

RESILIENCE AND YOUNG ADULTHOOD: TESTING THE MEDIATING
EFFECTS OF POSITIVE EMOTION AND SOCIAL CONNECTEDNESS ON
DISTRESS

A Dissertation

by

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ABSTRACT

Objective: To examine the potentially mediating effects of positive emotion and social support on the relationship of resilience and gender to distress indicated by poor psychological adjustment and physical health outcomes. **Design/Setting:** Participants in the National Longitudinal Study of Adolescent to Adult Health (Add Health; Harris, 2013) completed in-home interviews as part of Wave IV data collection. These data, collected when the participants were young adults, are part of a larger longitudinal dataset that began with Wave I data collection when the participants were in middle school. Data were analyzed using structural equation modeling.

Participants: Participants include the 5,114 respondents comprising the Wave IV Public Use Sample provided by the University of North Carolina at Chapel Hill (Carolina Population Center, 2008). The sample was predominately in their mid-twenties, Caucasian, and had completed at least a high school education. The sample was 54% female and 42% male. **Main outcome Measures:** Items from the NEO-PI-R were used to identify resilient, overcontrolled, and undercontrolled personality prototypes. Items from the CES-D10 were used to assess positive affect and depression. Additional questions from the Wave IV in-home interview regarding health outcomes, and social support including familial relationships, friendships, and romantic relationships were also included. **Results:** Both significant indirect and direct effects were observed from personality to the psychological distress outcome variable. The resilient prototype had significant indirect effects on psychological distress through its advantageous effects on

positive affect and social support. A significant direct effect was observed from gender to both the psychological distress and the physical health outcomes.

Conclusions: Resilience appears to impact psychological distress through advantageous associations with social support and positive affect. These anticipated relationships are independent of the significant association of gender to psychological distress.

Understanding the interactions between social support and positive affect over time in supporting psychological adjustment and overall well-being across the lifespan is a promising avenue requiring longitudinal research. Individuals endorsing psychological distress (for example, anxiety and depression symptoms) may benefit from interventions that promote social connectedness which may increase the likelihood of receiving social support and experiencing positive emotions.

DEDICATION

This dissertation is dedicated to my wonderful husband, who consistently and selflessly puts my needs before his own.

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CHAPTER I

INTRODUCTION

Psychologists have long been fascinated with personality characteristics associated with resiliency and the ability to effectively adapt when faced with adversity. Bonanno (2004) views resiliency as healthy adjustment across time as resilient individuals are able to “bounce back” in a manner “better than expected” when something potentially traumatic such as a life-threatening situation or death of a loved one occurs (Mancini & Bonnano, 2010). Block and Block (1980a) express this concept in terms of ego resiliency, with individuals low in ego resiliency demonstrating rigidity and maladaptive strategies when conflict arises and individuals high in ego resiliency expressing resourcefulness and healthy coping. Ego resiliency can further be broken down into three personality prototypes: resilient, overcontrolled, and undercontrolled (Block, 1993). Personality and personality variables are considered impactful factors in determining resilience (Bonanno, Westphal, & Mancini, 2011), and these prototypes can be derived from McCrae and Costa’s (NEO Five Factor Inventory & NEO Personality Inventory-Revised; Costa & McCrae, 1992; NEO-PI-R McCrae & Costa, 2010) Big 5 personality traits. They also have predictive utility as they are stable over time and influence functioning (Asendorpf & van Aken, 1999; Berry, Elliott, & Rivera, 2007; Caspi & Silva, 1995; Dennissen, Asendorpf, & van Aken, 2008; Ong, Bergeman, & Boker, 2009; Specht, Luhmann, & Geiser, 2014).

Resiliency is a widely studied predictor of adjustment among people experiencing a variety of concerns including posttraumatic stress disorder, traumatic

brain injury, and persons coping with disability (Bonanno, 2004; Bonanno et al., 2011; Elliott et al., 2015; Walsh, Armstrong, Poritz, Elliott, Jackson, & Ryan, 2016). It is also prevalent in developmental studies of children (Caspi & Silva, 1995) and adolescents (Block & Block, 1980b; Chapman & Goldberg, 2011) and transitional periods such as emerging and young adulthood as well (Shiner & Masten, 2012). Emerging adult social roles, developmental changes, and life events can affect resilient personality development (Block & Block, 1980a), and resilient prototypes appear to be on-track developmentally (Dennissen et al., 2008) as they resist stress and successfully cope with challenges. As Alessandri, Eisenberg, Vecchione, Caprara, and Milioni (2016) assert, it is expected that ego-resilient individuals are better equipped to handle social transitions featured in young adulthood such as finishing school, moving, starting a job, and living independently from one's parents.

Ego-resiliency is especially important during the adolescent transition to young adulthood because of the many social and environmental changes associated with this developmental period (Block & Block, 1980a; Milioni, Alessandri, Eisenberg, & Caprara, 2016). Through the lens of Erik Erikson's (1963) psychosocial development theory, an identity development trajectory involves encountering and overcoming conflicts requiring the individual to cope and adapt. Successful developmental change resulting in healthy identity formation occurs as the individual resolves the conflicts characterizing each of Erikson's eight developmental stages throughout the lifespan.

Young adulthood encompasses the Intimacy versus Isolation stage of development, where individuals begin to establish intimate relationships and foster

social connections (Erikson, 1963). This developmental stage occurs during a timeframe when it appears that ego-resiliency enters a “developmental window”; beginning at age 19, an increase in ego-resiliency has been noted in young adult populations (Alessandri et al., 2016). This pattern aligns with a previously noted pattern that personality traits associated with ego-resiliency such as conscientiousness, emotional stability, and agreeableness also increase during emerging adulthood (Roberts, Walton, & Viechtbauer, 2006). Thus, ego resiliency is a component of the dynamic changes individuals encounter in young adulthood that concurrently influence their ability to navigate this developmental stage’s challenges.

Block and Block’s (1980a) resilient, undercontrolled, and overcontrolled prototypes can be reliably derived from the Big Five personality dimensions captured with McCrae and Costa’s NEO Personality Inventory-Revised (NEO-PI-R; 1992/2010). The Five Factor personality inventory is an extremely reliable and valid measure (John & Srivastava, 1999; McCrae & Costa, 2010) and has predictive utility (Elliott et al., 2015). In the context of the Five Factor Model, overcontrolled types tend to internalize and have low extraversion and emotional stability scores, while undercontrolled types are low in emotional stability, agreeableness, and conscientiousness (Achenbach & Edelbrock, 1981). Resilient types, on the other hand, have above average emotional stability in addition to above average IQ scores (John & Srivastava, 1999). Research with the resilient, overcontrolled, and undercontrolled types has been conducted to predict adolescent psychopathology and adjustment (Asendorpf & van Aken, 1999; Hart, Hofmann, Edelstein, & Keller, 1997; Weir & Gjerde, 2002). More recently, the three

prototypes have been used in predicting adjustment after traumatic disability (Berry et al., 2007), with military veterans and PTSD (Elliott et al., 2015), substance dependence (Anderson, Tapert, Moadab, Crowley, & Brown, 2007), and health outcomes (Chapman & Goldberg, 2011). Their applicability to a wide range of research challenges makes the three prototypes ideal for the current study.

Protective factors (Bonnano et al., 2012) that foster healthy adaptation include positive self-concept and positive emotions (Charney, 2004; Davydov, Stewart, Ritchie, & Chaudieu, 2010). Positive emotion features prominently in one's ability to adjust in response to a stressor and is associated with high trait resiliency (Bonnano et al., 2011; Fredrickson, 2013; Ong et al., 2009). Resilient individuals tend to be high in positive emotion (Tugade & Fredrickson, 2004) and they also cultivate positive affect which perpetuates a positive emotion cycle (Fredrickson, Tugade, Waugh, & Larkin, 2003). In a 10-year longitudinal study spanning the transition from adolescence to young adulthood, Milioni et al. (2016) found that positivity predicted later ego-resiliency. This indicates a positive outlook is a key factor for individuals who successfully cope with stressful life events. Positive affect items were included in all four waves of the Add Health data and have been explored in previous research (DeNeve & Oswald, 2012; Harris, 2013).

Compared to non-resilient individuals, resilient individuals are more socially competent not only in childhood, but in adulthood as well (Caspi & Silva, 1995; Chapman & Goldberg, 2011). They are more actively engaged in their environments and demonstrate greater flexibility, contributing to their abilities to adjust to challenge

(Block & Block, 1980a; Farkas & Orosz, 2015). Because young adults are in a developmental stage where establishing close social connections and strong interpersonal bonds is the focus, their well-being is closely related to their ability to resolve this Intimacy vs. Isolation conflict (Erikson, 1963).

