

RESILIENCE IN THE GENERAL FACTOR OF PERSONALITY:
UNDERSTANDING THE ROLE OF POSITIVE AFFECT, SOCIAL SUPPORT, AND
PARTICIPATION IN DISTRESS RELATED TO CHRONIC ILLNESS OR
DISABILITY

A Dissertation

by

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ABSTRACT

This study investigated how positive affect, social support, and participation influence the relationship between resilience and distress for individuals with chronic health conditions. The data was gathered from the National Longitudinal Study of Adolescent to Adult Health (Add Health) database (Harris et al., 2009) and analyzed using path analysis. The GFP as it relates to resilience was compared to the resilient personality prototype model, and conclusions were drawn regarding which model best explains resilience and its relationship with psychological distress. Results can be used to inform treatment intervention and policy development impacting the lives of those who live with chronic health conditions.

DEDICATION

This dissertation is dedicated to many individuals to whom I owe great thanks and appreciation. First to my selfless and servant-hearted husband who has provided to me support and encouragement throughout our relationship and graduate training. Also, to my guide dog and partner Virginia who has lovingly and confidently led me through graduate school and life. And lastly, to my parents who taught me to always strive for the highest attainment, and to reframe an “I can’t...” in to an “I’ll find a way.”

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NOMENCLATURE

Add Health	National Longitudinal Study of Adolescent to Adult Health
CBT	Cognitive Behavioral Therapy
CES-D	Center for Epidemiologic Studies Depression scale
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
GFP	General Factor of Personality
IPIP	International Personality Item Pool
MCMI	Millon Clinical Multiaxial Inventory
MMPI	Minnesota Multiphasic Personality Inventory
RMSEA	Root Mean Square Error of Approximation
SEM	Structural Equation Modeling
SFBT	Solution-Focused Brief Therapy
SRMR	Standardized Root Mean Square Residual
SSA	Social Security Administration

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CHAPTER I

INTRODUCTION

Throughout human existence, individuals have faced adversity in some form or fashion at some point in their lifetime. For some, adversity equals a lower socioeconomic status. For others it may be being born in to a marginalized group of society. And still for others, it may be neglect or abuse in childhood or adulthood. While the frequency, intensity, and duration of adversity in someone's life varies from person to person; these individuals are all faced with challenges that present them with opportunities to adapt and overcome.

Not all individuals faced with adversity are able to adjust quickly or completely to their situation, while others seem to be equipped with a unique set of personal characteristics that makes adaptation more likely or fluid. For individuals who live with chronic illness or disability, there exists a wide spectrum of experiences and reactions to these life-altering conditions. Some individuals are born with diseases or impairments which may affect their development; while others acquire illness or disability later in life. While many people assume that chronic illness and disability would be insurmountable, there is a group of individuals who seem to have what it takes innately to adapt and adjust to difficult life circumstances.

Resilience in regard to chronic health conditions is a somewhat recent concept. Much of the historical literature on disabilities or chronic disease evaluated and described how negatively these conditions impact the patient and their family systems.

In the last several decades however, research has begun to take notice of resilient individuals who tend to portray a well-adapted and well-adjusted perspective on life despite their exposure to significant risk.

Personality and Resilience

Many theories arose initially about resilience and how it could best be predicted. Block and Block (1980) first identified two dimensions of ego-resilience and ego-control. These two dimensions were later expanded into three personality prototypes (ego-resilient, over-controlled, and under-controlled) which were predicted by the Big Five personality traits (neuroticism, extraversion, openness, agreeableness, and conscientiousness). Decades later, Digman (1997) identified two higher order factors of the Big Five personality traits that he first called Alpha and Beta. These Big Two were later relabeled as Stability and Plasticity by DeYoung, Quilty, and Peterson (2007), which were then thought to represent resilient personality types. Digman and DeYoung theorized that individuals who were emotionally stable, yet flexible enough to adapt to their environments were best suited for resilience in the face of adversity. These two higher order factors were in a sense a reorganization of the Big Five traits from Block and Block's model of ego-resilience. Within the next decade, other theorists had further simplified the model of resilient personalities through the identification of a General Factor of Personality or GFP (Museum, 2007).

The GFP combined Block's model of ego-resilience, and Digman's Alpha and Beta to form a single dimension of personality that was represented by well-adjusted, well-adapted, and overall well-rounded individuals. The GFP, consisting of low

neuroticism, and high extraversion, openness, agreeableness, and conscientiousness, was found to exist across several personality assessments/inventories, and demonstrated through the study of twins, a strong genetic component (Rushton, Irwing, & Booth, 2010). The GFP has also been found to be associated with positive affect, self-esteem, and life satisfaction which are all important aspects of resilience and adjustment. While the GFP helped to identify a group of people who may adjust and adapt more easily, other factors including positive affect, social support, and participation can be of great relevance for individuals adjusting to and living with chronic health conditions.

Although the GFP represents personality traits which have both genetic and environmental bases, these three variables (positive affect, social support, and participation) all serve as potential avenues for intervention or treatment with this population. Mediating variables such as these, help to isolate and identify which aspects of the person and environment interact to produce positive adjustment or mitigate distress. Because positive affect, social support, and participation have each previously been shown to play a significant role in adjustment and resilience for people with disabilities, this study helped to further isolate and identify how these variables interact with one another to reduce negative outcomes or distress. Understanding more about resilient response through the lens of the GFP, and observing how these variables impact the relationship between resilience and distress can help researchers and clinicians identify effective strategies and interventions for working with those who are adjusting to chronic conditions.

Analysis and Purpose

This study investigated the relationships between resilience, gender, positive affect, social support, participation, and distress through the use of Structural Equation Modeling (SEM). The study consisted of a secondary data analysis optimized by the use of pre-existing resources, which are often underutilized (Donnellan & Lucas, 2013), and adds to the wealth of scientific knowledge gathered through the Add Health database.

More specifically, this study extended previous, programmatic work that tested the ways in which trait resilience may facilitate adjustment through its predicted associations with beneficial characteristics and behaviors (Elliott et al., 2015; Leuthold, 2017; Walsh et al., 2016). Using a SEM framework these studies conceptualized characteristics such as positive emotions, coping, participation, and social support as mediating variables that could provide some "...explanation for the mechanism that drive the relationship" (Hoyt, Imel, & Chan, 2008; p. 323) between resilience and adjustment. In this study, path analysis, a special case within SEM, was used to determine how each of three mediating variables -- positive affect, social support, and participation -- influence the relationship between resilience, gender, and distress for a group of people with chronic health conditions.

This study aimed to help close the gap of knowledge that exists in resilience research among persons with disabilities studied outside a hospital or rehabilitation setting (Elliott & Brenner, in press). The inclusion of the three mediating variables also help to further explain which aspects of a person's personality and environment function as mechanisms of resilience and positive adjustment for a community sample. Results

can be used to help inform further research, policy, and treatment for individuals living with chronic conditions to promote healthy adaptation and reduce distress.

CHAPTER II

LITERATURE REVIEW

Disability and Response to Adversity

As soldiers returned from war in the late 1940's and early 1950's, medical and vocational providers worked to better understand the complex interplay between patient's personality, disability, and their adjustment to acquired chronic conditions (Harper & Richman, 1978; Wiener, 1948; Wright, 1960). Initially, medical professionals and psychologist worked toward this goal through the administration and interpretation of clinical personality assessments with various groups of patients with disabilities. More recently, the field has begun to focus on the more common place personality characteristics and aspects of the environment that lead to positive adjustment to chronic conditions. While many early medical and rehabilitation providers assumed that disability had an overwhelming negative impact on individuals; many providers began to take notice of people who continued to thrive after acquiring a chronic condition.

The first step toward understanding the complex interaction between disability and personality began with practitioners attempting to understand if people with certain personality types were more likely to become disabled. Malec (1985) found that individuals with spinal cord injuries were more likely to be extraverted, and to challenge the social and physical environments around them. It was postulated, that these individual's tendencies to challenge the world around them and to seek excitement led to the traumatic injury they eventually acquired. Rohe and Krause (1999) also found that

individuals with spinal cord injuries tended to score lower on conscientiousness, activity, and assertiveness; while scoring higher on excitement-seeking. Fordyce (1964) and Taylor (1970) found similar results with instruments that were originally designed to assess clinically-relevant behavioral issues and patterns (i.e., the MMPI), and an attempt to predict acquired disability through personality traits proliferated the early studies in the field.

Several others further documented the negative impact that disability or chronic illness can have on an individual's life (Anusic, Yap, & Lucas, 2014; Infurna & Wiest, 2016; King et al., 2003; Zolkoski & Bullock, 2012). For example, subjective well-being decreases over time at a predictable rate for individuals who experienced a variety of life events including marriage, birth of a child, widowhood, and job loss (Anusic et al., 2014). However, the same research found that individuals who acquired a disability not only took a significant hit to their subjective well-being immediately after the event, but their well-being scores over time remained lower than what would be expected from the mere passage of time and aging.

Historically, lay people and medical professionals alike assumed that the impact of a chronic condition would overwhelm and suppress a person's positive attitude or enjoyment of life. However, Beatrice Wright advocated for an alternative view. Wright, who had studied under Kurt Lewin at the University of Iowa, understood through her training and personal exposure to people with disabilities that not all individuals are overwhelmed by their circumstances. Wright authored two landmark publications in the field of rehabilitation that clarified and described the variety of human responses to

disability, and how the previous thought in the field was missing the mark (Wright, 1960; Wright, 1983).

Wright helped to change the language surrounding the research of populations with disabilities to include people-first terminology. She also described how Lewin's Field Theory shaped her perspective on disability adjustment. While the field had long assumed that disability often led to depression, Wright understood that a person's reaction to disability is extremely hard to predict as it is the result of the complex interaction between a person and their environment (Lewin, 1935). Others in the early field of rehabilitation agreed with Wright that predicting a person's reaction to chronic illness or disability was virtually impossible (Meyerson, 1948; Shontz, 1977). As the field was faced with the contradiction of presuppositions of maladjustment, and clear physical evidence of the opposite for many, researchers began to hone in on the idea of isolating and identifying which parts of the person and environment lead to positive adjustment for these groups.

While Malec (1985) found that people with spinal cord injuries were more likely to be high on extraversion and thrill-seeking, he also found that these same personality traits seemed to lead to better adjustment for these individuals. Individuals who were able to adapt and adjust to difficult circumstances came to be known in the literature as resilient. The resilient response research often considered the impact that chronic adversity had on children and adolescents (Luthar & Zigler, 1991; Zolkoski & Bullock, 2012), and later expanded to encompass the impact of life events and loss on adults (Bonanno, 2004; Shiner & Masten, 2012).

Researchers worked to understand how adversity impacted development throughout the lifespan, and also how various individual characteristics led to adaptive or maladaptive responses through the study of personality traits and prototypes. As researchers found more data supporting the positive influence that certain personality traits have on adjustment to disability, they worked to gather more information about these groups through the administration of clinical and non-clinical personality inventories. While traditional personality assessment for people with disabilities took place with the use of formal, clinically-based measures, Wright and fellow colleagues pushed for the de-medicalization of disability and assessment. Previously, the Minnesota Multiphasic Personality Inventory (MMPI) and the Millon Clinical Multiaxial Inventory (MCMI), among others, were used in the assessment of personality traits for individuals with chronic conditions. As Elliott and Umlauf (1995) stated, this often led to the inappropriate application of non-disabled norms to the groups of participants with disabilities. These formal personality measures also include items that can falsely elevate pathological symptoms because of their somatic nature and the association of somatic symptoms with conditions such as spinal cord injuries. While researchers worked to develop formulas or procedures for correcting these false elevations, many in the field pushed for the use of less clinical, and more common place personality measures.

The move away from measures like the MMPI and MCMI prompted a consideration of instruments that assess commonplace personality variables like the NEO-Pi (Costa & McRae, 1992) and other measures of the Big Five personality traits. This included studies of specific traits or facets and their associations with positive

adjustment (Krause & Rohe, 1998; Malec, 1985; Robb, Small, & Haley, 2007); it eventually included investigations of combinations of Big Five personality traits that were combined and studied for their association with adjustment to disability. These trait combinations and prototypes also helped to isolate and define the resilient response to adversity. Resilience has been described in several ways including the positive adaptation to circumstances that would ordinarily disrupt development (Ong, Bergeman, & Boker, 2009), or the simple ability to “bounce back” (Tugade & Fredrickson, 2004).

Block and Block (1980) also formulated theories of resiliency that involved personality traits and the creation of the ego-resilient, under-controlled, and over-controlled personality prototypes (Asendorpf & Van Aken, 1999; John & Srivastava, 1999). These personality prototypes, identified by cluster analysis, were based upon different combinations of normative personality traits such as the Big Five personality factors from Costa and McCrae (1992) and demonstrated the variety of reactions that children and adults had as a response to difficult life circumstances. Caspi and Silva (1995) also identified these three personality traits as occurring in childhood and emerging adulthood through their longitudinal study. Dennissen and colleagues also found evidence of these three prototypes in their 2008 study of childhood to adult personality traits (Dennissen, Asendorpf, & Van Aken, 2008). Robins, John, Caspi, Moffitt, and Stouthamer (1996) similarly identified these personality prototypes through their study of Caucasian and African-American adolescent boys, based on their Q-sort descriptions provided by their parents.

