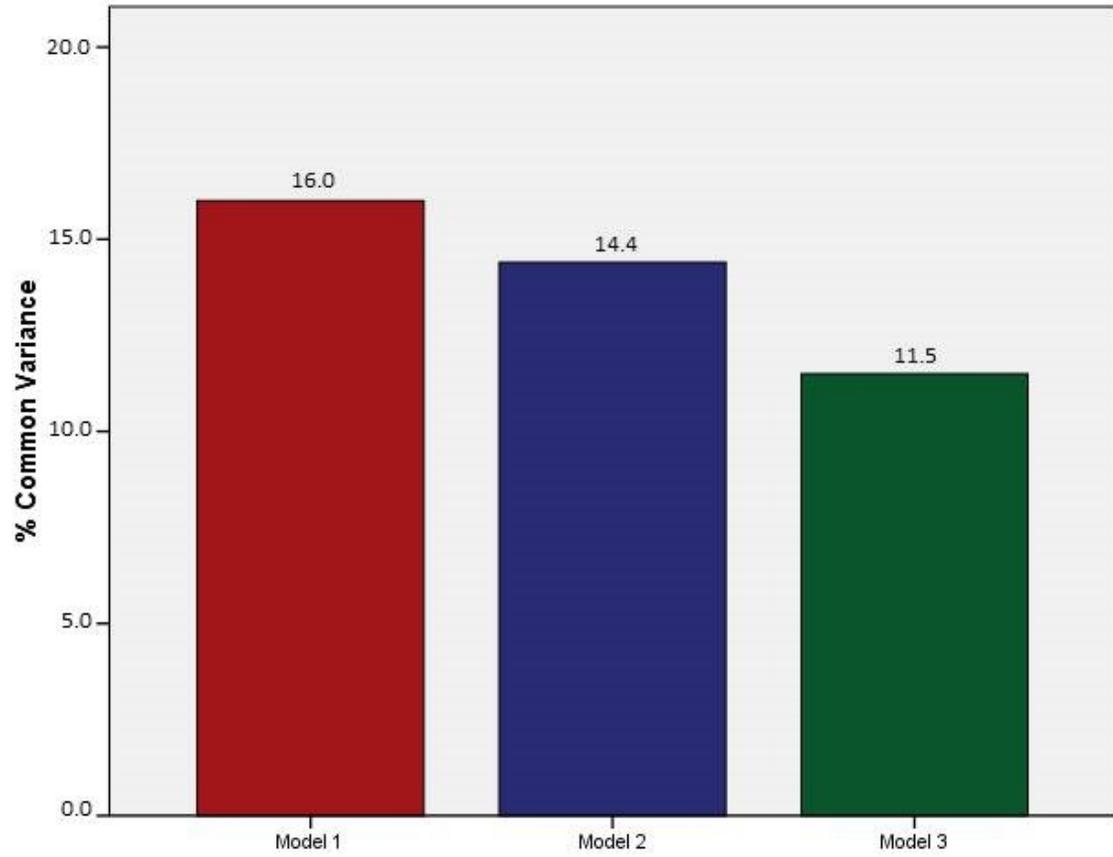
	General Well-Being (Vitality)	General Well-Being (Positive Emotion)	Trait Anxiety	Depression (CES-D)	Disability (Nagi)
General Well-Being (Vitality)	---				
General Well-Being (Positive Emotion)	.706**	---			
Trait Anxiety	-.537**	-.639**	---		
Depression (CES-D)	-.646**	-.682**	.721**	---	
Disability (Nagi)	-.493**	-.366**	.298**	.402**	---