In addition to friendships and an individual's ability to form interpersonal relationships, one social connection not to be overlooked includes familial support. Societal and cultural changes now include increased parental dependence in emerging adulthood (Alessandri et al., 2016), emphasizing the importance of foraging new social connections as well as maintaining existing ones. Ego-resiliency is significantly related to family support (Block & Block, 1980a) and an individual's ability to self-regulate (Tugade & Fredrickson, 2004). Alessandri et al. (2016) found that individuals perceiving high familial support as well as high self-efficacy beliefs regarding the ability to express positive emotion predicted stable high ego-resiliency scores in emerging adulthood (ages 19-25 years). In this way, social connection and positive affect are linked in the cycle described with Fredrickson's (2013) theory.

Resilient individuals are able to "maintain relatively stable, healthy levels of psychological functioning" (Mancini & Bonnano, 2010). Thus, individuals low in ego resiliency experience functional impairment impacting their psychological adjustment, and outcome trajectories of such individuals can include depression symptoms (Bonnano et al., 2011). In Block and Block's theory of ego control and ego resiliency, individuals low in ego resiliency engage in maladaptive strategies and are rigid in their approach to stress and conflict, inadequately managing demanding situations (Block & Block, 1980a;

DeYoung, 2010). Both overcontrolled and undercontrolled prototypes, in contrast to the resilient prototype, are characterized by high neuroticism (Chapman & Goldberg, 2011; Dennissen et al., 2008) which is associated with increased risk for depression (D’Zurilla, Maydeu-Olivares, & Gallardo-Pujol, 2011; Grav, Stordal, Romild, & Hellzen, 2012). A lack of resiliency has been linked to higher rates of depression and social isolation in traumatic disability research (Berry et al., 2007), poor psychological well-being in adulthood including depressive symptoms (Ong et al., 2009), and increased risk for depression and lack of positive emotion (Davydov et al., 2010; Fredrickson, 2003).

Mental health can have a strong influence on physical health outcomes. Negative affectivity can manifest as physical symptomatology and is closely linked to somatic complaints and, by default, medical diagnoses (Costa & McCrae, 1987). A reliable link has been noted between negative affectivity (neuroticism) and symptom reporting, with high negative affectivity associated with elevated symptom reports (Pennebaker, 2000). Poor self-rated health is also associated with depression (Ambresin, Chondros, Dowrick, Herman, & Gunn, 2014), a maladaptive psychological reaction indicating negative affectivity. Personality prototypes have predictive utility for adulthood health outcomes (Caspi & Silva, 1995; Dennissen et al., 2008). For example, resilient individuals tend to enjoy better health in general as well as a reduced risk for cardiovascular disease (Chapman & Goldberg, 2011).

Gender merits consideration because of its implications in personality and health research. Gender can play a role in physical health outcomes because, along with personality and life experiences, it has been found to predispose individuals to symptom

reporting (Pennebaker, 2000). Women and men have differences in how they notice, define, and react to physical symptoms; in general, women attend more to situational cues and men attend more to physiological cues (Pennebaker, 2000). There are also gender differences in responses to physical health symptoms, with a tendency for men to engage in more illness behavior and a tendency for women to have higher numbers of physician appointments (Weiss, Rief, Martin, Rauh, & Kleinstäuber, 2016). It has also been noted in personality research that women are more likely than men to endorse negative affect items and commonly have higher Neuroticism scores (Feldt, 2014; Grav et al., 2012). Because individuals high in negative affectivity tend to report an elevated number of symptoms (Pennebaker, 2000), it is possible that women are predisposed to report more symptoms than men. It is also worthwhile to note that women commonly have higher depression rates than men (Karhina, Ng, Ghazinour, & Eriksson, 2016; Zender & Olshansky, 2009). This phenomenon has been replicated in studies using National Longitudinal Study of Adolescent to Adult Health (Add Health) data, the dataset employed in the current study (Gibson, Baker, & Milner, 2015; McPhie & Rawana, 2015). Therefore, it can be expected in the present study that gender may be associated with psychological distress and physical health outcomes.

It is well established in theory and prior research that the resilient personality prototype is a protective factor fostering healthy adjustment and stress resistance when encountering hardship (Ong et al., 2009; Walsh et al., 2016). To our knowledge, no studies to date have investigated trait resiliency in the National Longitudinal Study of Adolescent to Adult Health sample (Add Health; Harris, 2013). It has not been

established whether the Big Five personality factors might yield resilient, overcontrolled, and undercontrolled personality prototypes among young adults with the Add Health data for the purposes of understanding adjustment in young adulthood in the context of Erikson's (1963) developmental theory. Understanding these distinctive personality factors is critical to anticipating an individual's psychological well-being and propensity for healthy functioning or, conversely, risk of developing mental health problems, across time. This study will extend previous research (Berry et al., 2007; Elliott et al., 2015) in explaining the ways the three personality prototypes may facilitate adjustment. This line of inquiry is beneficial in that it could enhance predictive utility of the personality prototypes, offering a method for predicting and understanding emotional, behavioral, and health outcomes throughout the lifespan.

The current study aimed to reproduce the three personality prototypes (i.e., resilient, undercontrolled, and overcontrolled) in a national sample of young adults. In addition, the study explored whether the prototypes, gender, and the mediating variables of social support and positive affect predicted psychological distress and physical health outcomes for a population of individuals in a young adulthood developmental trajectory. The model will test the potentially mediating effects of positive emotion and social support on the relationship of resilience and gender to psychological distress and physical health outcomes. The data were analyzed using structural equation modeling.

The current study will examine *a priori* hypothesized mechanisms, specifically positive affect and social support, through which resilience facilitates adjustment. Based on prior research (Elliott et al., 2015) and according to Block and Block's (1980a)

model, it is hypothesized that the three personality prototypes of adjustment will be reproduced in the sample. It is expected that higher resilience will be associated with higher social support and positive affect. It is further hypothesized that these mediating variables will be associated with less psychological distress and better physical health outcomes. It is expected that higher social support will be associated with higher positive emotion and vice versa. It is also hypothesized that resiliency will be associated with less psychological distress and better physical health outcomes. According to our contextual model the mediators indicate mechanisms by which resilience facilitates positive adjustment. Based on Block and Block's (1980a) model, the opposite pattern is expected for undercontrolled and overcontrolled types. Finally, it is hypothesized that female gender will be associated with more psychological distress outcomes and thus poor physical health outcomes, but personality prototypes will predict adjustment regardless of gender. No interaction effects between gender and personality are expected.

CHAPTER II

LITERATURE REVIEW

This chapter will focus on resiliency's influence on human development and physical health. The chapter will begin with a discussion of resiliency and its definition. A description of overcontrolled, undercontrolled, and resilient personality prototypes will be included. Prototype predictive utility will be detailed and the implications of these research findings are considered. A discussion of protective factors will be followed with an explanation of the link between Erikson's (1963) psychosocial identity development theory and resiliency. The influence of resiliency on physiological health outcomes will also be discussed. Last, the proposed study and research hypotheses are presented.

Defining Resiliency and Accompanying Theoretical Models

Resilience is a widely studied construct whose definition varies across theoretical models. This lack of conceptual unification makes research findings comparison difficult (Davydov et al., 2010; Fletcher & Sarkar, 2013). Despite this barrier, resilience is a construct included in an array of research including combat-related PTSD and military research with veterans, grief and loss, and persons with disabilities (Bonanno, 2004; Bonanno et al., 2011; Elliott et al., 2015). Resilience can be broadly conceptualized as the study of protective factors (Bonanno, Mancini, Horton, Powell, Leardmann, Boyko...& Smith, 2012) and has been considered in the context of both behavioral and genetic approaches (Davydov et al., 2010). It is recognized as an important factor in mental health research that aligns with the World Health Organization's view of mental

health as not merely the absence of disease but rather a positive state of psychological well-being (World Health Organization, 2005).

Resiliency first appeared as a construct in the 1970s when researchers focusing on individuals at “high risk” for psychiatric problems or living in disadvantaged environments such as poverty started to see interesting trends. Pioneer psychologists and psychiatrists including E. James Anthony, Emory Cowen, Norman Garmezy, Lois Murphy, Michael Rutter, and Emmy Werner focused on development across the lifespan and noticed unexpected examples of people overcoming odds despite their high risk (Masten & Wright, 2009). This new era of resilience research can be divided into four distinct phases (Masten & Wright, 2009): the first concentrated on description as investigators sought to define and measure resiliency and began to notice protective factors such as personal qualities and relationships; the second explored the “how” of resiliency and the processes that lead to resilience; the third aimed to test resilience process and ideas as well as interventions that could promote resiliency; the fourth is an ongoing endeavor to integrate different aspects of the resilience process such as genetics and neural plasticity.

Early resiliency models include “main effect” compensatory models depicting theoretical factors with direct, independent effects that offset experienced risk. These ideas were further expanded with “moderating effect” protective models in which theoretical factors’ effects vary with risk level (Masten & Wright, 2009). This concept suggests protective factors have an increased effect if and when risk exposure occurs. Additionally, Garmezy et al., (1984) articulated a challenge model in which an

individual can prepare for adversity and gradually build immunity with exposure to stressors, thus providing practice utilizing resilient coping responses. One commonality among these models is their conceptualization of resiliency as a pattern emerging over time that changes based on threat exposure, reaction, and adaptation (Masten & Wright, 2009; Shiner & Masten, 2012). Because resilience is dynamic, understanding developmental perspectives is key to modern resilience research. This understanding also informs practical applications and effective interventions. Understanding resilience in terms of development also encourages a strength and well-being focus that describes growth and adaptation as opposed to a deficit-oriented approach (Masten & Wright, 2009).