Block and Kremen (1996; p. 354) described pure ego-resilience as “...Characterized by assertiveness, direct expression of feelings, positive self-regard, social poise and presence, playfulness, an ability to establish interpersonal relationships, and an absence of self-concern, ruminativeness, and fearfulness.” They argued that ego-resilience was a balance in which a person was able to assess and adapt to circumstances given the inherent traits of the individual and their interaction with the environment. The under-controlled and over-controlled prototypes were theorized to demonstrate different points upon a spectrum of balance and adaptability to changing circumstances. Dennissen et al. (2008) and Asendorpf, Borkenau, Ostendorf, and Van Aken (2001) found that over-controlled personality types were most often associated with internalizing tendencies, and under-controlled personality types were most associated with externalizing tendencies.

Individuals displaying resilient responses often exhibit the most well-adjusted outcomes, whereas individuals who are under-controlled or over-controlled often experience more difficulty or maladjustment. Two important distinctions must be made however between ego-resilience and resilient response (Ong et al. 2009). First, ego-resilience is construed as an individual trait; but in the developmental literature resilience is construed as a process through which an individual adapts positively to adversity. Second, resilience in the developmental literature presupposes the presence of exposure to risk or adversity and unexpected positive outcomes; in contrast, in Block’s model of ego-resilience it is a trait independent of risk exposure. Other theories emerged from Block’s original model of ego-resilience and researchers proposed alternative

theories/models on how exactly personality predicts resilient and non-resilient responses (Digman, 1997; Rushton & Irwing, 2008, 2011). Higher-order factors such as the Big Two and the Big One were hypothesized, and these factors' association with resilience were examined. Furthering the trait conceptualization of resilience, these higher-order factors investigated Big Five trait combinations and their role in resilience/positive outcomes for a variety of populations.

Personality Organization and the Big Five

Decades of research on personality have culminated to identify the Five Factor Model of personality as the most complete and parsimonious model for personality (Goldberg, 1981). The Big Five make up what was initially believed to be the apex of human personality. Neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness are widely taught to be the most basic personality dimensions and can be assessed reliably by several instruments (Costa & McCrae, 1992; Goldberg, 1992; Gosling, Rentfro, & Swann, 2003; John & Srivistava, 1999).

Many studies have found support for the existence of the Big Five traits in adulthood, and a study by Halverson et al., (2003) also found evidence for the presence of the Big Five traits as early as two and three years of age. While researchers can agree that personality and its development is impacted by both biological and environmental factors, a variety of theories have emerged regarding the role that individual traits play in resilience across the lifespan. For example, researchers have sought to use the Big Five as predictors of resilient or adaptive response to adversity as in Shiner and Masten's (2012) study. These researchers found that children who were higher in

conscientiousness, agreeableness, and openness were more likely to be categorized as having resilience in young-mid adulthood despite their exposure to adverse events throughout childhood. Shiner and Masten (2012) also found that children who were lower in neuroticism were more likely to be identified as competent or resilient as compared to maladaptive; and children higher in conscientiousness were more likely to move from the maladaptive group in emerging adulthood to the resilient group in adulthood. Caspi and Silva (1995), along with Dennissen et al. (2008) advocated for the person-centered approach to personality measurement and organization, and later models of resilience described various organization of these five characteristics that formed resilient personalities or prototypes in adulthood (Block & Block, 1980; DeYoung, 2010; Digman, 1997).

The General Factor of Personality

Although the model of the Big Five has proliferated throughout the field of psychology as the highest order of personality organization, other researchers have proposed that a Big Two or Big One personality factor may exist as the true apex of personality (DeYoung, 2010; Musek, 2007; Struss, Cieciuch, & Rowinski, 2014).

Digman (1997) found that two higher-order factors of personality existed above the Big Five through his secondary analysis of several Five Factor Model studies. These two higher-order factors were first given the names of Alpha and Beta, and were later relabeled as stability and plasticity by DeYoung et al. (2007). Digman argued that the Big Five characteristics were correlated with one another across several studies and therefore could not be considered to be the most complete or parsimonious model of

personality dimension. Digman and other researchers (DeYoung et al., 2007) argued that the Big Five factors were often identified (through orthogonal rotations only) in factor analysis which imposed artificial orthogonality among the factors. Conversely, Digman's analyses used oblique rotations, which did not hold the Big Five factors to orthogonal relationships but allowed the factors to correlate with one another naturally.

Digman and DeYoung's identification of stability and plasticity, or alpha and beta, brought forth a new theory of resilient personality types in the field of psychology and rehabilitation. These researchers argued that individuals who were both emotionally stable (as identified by low neuroticism, high agreeableness, and high conscientiousness), along with being flexible (as identified by high extraversion and openness) were best suited to adapt to changing environments and circumstantial demands. Individuals who demonstrated both stability and plasticity were thought to have what it takes inherently to display resilience in a variety of life circumstances and adversities. This theory in a sense re-organized Block's theory of ego-resilience using the same five factors of personality but grouping and describing them differently. It was at this point that a new theory of resilience had been established based upon the Big Two (stability and flexibility) rather than prototypes constructed from the Big Five alone.

Musek (2007) agreed with Digman in that the Big Five were not truly orthogonal and could therefore not be determined as the highest order of personality organization. However, Musek went on to also state that the Big Two also correlated to some degree with one another, and then argued for the existence of a single highest order factor of personality. This Big One, or general factor of personality (GFP) has now been

identified as the most complete and parsimonious theory of personality organization and also has been identified as the resilient or most well-adjusted personality type (Rushton & Irwing, 2008, 2009a).

The GFP as identified by Rushton and Irwing is considered to be a personality that is stable, adaptive, and overall well-rounded. In their 2011 article, Rushton and Irwing described individuals high on the GFP as “altruistic, agreeable, relaxed, conscientious, sociable, and open, with high levels of well - being and self - esteem.” The GFP consists of high values on extraversion, openness, agreeableness, conscientiousness, and low neuroticism. The GFP, or Big One, has been found to account for much of the variance in several personality inventories including: The Multidimensional Personality Questionnaire (Rushton & Irwing, 2009a), the Guilford – Zimmerman Temperament Survey, the California Psychological Inventory, the Temperament and Character Inventory (Rushton & Irwing, 2009b), Comrey Personality Scales, the Minnesota Multiphasic Personality Inventory-2, the Multicultural Personality Questionnaire (Rushton & Irwing, 2009c), the Millon Clinical Multiaxial Inventory – III, the Dimensional Assessment of Personality Pathology, the Personality Assessment Inventory (Rushton & Irwing, 2009d), and has a strong genetic component (Rushton, Bons, & Hur, 2008; Veselka, Schermer, Petrides, & Vernon, 2009). Specifically, Rushton et al. (2008) found in their study of monozygotic and dizygotic twins that the GFP accounted for as much as 50% of overall variance across several measures of personality.

As was to be expected, critiques of the GFP model arose as well. Critics of the model stated that the all-encompassing, robustness of a single general factor resulted from response sets of individuals who maximized positive individual characteristics and minimized negative individual characteristics. As a result, some would say that the response sets identifying the general factor of personality were purely socially desirable responses and that the GFP was merely an artifact of social desirability (Anusic, Schimmack, Pinkus, & Lockwood, 2009; Ashton, Lee, Goldberg, & de Vries, 2009; Bäckström, Bjorklund, & Larsson, 2009). However, Rushton and Erdle in their 2010 study presented evidence contradicting this assumption and found that the GFP was not only not the result of socially desirable response sets, but that the GFP was also highly associated with other key factors of resilient personalities and responses.

Rushton and Erdle (2010) found that the GFP was highly associated with positive affect (a key factor of resiliency (and negatively correlated with negative affect and depression. Erdle, Irwing, Rushton, and Park (2010) also found that the GFP accounted for 57% of variance in self-esteem which also plays a role in resilience and adjustment. In addition to the general support for the existence of the GFP and its association with positive/well-adjusted personality characteristics, other research has found that the GFP is also present in the assessment of pathological personalities. Rushton, Irwing, and Booth (2010) found evidence to support the existence of the GFP in the Dimensional Assessment of Personality Pathology – Basic Questionnaire (DAPP – BQ) across three studies demonstrating the existence of the GFP across the spectrum of human personality and its presentations.

The introduction of the GFP as the apex of human personality has also led to its association with resilience in the literature. Building upon Block and Block's and Digman's work, it is believed that the GFP represents a personality type that demonstrates stability, adaptability, and the capacity to respond with resilience in the face of adversity. Whether personality is considered in terms of the Big Five, Big Two, or Big One, irrefutable evidence for the role of personality in resilience is evident. For example, Waaktaar and Torgersen (2010) found that the Big Five traits were better at predicting adjustment than several resiliency specific scales. While these personality characteristics help to explain some of the variability in response to adversity; other factors such as positive affect, social support, and participation in one's environment have also been shown to mediate the relationship between resilience and positive adjustment for individuals with chronic illness or disability.

Positive Affect and Resilience

The role of positive affect in adjustment has been demonstrated through several studies involving resilience and disability. Walsh et al. (2016) found that positive affect was positively associated with resilience and negatively associated with depression for a population of veterans with traumatic brain injuries and post-traumatic stress disorder. In addition to these findings, Walsh and colleagues also found that positive affect mediated the relationship between resilience and adjustment for these individuals as well. This study demonstrated the integral, mediating role that positive affect plays in adjustment for individuals with both disabilities and mental health concerns; and the authors also identified positive affect as the key factor in resilient response for this sample.

Similarly, others have found that positive affect plays a primary role in resilient response and is considered to be a key factor of resilient personalities (Dunn, Uswatte, & Elliott, 2009). Tugade and Fredrickson found in their 2004 study of resiliency that individuals who were able to bounce back from adversity used positive emotions and found positive meaning in difficult situations. Ong, Zautra, and Reid (2010) and Ong, Bergeman, Bisconti, and Wallace (2006) also state that positive affect is a mechanism of resilient response and not just a bi-product of resiliency.

While positive affect has been demonstrated to mediate the role between resilience and adjustment for several samples, the two variables are found to jointly promote adjustment and well-being in a variety of ways. Cohn and colleagues in their 2009 study of a non-disabled sample, found that resilience mediated the relationship between positive affect and life-satisfaction (Cohn, Fredrickson, Brown, Mikels, & Conway, 2009), whereas Rushton and Irwing (2011) found in their study that the GFP strongly correlated with positive affect ($r = 0.62$) and accounted for 60% of total variance in overall subjective well-being. While frequent associations between positive affect and resilience have been found, it must be understood that positive affect functions as a mechanism of resilience and helps to facilitate positive adjustment for people exposed to a variety of risks or adverse circumstances. Through its association with resilience and adjustment, it follows that positive affect helps to promote the reduction of distress resulting from adverse experiences as well. Each of these findings further supports the integral role that positive emotions play in resilient response, and demonstrates an avenue of intervention that can be pursued when working with

individuals with chronic illness or disabilities. In addition to positive affect, social support also plays an important role in resilience and adjustment for individuals in these populations.

Social Support and Resilience

Several studies have found that social support plays a significant role in adjustment to disability and other mental health disorders (Bonanno, Westphal, & Mancini, 2011; Elliott et al., 1991; Infurna & Wiest, 2016; Patterson & Blum, 1996; Shiner & Masten, 2012; Silverman et al., 2015; Zautra, Hall, Murray, & The Resilience Solutions Group, 2008). Social support has been demonstrated to be an integral factor leading to recovery from a variety of physical and mental health concerns and its importance in coping and adjustment is especially important in the field of rehabilitation psychology. Like positive affect, resilient individuals are found to have more actual and perceived social support than non-resilient individuals. While many studies inquire passively about an individuals' available social support network, other researchers attempted to connect personality traits to a person's capacity for obtaining and maintaining social support.

Boyce and Wood (2011) found that individuals with disabilities who were higher in agreeableness reported higher levels of life-satisfaction and better adjustment to disability than those who were lower in agreeableness. Boyce and Wood suggested that more agreeable individuals might be better at getting along with others, creating and maintaining social relationships which may have led to greater life satisfaction for this

group. These results further support a hypothesis associating personality and adjustment to adverse life circumstances, and a resilient personality type.

Elliott et al. (1991) found that greater social support among persons with spinal cord injuries is associated with less depression, and social support networks appear to serve as a source of encouragement toward engaging in their environments. Elliott and Shewchuk (1995) also found that social support was significantly associated with engagement in leisure activities for veterans with spinal cord injuries; activity engagement being another protective factor in adjustment for individuals with disabilities. Patterson and Blum identified similar findings for children with disabilities in that higher levels of social support were associated with greater activity engagement (1996). Because children and adults with chronic illness and disabilities are at risk for lower social and activity engagement, the interaction of social support with participation should be further examined as a mechanism of positive adaptation and resilience.

Participation and Resilience

Lastly, participation in one's environment is an integral component of adjustment to disability and stress for individuals across the lifespan. Resilient individuals have been found to be more likely to engage positively with their environment; a comfort in exploration in new situations resulting from positive attachments in childhood (Block & Kreman, 1996; Caspi & Silva, 1995; Garmezy, 1985). Furthermore, resilient individuals are more goal directed and more likely to use positive/active problem solving coping strategies than their non-resilient peers (Block & Kreman, 1996; Elliott et al., 2015).

The importance of participation and the deleterious effects of activity restriction have been demonstrated for both children and adolescents with disabilities (King et al., 2003; Patterson & Blum, 1996; Shikako-Thomas, Majnemer, Law, & Lach, 2008) as well as with adult populations (Caldwell & Gilbert, 1990; Dunn et al., 2009; Elliott et al., 1991; Erosa, Berry, Elliott, Underhill, & Fine, 2014; Farkas & Orosz, 2015; Kalpinski et al., 2013; Kinney & Coyle, 1992; Ong et al., 2009; Walsh et al., 2016). In addition to the demonstrated impact that activity restriction and participation can have across various age groups, the same effects are present across a variety of disabilities and health concerns.