** Correlation is significant at the 0.01 level (1-tailed).

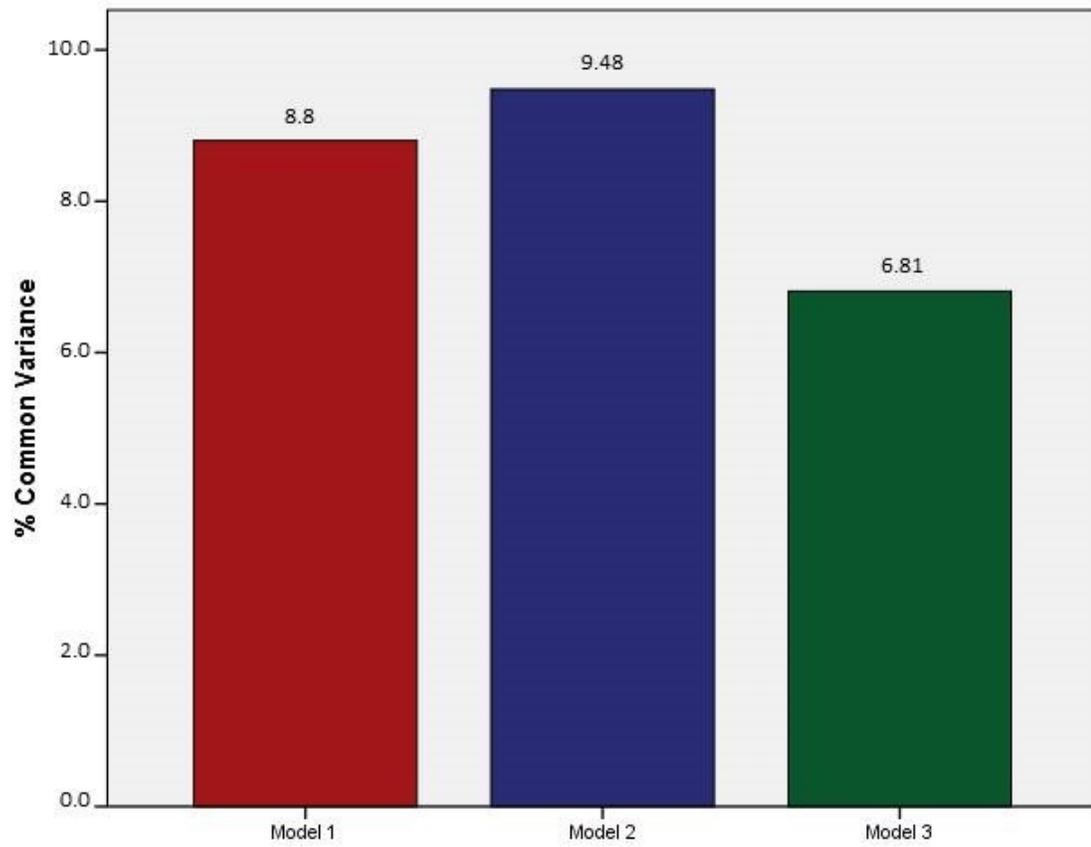
Table 6. Physical Disability (Nagi) Summary of Results

	Model 1	Model 2	Model 3	Model 4
	Beta	Beta	Beta	Beta
Depression (CES-D)	.530***	.513***	.461***	.378***
Trait Anxiety	.183***	.195***	.166***	.131***
General Well-Being (Positive Emotion)	-.216***	-.220***	-.173***	-.147***
General Well-Being (Vitality)	-.298***	-.301***	-.265***	-.241***