Defining resilience in the context of human lifespan development includes “patterns of positive adaptation and development in the context of significant threats to an individual’s life or function” (Masten & Wright, 2009, p. 215). People vary in their responses to challenge and trauma, and understanding resiliency across the lifespan necessitates a consideration of differences in each individual’s developmental trajectory. Moreover, individuals vary in resiliency based on different environmental factors including social support and the nature of the stressful events encountered. In this way, resilience is a dynamic function of individual characteristics, environment, developmental stage, and specific adverse situations (Rutter, 2007). It is important to note that resiliency is not simply being well adjusted throughout the lifespan; resiliency necessitates an adaptive response to significant stressors and trauma. A person may express resiliency in the face of adversity at one point in the lifespan and respond to a

later stressor in a maladaptive way at a different point on the person's developmental trajectory (Masten & Wright, 2009).

Within the context of human development, it can sometimes be difficult to determine a risk factor's impact since risks and outcomes are ongoing on a developmental continuum with start and end points that can be difficult to distinguish (Masten & Wright, 2009). Additionally, stressors can accumulate over time that impact an individual's ability to adapt in a positive manner. For instance, trauma occurring early in an individual's development may have a more overwhelming impact when the individual is older and is able to conceptualize what happened in a cognitively mature way. Because children's brains are still developing cognitively, socially, and emotionally, they may not understand their trauma or may lack the mental sophistication to articulate what happened (Price et al., 2013; van der Kolk, 2005). It is no coincidence then that childhood trauma is highly correlated with a lifespan trajectory of poor physical health, mental health concerns, and a need for psychological services in adulthood (Kessler, Davis, & Kendker, 1997; van der Kolk, 2005).

Luthar's (2006) child development resilience synthesis spanning five decades asserts that relationships are fundamental to resilience. Advocating for relationships as a protective factor in resilience is supported with prominent attachment theory and research (Ainsworth, 1989; Bowlby, 1969, 1982, 1988). Early human development in infancy necessitates attachment to an adult caregiver to ensure survival and evolves throughout the lifespan into relationships with peers, friendships, romantic relationships, and ultimately parenting the next generation. Bowlby (1982) explains that in infancy and

childhood healthy attachment to a caregiver provides children with security in nonthreatening situations allowing children to explore their environments and fostering overall healthy development. Secure attachment provides reassurance and comfort in threatening situations, which can help children regulate their responses and learn how to handle stress.

Mastery motivation is also a developmental protective factor influencing resiliency. Individuals who are intrinsically motivated (Deci & Ryan, 2000) with a strong sense of self-efficacy (Bandura, 1997) are driven in their efforts to succeed and have a foundational belief that with persistence they can reach their goals even if they experience challenges or initial failure. The ability to exercise self-control allows individuals to restrain impulse, delay gratification, and achieve long-term goals (Lieberman, 2007); such effortful control or lack thereof impacts social competence (Eisenberg, Champion, & Vaughan, 2007) which in turn contributes to resiliency. Effortful control and self-regulation are skills that mature and develop across the lifespan and also highlight individual differences in positive adaptation and maladaptive functioning.

Positive adaptation and development can be operationalized as either internal function such as well-being or external function such as performance and being successful (Masten & Wright, 2009). Historically from a developmental perspective, meeting developmental milestones at appropriate times and competency in developmental tasks indicates healthy functioning and, by extension, resiliency (Erikson, 1963; Havinghurst, 1972; Masten, Burt, & Coatsworth, 2006). It is common in the early

literature for children to be considered resilient or at risk based on their abilities to perform age-salient developmental tasks such as academic success and appropriate behavior (Shiner & Masten, 2012). Adults, on the other hand, may be considered resilient based on romantic relationships and workplace success (Masten et al., 2005), which are developmentally appropriate tasks for their stage in the lifespan (Erikson, 1963).

Research supports the assertion that children with poor school performance and behavior problems often foreshadow difficulties in adulthood (Masten, Burt, & Coatsworth, 2006). By their very nature, developmental tasks build upon each other; mastering tasks at one developmental level establishes a foundation for future development (Havinghurst, 1972; Masten, Burt, & Coatsworth, 2006). It would be illogical, for example, to expect a baby to crawl if the baby cannot yet roll over. A similar coherence can be seen throughout the lifespan in other domains. For example, it can be reasonably expected that a young child who struggles with attachment may also have difficulty establishing meaningful relationships in adulthood. Competency struggles can even spread across domains. Masten et al., (2005) explain this phenomenon as a developmental cascade in which effects “snowball”. This is illustrated in findings that childhood cognitive function and antisocial behavior predicted outcomes in multiple domains of adult adjustment (Kohlberg, LaCrosse, & Ricks, 1972). From a developmental standpoint, resiliency must be dynamic to accommodate expected growth based on age-graded changes. While external function is certainly a tangible way to assess resiliency, it is likely to some extent a manifestation of internal function and is an

incomplete view of the person as a whole. It is possible that one can function well externally in some domains while struggling internally with psychological well-being; thus, taking a holistic approach to resiliency can be beneficial. A person's overall resiliency is best considered to be a blend of the two functions.

Bonanno's (2004) popular conceptualization that resilience is "the ability of adults in otherwise normal circumstances who are exposed to an isolated and potentially highly disruptive event, such as the death of a close relation or a violent or life-threatening situation, to maintain relatively stable, healthy levels of psychological functioning" suggests resilient individuals are able to "bounce back" with "better than expected" adjustment (Mancini & Bonnano, 2010). Exposure to a potentially traumatic event (PTE) is likely to occur at least once for most people during their lifetimes and common response trajectories to such events include: resilience, characterized by healthy functioning; recovery, characterized by some functional impairment but a gradual return to normal levels of functioning; chronic distress, characterized by PTSD symptoms; delayed reaction, characterized by PTSD symptoms exacerbating over time (Bonanno et al., 2011). According to Bonanno (2004), adequately understanding resiliency requires operationalization as a stable trajectory of healthy adjustment across time.

Another well-known theoretical model unique in its presentation of resiliency offers distinct personality prototypes that have predictive efficacy (Block & Block, 1980a). Block and Block's theory of ego control and ego resiliency conceptualizes an individual's capacity for effective adjustment to change with two psychological factors, ego control and ego resiliency (Block & Block, 1980a; Block, 1993). Ego control

reflects an individual's ability to delay gratification and control impulses; those low in ego control tend to seek immediate gratification and act on impulses even in inappropriate contexts (Block & Block, 1980a; DeYoung, 2010). Ego resiliency encompasses an individual's resourcefulness and ability to adjust ego control levels to adapt to changing circumstances; those low in ego resiliency express rigidity in the face of stress and conflict, perseverating on maladaptive strategies that fail to meet the demands of the situation (Block & Block, 1980a; DeYoung, 2010).

Block (1993) further expands ego control and ego resiliency in a conceptualization of specific personality prototypes—resilient, undercontrolled, and overcontrolled—that capture an individual's propensity for impulse control and flexible adaptation. The three prototypes encompass the Big Five typology (McCrae & Costa, 2010) which includes the personality traits of neuroticism, extraversion, openness to experience, conscientiousness, and agreeableness. The resilient prototype is associated with low neuroticism and above-average scores on the remaining personality traits. Undercontrolled individuals are typified by low conscientiousness and moderate neuroticism, while overcontrolled individuals are characterized by high neuroticism and low extraversion with average scores on the remaining personality factors. These three prototypes are evident across the lifespan in child behavior ratings (Caspi & Silva, 1995), and in adolescent and adult self-report on personality trait measures (Chapman & Goldberg, 2011; Dennissen et al., 2008; Letzring, Block, & Funder, 2005).

Undercontrolled and overcontrolled prototypes are at opposite ends of the ego control spectrum. Undercontrolled individuals do not moderate impulses or delay

gratification and can be distracted by environmental context; their boundaries are too permeable. This type of individual tends to be expressive and spontaneous.

Overcontrolled individuals have rigid boundaries, inhibiting impulse and delaying gratification to the point that they are not engaged in their environments (Block & Block, 1980a). They tend to be constrained, avoid ambiguity, and express emotion minimally. Both overcontrolled and undercontrolled types are considered adaptively dysfunctional.

Resiliency, on the other hand, facilitates functional adjustment and resilient individuals engage adaptive strategies to “bounce back” under stressful or challenging conditions. It can be conceptualized in Lewinian terms as elasticity, referring to a resilient individual’s dynamic ability to meet environmental demands by altering ego-control levels (Block & Block, 1980a). Elasticity is the flexibility to adapt to a challenge and then return to one’s original state once the stressor has passed. Ego-resilient individuals are resourceful both in new, non-threatening situations and when faced with adversity.