Erosa et al. found that participation mediated the role between functional impairment and pain to quality of life for a sample of individuals with traumatic spinal cord injuries (2014). Similarly, Kalpinski et al. (2013) found that participation in meaningful activities mediated the relationship between adjustment and disability. In addition to these findings, Walsh and colleagues (2016) found that positive affect and activity restriction completely mediated the relationship between resilience and depression/PTSD symptoms for a group of individuals with upper limb loss. Given these results, Walsch et al. suggested that individuals with disabilities can benefit from interventions designed to reduce avoidance/activity restriction, and should be encouraged to engage in activities or experiences that promote positive affect.

Understanding the impact that chronic illness and disability can have on those around the identified patient is also important to note. In a study of medical patients, Mausbach and colleagues (2011) identified the impact that activity restriction can have

on both the patient and the patient's caregiver. The researchers found that activity restriction was highly correlated with depression in both groups. These findings are of particular interest because they highlight how disability and chronic illness can negatively impact an entire social system. As a result of these findings, healthcare providers can more effectively intervene with patients and their families to promote healthy adjustment and coping.

While activity restriction functions as something individuals who adjust well should avoid, participation serves as a positive inverse for individuals to strive for. Participation has been defined in several ways including physical, social, or occupational engagement in one's environment; however, participation can be conceptualized as more than the act of engaging in one's world but the perceived option to do so. Perenboom and Chorus (2003) defined participation as an individual's perceived control over their life and experiences which is of great importance for those living with chronic illness and disabilities.

Many people living with chronic conditions are limited by mobility or health concerns which make engaging with others and their environments extremely difficult. Physical, financial, or institutional barriers can also prohibit participation for individuals with disabilities and this has proved detrimental for adjustment.

The World Health Organization (2001) also conceptualizes disability through the aspect of participation by defining functional status of disability in part by the extent to which an individual is unable to participate in tasks of social and occupational daily living. Similarly, the Social Security Administration (SSA) defines disability by an

individual's inability to perform a variety of tasks of daily living and occupational engagement (Social Security Administration Red Book, 2017). Because disability is in some sense defined by the lack of ability to engage in activities, the detrimental effects that activity restriction can have in creating a sense of powerlessness and hopelessness for these populations cannot be ignored. As the importance of participation in the reduction of distress and adjustment has been recognized, and the influence that social support can have on engagement; it should be further explored how these two factors, in conjunction with positive affect, impact the relationship between resilience and adjustment for individuals with chronic illness and disabilities. Resilient individuals possess greater levels of positive affect, social support, and participation than their non-resilient peers as demonstrated by the current literature; and further study of these variables as mediators will help to isolate and identify how each of these aspects of a person or their environment promote resilience and reduce distress.

The Proposed Model in the Present Study

Consideration of the impact that each of these factors has on resilience and distress for individuals with disabilities led to the formation of the proposed model in this study. The National Longitudinal Study of Adolescent and Adult Health (Add Health) contains a nationally representative sample of young adults who live with and without chronic illness or disabilities. A sample of individuals with chronic health conditions was drawn from the public use data set and used for the following analyses.

It was predicted that a General Factor of Personality would be obtained from Big Five data collected in the Add Health data set. It was also hypothesized that positive

affect, social support, and participation variables would mediate the relationship between resilience and distress for the group of individuals with chronic illness and disabilities. It was predicted that social support would also be associated with participation for participants of this study. A diagram of the hypothesized model can be found in Figure 1. Lastly, differences between men and women in the proposed model would be identified and observed to determine if model fit varied significantly among the two groups. Additionally, the proposed GFP model was compared to the resilient personality prototype model to determine in which ways the models differently capture and explain resilience and mediated effects. Within the prototype model, two groups were predicted to emerge based on their Big Five trait standings; a resilient group high in extraversion, openness, agreeableness, and conscientiousness and low in neuroticism, and a non-resilient group with opposite standings on the Big Five traits.

Historically, resilience has been studied in one of two ways; via the personality trait method, or through the person-centered approach based on the organization of various traits within individuals (Elliott, Barron, et al., 2019). Through the incorporation of the GFP, this study allows for the comparison of these two approaches. Results can then guide future research in resilience based upon the approach that best captures and explains resilient response to disability.

Thus far the importance of these mediating factors have been demonstrated across studies for a variety of populations, but no study has yet observed these factors in combination for a group of individuals with chronic health conditions. Observing the impact that each of these mediating variables has on resilience and distress should help

to define the mechanisms of change through which positive adaptation takes place. The results of this study may also provide further support for the existence of the GFP and its association with resilience. Results of this study aimed to help to further expand the scientific knowledge regarding resilience and disability, and also highlight possible avenues of intervention, treatment, or policy modification.

CHAPTER III

METHODOLOGY

Procedures

The Add Health database is an archival dataset containing four waves of data collected across several decades (Harris et al., 2009). This study used data from the public use dataset from Wave IV (collected in 2008-2009, when participants ages ranged from 24-32). The public use data has been consolidated, de-identified, and made available to researchers through partners of the Carolina Population Center.

Wave IV of the study involved the collection of data through in-home interviews with participants who have been a part of the previous three waves of data collection. The in-home interview included items assessing a variety of topics including physical/mental health, personality, social engagement, romantic and family relationships, finances, career, neighborhood, substance abuse, and parenting. For the purposes of this study, data from the Wave IV of the Add Health study was analyzed using statistical software. The Texas A&M Institutional Review Board (IRB) has a pre-approved status for the public use dataset from Add Health and no formal IRB request was required. The public use data set has been created as a nationally representative sample, and the sample of interest for this study was extracted and analyzed.

Participants

Participants in Wave IV of the Add Health Study self-reported their status on several chronic illness/disability items including whether or not they are visually impaired/blind, hearing impaired/deaf, have/had diabetes, have/had asthma, have/had, epilepsy, and whether they use a mobility device such as a brace, cane, or wheelchair. Participants responded to the item “Do you have total blindness in one or both eyes” and selected their response from the options “2: no”, “3: yes, one eye”, or “4: yes, both eyes.” Participants who indicated a response of either total blindness in one or both eyes were considered to have a visual impairment for this study. For Hearing impaired status participants responded to the item “Which statement best describes your hearing without a hearing aid or other assistive devices” with response options including “1: excellent”, “2: good”, “3: a little trouble”, “4: moderate trouble”, “5: a lot of trouble”, and “6: deaf.” Participants who responded to this item with either “moderate trouble”, “a lot of trouble”, or “deaf” were considered to have a hearing impairment. Participants were also asked to indicate whether or not they use a “brace, cane, wheelchair, or other device because of a physical condition” and responded either “0: no” or “1: yes.” Participants who indicated yes to using a mobility device because of a physical condition were included in this study as having a mobility related disability/chronic illness.

The remaining chronic illness items included in this study asked each participant if “a doctor, nurse, or other healthcare provider ever told them if they have or had: high blood sugar/diabetes, asthma/chronic bronchitis/emphysema, or epilepsy/another seizure disorder.” Participants responded with either “0: no” or “1: yes.” Individuals who

indicated “yes” to a previous diagnosis of any of the above conditions were considered to have a chronic illness for this study. The total number of participants included in the public use data set was $N = 5114$. A total of $n = 1151$ participants were identified as having one or more disability from the categories selected.

Individuals with disabilities/chronic illness were identified as follows: visual impairment 2.2% ($n = 25$), hearing impairment 5.5% ($n = 63$), mobility impairment 15.2% ($n = 175$), diabetes 13.0% ($n = 150$), asthma 68.6% ($n = 789$), and epilepsy 6.2% ($n = 71$). The average age of the participants in the selected sample was 28.94 with a standard deviation of 1.78 years. The age range included in this sample was 25 to 34 years of age, and 57.1% ($n = 657$) of the selected participants were female and 42.9% ($n = 494$) were male. Demographically, 67.2% ($n = 773$) identified as White, 26.4% ($n = 304$) as Black, 9.6% ($n = 110$) as Hispanic/Latino(a), 5.1% ($n = 59$) as American-Indian or Alaskan Native, 2.4% ($n = 28$) as Asian or Pacific Islander, and 6.0% ($n = 69$) as Other. Table 2 specifies each of the demographic categories and their respective n values and percentages. participants in Wave I of the study were permitted to select as many options as desired to identify their race/ethnicity and were not limited to selecting only one racial category.

Measures

The measures of personality/resilience, positive affect, social support, participation, and psychological distress included in this project were taken from the Wave IV Add Health study and are described in detail in this section. The other measures included in the Add Health Wave IV study are not discussed as they are not

pertinent to this specific project. For a complete list of items and measures included in Wave IV of the Add Health study, visit the study's website at <http://www.cpc.unc.edu/projects/Addhealth>.

Predictor Variables

The two predictor variables included in this study are gender and resilience. Women were coded as "0" in the data, and men were coded as "1" as originally defined by the creators of the Add Health data set. Gender was included as a predictor variable as a means for observing and interpreting the impact that gender has on the model variables and model as a whole. Women are typically found to have higher levels of neuroticism and self-reported psychological distress, and these factors may impact the fit of the model for the two gender groups included in this study.

Resilience was measured and observed using the Big Five traits within the context of the GFP. Previous literature indicates that greater resilience is associated with low levels of neuroticism, and high levels of extraversion, openness, agreeableness, and conscientiousness. In an additional analysis, cluster analysis were used to group individuals into the resilient or non-resilient group based on their standing on these Big Five traits as conceptualized through the resilient prototype model. Both the resilient GFP model and resilient prototype model were analyzed to observe and distinguish how each model captured and explained the proposed mediated effects. Resilience in both models was linked directionally with the three mediating variables described in the following section. The Big Five personality traits were measured using items taken from Baldasaro, Shanahan, and Bauer's 2013 study on the Mini-International Personality Item

Pool (IPIP) in the Add Health study. The Mini-IPIP is a brief, 20-item measure that includes items that assess each of the Big Five traits based on Goldberg's (1999) 50-item IPIP Five-factor model (IPIP-BF). Each trait included four items asking the participant to identify "how they generally are now, and not as how they wish to be in the future." For a complete list of items included in the Big Five measure for this study see Table 3.

All 20 personality items included responses on a 5-point Likert-type scale including: "1: strongly agree", "2: agree", "3: neither agree nor disagree", "4: disagree", or "5: strongly disagree."

Cronbach's alphas for each of the personality factors were as follows: neuroticism = .68, extraversion = .71, openness = .66, agreeableness = .71, and conscientiousness = .66. These values are virtually identical to the values found by Baldasaro, Shanahan, and Bauer (2013). Costa and McCrae acknowledge that lower alphas for openness and conscientiousness (.66) can be explained by the limited number of items included in the measure and varied item content. Measures that include items that are similar and inquire about the same content repeatedly can often have inflated alpha values whereas items that address differing aspects of a domain in a short measure can produce lower alpha values.

Mediator Variables

Positive affect, social support, and participation were hypothesized to significantly mediate the relationship between resilience and psychological distress for individuals with chronic illnesses or disabilities. Each of the three mediators was hypothesized to significantly mediate the path from resilience to distress individually,

and social support was also hypothesized to directly impact participation as well. Results regarding the direct and indirect significance of these paths identified which aspects of the person and environment help to reduce psychological distress.

Positive affect.

First, a 2-item scale measuring positive affect asked respondents to indicate if in the last week they “enjoyed life” or “felt happy.” These two items included response values of “0: never or rarely”, “1: sometimes”, “2: a lot of the time”, or “3: most of the time or all of the time.” These two items were taken from the Center of Epidemiological Studies Depression Scale (Radloff, 1977) and produced an alpha level of .88.

Social support.

Social support was also included as a mediator in this study as several studies have indicated the important role that social support plays in adjustment to disability and chronic illness (Elliott et al., 1991; Infurna & Wiest, 2016; Patterson & Blum, 1996; Shiner & Masten, 2012; Silverman et al., 2015; Zautra, Hall, Murray, & The Resilience Solutions Group, 2008). A 7-item scale was used to measure social support for this study and included items related to relationships with friends and the participants’ current or most recent romantic relationship. The first item inquired about the number of close friends the participant had. Close friends were defined as “people whom you feel at ease with, can talk to about private matters, and can call on for help” and participants could respond with either “1: none”, “2: 1 to 2 friends”, “3: 3 to 5 friends”, “4: 6 to 9 friends”, or “5: 10 or more friends.” Five items were regarding the participants’ current or most recent romantic relationship. Items included: we enjoy/enjoyed even ordinary, day to day

things together; I am/was satisfied with the way we handle our problems and disagreements; I am/was satisfied with the way we handle family finances; my partner listens/listened to me when I needed someone to talk to; and my partner expresses/expressed love and affection to me. Participants responded on a 5-point Likert-type scale including “1: strongly agree”, “2: agree”, “3: neither agree nor disagree”, “4: disagree”, and “5: strongly disagree.” One last item was also included in this study’s measure of social support and inquired about how often the participant feels isolated from others. Response options included “0: never”, “1: rarely”, “2: sometimes”, or “3: often.” The combined social support items produced an alpha level of .79 which is considered to be adequate (Little, Lindenberger, & Nesselroade, 1999).

Participation.

The last mediator included in this study was participation. Perenboom and Chorus (2003) conceptualize participation as a person’s perception of having control over the happenings in their life, and similar items were drawn from the Add Health study to measure participation through this lens. A 6-item scale included five items on perceived control/participation and one item on how a health condition limits participation in daily school or work activities. The first five items regarding perceived control included responses to how much the participant agreed or disagreed with the following statements: there is little I can do to change the important things in my life; other people determine most of what I can and cannot do; there are many things that interfere with what I want to do; I have little control over the things that happen to me; and there is really no way I can solve the problems I have.