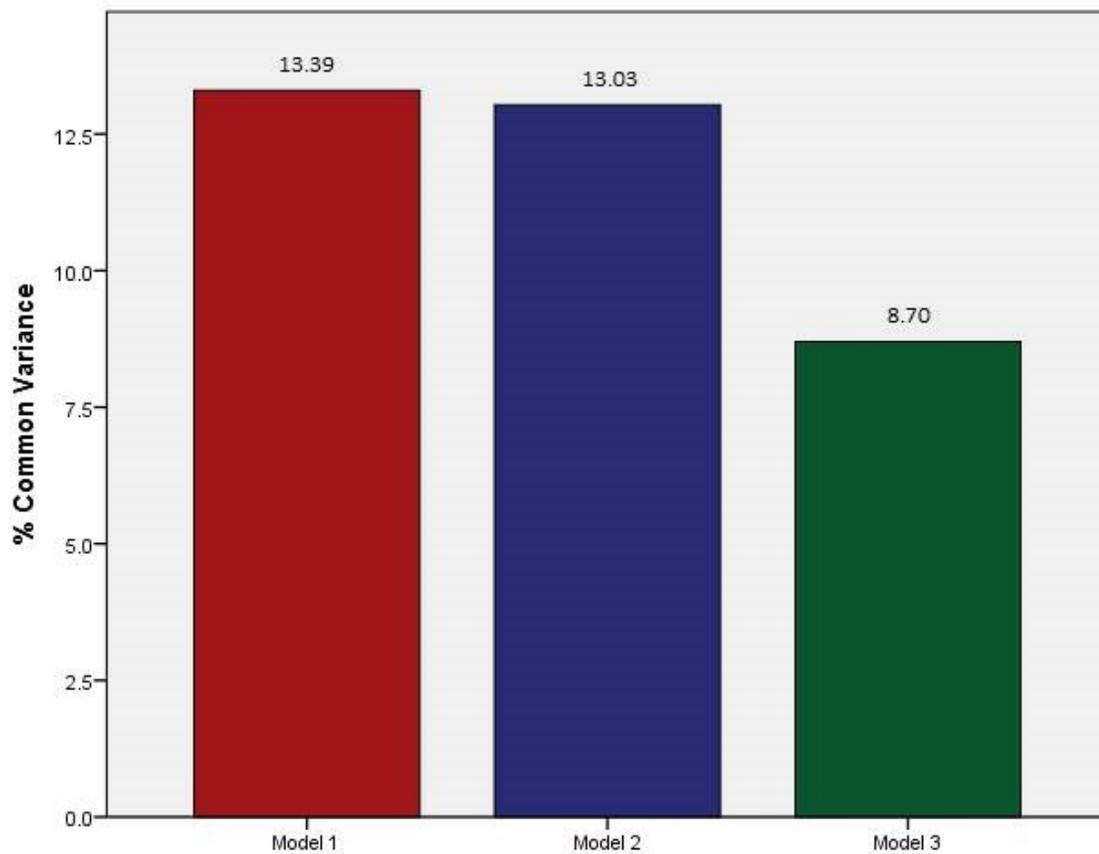
*** Correlation is significant at the 0.001 level.

Graphs**Graph 1.** Disability and C-ESD Percent Common Variance Across Models 1-3

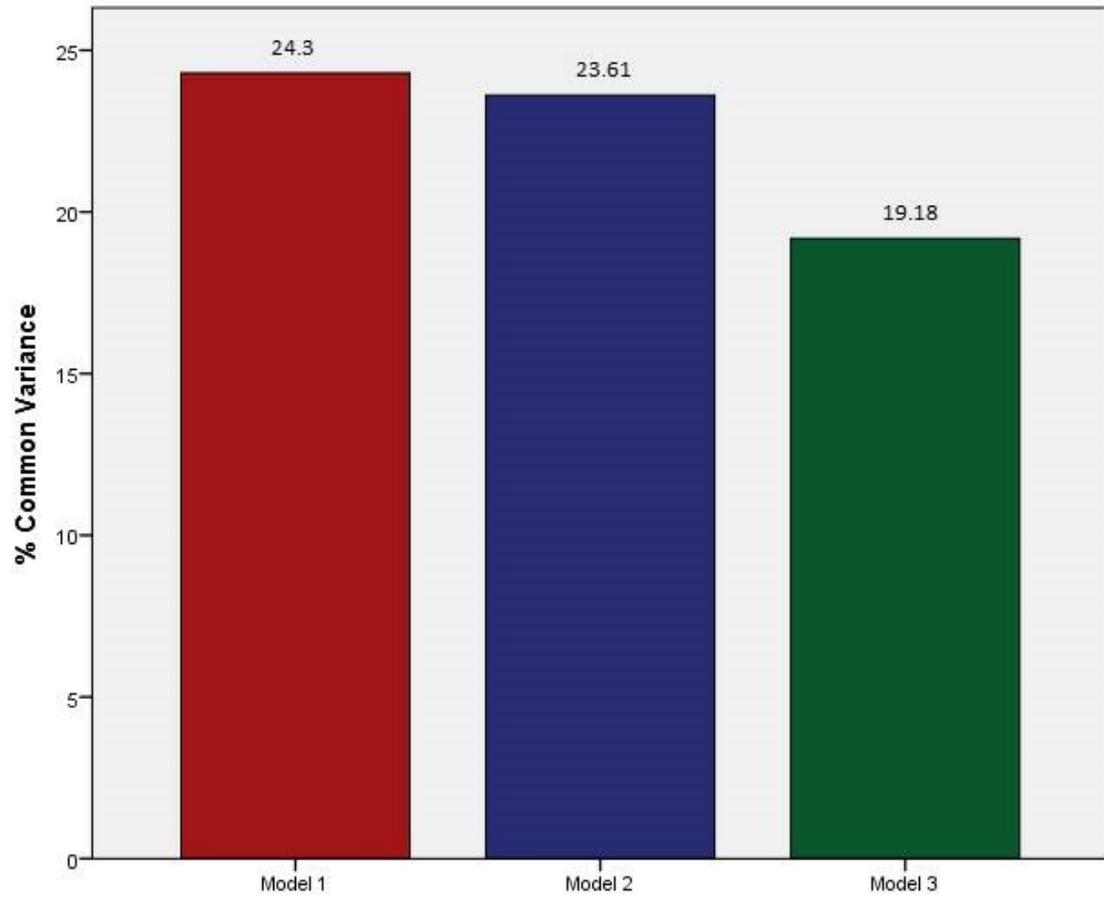
Graph 2. *Disability and Anxiety Percent Common Variance Across Models 1-3*