Prototype Predictive Utility

In addition to clearly detailing reactions to challenge and adversity, Block and Block’s (1980a) personality prototypes have predictive utility. Resilient individuals have above average emotional stability as assessed with the Big Five personality dimensions, as well as above average IQ and academic achievement (John & Srivastava, 1999). In contrast, undercontrolled individuals have a propensity for externalization. They obtain low emotional stability, agreeableness, and conscientiousness scores, high aggressiveness scores, and lower scores than resilient types on intelligence and

achievement measures (Achenbach & Edelbrock, 1981). Overcontrolled individuals have a propensity for internalization and tend to obtain low extraversion and emotional stability scores.

Multiple studies using child behavior ratings demonstrate that personality prototypes predict emotional, behavioral, and health outcomes in adulthood (Caspi & Silva, 1995; Chapman & Goldberg, 2011; Shiner & Masten, 2012). Childhood personality has also been found to predict adult psychopathology, crime, employment, and interpersonal relationships (Caspi, Elder, & Bem, 1987; Caspi & Silva, 1995; Roberts, Caspi, & Moffit, 2003; Shiner, Masten, & Roberts, 2003). These results indicate that Block and Block's (1980a) personality prototypes are both stable over time and influence functioning across the lifespan.

Caspi and Silva (1995) found that children characterized as undercontrolled at age 3 had the highest aggression scores compared to their counterparts at age 18 and their overall scores indicated a propensity towards impulsivity, negative emotionality, danger-seeking, and poor behavioral constraint. Inhibited children, in accordance with an overcontrolled prototype, were restrained and nonassertive as adolescents and reported withdrawn social behaviors. Well-adjusted children, on the other hand, responded appropriately to situations at age 3, displaying self-confidence and the ability to cope with challenging tasks. Their behavior was characterized the same way at age 18 and they "defined normal, average young adults" (Caspi & Silva, 1995, p. 496). This assessment is in accordance with findings that undercontrolled and overcontrolled children took longer to accomplish tasks in young adulthood such as moving away from

home, getting hired for a job, and establishing romantic relationships; resilient children tended to assume adult social roles at a younger age (Dennissen et al., 2008).

Achieving financial independence and assuming more responsible roles are key factors in emerging adulthood (Arnett, 2000) and personality can predict an individual's response to this transition. The California Q-Set (Block & Block, 1980b) yields the three basic resilient, overcontrolled, and undercontrolled personality types and has been useful in predicting adolescent psychopathology and adjustment (Asendorpf & van Aken, 1999; Hart et al., 1997; Robins, John, Caspi, Moffitt, & Stouthamer-Loeber, 1996; Weir & Gjerde, 2002). For example, preschoolers with the highest scores for inhibition and aggressiveness on the California Q-Set displayed social transition delays and a tendency towards externalization two decades later (Asendorpf, Dennissen, & van Aken, 2008).

The Five Factor Model of personality (McCrae & Costa, 2010) also yields the three personality prototypes and has predictive utility. In the context of conduct disorder and substance use disorder etiology, undercontrolled characteristics of high neuroticism scores coupled with low conscientiousness and agreeableness were predictive of adolescent deviant behavior and substance dependence (Anderson et al., 2007). These associations occurred during adolescents' transition into adulthood, suggesting these behaviors are maladaptive strategies undercontrolled adolescents employed to cope with the adjustment. Historically within resilience research, resilient adolescents engage in adaptive coping strategies when exposed to risks or developmental stressors. Resiliency

is a “protective trait” allowing the “maintenance of positive outcomes in the face of challenge” for children, adolescents, and adults (Ong et al., 2009, p.1784).

Resilience is a prominent factor in adjustment and well-being across the lifespan. Individuals characterized as resilient in childhood not only experience better overall health than their over-and-undercontrolled counterparts, they are also at a lower risk for cardiovascular disease (Chapman & Goldberg, 2011). In contrast, an overcontrolled typology is associated with poor cardiovascular health and a greater risk for hypertension while an undercontrolled typology is associated with greater risk for stroke (Chapman & Goldberg, 2011). Resilience is also a pertinent predictor in the context of traumatic injury and disability in adulthood. Berry et al. (2007) note that resilient types have more adaptive problem-solving styles after traumatic disability, in addition to a greater sense of acceptance than overcontrolled types. After traumatic disability, overcontrolled individuals experienced higher rates of depression and social isolation. They also engaged in fewer recreational activities, consistent with overcontrolled typology tendencies to be rigid, socially withdrawn, constrained, and emotionally unexpressive (Berry et al., 2007). Especially in the context of adulthood, resilience is considered more broadly, expanding on coping with trauma and loss to include a positive state of psychological well-being that encompasses potential stressors in daily life (Davydov et al., 2010; Ong et al., 2009). Block and Block’s (1980a) ego resiliency model is widely used as an effective mode of predicting emotional, behavioral, and overall functioning outcomes.

Protective Factors: Positive Emotion and Social Support

Broadly conceptualized as the study of protective factors (Bonanno et al., 2012), resiliency includes positive adaptation that enables an individual to function despite risk exposure. Ong et al. (2009) identify protective factors as constructs that facilitate this beneficial adaptation. Factors supporting resilience include cognitive flexibility, social attachment, positive self-concept, effective emotion self-regulation, positive emotions, social support, and active coping styles including exercise (Charney, 2004; Davydov et al., 2010). Positive emotion, as well as external environmental resources such as supportive relationships, aids an individual in a resilient response to adversity.

Positive emotion is a prominent adjustment factor after adversity (Bonanno et al., 2011). Among persons with chronic conditions, resilience is associated with healthy adjustment by fostering positive emotions and the individuals' cognitive appraisals of their situations (Ong, Zautra, & Reid, 2010). Positive emotions also play a role in an individual's ability to resist stress (Ong et al., 2009). For example, a study by Papa and Bonanno (2008) found that college students who were first exposed to a sadness-inducing task and then made to smile had better psychological adjustment two years later. Because there is an established relationship between low trait resiliency and negative emotion (Ong et al., 2009), it is reasonable to expect positive emotion and high trait resiliency are related as well.

Fredrickson's (2013) model of positive emotions asserts a tendency for positive emotions that promote cognitive flexibility and adaptive coping strategies in the face of adversity and stress is a distinctive characteristic of resilient individuals. This propensity

for positive emotion also facilitates affirmative social interactions, which in turn fosters more positive emotion. Positive emotion benefits thus perpetuate a cycle of more positive emotion (Cohn, Fredrickson, Brown, Mikels, & Conway, 2009; Kok et al., 2013; Ong et al., 2009). Resiliency and positive emotion byproducts such as social interaction are linked in research; for example, Silverman, Molton, Alschuler, Ehde, and Jensen (2015) conducted a study showing a positive association with resilience in persons with disability and measures of their increased social functioning three years later.

Research examining childhood traits reveals resilient individuals compared to non-resilient individuals are more socially competent during both childhood and adulthood (Caspi & Silva, 1995; Chapman & Goldberg, 2011). Resilient individuals also report more flexibility and resourcefulness, as well as more active engagement with their environments as compared to their non-resilient counterparts; these higher activity levels and greater flexibility are present in both routine circumstances and more stressful situations for resilient individuals (Block & Block, 1980a; Block & Kremen, 1996; Farkas & Orosz, 2015). Social connectedness even has physical health benefits. High cognitive social capital (defined as resources available as a result of social networks) is associated with good self-rated health (Karhina et al., 2016) and is believed to be an influence of psychosocial factors contributing to stress reduction and improved health behaviors.

Identity Development

Resilience can be conceptualized within the framework of developmental theory. Erik Erikson's (1963) widely accepted theory of psychosocial development puts identity development in the context of encountering and overcoming conflicts that require the individual to adapt to new situations dictated externally by culture and internally by biological maturation. Healthy identity formation results from the individual successfully undergoing developmental change as the individual works to resolve conflict in each of Erikson's eight developmental stages from infancy through old age (Erikson, 1963). The final four stages encompass adulthood; young adults find themselves in the fifth stage as they seek to resolve the conflict of Intimacy vs. Isolation. These young adults have already transitioned from childhood to adulthood in the Identity vs. Inferiority stage, and now must build off their newfound sense of identity to establish intimate relationships with others including both friendships and romantic relationships. This social connectivity boosts emotional well-being and fosters the individual's self-confidence; conversely, a failure to establish intimate relationships causes isolation and subsequent emotional distress (Erikson, 1963).

Recent research (Luthar, 2006; Svetina, 2014) has found strong correlations between developmental outcomes and resilience, even linking Erikson's developmental stages to resiliency outcomes (Svetina, 2014). As individuals resolve the crises set forth in each of Erickson's developmental stages they are faced with developmental adversity and must adapt in order to follow a healthy identity development trajectory. This clearly parallels resiliency's definition within trauma literature that individuals confronted with

a disruptive event are still able to maintain psychological well-being and effectively cope with distress (Block & Block, 1980a; Bonnano, 2004; Mancini & Bonnano, 2010). In fact, from an ego-resiliency perspective developmental transitions including biological factors (puberty, sexuality, developing into adults) and important life events like attending college or starting one's first job are viewed as common influences on expected changes in ego-resiliency (Alessandri et al., 2016; Block & Block, 1980a).