Participants indicated their responses to these items on a 5-point Likert-type scale from “1: strongly agree” to “5: strongly disagree.” The last item on the participation scale asked about how often in the last 30 days that a health problem cause them to miss a day of school or work. Participants response options included: “0: never”, “1: a few times”, “2: about once a week”, “3: almost every day”, or “4: every day.” The Cronbach’s alpha for this participation scale was found to be .73 and is also considered to be adequate.

Outcome Variable

Psychological distress was measured as the outcome variable in this study and the measure contained several items taken from the CES-D 10 depression subscale which is a part of the larger CES-D measure from Radloff (1977). Five items asked about the respondent’s feelings in the last seven days. Items included: you had trouble keeping your mind on what you were doing; you felt depressed; you felt that you were too tired to do things; you felt sad; you felt that people disliked you; and participants responded with either “0: never or rarely”, “1: sometimes”, “2: a lot of the time”, or “3: most of the time or all of the time.” The other two items inquired about whether or not the participant had ever been diagnosed with depression or an anxiety/panic disorder by a doctor, nurse, or other healthcare provider. Participants responded with either “0: no” or “1: yes.” All items on this scale were coded so that the variable would trend as the other variables in this study do; i.e. higher scores on this variable indicate more of that particular construct. The Cronbach’s alpha for the psychological distress scale in this study was .75, which is considered adequate.

Structural Analyses

Several statistical analyses were performed for this cross-sectional study using Stata 15 statistical software (Stata Corp 2017). First, several analyses were used to identify the presence of the GFP in the given data using the Big Five traits of neuroticism, extraversion, openness, agreeableness, and conscientiousness.

Confirmatory Factor Analysis (CFA) was employed to determine loadings of each of the Big Five traits on the GFP, and overall fit of the CFA model. The GFP was then predicted as a latent construct in the proposed path model. In an additional analysis, cluster analyses were used to partition the study participants into two groups; a resilient group and non-resilient group based on the Big Five trait values. Structural Equation Modeling (SEM), in the form of path analysis, was then employed to observe how the relationships for resilience and gender to psychological distress were impacted by the mediating variables of positive affect, social support, and participation. The hypothesized GFP model presented in Figure 1 includes predictors of resilience and gender, mediators of positive affect, social support, and participation, and an outcome variable of psychological distress. The hypothesized relationship between the two endogenous variables of social support and participation is also represented in the model. An analogous resilient prototype path model was also analyzed to compare how each model captures the construct of resilience as based on Big Five traits, and explains the relationships between resilience, gender, and distress.

Path analysis serves as an effective way to observe direct and indirect effects of several interacting variables (Kline, 2016) and was used to demonstrate observed

relationships among variables in this study. The observations obtained through path analysis provide further insight in to how each of the mediating variables interact with the predictor and outcome variables so that pathways of significance were identified. These pathways can then be examined further to better understand how each mediator helped to reduce distress through its association with resilience and gender.

CHAPTER IV

RESULTS

All analyses were conducted using Stata 15 statistical software (StataCorp., 2017). Across all analyses maximum likelihood (ml) estimation was used for parameter estimation and to account for missing data. The sample of persons with chronic health conditions contained a total of $N = 1151$ with 657 (57.1%) females and 494 (42.9%) males.

Preliminary Analyses

All model variables were tested for normality, and were found to be normally distributed. Descriptive statistics including means and standard deviations for all model variables were obtained, and results are presented in Table 4. Two-tailed independent t-test analyses for all model variables found significant differences between men and women on each of the Big Five variables and psychological distress. Women were found to have significantly higher scores in neuroticism, extraversion, agreeableness, and conscientiousness while men scored significantly higher in openness. There were no significant differences amongst men and women for any of the three mediating variables, and women scored significantly higher in psychological distress.

Correlational analyses were also run to observe any significant associations among the model variables. Table 5 includes results from the correlational analyses, as well as asterisks indicating significance levels. All five of the Big Five traits were found to be significantly correlated with one another at the $p < .001$ level, with the exception of

openness and conscientiousness. These two variables were found to have a minimal correlation value that was insignificant. These results are not unexpected as by nature these two variables measure opposite constructs; i.e. conscientiousness measuring a person's preference for structure and order, and openness measuring a person's preference for fluidity and flexibility of thoughts and actions. Each of the three proposed mediating variables were also found to significantly correlate with one another ($p < .001$). Psychological distress was found to correlate significantly with all model variables except for openness and agreeableness, and gender was significantly associated with all Big Five traits and psychological distress. These variable associations further support the proposed identification of the GFP, and the inclusion of these mediators in the analyzed models.

This study investigated the existence of the GFP and observed how it interacts with positive affect, social support, participation, and psychological distress. The GFP has been identified as a way to represent resilient personalities in a single construct, and GFP resilience was compared to the resilient personality prototype model as described in previous research. It was proposed that resilience would predict lower levels of psychological distress through indirect paths including social support, positive affect, and participation for this sample of individuals with chronic illness/disability. Social support was hypothesized to significantly impact participation in the models, and model differences based on gender were observed. The following sections of this chapter outline the methods and outcomes of these proposed hypotheses.

Identifying the GFP

In order to identify the GFP in the data, Confirmatory Factor Analysis (CFA) was used to obtain factor loadings and goodness of fit indices for the latent variables Alpha, Beta, and the GFP. Following the procedure of Digman (1997) and Musek (2007), composite scores of the Big Five traits were included as observed variables in the CFA analyses. First, the variables of neuroticism, agreeableness, and conscientiousness were loaded on to the latent variable of Alpha; while extraversion and openness were loaded on to Beta. Neuroticism's factor loading was constrained to 1.00 and openness' factor loading was constrained to 1.00 in the model as well. Each of these loadings are constrained as each variable serves as a reference variable for the two latent factors. The remaining factor loadings obtained were: Alpha to agreeableness = -2.96, Alpha to conscientiousness = -0.95, and Beta to extraversion = 0.96.

This analysis produced a significant X^2 value of 31.14 ($df = 4$) and a Comparative Fit Index (CFI) of .91. X^2 values that are greater than $p < .05$ are indicative of good fit, and X^2 values that are $p < .05$ typically indicate poor fit in the model. Digman's (1997) article identifying Alpha and Beta also found a significant X^2 value suggesting poor fit, but found CFI values ranging from .95 - 1.00 suggesting excellent fit. Despite this study's CFI slightly lower value of .91, CFI values greater than .90 are generally considered to be adequate (Kline, 2016). Differences in CFI values from this study to Digman's can be attributed to differences in sample makeup and sample size. Digman's 1997 article examined 14 samples including children, adolescents, and adults with

participants from the United States, Germany, and China, whereas this sample only includes young adults from the United States.

A root means square error of approximation (RMSEA) value was also produced (RMSEA = .08) indicating fair fit of the model. According to Kline (2016) RMSEA values below .08 are considered adequate, while values below .05 indicate good fit of the model. A Standardized Root Mean Square Error of Approximation (SRMR) value was also produced (SRMR = .04) indicating good fit of the model. Kline (2016) states that SRMR values below .08 indicate adequate fit, while SRMR values less than .05 demonstrate good fit of the model. Lastly, the latent factors of Alpha and Beta were also found to be significantly correlated with one another $r = -.10$ ($p < .001$). The significant association among Alpha and Beta further suggests that a single higher-order factor may exist in the data that can be identified as the GFP.

Moving beyond Alpha and Beta, the next CFA model included the Big Five traits as observed variables and a single latent factor for the GFP as demonstrated in Musek (2007). The theoretical development of the GFP and previous research support this methodology, suggesting first to identify Alpha and Beta and then isolating the GFP in subsequent analyses. A single path was constrained to 1.00 as neuroticism served as the reference for the latent variable. Musek (2007) also allowed for the covariance of the errors of neuroticism and conscientiousness, a path that was also added for this study's CFA analysis. Factor loadings for the remaining non-reference variables included: GFP to agreeableness = -3.13, GFP to conscientiousness = -0.90, GFP to extraversion = -2.22, and GFP to openness = -2.32. The negative direction of these factor loadings can be

attributed to neuroticism's status as the reference variable for the GFP, and its inverse relationship with the other four Big Five traits.

The CFA model produced the following fit indices: $\chi^2 = 16.08$ ($df = 4$), RMSEA = .05, CFI = .96, and SRMR = .02. The RMSEA, SRMR, and CFI values produced indicate excellent fit of the GFP latent factor model and are comparable to values obtained by Musek (2007). The results of these two CFA analyses confirm the existence of the GFP in the Add Health data and warranted its inclusion in the proposed mediation model.

GFP Resilience Path Analysis

In the proposed model, resilience served as a predictor variable and is connected to psychological distress through three mediating paths involving social support, positive affect, and participation. A single path from social support to participation was also included in the model per theoretical basis from the literature. Gender was also included as a predictor variable with paths to each of the mediating variables, allowing for the observation of the impact of gender on the model. Given the proposed association among the Big Five traits as conceptualized through Alpha and Beta, the errors of neuroticism, agreeableness, and conscientiousness were permitted to covary, as well as the errors of extraversion and openness. The errors of social support and positive affect, as well as the errors of positive affect and participation were permitted to covary as well.

Results from the model indicated poor fit, and two theoretically supported paths were added to the subsequent GFP path analysis. A direct path from neuroticism to psychological distress was added, as well as a direct path from the GFP to distress.

Figure 2 displays the proposed model with the additional paths included. The fit indices for this subsequent model also indicated poor fit, but no additional added paths were supported by either theory or previous research.

The following fit indices were obtained: $\chi^2 = 460.73$ ($df = 21$, $p < .000$), RMSEA = .14, CFI = .79, and SRMR = .08. The GFP and gender explained 22% of the variance in social support, 60% of the variance in positive affect, and 53% of the variance in participation. All predictor and mediator variables combined explained 57% of the variance in psychological distress. Cutoffs for R^2 of .02, .15, and .35 as small, medium, and large, respectively are recommended (Cohen, 1995). Although the model fit was lacking, path analysis is a form of multiple regression where several regression analyses are performed simultaneously. This allows us to examine individual paths and observe any direct or indirect effects beyond model fit alone.

Several direct paths of significance were found in the model. Table 6 contains the unstandardized direct effects and 95% confidence intervals for this model. All paths from the GFP to the Big Five traits were found to be significant at the $p < .001$ level, and coefficients ranged from .15 to .62 (absolute value). The largest coefficient was found for the path between the GFP and neuroticism (-.62), and all other paths from the GFP to the Big Five traits were positive. These results indicate that the GFP is significantly associated with each of the Big Five traits, and the strongest association lies between the GFP and neuroticism. These findings further support the existence of the GFP as the apex of human personality as suggested in the literature. All paths from the GFP to each of the mediating variables were also significant at the $p < .001$ level, and path

coefficients included .47 (social support), .78 (positive affect), and .79 (participation). These results are important in that they demonstrate that the GFP is significantly associated with mediating variables that have been previously shown to promote adjustment for individuals with chronic health conditions. Not only was the GFP associated with all three mediating variables, the largest associations were observed between the GFP and positive affect and the GFP and participation. The GFP has been found to be associated with positive affect previously, but its association with ideological participation in one's environment adds to the list of positively valenced variables that the GFP is related to that can potentially serve as a malleable aspect of an individual's life through which interventions can be targeted.

The direct paths from neuroticism to distress (.24) and the GFP to distress (.75) were also found to be significant at the $p < .001$ and $p < .05$ levels respectively. These significant direct paths indicate that personality plays a notable role in psychological distress, a good portion of which can be attributed to neuroticism specifically. Suls and Martin in their 2005 article suggested a "neurotic cascade" that may have contributed to these results; where people with high levels of neuroticism are more likely to experience negative events and interpret events negatively, while also taking longer to bounce back from exposure to negative circumstances. The direct path from social support to participation was found to be significant with a path coefficient of $-.15$ ($p < .01$). These results indicate that social support significantly impacted participation as proposed. Lastly, the path from gender to participation was also found to be significant with a path

coefficient of $-.22$ ($p < .01$) where being female was associated with greater participation.

Mediation Effects Within the GFP Resilience Model

It was hypothesized that social support, positive affect, and participation would mediate the relationship between resilience and distress as supported by previous research. Based on the research of Preacher and Hayes (2008), 1000 bootstrapped samples were produced to estimate the 95% confidence interval for the indirect effects. Table 7 includes the unstandardized indirect effects for the GFP model analyzed as well as the 95% bootstrapped confidence intervals. Results indicated that no indirect paths in the model were significant. The direct path from the GFP to distress was found to be quite large, and this indicates that mediation is not present in the model as proposed. Results demonstrated significant associations between the GFP and distress, and the GFP and each of the mediators, but significant associations between the mediators and distress were not observed as expected. However, as Winer and colleagues (2016) point out, cross-sectional mediation analyses are atemporal and strong inferences regarding mediation are difficult to observe. It is possible that the GFP, distress, and the three mediators in this study are predictive of one another across time, but longitudinal data are required to uncover in what order, and how significantly, these variables impact one another.

Ad Hoc Analysis of the GFP Model

The lack of poor fit of the GFP model was unexpected, and exploration of the preceding theory of the GFP was examined for further analysis. The GFP was

conceptualized and developed through higher-order exploration of common personality traits such as the Big Five. These traits were first found to load on to the higher-order factors of Alpha and Beta, and later found to load on to a single higher-order factor of the GFP. Because the GFP model demonstrated poor fit and expected relationships among the mediator and outcome variables were not found, further analyses were employed to examine the role of personality in resilience and its association with psychological distress for this population. Two additional analyses were performed; a path analysis including Alpha and Beta in place of the GFP measurement portion of the proposed model, and a path analysis conceptualizing resilience through the cluster analysis approach as demonstrated in previous research. These additional analyses provided further insight into the relationship of personality and resilience, and how the model variables impact one another when conceptualizing resilience through the trait versus prototype approach.