Graph 3. Disability and General Well-Being (Positive Emotion) Percent Common Variance Across Models 1-3



Graph 4. Disability and General Well-Being (Vitality) Percent Common Variance Across Models 1-3



Appendices

Appendix A: Disability Measure

Below are some tasks and activities that you may or may not find difficult to do. For each task please circle only one response in each column. Please answer each question to the best of your ability without skipping any. If you have any comments about any of the tasks or questions asked please make them on the last page of the questionnaire.

Tasks	How difficult is this for you, or can you do this?	Doctor's Orders?
1. Pulling or pushing large objects- like a living room chair	A. A lot of difficulty B. Some difficulty C. A little difficulty D. No difficulty	A. Should not do under a doctor's order B. No doctor's orders involved
2. Either stooping, crouching or kneeling	A. A lot of difficulty B. Some difficulty C. A little difficulty D. No difficulty	A. Should not do under a doctor's order B. No doctor's orders involved
3. Lifting or carrying weights <i>under</i> 10 lbs. (like a bag of potatoes)	A. A lot of difficulty B. Some difficulty C. A little difficulty D. No difficulty	A. Should not do under a doctor's order B. No doctor's orders involved
4. Lifting or carrying weights <i>over</i> 10 lbs. (like a heavy bag of groceries)	A. A lot of difficulty B. Some difficulty C. A little difficulty D. No difficulty	A. Should not do under a doctor's order B. No doctor's orders involved

Tasks	Difficulty?	Doctor's Orders?
5. Reaching or extending arms <i>below</i> shoulder level	<p>A. A lot of difficulty</p> <p>B. Some difficulty</p> <p>C. A little difficulty</p> <p>D. No difficulty</p>	<p>A. Should not do under a doctor's order</p> <p>B. No doctor's orders involved</p>
6. Reaching or extending arms <i>above</i> shoulder level	<p>A. A lot of difficulty</p> <p>B. Some difficulty</p> <p>C. A little difficulty</p> <p>D. No difficulty</p>	<p>A. Should not do under a doctor's order</p> <p>B. No doctor's orders involved</p>
7. Either writing, handling or fingering small objects	<p>A. A lot of difficulty</p> <p>B. Some difficulty</p> <p>C. A little difficulty</p> <p>D. No difficulty</p>	<p>A. Should not do under a doctor's order</p> <p>B. No doctor's orders involved</p>
8. Standing in one place for long periods (say 15 minutes)	<p>A. A lot of difficulty</p> <p>B. Some difficulty</p> <p>C. A little difficulty</p> <p>D. No difficulty</p>	<p>A. Should not do under a doctor's order</p> <p>B. No doctor's orders involved</p>
9. Sitting for long periods (say 1 hour)	<p>A. A lot of difficulty</p> <p>B. Some difficulty</p> <p>C. A little difficulty</p> <p>D. No difficulty</p>	<p>A. Should not do under a doctor's order</p> <p>B. No doctor's orders involved</p>

Appendix B: CES-D Measure

CES-D SCALE

Directions: Below is a list of the ways you might have felt or behaved. Please tell me how often you have felt this way during the past week.