Although Erikson's theory focuses on developmental conflict and not unexpected aversive events, the uncertainty and potential threat involved in both requires effectively utilizing resources to adapt. Erikson's Intimacy vs. Isolation stage is also mirrored in personality maturation research focusing on early adulthood as a key developmental period where individuals become more responsible and socially connected in their communities, assuming normative adult roles (Arnett, 2000; Roberts, Wood, & Smith, 2005).

Psychological Impact on Physical Health

Physical health outcomes are greatly influenced by mental health and well-being. As Costa and McCrae (1987) explain, negative emotions are often expressed with physical health symptomatology. Defining negative affectivity (NA) as their dispositional construct of neuroticism, Costa and McCrae (1987) assert that it is logical to hypothesize that chronic emotional distress could cause chronic physiological responses that would lead to disease development; NA is closely linked to somatic complaints and illness behavior, which in turn influences medical diagnosis.

Neuroticism is also consistently associated with depression risk (D’Zurilla et al., 2011; Grav et al., 2012).

According to Pennebaker (2000), personality plays a role in developing and reporting physical symptoms. NA reflects pervasive negative mood and is related to higher distress and dissatisfaction levels across time and situations. Individuals high in negative affectivity tend to be hypervigilant about body signals and are more likely to notice and report subtle changes and worry about what their perceived symptoms might imply. Throughout research there is a reliable link between Negative Affectivity and symptom reporting, suggesting that this personality trait greatly influences physical symptom reports (Costa & McCrae, 1987; Pennebaker, 2000). This is also true for research indicating people classified as exhibiting high illness behavior also report significantly higher rates of health anxiety (Weiss et al., 2016).

It is common for illnesses to have symptoms with no clear biological basis; however, it is widely accepted that these symptoms are a part of the individual’s subjective experience and that an individual’s perception determines how that individual will attend to and interpret body sensations. Because self-reports are subjective and are influenced by an individual’s perception and interpretation of body signals and symptoms, self-reports may or may not be an accurate reflection of the individual’s physical health (Pennebaker, 1982; Watson & Pennebaker, 1989). It is also important to note that “...individuals with a history of reporting negative moods, thoughts, and symptoms” (i.e., individuals high in NA) tend to report an elevated number of symptoms (Pennebaker, 2000, p. 132). Common symptoms including fatigue, sweating, rapid

pulse, anxiety, headaches, dizziness, and muscle tension and are associated with not only healthy samples but somatization disorders, clinical depression, and the personality construct negative affect (Costa & McCrae, 1987; Pennebaker, 2000). For example, poor self-rated health was associated with depressive symptoms in populations across six countries (Herman, Patrick, Diehr, Martin, Fleck, Simon, et al. 2002) and was also found to predict risk for future long-term depression (Ambresin et al., 2014).

Research has shown people pay more attention to body signals and report more symptoms in boring situations as compared to situations where they are actively engaged. This is also indicated for people who live alone, in rural areas, or work in unstimulating environments. People also report more symptoms during times of stress, and it has been shown that symptom reporting both in the presence and absence of objective disease markers increase after trauma exposure (Pennebaker, 1982; 2000). Perceptual learning also plays a role in symptom reporting, as some people will report symptoms for secondary gain such as attention or less responsibility due to playing a sick role. As a result, Pennebaker (2000) concluded that self-reports of physical symptoms express an individual's "...situational context, beliefs, emotions, and needs" in addition to reflecting physiological reactions (p.303).

Watson and Pennebaker (1989) conducted research that indicates negative affectivity (NA, a pervasive disposition) is reflected in self-report health measures and is also correlated with health complaint scales. Three possibilities include that (1) the psychosomatic hypothesis that high NA causes health problems, (2) the disability hypothesis, that health problems cause high NA, and (3) the symptom perception

hypothesis that individuals differ in perception of and response to symptoms. A combination is possible; for example, high NA individuals could have more physical symptoms and also complain more. Research indicates that while NA is strongly correlated with physical complaints, it is not consistently correlated with long-term health (Watson & Pennebaker, 1989). Those high in negative affectivity may be more sensitive to pain, because anxiety (characteristic of NA) can cause people to experience pain more intensely. Watson and Pennebaker (1989) caution against the sole use of subjective complaint scales in research, advocating for the inclusion of physical symptom scales so that biological markers can be evaluated as well as individual perception of symptoms.

Gender, personality, and life experiences predispose people to symptom reporting (Pennebaker, 2000). In healthy populations, males and females generally report comparable levels of physical symptoms; however, there are some clear gender differences regarding how people notice, define, and even react to their symptoms. For example, controlled laboratory studies indicate men are better able than women in detecting physical symptoms such as heart rate and blood pressure. In general, women are more attentive to situational cues in their symptom-reporting patterns and men are more attentive to physiological cues (Pennebaker, 2000). Men and women also respond to physical symptoms differently, as findings show men tended to engage in more illness behavior while women tended to have higher numbers of doctor visits (Weiss et al., 2016). Because women are more likely to endorse negative affect items than men (Feldt, 2014) including more worry items, it is possible that this inclination towards negative

affect influences symptom perception. Women commonly endorse the highest Neuroticism scores (Grav et al., 2012) and report higher depression rates than men (Karhina et al., 2016; McPhie & Rawana, 2015). Clearly, men and women focus on different aspects of physiological phenomena, suggesting their perception and interpretation of physical cues and subsequent action depends on more than objective symptom markers alone.

The Proposed Study

In the present study, I examined the relationships between resilience, positive emotion, and social connectedness to distress indicators among young adults in Wave IV of the Add Health data. The present study aimed to reproduce the resilient, undercontrolled, and overcontrolled prototypes as an independent variable (Block & Block, 1980a). Prior research has noted gender differences in negative affectivity (Feldt, 2014; Pennebaker, 2000), depression (Gibson, Baker, & Milner, 2015; Karhina et al., 2016), and response to physical symptoms (Pennebaker, 2000); therefore, I include gender as a predictor variable. Positive emotion and social support are included as mediator variables. In my proposed model I expect higher resilience will be associated with higher positive affect and higher social support. It is expected that higher social support will be associated with higher positive emotion and vice versa. It is further hypothesized that these mediating variables would be associated with less psychological distress and better physical health outcomes. It was also hypothesized that resiliency will be associated with less psychological distress and positive physical health outcomes. Based on Block and Block's (1980a) model, the opposite pattern is expected for

undercontrolled and overcontrolled types. Finally, it is hypothesized that female gender would be associated with higher psychological distress and poor physical health outcomes. Figure 1 depicts the hypothesized model. My path model will determine if the anticipated relationships of resilience to the mediating and outcome variables are independent of the associations of gender on these same variables. In this process, the current study will clarify the ways in which trait resiliency promotes adjustment among a nationally representative sample of young adults.

CHAPTER III

METHODS

Overview

This chapter provides descriptions of the data collection procedures, statistical analysis, and measures used in this study. The data used in this study are a part of a larger project. Data were collected during four separate occasions (i.e., during middle school, twice in high school, and once in young adulthood). The aim of this study is to first reproduce the three prototypical pathways of adjustment (i.e., resilient, overcontrolled, undercontrolled) described by Block and Block (1980a). Cluster analysis will be employed on a measure of personality to reproduce the prototypical model. Structural equation modeling (SEM) will then be employed to test assumed relations between the personality prototypes, the mediators, and the outcomes. The Block's model prototypes and gender are the indicator variables. Social support and positive affect are the mediator variables. The outcome variables include psychological distress and physical health.

Procedures

This study utilizes data collected from the National Longitudinal Study of Adolescent to Adult Health (Add Health): Wave IV. The data are available through the Public Access Data provided by the University of North Carolina at Chapel Hill on the Add Health website (<http://www.cpc.unc.edu/addhealth>). Studies using Add Health public use data are pre-approved by the Texas A&M University Institutional Review Board. Data collection for Wave IV sought to explore developmental and health

trajectories spanning the transition from adolescence to young adulthood. During this key developmental transition, emerging young adults are increasingly taking on adult responsibilities and establishing lifestyle habits that will be a foundation for their overall well-being in adulthood (Harris, 2013).

The data were collected from young adults in 2008 who originally participated as adolescents in a nationally representative sample first interviewed in 1994 and 1995. Wave IV conducted interviews with 15,701 original Add Health Respondents from Wave I, and has a response rate of 80.3% which is comparable to other national longitudinal studies (Harris, 2013). Because Wave IV non-response bias is negligible, Harris (2013) asserts that when using final sampling weights to compute population estimates, the sample at Wave IV adequately represents the original population surveyed at Wave I. 92.5% of Wave IV sample was located for the study, and 80.3% of eligible participants were interviewed in the year spanning January 2008-February 2009. Participants were located across all fifty states. Prior to data collection, each Wave IV protocol was pre-tested in a sample of 300 respondents from three states.