Alpha-Beta Ad Hoc Analysis

The Alpha-beta path model was identical to the GFP path model with the exception of the direct path from social support to participation. This direct path between the two mediators was found to be insignificant in the initial run of the post hoc model and was subsequently excluded. Figure 3 displays the analyzed path model for Alpha and Beta.

The model included Alpha, Beta, and gender as predictor variables and psychological distress as the outcome variable. All three mediators of social support, positive affect, and participation were included as initially proposed. The errors of

positive affect and social support were permitted to covary, as were the errors of positive affect and participation. The Big Five traits that make up Alpha and Beta respectively were included in the measurement portion of the model, and the errors within each latent construct were permitted to covary as in the GFP model. Modification indices from the initial run of the Alpha-Beta path model also suggested the addition of a direct path from Alpha to distress. The following fit indices were obtained: $X^2 = 427.71$ ($df = 17, p < .000$), RMSEA = .15, CFI = .81, and SRMR = .09. Alpha, Beta, and gender explained 13% of the variance of social support, 45% of the variance of positive affect, and 41% of the variance of participation. All predictor and mediator variables combined explained 61% of the variance in psychological distress. Direct and indirect effects were again examined to uncover any variable associations of significance. Table 8 contains the unstandardized direct effects for the model and 95% confidence intervals, and Table 9 contains the unstandardized indirect effects for the Alpha-Beta model as well as the 95% bootstrapped confidence intervals.

Mediation Effects Within the Alpha-Beta Path Model

Several direct paths within the model were found to be significant. All paths from the latent constructs to their respective Big Five traits were found to be significant excluding the path from Alpha to agreeableness. The paths from Alpha to neuroticism, Alpha to conscientiousness, and Beta to extraversion were significant at the $p < .001$ level, while the path from Beta to openness was significant at the $p < .01$ level. Coefficients for each of these paths are shown in figure 3. These results were expected in that each variable was associated with its respective latent construct significantly, except

for the trait of agreeableness. Because Alpha represents stability as a whole, it could be hypothesized that neuroticism and conscientiousness better capture the construct of stability over agreeableness, and that could help to explain the insignificant association. The coefficients from Alpha and Beta to social support (.28 and .16 respectively), from Alpha and Beta to positive affect (.44 and .38 respectively), and from Alpha and Beta to participation (.30 and .48 respectively) were also found to be significant. As identified with the GFP model, each of these higher order factors was found to be significantly associated with potentially malleable aspects of individual's lives that can help to reduce distress and promote adjustment. Only two of the three paths from the mediators to the outcome variable were found to be significant: social support to distress = $-.06$ ($p < .05$) and positive affect to distress = $-.21$ ($p < .001$). Positive affect's association with the outcome variable of distress was expected, as was social support's association with distress because of the make-up of the psychological distress measure itself. The lack of significant association between participation and distress was surprising and it was unclear as to why that association was weaker in the Alpha-Beta model versus the GFP model. Again, using bootstrapped 95% confidence intervals, no indirect paths were found to be significant in this model. However, the direct path from Alpha to psychological distress was found to be significant at the $p < .001$ level ($-.84$). These results indicate that mediation is not present within this specific path model, but the significant associations among the model variables are still of note. This Alpha-Beta mediation model is subject to the same limitations as the GFP mediation model because

of the cross-sectional nature of the data, and it is difficult to imply temporal predictions among the variables.

Each of these models demonstrated poor model fit, but appeared to capture a large portion of the variance for the outcome variable of psychological distress. Poor fit of the models may be attributed to their complexity and vast number of parameters estimated, as well as large quantity of paths left un-estimated due to lacking theoretical support. Expected mediated relationships were also not present in these models, and comparison to the resilient prototype model was warranted for further exploration and clarification.

Resilient Prototype Ad Hoc Analyses

Previous research has attempted to observe how and through which mechanisms resilient versus non-resilient individuals adapt to difficult circumstances. The two previous models analyzed examined resilience as a trait on which each individual had a unique standing. The prototype approach to resilience instead groups individuals into resilient versus non-resilient clusters based on common personality trait scores, and observations can be made about how resilient individuals interact or engage with proposed mediator variables differently to promote adjustment or reduce distress. The use of cluster analysis in this study allowed for the two approaches (trait resilience and prototype resilience) to be compared, and observations made about how each “type” of resilience predicts outcomes and through which mechanisms adjustment is promoted.

In order to identify resilient and non-resilient groups in the sample, two cluster analyses were employed to partition the data in to the two proposed classifications following the methods of Elliott, Hsiao, et al. (2019). First, hierarchical cluster analysis

was used to determine the optimal number of groups in the data based on the Big Five traits of neuroticism, extraversion, openness, agreeableness, and conscientiousness. Cluster analysis allows a researcher to observe at which point an optimal number of clusters is achieved given all possible grouping combinations. Because this sample contains $n = 1151$ individuals with chronic health conditions, the possible number of clusters ranged from 1 (totally homogenous) to 1151 (totally heterogeneous). Ward's method and squared Euclidean distance were used to observe changes in the total within-cluster sums of squares values for each grouping solution. Through the examination of the point in which the largest change between total within-cluster sums of squares occurred (between 1 and 2 clusters) and a drop off in total sums of squares (3 clusters or more), it was determined that two groups emerged as the best classification of the data. Second, k-means partition cluster analysis was used to verify the group membership status and employed the cluster centers identified in the first cluster analysis. Two clusters were confirmed and independent t-tests were used to observe group member standings on the Big Five traits. Figure 4 displays the standardized values of each group's standing on the Big Five traits.

A resilient group clearly emerged with higher than average scores on extraversion, openness, agreeableness, and conscientiousness with lower than average scores in neuroticism ($n = 618$). Conversely, a non-resilient group was identified with higher than average scores in neuroticism and lower than average scores on the other four personality traits ($n = 507$). A total of $n = 26$ participants had missing Big Five data, and were excluded from the cluster analysis. Results indicate that a slight majority of

study participants were placed in the resilient group (54.9%) over the non-resilient group (45.1%). T-test results indicate that these groups differ significantly on each of these Big Five traits at the $p < .001$ level. Members of the resilient group were also found to have significantly higher levels of social support, positive affect, and participation, and significantly lower levels of psychological distress. These results parallel previous research by Elliott and colleagues (2019). With the confirmation of resilient and non-resilient groups, a single variable labeled “resilience” was generated and included in the mediation model. The generated clustering variable coded membership in the resilient group as “1”, and membership in the non-resilient group as “2”.

Resilient Prototype Path Analysis

An identical path model to the proposed GFP model in Figure 1 was used for this analysis. However, in place of the measurement portion of the model containing the GFP and Big Five traits, the resilience variable generated by the cluster analyses was used. Resilience and gender each were loaded on to all three mediator variables, and all three mediator variables were loaded on to psychological distress. A direct path from social support to participation was included as in the proposed model. The errors of social support and positive affect, and the errors of positive affect and participation were again allowed to covary.

The model yielded indices indicating good but not excellent fit ($X^2 = 22.50$ ($df = 2$, $p < .000$), RMSEA = .10, CFI = .98, SRMR = .03, and $R^2 = .39$ (39% of distress explained)), and two additional paths were added in a subsequent analysis. A direct path from resilience to psychological distress, and a direct path from gender to psychological

distress. The model results indicated that the direct path from resilience to the outcome variable was insignificant with a path coefficient near to zero, and this path was excluded from the final model. Figure 5 includes the path model diagram for this analysis. The model yielded excellent fit indices: $\chi^2 = .06$ ($df = 1, p > .05$), RMSEA = .00, CFI = 1.00, and SRMR = .001. Resilience and gender explained 2% of the variance in social support, 6% of the variance in positive affect, and 10% of the variance in participation. The predictor variables along with the mediating variables combined to explain 40% of the variance in psychological distress.

Table 10 contains the unstandardized direct effects for the prototype resilience model with 95% confidence intervals. All paths from resilience to each of the mediating variables were significant and coefficients ranged from $-.30$ to $-.48$ ($p < .001$). As in the two previous models, resilience was found to be significantly associated with the hypothesized mediators that can serve as avenues for intervention to reduce distress and promote adjustment. Additionally, all paths from each of the mediating variables to psychological distress were significant ($p < .001$). Path coefficients ranged from $-.12$ to $-.44$. The path from social support to participation was also found to be significant at the $p < .001$ level and produced a path coefficient of $.18$. Similar to the GFP model analyzed, this indicates that social support significantly impacts participation for this sample as proposed. The paths from gender to social support and positive affect were also found to be significant at the $p < .01$ and $p < .001$ levels respectively. Being female was associated with higher levels of each of these constructs (social support and positive affect). The direct path from gender to psychological distress was also found to be

significant and produced a path coefficient of $-.23$ ($p < .001$). Despite women having higher levels of social support and positive affect, being a woman was also associated with higher levels of psychological distress. Membership in the resilient group versus the non-resilient group was associated with significantly higher levels of social support, positive affect, participation, and lower levels of psychological distress.

Mediation Effects Within the Resilient Prototype Model

In addition to these direct effects, indirect effects were also examined to identify any partial or full mediation in the model. Table 11 contains the indirect effects for the prototype model as well as the 95% bootstrapped confidence intervals. Several indirect effects (using biased-corrected standard errors for 1,000 bootstrap replications) were found to be significant. The significant indirect effects involved the total indirect effect from resilience to psychological distress (.36), the total indirect path from gender to psychological distress (-.09), the indirect path from resilience to participation through social support (-.05), the indirect path from gender to participation via social support (.03), and the indirect path from social support to distress through participation (-.04).

Specific indirect effects were calculated for each of the mediated paths as well with the following results: resilience to distress via social support = .04, resilience to distress via positive affect = .21, resilience to distress via participation = .10, gender to distress via social support = -.02, gender to distress via positive affect = -.07, and gender to distress via participation = .001. These results indicate that the relationship between resilience and psychological distress is partially mediated by all three hypothesized mediators as expected. Gender also has a notable direct and indirect impact on distress

via each proposed mediator, indicating that gender group membership may be important for clinical intervention.

Gender-Based Differences

Several methods were used to identify the degree to which gender influenced the model variables and the overall fit of the models analyzed. First, two-tailed independent t-tests were used to observe any significant differences between men and women for each of the model variables. Results are displayed in Table 4. Women and men scored significantly different on each of the Big Five traits and on the outcome variable of psychological distress. Women were found to score significantly higher in neuroticism, extraversion, agreeableness, conscientiousness, and distress, while men scored significantly higher in openness.

Second, gender was included in all three analyzed models as a predictor variable and several direct and indirect paths were found to be significant. Within the proposed GFP model, gender significantly predicted participation, and the errors of the GFP and gender were found to covary significantly ($.06, p < .01$). Within the post hoc model including Alpha and Beta, the errors of Alpha and gender were also found to covary significantly ($.11, p < .001$). Within the resilient prototype model based on cluster groups, the total indirect path from gender to psychological distress was found to be significant, the indirect path from gender to participation through social support was identified as significant, as well as direct paths from gender to social support, positive affect, and psychological distress. Lastly, two additional models were analyzed that removed gender as a predictor and compared model fit for each gender group within the GFP model and

resilient prototype model. The following group-specific fit indices were obtained for the GFP and prototype models respectively: Women SRMR = .08 and men SRMR = .08; women SRMR = .02 and men SRMR = .02. Despite the significant differences among men and women on the model variables, there does not appear to be a significant difference in model fit for the two groups. However, gender seems to play a notable role in social support, positive affect, and distress for this sample of individuals with chronic illness/disability.

Summary

This study aimed to identify the GFP and its association with resilience, distress, and historically relevant mediators. In an additional analysis, two groups in the Add Health data, a resilient group of persons with chronic illness/disability and a non-resilient group from the same sample were identified. The analyzed path models connected resilience and gender to psychological distress via three mediators representing malleable aspects of these individuals lives that serve as protective factors against psychological distress.

Within the trait models analyzed, the direct impacts of the GFP and Alpha on distress were most notable, and no mediation effects were observed. Within the prototype model, results found that social support, positive affect, and participation each partially mediated the relationship between resilience and distress. Membership in the resilient group was associated with significantly higher levels of social support, positive affect, participation, and significantly lower levels of psychological distress as compared to the members of the non-resilient group. Effect size results indicated that the trait

models accounted for higher levels of variance explained in all of the mediating variables and psychological distress, whereas the prototype model demonstrated better model fit and produced mediation effects as expected. Gender differences in the models were also observed, and it was found that no difference in fit of the model existed for men versus women, despite significant differences found on group standings on the Big Five traits and psychological distress between the two groups. Gender was also found to be significantly associated with social support, positive affect, and psychological distress in the prototype model, and the error of gender covaried significantly with the error of Alpha and the GFP in the trait models analyzed. Implications of these results are discussed in the following chapter.

CHAPTER V

CONCLUSIONS

The present study investigated the existence of a general factor of personality (GFP) within the Add Health Wave IV data, and sought to examine the role that the GFP plays in resilience through its proposed mediated relationship with psychological distress. An additional post hoc trait model was analyzed as well, as was a person-centered prototype model based on resilient versus non-resilient groups identified through cluster analyses. SEM was then used to observe direct and indirect relationships among resilience, gender, social support, participation, positive affect, and psychological distress. The study aimed to identify mechanisms through which resilience impacts distress for this population, and to observe whether trait or prototype resilience best explains resilient response to chronic illness or disability. Recommendations for treatment interventions and strategies are discussed below.