	Rarely or None of the Time (Less than 1 Day)	Some or a Little of the Time (1-2 days)	Occasionally or a Moderate Amount of the Time (1-2 days)	Most or All of the Time (5-7 Days)
1. I was bothered by things that usually don't bother me.				
2. I did not feel like eating; my appetite was poor.				
3. I felt that I could not shake off the blues even with the help from my family and friends.				
4. I felt that I was just as good as other people.				
5. I had trouble keeping my mind on what I was doing.				
6. I felt depressed.				
7. I felt that everything I did was an effort.				
8. I felt hopeful about the future.				
9. I thought my life had been a failure.				
10. I felt fearful.				
11. My sleep was restless.				
12. I was happy.				
13. I talked less than usual.				
14. I felt lonely.				
15. People were unfriendly.				
16. I enjoyed life.				
17. I had crying spells.				
18. I felt sad.				
19. I felt that people dislike me.				
20. I could not get "going."				

Appendix C: Spielberger Trait Anxiety Measure

Trait Anxiety
SELF-ANALYSIS QUESTIONNAIRE X-2

Directions: A number of statements that people have used to describe themselves are given below. Read each statement and then blacken the appropriate space on the answer sheet to indicate how you *generally* feel. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe how you *generally* feel.

	None or a little of the time	Some of the time	Good part of the time	Most of the time
31. I am a steady person				
32. I feel like exploring my environment				
33. I feel satisfied with myself				
34. I feel curious				
35. I feel nervous and restless				
36. I feel interested				
37. I wish I could be as happy as others seem to be				
38. I feel inquisitive				
39. I feel like a failure				
40. I feel eager				
41. I get in a state of tension or turmoil as I think over my recent concerns and interests				
42. I am in a questioning mood				
43. I feel secure				
44. I feel stimulated				
45. I lack self-confidence				
46. I feel disinterested				
47. I feel inadequate				
48. I feel mentally active				
49. I worry too much over something that really does not matter				
50. I feel bored				

Appendix D: General Well-Being Adjustment Scale

GENERAL WELL-BEING

1. How have you been feeling in general (during the past month)?

In excellent spirits.....	1
In very good spirits.....	2
In good spirits mostly.....	3
I have been up and down in spirits a lot.....	4
In low spirits mostly.....	5
In very low spirits.....	6

2. How much energy, pep, or vitality did you have or feel (during the past month)?

Very full of energy, lots of pep.....	1
Fairly energetic most of the time.....	2
My energy level varied quite a bit.....	3
Generally low in energy, pep.....	4
Very low in energy or pep most of the time.....	5
No energy or pep at all, I felt drained, sapped.....	6

3. How happy, satisfied, or pleased have you been with your personal life (during the past month)?

Extremely happy, could not have been more satisfied or pleased.....	1
Very happy most of the time.....	2
Generally satisfied, pleased.....	3
Sometimes fairly satisfied, sometimes fairly unhappy.....	4
Generally dissatisfied, unhappy.....	5
Very dissatisfied or unhappy most or all of the time.....	6

4. Have you been in firm control of your behavior, thoughts, emotions or feelings (during the past month)?

Yes, definitely so.....	1
Yes, for the most part.....	2
Generally so.....	3
Not too well.....	4
No, and I am somewhat disturbed.....	5
No, and I am very disturbed.....	6

5. Did you feel active, vigorous or dull, sluggish (during the past month)?

Very active, vigorous every day.....	1
Mostly active, vigorous never really dull, sluggish.....	2
Fairly active, vigorous, seldom dull, sluggish.....	3
Fairly dull, sluggish, seldom active, vigorous.....	4
Mostly dull, sluggish, never really active, vigorous.....	5
Very dull, sluggish every day.....	6

6. Have you had any reason to wonder if you were losing your mind, or losing control over the way you act, talk, think, feel, or of your memory (during the past month)?