The Wave IV survey included questionnaires on social, economic, psychological, and health information. Wave IV also included biospecimen collection, which will not be included in this dissertation. Demographic variables (i.e., age at interview, gender, ethnicity, educational level, income) were obtained through both Wave IV and previous wave interview records. Interviews were conducted by RTI International under sub-contract to the University of North Carolina at Chapel Hill. Surveys were administered by an interviewer with a 90-minute computer-assisted personal interview (CAPI)

instrument, and questionnaire sections requesting more sensitive information were completed with computer-assisted self-interview (CASI) technology. Interviews were conducted in person, most often in the respondents' homes. The interviewer then collected biospecimen samples with a protocol that lasted approximately thirty minutes; however, these results are not explored in the context of the present study.

Participants

Of the individuals from the original Wave I sample 15,701 (80.3% response rate) completed the Wave IV interview (Harris, 2013). Participants for the current study include the 5,114 respondents comprising the Wave IV Public Use Sample provided by the University of North Carolina at Chapel Hill (Carolina Population Center, 2008). The mean age of the sample was 29 ($SD = 1.78$). The ages of the sample ranged between 24 and 34 years old. In the current sample 2,352 participants (46%) were male and 2,762 (54%) were female. The majority earned a high school diploma (85.1%) or a GED (8.2%), and some (32.7%) completed a bachelor's degree or higher. Over half were currently employed at the time of the survey (65.72%) while others were, for example, students (3.15%), or unemployed and looking for work (4.54%). Table 1 provides further information about the self-reported race of the participants.

Measures

The measures used in this study are a part of the larger Add Health project (Harris, 2013). Only the measures relevant to the current study will be described.

Indicator Variables

Personality. This 28-item scale is comprised of items from McCrae and Costa's NEO Personality Inventory-Revised (NEO-PI-R; 2010). It captures the "Big Five" personality traits of Neuroticism, Extraversion, Openness to Experience, Agreeableness, and Conscientiousness from which the resilient, overcontrolled, and undercontrolled prototypes can be derived (Block & Block, 1980a). These same personality items from Wave IV have been used in previous research (De Neve & Oswald, 2012). Participants were asked to rate how much they agreed with certain statements about themselves as they currently are now (for a complete list of items, see Appendix A). Responses were originally scored on a five-point Likert scale anchored with choices: 1, strongly agree and 5, strongly disagree. This scale was re-coded to a five-point Likert scale anchored with the choices: 1, strongly disagree and 5, strongly agree for ease of interpretation. Negatively worded items were reverse-coded. The Cronbach's Alpha for each personality trait for this sample was: Neuroticism .85, Extraversion .70, Openness .63, Agreeableness .68, and Conscientiousness .64.

While Cronbach Alpha values around .90 are considered excellent, those around .80 very good, and those around .70 adequate, somewhat lower coefficients can be acceptable when using latent variable methods with sufficiently large sample sizes (Little, Lindenberger, & Nesselroade, 1999). The "very good" alpha for Neuroticism could be due to the larger number of items (12) comprising the scale, while the other personality traits with lower alphas each only had four items per scale included in the Wave IV questionnaire. Openness to Experience has the lowest Cronbach's Alpha for

this sample ($\alpha = .6264$), mirroring its traditionally lower internal consistency reported for the NEO-PI-R ($\alpha = .58$; McCrae & Costa, 2010). Despite this seemingly low value, the Openness scale still shows all the characteristics of a reliable and valid measure and has been widely used in research (McCrae & Costa, 2010). As McCrae and Costa (2010) explain, low coefficient alphas could be due to the redundancy often found in internal consistency. In other words, when many items ask the same questions coefficient alpha is high even if the scale in question is not a good indicator for the measured trait. This also means that if a scale has items asking more varied questions still pertaining to the same trait, the internal consistency may be low even though the validity is high (McCrae & Costa, 2010). This logic can help explain why the coefficient alphas for Agreeableness ($\alpha = .68$), Conscientiousness ($\alpha = .64$), and Openness ($\alpha = .63$) are below the more desirable .70 or .80 values. It is also possible that this redundancy effect could be exacerbated with the small number of items included for each scale in the Wave IV questionnaire.

When taken as a whole, the 28 personality items together have a Cronbach Alpha of .698 for this sample. Furthermore, conducting Confirmatory Factor Analysis (CFA) with each Big Five variable revealed that factor loadings for each variable (Neuroticism, Extraversion, Openness, Agreeableness, Conscientiousness) were significant at the $p < .00001$ level.

Mediator Variables

Social Support. This was a thirteen-item scale, utilizing a previously employed five-item scale by Musliner and Singer (2014) regarding friendships and parental

relationships as well as eight items focusing on adult romantic relationships. Musliner and Singer (2014) used two items scored on a five-point Likert scale pertaining to the person each participant considered a parental figure. These items were “*You are satisfied with the way your mother figure and you communicate with each other*” and “*You are satisfied with the way your father figure and you communicate with each other*”.

Responses were originally scored on a five-point Likert scale anchored with choices: 1, strongly agree and 5, strongly disagree. This scale was re-coded to a five-point Likert scale anchored with the choices: 1, strongly disagree and 5, strongly agree for ease of interpretation. Musliner and Singer (2014) also used two items scored on another five-point Likert scale (1 = not at all close, 2 = not very close, 3 = somewhat close, 4 = quite close, 5 = very close). These items were “*How close do you feel to your mother figure*” and “*How close do you feel to your father figure.*” The last item, “*How many close friends do you have*” was scored on a third 5-point Likert scale (1 = none, 2 = one or two friends, 3 = three to five friends, 4 = six to nine friends, 5 = ten or more friends).

In addition to the items employed by Musliner and Singer (2014), the following items regarding each participant’s current or most recent romantic relationship were 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; my partner expresses/expressed love and affection to me; I am/was satisfied with our sex life; I trust/trusted my partner to be faithful to me.* These items were scored on a five-point Likert scale with 1 representing strongly agree and 5 representing

strongly disagree that were re-coded to a five-point Likert scale anchored with the choices: 1, strongly disagree and 5, strongly agree for ease of interpretation. The item “*how often do you feel isolated from others*” was also included, scored on a three-point Likert scale with the values 0 = never, 1 = rarely, 2 = sometimes, and 3 = often. The Cronbach’s alpha for all thirteen items in this sample was .799 which is considered very good (Little et al., 1999).

Positive Affect. This two-item scale included items from the CES-D10, a subscale of the well-established and widely used Center for Epidemiologic Studies Depression scale (CESD; Radloff, 1977). The items inquire about the past seven days. Responses were scored on a four-point Likert scale with the choices: 0 = never or rarely, 1 = sometimes, 2 = a lot of the time, and 3 = most of the time or all of the time. Question items included “*During the past seven days: you felt happy*” and “*During the past seven days: you enjoyed life.*” The Cronbach’s alpha in this sample was .86, which is considered very good and approaches the excellent range (Little et al., 1999).

Outcome Variables

Psychological Distress. This seven-item scale included questions about the past seven days as well as questions regarding medical diagnoses from a physician. Responses regarding the past seven days were scored on a four-point Likert scale with the choices: 0 never or rarely, 1 sometimes, 2 a lot of the time, and 3 most of the time or all of the time. These items are from the 10-item subscale of the Center for Epidemiologic Studies Depression Scale (CES-D10), a part of the widely used CES-D (Radloff, 1977). Five of the 10 items are included here. Question 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”* and *“you felt that people disliked you.”* Responses regarding medical diagnoses were scored on a two point Likert scale with the choices: 0 no, 1 yes. Question items included *“Has a doctor, nurse, or other health care provider ever told you that you have or had: anxiety or panic disorder?”* and *“Has a doctor, nurse, or other health care provider ever told you that you have or had depression?”* The Cronbach’s alpha in this sample was .79, which is considered very good (Little et al., 1999).

Physical Health. This 27-item scale included questions about general health, health and illness questions regarding the past four weeks as well as the past two weeks, and questions regarding both physical and sedentary activity. Responses were scored on a variety of Likert scales appropriate for each item. For example, a 5-point Likert scale with the choices: 1 = excellent, 2 = very good, 3 = good, 4 = fair, and 5 = poor for the item *“in general, how is your health?”* (for a complete list of items, see Appendix A). This scale was re-coded with choices 1 = poor, 2 = fair, 3 = good, 4 = very good, and 5 = excellent for ease of interpretation. The Cronbach’s alpha in this sample was .64, which can be considered acceptable when using latent variable methods with sufficiently large sample sizes such as the current sample (Little et al., 1999).

Proposed Analysis

A variety of software was used to complete the data analysis required by this study. First, STATA (StataCorp, 2015) was used to calculate Cronbach Alphas. SPSS 22.0 (IBM SPSS Statistics, Chicago, IL, USA) was used to conduct cluster analyses and

calculate descriptive statistics and correlations. Last, Mplus 7.4 (Muthén & Muthén, 2012) was used to conduct a path analysis. The data analysis plan consisted of analyzing initial data by gathering descriptive statistics to examine means, standard deviations, distribution normality, and to identify outliers. Next, data from the NEO-PI-R was used to replicate the personality typologies using cluster analysis procedures (Asendorpf, Borkenau, Ostendorpf, & van Aken, 2001; Chapman & Goldberg, 2010).