The Trait Versus Prototype Approach

The GFP suggests that a single general factor occupies the apex of human personality, and represents the most parsimonious model in the field (DeYoung, 2010; Musek, 2007; Struss, Ciecuch, & Rowinski, 2014; Rushton & Irwing, 2008, 2009a). Consisting of low neuroticism and high levels of extraversion, openness, agreeableness, and conscientiousness, the GFP has been found to be associated with positive affect (Rushton & Erdle, 2010; Rushton & Irwing, 2011) and self-esteem (Erdle, Irwing, Rushton, & Park, 2010).

This study aimed to identify further evidence of the GFP through its identification in a nationally representative sample of young adults. Through CFA analyses, the GFP was identified in the data along with the higher order factors of Alpha (stability) and Beta (plasticity). In addition to identifying the GFP in the Add health data, this study observed the impact that resilience has on psychological distress as conceptualized through the trait of the GFP. The identification of the GFP in this data further supports the idea that the Big Five are not orthogonal, and should not be considered as the highest-order factors of personality. Not only do the Big Five traits load on to Alpha and Beta as predicted by Digman (1997), but these two higher-order factors, representing stability and plasticity, also are significantly associated with one another indicating non-orthogonality.

Previous research has shown that resilience is associated with low neuroticism, and high levels of extraversion, openness, agreeableness, and conscientiousness (Asendorpf et al., 2001; Rushton & Irwing, 2008, 2009a; Shiner & Masten, 2012), while non-resilience is most often associated with high levels of neuroticism and low levels of extraversion, openness, agreeableness, and conscientiousness. The GFP allows us to simplify previous Big Five trait research on resilience, producing a single factor of personality that can be used to measure and observe the impact that personality has on distress and well-being.

Results from this study indicate that the GFP has a large direct impact on psychological distress, and the analyzed GFP model explained a large portion of the variance of the outcome variable. However, the post hoc analysis using Alpha and Beta

also found that Alpha (stability) has a very large direct impact on psychological distress, and the Alpha-Beta model analyzed explained the largest portion of variance of the outcome variable as compared to all three path models analyzed. While these two trait models explained the largest portion of variance for psychological distress, the hypothesized mediated relationships included in the models were non-existent. The prototype model analyzed that included resilient and non-resilient cluster groups still explained a large portion of the variance of psychological distress, and also found significant indirect effects for the hypothesized mediators.

These results indicate that while the trait models appear to explain “the most” variance of distress for this population, they fail to provide clinically relevant instruction on ways in which to work with individuals adjusting to chronic health conditions. Mediation models are designed and analyzed in hope that they can isolate and identify behavioral mechanisms through which individuals and health care providers can target interventions or encourage engagement. The trait models analyzed in this study demonstrate that personality plays an overwhelmingly significant role in distress, but do not identify avenues through which resilience can be promoted or distress reduced through action/intervention. Shadel (2010) also suggests that trait-based approaches are useful for descriptive purposes, but that they provide little “...information on internal psychological mechanisms at the level of the individual...that could be the target of change via intervention or therapeutic technique” (p. 336). The person-centered resilient prototype model as identified here and in previous research (Elliott, Hsiao, et al., 2019), seems to provide the most clinically useful information to the researcher and healthcare

clinician. Each of the three models analyzed further adds to the literature in the field; the GFP model and Alpha-Beta model further supporting the existence of these higher-order factors in the study of human personality, and the prototype model further supporting the theoretical and clinical usefulness of isolating and identifying the ways in which resilient individuals better adapt to their circumstances through behavioral mechanisms.

Clinical Implications

Several implications can be taken from the results of the significant and insignificant mediation paths analyzed in this study. First, the insignificant mediated paths in the two trait models analyzed still provide some clinically useful information. In both the GFP model and the Alpha-Beta model, a large portion of variance explained in all three mediators resulted from the associations of the resilient traits and gender to each of these variables. Direct paths analyzed from the GFP, Alpha, and beta to social support, positive affect, and participation indicated that these personality constructs significantly predict each of the mediating variables.

Of particular note were the direct associations between Alpha and positive affect, and the direct association between Beta and participation. While all paths from Alpha and Beta to each of the mediators were found to be significant, these paths produced the highest path coefficients, and provide some insight into how personality impacts these mediators. Because Alpha consists of neuroticism, agreeableness, and conscientiousness, it seems intuitive that Alpha's link to neuroticism plays a large role in Alpha's association with positive affect. However, if neuroticism were "driving the bus" for Alpha as a whole, the associations between Alpha and these positively valenced

mediators would likely be negative. This indicates that agreeableness and conscientiousness also play a significant role in positive affect, and individuals higher in these traits likely experience greater emotional stability and positive affect. Similarly, the association between Beta and participation is of particular interest.

For this study participation was framed in an ideological sense, in that a person's belief that they could participate in their environment indicated their level of participation for this study. Beta's association with extraversion and openness likely supported this cognitive flexibility, and individuals high in Beta likely ideologically and physically participate more in their environments. Beta as a construct has been defined by its association with plasticity, and this fluidity of thought and action may help to promote goal-oriented behavior and active problem solving strategies. These results demonstrate the importance of the Big Two in identifying and clarifying in which ways stability and plasticity impact known mechanisms of resilient response.

All direct paths from the GFP to each of the mediating variables were also significant, and again, the largest path coefficients were found between the GFP and positive affect and the GFP and participation. Previous research has also found a close association between positive affect and the GFP (Rushton & Erdle, 2010; Rushton & Irwing, 2011). These results, combined with the significant association between social support and participation as hypothesized, seem to highlight the importance that ideological participation plays in adjustment. Previous research in resilience and disability has highlighted the importance of participation, reducing activity restriction, active coping, and goal-oriented behaviors, and these paths have been identified as

mechanisms of resilience. . For the population of individuals with chronic illness or disability, research has shown that social support helps to promote positive activity engagement and avoid activity restriction as well. The results from this study further support the significant role that participation plays in reducing distress, and the significant role that social support plays in promoting participation. Not only do personality traits impact an individual's likelihood of greater participation, but resilient individuals report greater levels of both social support and participation, which can help to reduce distress.

The large majority of direct paths in all three models analyzed were found to be statistically significant, and this may be a result of a positive cascade of personality, behavior, and adjustment. Because it is widely thought that personality is developed early in life and solidified in early adulthood, it is possible to assume that the personality traits of the GFP, Alpha, and Beta impact these mediators temporally; but without longitudinal data, this cannot be confirmed. What can be observed however, is the likely cascade of positive traits and behaviors that cyclically influence one another. Resilience as measured by personality factors influences greater positive affect, which influences greater social support, which influences greater participation, which all help to reduce overall distress. Without a wealth of longitudinal data to analyze, it is difficult to determine in which order these variables cascade with one another. As Winer (2016) also states, the lack of longitudinal data also makes it difficult or impossible to imply causation from mediation analyses conducted using only cross-sectional data. The lack

of reliable information regarding time and its association with these variables, we can only imply atemporal associations within our results.

Taking these factors into consideration, results from the mediation analysis as a part of the prototype model provided insight in to the behavioral mechanisms through which distress can be reduced and adjustment promoted. The indirect path from resilience to distress through the three mediators was found to be significant indicating partial mediation. Within the total indirect mediation from resilience to psychological distress the mediated path via positive affect produced the largest specific indirect effect, followed by participation and then social support. This suggests that positive affect, within this prototype model, most significantly mediates the relationship between resilience and distress. Previous research supports these findings, and has found that positive affect mediates the relationship between resilience and distress in previous studies (Leuthold, 2018; Walsh et al., 2016).

This information provides an avenue for practical intervention for individuals with disabilities adjusting to their condition. Evidence-based treatments that aim to increase positive affect and reduce negative affect such as Cognitive Behavioral Therapy (CBT) may be of particular use when working with this population. Strength-based techniques such as Solution-Focused Brief Therapy (SFBT) or Positive Psychology interventions can also assist people with chronic illness to set goals, find meaning, and practice optimism which can help to increase positive cognitions and emotions. As a part of the positive cascade mentioned above, participation in one's environment can also promote positive emotion. This suggests that behavioral activation strategies can also be

employed to help clients increase positive affect and participation levels throughout their adjustment process.

Social support and participation were also found to mediate the relationship between resilience and distress, while participation's indirect effect was found to be somewhat larger than the indirect effect attributed to social support. This finding was surprising in that a larger effect associated with social support was expected. Support from friends and family clearly still help to mitigate psychological distress, but it is intriguing to find that a person's belief in their ability to engage with their environment plays a somewhat larger role.

Participation has been shown to promote adjustment and well-being for people with chronic illness or disabilities in previous research (Caldwell & Gilbert, 1990; Dunn et al., 2009; Elliott et al., 1991; Erosa et al., 2014; Farkas & Orosz, 2015; Kalpinski et al., 2013; King et al., 2003; Kinney & Coyle, 1992; Patterson & Blum, 1996; Ong et al., 2009; Shikako-Thomas et al., 2008; Walsh et al., 2016), but much of the existing research focuses on actual engagement with the environment over the belief that one could engage if they chose to. These results indicate that treatment interventions and rehabilitation services that are designed to help these populations build/enhance social support and participation may prove useful in helping people with disability adjust to their conditions. Techniques that aim to enhance thought flexibility and positive cognition may be of particular benefit in increasing participation as framed by this study. Interventions such as cognitive restructuring or CBT may help individuals develop thought patterns and action-oriented practice assignments that promote ideological and

physical participation in one's environment. Further research should explore the impact of ideological versus physical participation in one's environment and how these variables promote adjustment or mitigate psychological distress.

Engagement in social and occupational endeavors can also help to increase and further develop an individual's social support network. Not only was the direct path from social support to participation found to be significant, but the indirect path from resilience to participation through social support, and the indirect path from social support through participation to distress were also found to be significant. These results demonstrate the critical role that social support plays in a person's belief that they can engage in their environment if they chose to. Because individuals living with chronic illness or disabilities are in some ways limited in their functioning, it comes naturally to expect that support from others can help to promote adjustment and close the gaps in functioning that exist. Therapeutic interventions and policies should be tailored to assist this population in developing, and utilizing, their social support networks as well.

This study's findings are also notable for their addition to the theoretical knowledge surrounding the development of resilience across the lifespan. Previous research has suggested that resilience is developed early in childhood, and these individual differences help individuals adapt to a variety of adverse life circumstances. Results from this study find that resilience does indeed develop in early life, and assists individuals with chronic health conditions and disabilities to reduce distress in early adulthood. Young people with and without disabling conditions appear to develop resilience early on, and these individual differences play a significant role in how they

adapt to difficult conditions and life circumstances. These findings further support ideas proposed by Elliott, Barron, et al. (2019) that no special case should be made for personality development for disabled versus non-disabled populations, and further evidence should be gathered to support and inform clinical intervention when working with individuals adapting to chronic health conditions.

The Impact of Gender

Several analyses were used to identify any model/variable differences between men and women included in this study. Two-tailed t-test analyses for each of the model variables, including the Big Five traits, found that women scored significantly higher than men in neuroticism, extraversion, agreeableness, conscientiousness, and psychological distress, and men scored significantly higher than women on the Big Five trait of openness. No significant differences were found between men and women for any of the three mediating variables.

Boyce and Wood (2011) found that individuals with disabilities who were higher in agreeableness reported higher levels of life-satisfaction and better adjustment to disability than those who were lower in agreeableness. Boyce and Wood attributed these differences to the individual's ability to obtain and maintain social support in their lives. Interestingly, these results indicate that women score significantly higher in agreeableness than men, but do not score significantly higher in social support as measured by this study. Also, women scored significantly higher in agreeableness than men, but also scored significantly higher in psychological distress. While these results indicate a departure from the findings of Boyce and Wood, previous research has shown

that women frequently score significantly higher in depression. Because this study's outcome variable of psychological distress was measured based on several items from the CES-D depression scale, it follows that women's higher score on the outcome measure for this study was expected.

Additional analyses were used to observe the overall impact that gender had on the analyzed models. In the proposed GFP model, gender was found to significantly predict participation directly. Within the prototype model, the relationship between gender and distress was partially mediated by the three variables of social support, positive affect, and participation, social support partially mediated the relationship between gender and participation, and the direct relationship between gender and distress was also found to be significant. Leuthold (2018) also found a significant direct relationship between gender and psychological distress suggesting that gender may play a notable role in the development or maintenance of distress. Similar to the mediation effects between resilience and distress, positive affect demonstrated the greatest strength in mediation between gender and the outcome variable. While these paths of mediation were found to be significant, they are much smaller than the mediation effects found regarding the relationship between resilient and non-resilient prototypes and distress. No significant differences were found in the fit of the model between men and women, and these mediation effects should be further explored in future research to determine if they are merely an artifact of the large sample size and analytical methods.

Limitations

Several limitations must be acknowledged in regard to this study's design. First, the number of participants within each chronic condition-specific group varied widely. For better comparison across condition-specific groups, future studies should aim to include an equal number of participants in each condition group. If equivalent group membership is accomplished, future researchers can replicate this study's design and compare individuals with specific conditions between groups. This can allow researchers to better understand how certain conditions and/or impairments impact the model fit and findings.

Another limitation is this study's lack of information about the origin and age of onset of chronic illness/ disability for these participants. The impact that disability and chronic illness has on resilience and distress can be better understood if the age of diagnosis is available so that researchers can better observe how these conditions potentially impact personality development. Knowing how long each participant has lived with their specific diagnosis would also help researchers to understand how personality/resiliency may change over time and how this may influence distress outcomes.