Not at all.....	1
Only a little.....	2
Some, but not enough to be concerned or worried about.....	3
Some, and I have been a little concerned.....	4
Some, and I am quite concerned.....	5
Yes, very much so and I am very concerned.....	6

7. Have you felt tired, worn out, used up, or exhausted (during the past month)?

All of the time.....	1
Most of the time.....	2
A good bit of the time.....	3
Some of the time.....	4
A little of the time.....	5
None of the time.....	6

8. Has your daily life been full of things that were interesting to you (during the past month)?

All of the time.....	1
Most of the time.....	2
A good bit of the time.....	3
Some of the time.....	4
A little of the time.....	5
None of the time.....	6

9. Have you been waking up feeling fresh and rested (during the past month)?

All of the time.....	1
Most of the time.....	2
A good bit of the time.....	3
Some of the time.....	4
A little of the time.....	5
None of the time.....	6

10. Have you been feeling emotionally stable and sure of yourself (during the past month)?

- | | |
|-----------------------------|---|
| All of the time..... | 1 |
| Most of the time..... | 2 |
| A good bit of the time..... | 3 |
| Some of the time..... | 4 |
| A little of the time..... | 5 |
| None of the time..... | 6 |

11. Have you felt cheerful, lighthearted (during the past month)?

- | | |
|-----------------------------|---|
| All of the time..... | 1 |
| Most of the time..... | 2 |
| A good bit of the time..... | 3 |
| Some of the time..... | 4 |
| A little of the time..... | 5 |
| None of the time..... | 6 |

Appendix E: Social Activity Measure

SOCIAL ACTIVITIES

The next questions are about social activities people sometimes participate in. Please indicate below how often you participated in the following activities during the past month: Not at all, 1-2 times a month, 1-2 times a week, several times a week, or daily. If "not at all" circle "0" and go to the next item. Otherwise for items 6 thru 13 also answer Part A to the right.

	Not At All (Next Item)	1-2 Times/ Month (Do Part A For Items 6-13)	1-2 Times/ Week	Several Times/ Week	Daily	A. Did you participate in the activity alone or with one or more persons?		
						Alone	Some-Times Alone	With 1 Or More
1. Attended church services or synagogue..	0	1	2	3	4	-	-	-
2. Attended group meetings or events (community, church, or senior citizens groups).....	0	1	2	3	4	-	-	-
3. Had friends or relatives visit your home..	0	1	2	3	4	-	-	-
4. Gotten together with friends or relatives outside of your home.....	0	1	2	3	4	-	-	-
5. Talked on the telephone with friends or relatives.....	0	1	2	3	4	-	-	-
6. Done physical exercise (such as walks, exercises, sports).....	0	1	2	3	4	0	1	2
7. Spent time on hobbies (such as arts, crafts, collecting).....	0	1	2	3	4	0	1	2
8. Eaten out at a restaurant.....	0	1	2	3	4	0	1	2
9. Attended movies, plays, concerts or sporting events.....	0	1	2	3	4	0	1	2
10. Watched television or home videos.....	0	1	2	3	4	0	1	2
11. Taken days trips or overnight trips.....	0	1	2	3	4	0	1	2
12. Done volunteer work.....	0	1	2	3	4	0	1	2
13. Done paid work.....	0	1	2	3	4	0	1	2

BIOGRAPHY OF THE AUTHOR

Grace Marie Avakian was born in Charlotte, North Carolina on July 8th, 1992. Grace was raised in Coralville, Iowa, and later moved to Maine with her family. She graduated from Narraguagus High School in 2010. Grace graduated from the University of Maine in May 2014 with a degree in Psychology and a minor in Dance. Grace is continuing her education in Fort Lauderdale, Florida where she will receive a Master's in Occupational Therapy in 2016 from Nova Southeastern University. She wishes to do missionary work later in life and her ultimate goal is to serve God and serve people.