Assuming that the three personality typologies emerge as predicted, I plan to use structural equation modeling (SEM) to test the potentially mediating effects of positive emotion and social support on the relationship of resilience and gender to psychological distress and physical health outcomes. Path modeling is a recommended method when testing theoretical assumptions regarding relationships between variables, indicating both direct and indirect effects (Mueller, 1996). In the theory-driven model (see Figure 1) resilience and gender are the predictor variables and social connectivity and positive emotion are mediating variables. Gender was coded 1 = male, 2 = female. Psychological distress and physical health are the outcome variables.

CHAPTER IV

RESULTS

Cluster Analysis

In order to identify the three personality prototypes, SPSS 22.0 (IBM SPSS Statistics, Chicago, IL, USA) was used to conduct a cluster analysis. Of the original 5,114 participants, 94 (male, $n = 45$; female, $n = 49$) did not respond to each Big Five item in the questionnaire and were removed for a final sample of 5,020 (male, $n = 2,308$; female, $n = 2,712$). Initially, hierarchical clustering using a series of steps that treated each participant as one independent cluster as well as combining them in pairs was performed. The total within-cluster sums of squares for each step were minimized by using Ward's method and squared Euclidean distance measures before the number of clusters was determined (Asendorpf et al., 2001; Sharma, 1996). Locating the largest shift in the total within-cluster sums of squares between steps is a common method to identify the appropriate number of clusters (Aldenderfer & Blashfield, 1984). After the three cluster solution a significant drop in the within subject error in the agglomeration schedule was not observed, suggesting three clusters emerged for this data. Prior research also indicates three clusters are interpretable (Alessandri, Vecchione, Donnellan, Eisenberg, Caprara, & Ciecuch, 2014; Elliott et al., 2015).

After defining the three clusters, a follow-up nonhierarchical K-means analysis was performed with the initial cluster centers obtained using Ward's method. This follow-up analysis optimizes cluster classification and can be compared to the Ward's method results to estimate agreement between the two analyses. The Cohen's Kappa

coefficient for the agreement between the Ward and K-means classifications was .50, which is regarded as moderate agreement (Landis & Koch, 1977). It is possible that the large sample size ($N = 5,020$) could account for agreement below the substantial range (.61 to .80). After evaluating agreement, examining the average scores of each Big Five trait (extraversion, agreeableness, conscientiousness, neuroticism, openness) for each cluster provided evidence needed to assign a label to each cluster. Each participant was assigned to one cluster based on the three-cluster solutions provided by the Ward method and K-means cluster analysis. Figure 2 displays the undercontrolled, overcontrolled, and resilient personality prototypes derived from the K-means cluster results. Z scores are used for straightforward interpretation. The undercontrolled group ($n = 1,348$) was identified by its low level of conscientiousness and moderate neuroticism. The overcontrolled group ($n = 1,915$) was identified by its low extraversion, as well as low agreeableness and openness. It was also characterized by higher neuroticism than the third group. Finally, the resilient group ($n = 1,757$) was identified by its high levels of extraversion, agreeableness, conscientiousness, and openness, and its low neuroticism score.

Associations Among the Variables

All of the Big Five personality traits were significantly correlated with each other with the exception of the correlation between Conscientiousness and Openness ($p = .027$). Neuroticism was significantly and inversely correlated with the other variables ($p < .01$): Extraversion, $-.790$; Agreeableness, $-.047$; Conscientiousness, $-.144$; and

Openness, -.149. All other correlations were significant ($ps < .01$) and indicated positive associations.

Table 2 provides the simple associations between personality type and the potential mediators and distress outcomes. One-way analyses of variance results revealed significant associations between personality prototype and all potential mediators and distress outcomes except Physical Health (physical health, $p = .118$; all other manifest variables $p < .001$). The mean score differences between any two of the personality types are apparent in follow-up post hoc comparisons. The resilient group had higher social support and positive affect than the undercontrolled and overcontrolled groups. Both the undercontrolled and overcontrolled groups had higher levels of psychological distress than the resilient group; the undercontrolled group had the highest levels of psychological distress.

A significant association was observed between gender and personality prototype, $\chi^2(2) = 19.345$, $p = .000$. The Undercontrolled group ($n = 1,348$) had 613 males and 735 females. The overcontrolled group ($n = 1,915$) had 950 males and 965 females. The resilient group ($n = 1,757$) had 745 males and 1,012 females. It appears the resilient group had the highest percentage of females (57.60%) and the overcontrolled group had the highest percentage of males (49.61%).

Independent samples t-tests were conducted to compare all self-report variables for males and females. These results are displayed in Table 3. Significant differences for males and females were noted for all Big 5 traits (extraversion, agreeableness, conscientiousness, neuroticism, openness) and for both outcome variables (physical

health, psychological distress) but were not observed for the mediator variables (social support, positive affect). Results for the Big 5 traits indicate females endorse higher extraversion, agreeableness, conscientiousness, and neuroticism than males but males endorse higher openness than females. Results also suggest males endorse worse physical health and less psychological distress than females.

Correlations among all the measured variables (i.e., the indicator, mediator, and outcome variables) are displayed in Table 4. The mediator variables (social support, positive affect) were negatively associated with psychological distress ($p < .01$). Positive affect was significantly inversely associated with poor physical health ($p < .05$); however, social support's relationship with physical health was nonsignificant. Resilience was positively associated with social support and positive affect, and inversely associated with psychological distress ($p < .01$). Conversely, undercontrolled and overcontrolled types were significantly inversely associated with social support and positive affect ($p < .01$). Similarly, both types were positively associated with psychological distress ($p < .01$), and the undercontrolled type was significantly associated with poor physical health ($p < .05$).

Path Analysis

Path analysis was used to test the proposed contextual model (Figure 1) in which social support and positive affect were placed as potential mediators of the relationships between personality prototypes and distress outcomes including psychological distress and physical health. Mplus 7.4 (Muthén & Muthén, 2012) was used to inspect the causal pathways between variables in the model, which included both direct and indirect

effects. When testing theoretical assumptions about the relationships between variables, path modeling is recommended (Mueller, 1996). Missing data were handled by utilizing full information maximum likelihood methods (Mplus syntax ESTIMATOR = ML). These methods allow retention of the available information each of the 5,020 participants provided while utilizing material from incomplete responses.

Fit indices employed to assess model fit include χ^2 test of model fit, comparative fit index (CFI), Tucker–Lewis Index (TLI), root mean square error of approximation (RMSEA), and standardized root means square residual (SRMR). A nonsignificant chi-square test ($p > .05$) indicates adequate model fit. For the incremental fit indices, CFI and TLI values above .95 indicate good fit (Kline, 2005; Yu, 2002). For the absolute fit indices, RMSEA values between .05 and .08 indicate acceptable fit while below .05 indicate good fit (Browne & Cudeck, 1992) and SRMR values below .05 suggest good model fit (Kline, 2005). The test of the initial path model yielded fit indices suggesting the model could be improved. The chi-square test indicated poor fit, $\chi^2(6) = 135.25$, $p < .001$; the CFI (.947) indicated good fit but the TLI (.842) was just below the cutoff; RMSEA (.066) and SRMR (.023) indicated good fit. Modification indices suggestions to include direct paths from overcontrolled and undercontrolled to the distress outcomes were incorporated. The test of the corrected model (see Figure 3) provided excellent fit indices: $\chi^2(2) = 5.985$, $p = 0.0502$; CFI = 0.998; TLI = 0.985; RMSEA = 0.02; SRMR = 0.007. This path model, then, had overall good fit and the path coefficients were interpretable.

The personality prototype predictor variables in this model accounted for .9% of the variance in social support ($R^2 = .009$) and 5.9% of the variance in positive affect ($R^2 = .059$). All the predictor (undercontrolled, overcontrolled, gender) and mediator (social support, positive affect) variables together accounted for 32.1% of the variance in psychological distress ($R^2 = .321$) and .6% of the variance in physical health ($R^2 = .006$).

Direct Effects. The standardized path coefficients for the corrected model are displayed in Table 5. Personality prototype was significantly associated with both mediators (social support and positive affect, $p < .001$). These negative associations indicate that undercontrolled and overcontrolled personality prototypes are associated with less social support and less positive affect compared to the resilient group. Undercontrolled and overcontrolled personality prototypes significantly predicted psychological distress ($p < .001$), indicating these personality prototypes are connected to endorsing psychological distress difficulties. Gender was also significantly associated with psychological distress ($p < .001$). Both mediators were associated with psychological distress. Greater social support ($p < .01$) and greater positive affect ($p < .001$) significantly predicted less psychological distress. Gender was negatively associated with physical health ($p < .001$), suggesting males are more likely to report more physical health symptoms than females. No significant direct effects were observed for personality prototype or the mediators on physical health in the final model.