The cross-sectional nature of this study is limiting as well. As discussed previously, cross-sectional mediation analyses are limited to imply only atemporal associations among variables, and causation is impossible to determine. If longitudinal information were available for these study participants, changes in model variable standing and model fit could be observed across several points in time. This would allow

researchers to observe how time and length of diagnosis impacts resilience and distress for these participants with chronic illness and disability. A benefit of working within the Add Health data set is that future waves of data are still being collected for this nationally representative sample. This means that a future longitudinal study with these same participants and variables could be possible in the near future.

Lastly, the nature of the variables included in this study and their properties created several limitations. First, the close association between this study's outcome variable and the CES-D depression inventory lead to outcomes that were influenced by the scale's make-up. Resilience and adjustment to chronic illness or disability may be better understood and defined through its association with positive outcomes for participants rather than the lack of negative outcomes or depressive symptoms. Additionally, the participation scale make-up could be improved to not only include the participant's understanding that they could engage in their environment if they chose to, to also include data on actual engagement in social/vocational involvement in their communities. This expansion of participation can help to better align this study's results with previous research that was based on actual engagement ratings rather than a person's ideological participation. Despite these limitations, the results of this study broaden the field's understanding of resilience as understood through the trait versus person-centered approaches, and how personality interacts with behavior to reduce psychological distress.

Conclusions

This study aimed to investigate how personality, as conceptualized through the framework of the GFP, impacted resilience and its relationship to psychological distress. Through subsequent analyses, it was found that the GFP, Alpha, beta, and a resilient prototype all significantly impact social support, positive affect, and participation. Effect sizes indicate that all three models analyzed explain a large portion of the variance within psychological distress, however, mediation effects were only observed within the prototype model based on resilient and non-resilient groups identified through cluster analysis.

Within the prototype model, several observations were made. It was found that resilient versus non-resilient individuals were found to have higher levels of social support, positive affect, participation, and lower levels of psychological distress. Social support was found to play a significant role in participation for these individuals with chronic illness, and gender was found to directly and indirectly impact distress significantly.

Positive affect was found to have a large influence on the relationships between resilience and distress and gender and distress. Therapeutic interventions that aim to increase positive affect were recommended as best suited for this population. Social support and participation were also found to influence these relationships, but to a lesser extent than positive affect. One's belief in their ability to engage with their environment and to draw on social support also can assist individuals with disabilities to reduce

psychological distress. Interventions that aim to enhance social support and participation may also prove useful.

These results have provided insight in to the benefits and drawbacks of using a trait-based versus person-centered approach to studying resilience. This study's findings indicate that higher-order factors known as Alpha, Beta, and the GFP exist in a large nationally representative sample, and these traits are directly, and largely associated with psychological distress. However, these trait models failed to produce any significant mediated effects, indicating that the resilient prototype model may prove to be more clinically relevant. Positive affect, participation, and social support have also been further supported as significant mediators, and avenues of intervention for people adjusting to chronic illness or disability. These results help to isolate which aspects of people's lives can help to promote adjustment or mitigate the deleterious effects of adverse situations. As more is understood about the role that positive affect, participation, and social support play in adjustment to chronic illness/disability, intervention methods and strategies can be best adapted to serve this population.

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APPENDIX

Table 1.

Participant Self-Identified Disability or Chronic Illness Category

Disability	<i>N</i>	Percent (%)
Visual Impairment	25	2.2
Hearing Impairment	63	5.5
Diabetes	150	13.0
Asthma	789	68.6
Epilepsy	71	6.2
Mobility Impairment	175	15.2

Note: Participants were permitted to identify as having more than one disability from the categories selected for this study.

Table 2.

Gender and Ethnicity of Participants

	<i>N</i>	Percent (%)
Male	494	42.9
Female	657	58.1
White	773	67.2
Black or African-American	304	26.4
American-Indian or Alaskan Native	59	5.1
Asian or Pacific Islander	28	2.4
Hispanic/Latino(a)	110	9.6
Other	69	6.0

Table 3.

Big Five Items Included in the Proposed Study

Big Five Factor	Descriptors
Neuroticism	<ul style="list-style-type: none"> I have frequent mood swings I am relaxed most of the time I get upset easily I seldom feel blue
Extraversion	<ul style="list-style-type: none"> I am the life of the party I don't talk a lot I talk to a lot of different people at parties I keep in the background
Openness to Experience	<ul style="list-style-type: none"> I have a vivid imagination I am not interested in abstract ideas I have difficulty understanding abstract ideas I do not have a good imagination
Agreeableness	<ul style="list-style-type: none"> I sympathize with others' feelings I am not interested in other people's problems I feel others' emotions I am not really interested in others
Conscientiousness	<ul style="list-style-type: none"> I get chores done right away I often forget to put things back in their proper place I like order I make a mess of things

Table 4.

Descriptive Statistics for Model Variables by Gender

Variable	Male Mean	Male Standard Deviation	Female Mean	Female Standard Deviation
Neuroticism***	10.23	2.89	11.35	3.03
Extraversion**	12.91	3.19	13.46	3.16
Openness*	14.84	2.63	14.46	2.46
Agreeableness***	14.49	2.63	15.97	2.31
Conscientiousness***	13.92	2.75	14.72	2.85
Social Support	26.13	4.55	25.54	5.48
Positive Affect	4.32	1.54	4.17	1.65
Participation	22.71	3.33	22.90	3.21
Psychological Distress***	3.47	2.77	4.28	3.18

Note: *= statistical significance at the $p < .05$ level

**= statistical significance at the $p < .01$ level

***= statistical significance at the $p < .001$ level

Table 5.

Correlations Among Model Variables

Variable	N	E	O	A	C	Social Support	Positive Affect	Participation	Psychological Distress	Gender
N	---									
E	-0.10***	---								
O	-0.13***	0.23***	---							
A	-0.11***	0.29***	0.31***	---						
C	-0.15***	0.11***	0.01	0.16***	---					
Social Support	-0.29***	0.10***	0.03	0.11***	0.12***	---				
Positive Affect	-0.51***	0.22***	0.07*	0.07*	0.16***	0.37***	---			
Participation	-0.38***	0.23***	0.16***	0.23***	0.28***	0.20***	0.35***	---		
Psychological Distress	0.59***	-0.17***	-0.03	-0.02	-0.22***	-0.34***	-0.57***	-0.39***	---	
Gender	-0.18***	-0.09**	0.07*	-0.29***	-0.14***	0.06	0.05	-0.03	-0.13***	---

Note: N = Neuroticism, E = Extraversion, O = Openness, A = Agreeableness, and C = Conscientiousness.

* = statistical significance at the $p < .05$ level

** = statistical significance at the $p < .01$ level

*** = statistical significance at the $p < .001$ level

Table 6.

Unstandardized Direct Effects for the Analyzed GFP Resilience Model with 95% Confidence Intervals

Path	Unstandardized Effect	95% CI	Unstandardized Effect (Bootstrap)	95% CI (Bootstrap)
GFP -> N	-.62*	[-.70 - -.54]	-.62*	[-.80 - -.44]
GFP -> E	.28*	[.21 - .34]	.28*	[.16 - .39]
GFP -> O	.15	[.08 - .22]	.15	[-.01 - .30]
GFP -> A	.15*	[.08 - .21]	.15	[.16 - .41]
GFP -> C	.29*	[.22 - .35]	.29*	[.12 - .38]
GFP -> SS	.47*	[.38 - .56]	.47*	[.31 - .64]
Gender -> SS	-.01	[-.14 - .12]	-.01	[-.21 - .19]
GFP -> PA	.78*	[.69 - .88]	.78*	[.54 - 1.02]
Gender -> PA	-.09	[-.22 - .04]	-.09	[-.40 - .22]
GFP -> PT	.79*	[.66 - .92]	.79*	[.43 - 1.15]
Gender -> PT	-.22*	[-.36 - .09]	-.22	[-.52 - .07]
SS -> Distress	.02	[-.11 - .16]	.02	[-3.00 - 3.05]
PA -> Distress	.05	[-.31 - .41]	.05	[-7.60 - 7.70]
PT -> Distress	.19	[-.13 - .52]	.19	[-9.21 - 9.60]
GFP -> Distress	-.75*	[-1.42 - -.09]	-.75*	[-15.45 - 13.94]
N -> Distress	.24*	[.12 - .36]	.24	[-.37 - .85]
SS -> PT	-.15*	[-.26 - -.04]	-.15	[-.41 - .11]

Note: * = $p < .05$ significance level.

GFP = General Factor of Personality, N = Neuroticism, E = Extraversion, O = Openness, A = Agreeableness, C = Conscientiousness, SS = Social Support, PA = Positive Affect, and PT = Participation.

Table 7.

Indirect Effects for the Analyzed GFP Resilience Model

Path	Unstandardized Effect (Bootstrap)	95% CI (Bootstrap)
GFP -> Distress	.04	[-13.94 – 14.02]
Gender -> Distress	-.05	[-2.89 – 2.77]
SS -> Distress	-.03	[-1.48 – 1.42]
GFP -> PT	-.07	[-.20 - .06]
Gender -> PT	.002	[-.03 - .03]

Note: GFP = General Factor of Personality, SS = Social Support, and PT = Participation.

Table 8.

Unstandardized Direct Effects for the Analyzed Alpha-Beta Resilience Model with 95% Confidence Intervals

Path	Unstandardized Effect	95% CI	Unstandardized Effect (Bootstrap)	95% CI (Bootstrap)
Alpha -> N	-.90*	[-1.01 - -.78]	-.90*	[-1.47 - -.32]
Alpha -> A	.03	[-.05 - .11]	.03	[-.37 - .43]
Alpha -> C	.28*	[.19 - .36]	.28*	[.06 - .49]
Beta -> E	.41*	[.20 - .63]	.41	[-.25 - 1.08]
Beta -> O	.21*	[.07 - .34]	.21	[-.25 - .67]
Alpha -> SS	.28*	[.18 - .38]	.28	[-.74 - 1.29]
Beta -> SS	.16*	[.03 - .28]	.16	[-.89 - 1.20]
Gender -> SS	.02	[-.12 - .17]	.02	[-.41 - .46]
Alpha -> PA	.44*	[.25 - .63]	.44	[-.48 - 1.37]
Beta -> PA	.38*	[.10 - .65]	.38	[-.44 - 1.20]
Gender -> PA	.001	[-.23 - .23]	.001	[-.47 - .47]
Alpha -> PT	.29*	[.07 - .52]	.29	[-1.31 - 1.90]
Beta -> PT	.48*	[.15 - .80]	.48	[-1.16 - 2.11]
Gender -> PT	-.06	[-.33 - .21]	-.06	[-227.81 - 227.69]
Alpha -> Distress	-.84*	[-1.30 - -.39]	-.84	[-14.03 - 12.34]
SS -> Distress	-.06*	[-.12 - -.004]	-.06	[-7.07 - 6.94]
PA -> Distress	-.21*	[-.33 - -.08]	-.21	[-14.73 - 14.32]
PT -> Distress	-.06	[-.15 - .03]	-.06	[-1.07 - .95]
N -> Distress	-.30	[-.73 - .13]	-.30	[-1.94 - 1.34]

Note: * = $p < .05$ significance level.

N = Neuroticism, E = Extraversion, O = Openness, A = Agreeableness, C =

Conscientiousness, SS = Social Support, PA = Positive Affect, and PT = Participation.

Table 9.

Indirect Effects for the Analyzed Alpha-Beta Resilience Model

Path	Unstandardized Effect (Bootstrap)	95% CI (Bootstrap)
Alpha -> Distress	.14	[-4.42 – 4.71]
Beta -> Distress	-.12	[-4.98 – 4.74]
Gender -> Distress	.002	[-13.64 – 13.64]

Table 10.

Unstandardized Direct Effects for the Analyzed Prototype Resilience Model with 95% Confidence Intervals

Path	Unstandardized Effect	95% CI	Unstandardized Effect (Bootstrap)	95% CI (Bootstrap)
Resilience -> SS	-.30*	[-.42 - -.18]	-.30*	[-.43 - -.17]
Gender -> SS	.14*	[.02 - .26]	.14*	[.02 - .26]
Resilience -> PA	-.47*	[-.59 - -.35]	-.47*	[-.59 - -.34]
Gender -> PA	.16*	[.04 - .28]	.16*	[.04 - .28]
Resilience -> PT	-.48*	[-.60 - -.37]	-.48*	[-.60 - -.37]
Gender -> PT	-.005	[-.12 - .11]	-.005	[-.12 - .11]
SS -> Distress	-.12*	[-.17 - -.07]	-.12*	[-.18 - -.06]
PA -> Distress	-.44*	[-.49 - -.39]	-.44*	[-.51 - -.38]
PT -> Distress	-.22*	[-.27 - -.17]	-.22*	[-.28 - -.15]
SS – PT	.18*	[.12 - .23]	.18*	[.11 - .24]
Gender -> Distress	-.23*	[-.32 - -.13]	-.23*	[-.32 - -.13]

Note: * = $p < .05$ significance level.

SS = Social Support, PA = Positive Affect, and PT = Participation.

Table 11.

Indirect Effects of the Analyzed Prototype Resilience Model

Path	Unstandardized Effect (Bootstrap)	95% CI (Bootstrap)
Resilience -> Distress	.36*	[.28 - .44]
Gender -> Distress	-.09*	[-.17 - -.02]
SS -> Distress	-.04*	[-.06 - -.02]
Resilience -> PT	-.05*	[-.09 - -.02]
Gender -> PT	.03*	[.002 - .05]

Note: * = $p < .05$ significance level.

SS = Social Support and PT = Participation.

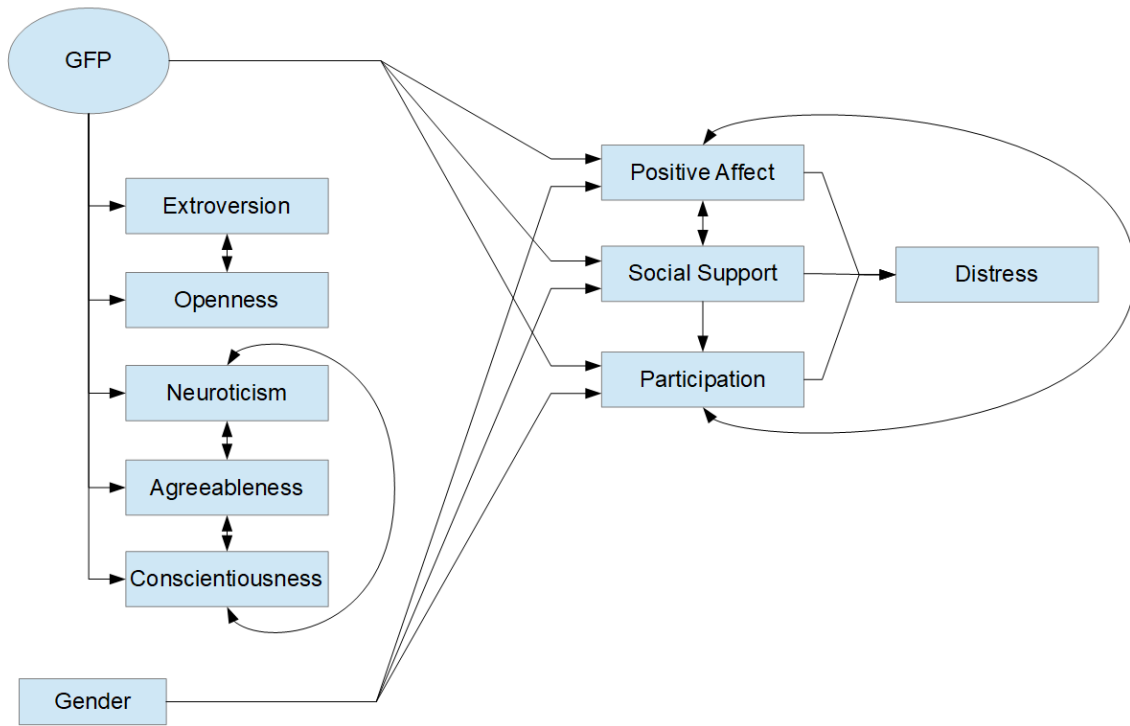


Figure 1. Proposed GFP resilience path model.

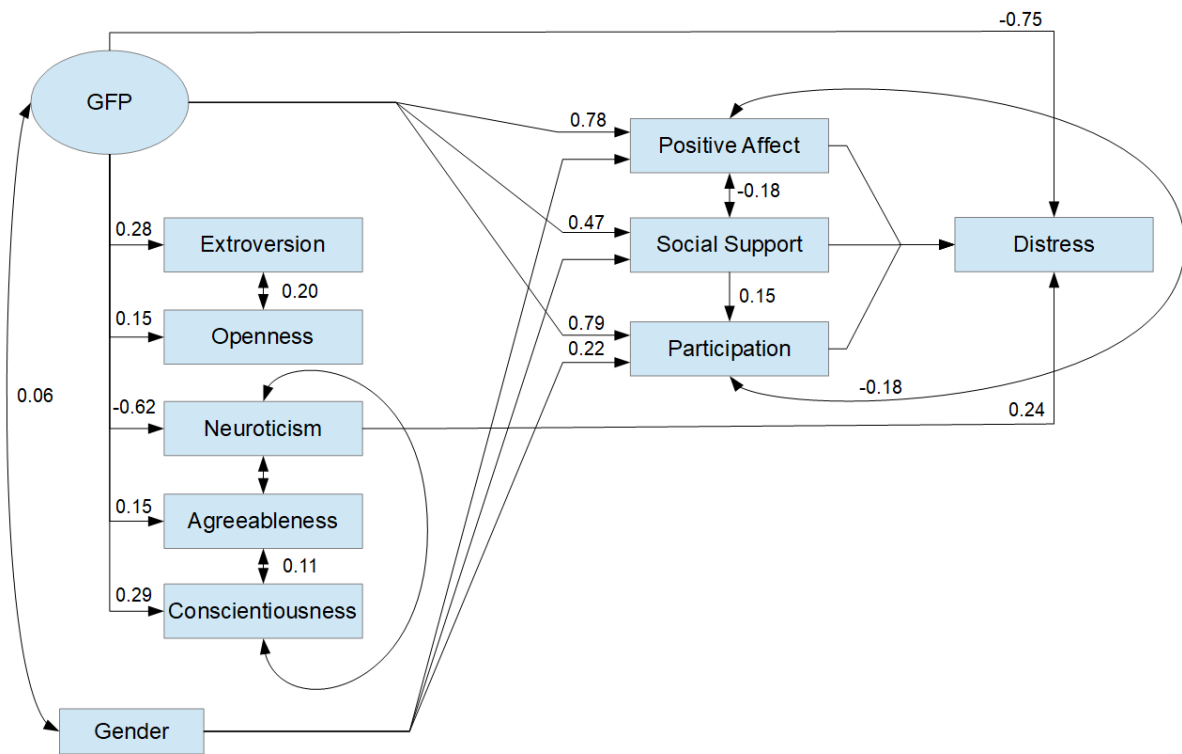


Figure 2. Analyzed GFP resilience path model with significant paths. $R^2 = 57\%$

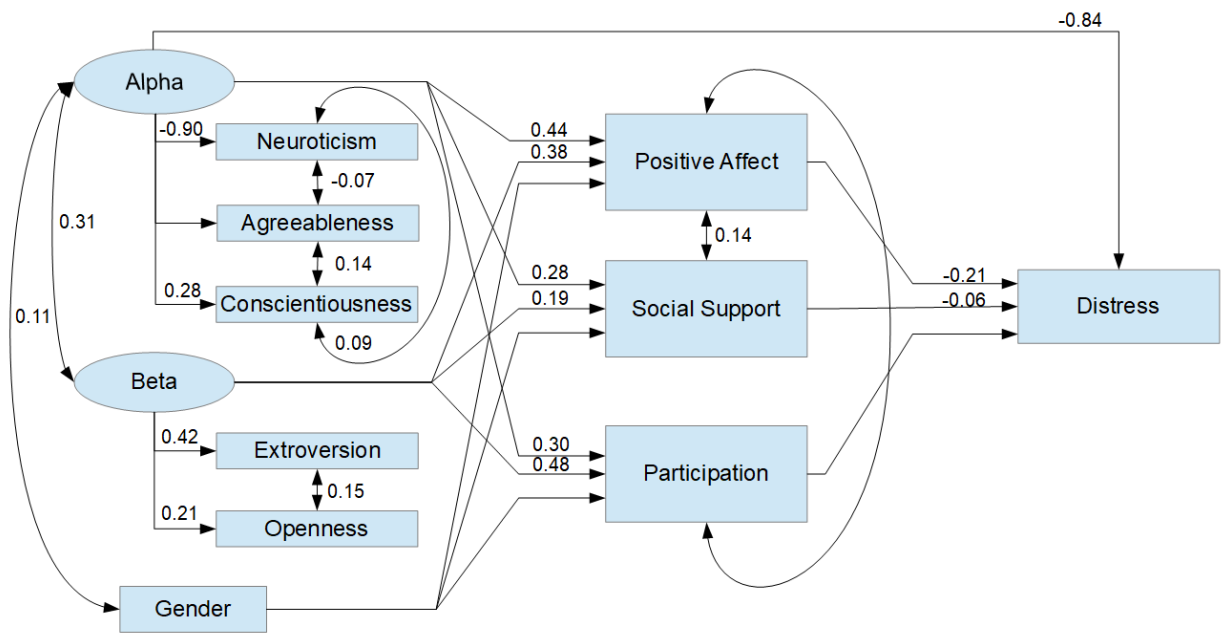


Figure 3. Post hoc Alpha-Beta resilience path model with significant paths. $R^2 = 61\%$

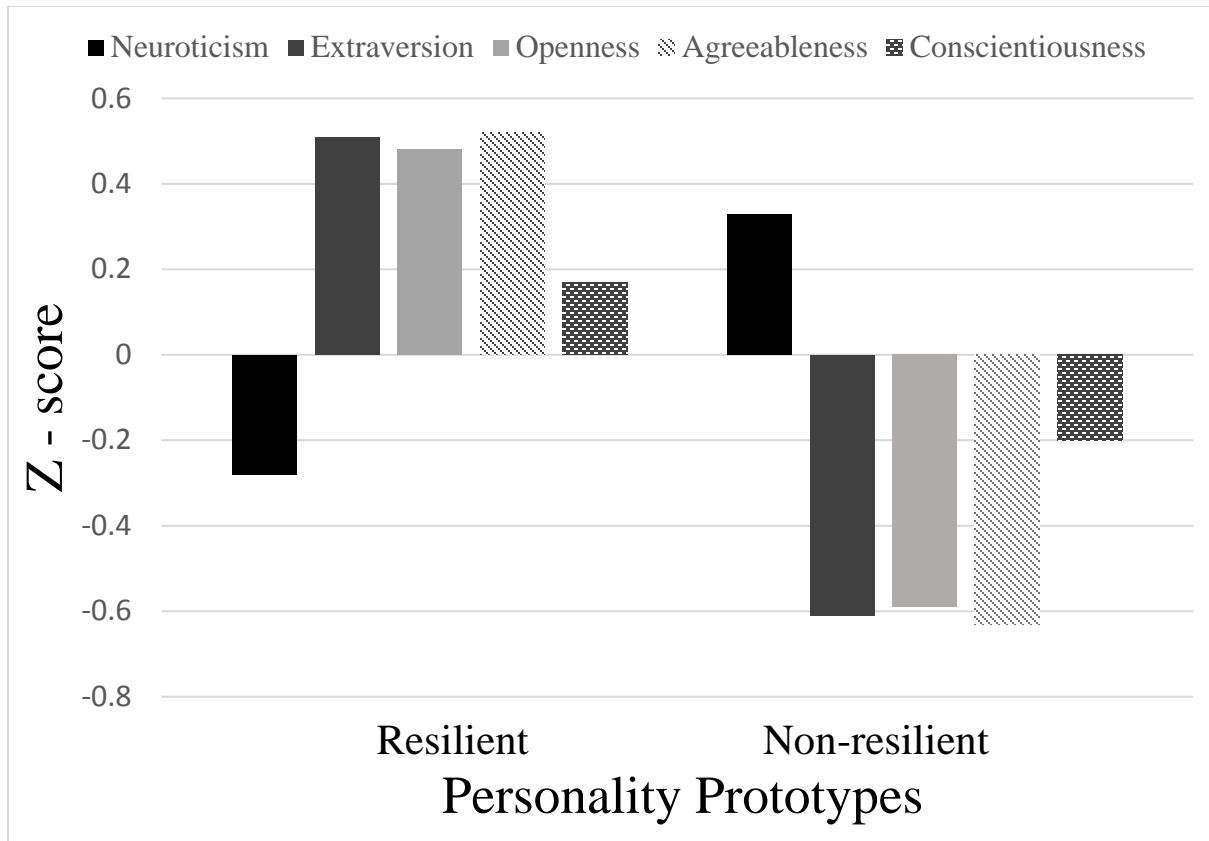


Figure 4. Resilient (n = 618) versus non-resilient (n = 507) prototype Big Five trait values.

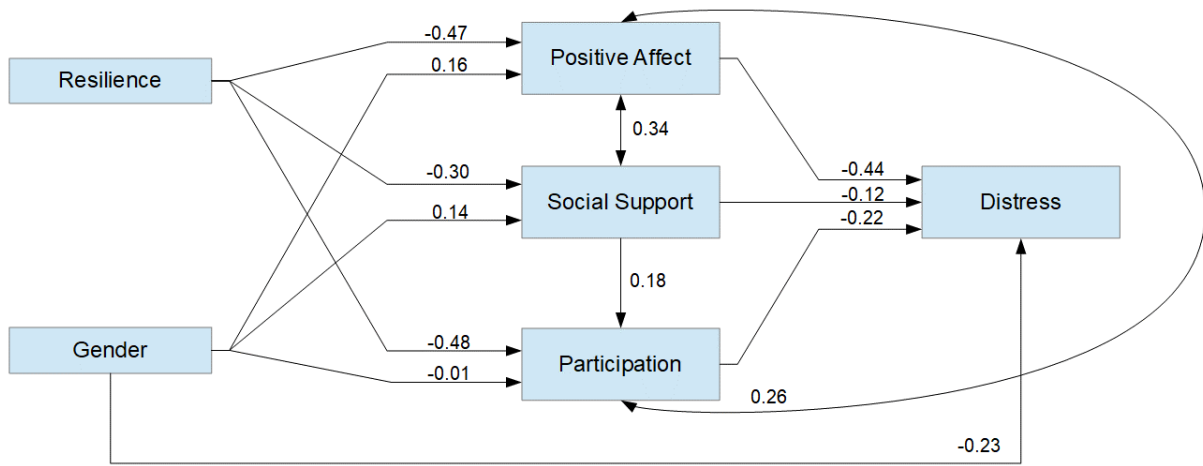


Figure 5. Analyzed prototype resilience path model with significant paths. $R^2 = 40\%$