Indirect Effects. Table 6 presents all possible indirect effects of personality prototype (undercontrolled, overcontrolled) to the two outcome variables, the parameter estimates of the indirect effects, and confidence intervals. Personality prototype had

indirect effects through social support ($p < .01$) and through positive affect ($p < .001$) to psychological distress. Consequently, the prospective relationship of the overcontrolled and undercontrolled personality prototypes to psychological distress is partially understood in their effects on social support and positive affect.

The hypothesized relationship of personality prototype to the psychological distress outcome variable was partially mediated by its association with social support and positive affect. Undercontrolled and overcontrolled types were directly associated with lower social support and lower positive affect. These, in turn, were significantly associated with elevated psychological distress scores indicating increased endorsement of symptomatology. No significant indirect effect was observed for the personality prototypes on physical health in the final model.

Results Summary

Both significant indirect and direct effects were observed from personality to the psychological distress outcome variable. The resilient prototype had significant indirect effects on psychological distress through its advantageous effects on positive affect and social support. Overcontrolled and undercontrolled types were associated with lower social support and lower positive affect, as well as increased psychological distress. These relationships are independent of the significant association of gender to psychological distress. A significant direct effect was observed from gender to both the psychological distress and the physical health outcome variables. Female gender was associated with worse psychological distress and better physical health than males.

CHAPTER V

DISCUSSION AND CONCLUSIONS

The present study examined the relationships between resilience, positive emotion, and social connectedness to distress indicators among young adults in Wave IV of the Add Health data. The study aimed first to reproduce the resilient, undercontrolled, and overcontrolled prototypes (Block & Block, 1980a) and then test their relationships to psychological distress and physical health outcomes through the mediation of social support and positive affect. In this manner, the study sought to clarify the ways in which resiliency promotes adjustment and well-being in a nationally representative sample of young adults.

Discussion of Personality Prototypes

Consistent with the initial hypothesis, the three personality prototypes emerged with the present data via cluster analysis. Overcontrolled types traditionally have higher neuroticism than undercontrolled types; however, that trend did not occur in this study. For this data, the low extraversion and openness scores characterize the cluster as overcontrolled.

A developmental perspective can help explain this difference. Specht, Luhmann, and Geiser (2014) found that older adult groups had more resilient types and fewer undercontrolled types than younger adult groups, although overall they report that personality types were highly consistent across gender, age, and time for the populations they studied. Most personality studies use child, adolescent, and young adult populations; even with excluding older adult populations, it has been observed that as

individuals grow and mature the number of resilient individuals tends to increase (Specht et al., 2014). Therefore, in the present study it could be that in this sample of young adults ranging in age from 24 to 32 years old ($M=29$, $SD = 1.78$) the undercontrolled and overcontrolled prototypes do not exactly match what was expected because they are still developing. Developmental trajectories are dynamic and do not progress in a strict linear fashion so it could be expected that the prototypes may have slightly varied characteristics during times when development is in flux. This could be especially true for the current young adult sample under study that is in a key developmental transition resolving the Intimacy vs. Isolation conflict (Erikson, 1963).

Alessandri et al., (2014) noted that the three prototypes (resilient, overcontrolled, undercontrolled) have been replicable in research in both Europe and the United States for at least twenty years. The literature supports a resilient profile including low neuroticism and high scores on all other traits; an undercontrolled profile with low agreeableness and conscientiousness; and, an overcontrolled profile with high neuroticism and low scores on the other traits (Alessandri et al., 2014). In the same way, Asendorpf et al. (2001) identified the three prototypes in several studies using Big Five measures. In this context, the resilient type was characterized by low neuroticism and high scores on all other traits; the overcontrolled type was characterized by high neuroticism and low extraversion; and, the undercontrolled type was characterized by low agreeableness and low conscientiousness. Alessandri et al. (2014) found similar results in samples from four different countries utilizing Big Five measures, although the authors acknowledged that variation in the prototypes across the samples existed.

While the resilient profile identified in prior research matches that of the current study, the prior characterization of overcontrolled differs somewhat from the present findings. The current study's overcontrolled type had a slightly lower neuroticism score than expected, although like previous classifications the extraversion score was very low. Similarly for the undercontrolled type, the current study had low conscientiousness as expected but a slightly higher agreeableness score than prior characterizations.

It should be noted that all three resilient, overcontrolled, and undercontrolled types are not always found within the research and this inability to produce the prototypes is more often reported when using measures based off the Big Five (Donnellan & Robins, 2010). Sampling error could be the culprit as convenience sampling and bias may reduce the chances of including undercontrolled and overcontrolled types in the samples. Additionally, there is no standard statistical procedure for analyzing data to identify the three personality types so inconsistencies here could also influence results across datasets (Donnellan & Robins, 2010). It has also been suggested that the personality types are not to be regarded as strict categories but rather as broad labels that are useful for distinguishing differences between people but aren't absolute descriptions (Donnellan & Robins, 2010).

Considering that it can be difficult to identify the three types with Big Five measures, it is noteworthy that the types were replicated in the current study and that there are only slight differences from classifications in prior research. As Alessandri et al. (2014) explains, commonalities tend to exist alongside variation in the resilient, overcontrolled, and undercontrolled profiles identified in various datasets. In other

words, although it is not uncommon to find slight differences in personality prototypes from dataset to dataset core commonalities are also present that align with theory and make the clusters interpretable. With the present data, the very low conscientiousness score for the undercontrolled group and the low extraversion score for the overcontrolled group are the core commonalities in agreement with other research that define the prototypes. Furthermore, the present study employed cluster analysis, a method effective in identifying resilient, overcontrolled, and undercontrolled types in previous research (Asendorpf et al., 2001; Chapman & Goldberg, 2010; Elliott et al., 2015). In the context of prior research findings and methodology we can be confident that the current study using cluster analysis to identify the three personality types from Big Five measures is interpretable.

It is essential to approach resiliency research with a consideration of whether all three clusters or a two group resilient vs. non-resilient approach best suits the research goals at hand. There are instances when a simple distinction of resilient and non-resilient types is adequate. This is certainly the case for research aiming to identify resilience for preventative purposes such as combat selection or eligibility to serve as a first responder. The resilient vs. non-resilient approach could also be parsimonious for resiliency studies that only need a non-resilient comparison to focus on what makes resilient individuals different. For example, Shiner and Masten (2012) used Big Five personality traits in longitudinal research following individuals from childhood through emerging adulthood into young adulthood, identifying key risk factors and protective factors separating resilient children who matured into competent adults from the maladaptive group low in

competence. This line of inquiry has predictive utility and sets the foundation for outcome studies further exploring how childhood personality traits could influence adult competence in both low adversity and high adversity settings. When research aims to explore interventions and treatment options, further classifying non-resilient people into overcontrolled and undercontrolled types is necessary to honor best clinical practice. Research focusing on personality composition and in-depth conceptualization of traits would also benefit from a more thorough classification that discriminates between different types of non-resilience.

Distinguishing between overcontrolled and undercontrolled is important because there are differences in how the two types react to stress, and in subsequent developmental outcomes. At the most basic level of understanding, overcontrolled internalizes and undercontrolled externalizes. Studies involving children and adolescents have found that overcontrolled types were more likely to internalize suggesting a propensity for outcomes like depression and anxiety while undercontrolled types were more likely to externalize with aggression problems and attention deficits in addition to internalizing (Asendorpf & van Aken, 1999; Donnellan & Robins, 2010; Hart et al., 1997). Likewise, Caspi and Silva (1995) linked undercontrolled characterizations in preschool to higher aggression and lack of self-control in adolescence. In the same study, overcontrolled characterization in preschool was linked to withdrawn social behaviors and lack of assertiveness in adolescence. All three prototypes (resilient, overcontrolled, undercontrolled) repeatedly emerge across studies and populations through decades of research; to reduce the differentiation of overcontrolled and undercontrolled to the less

nanced “non-resilient” characterization overlooks key distinctions that illuminate varied stress responses and outcomes.

Discussion of Hypotheses

Higher resilience was associated with higher positive affect and higher social support in the present study. The mediating variables social support and positive affect were associated with less psychological distress. This is consistent with prior research that first created the prototypes with cluster analysis and then reported findings indicating individuals in the resilient group had greater perceived social support and reported the lowest levels of depression and PTSD compared to overcontrolled and undercontrolled types (Elliott et al., 2015). Also consistent with initial hypotheses, undercontrolled and overcontrolled personality prototypes were associated with lower positive affect and lower social support.

Although not anticipated in the original hypotheses, undercontrolled and overcontrolled types were directly associated with psychological distress. This indicates that the model is partially as opposed to completely mediated and designates resiliency as a partially independent contributor to well-being.

As hypothesized, the interplay between social support and positive affect was significant, as higher social support was associated with higher positive affect. Similarly, poor physical health was associated with psychological distress.

As hypothesized, female gender was positively associated with psychological distress. Male gender was negatively associated with psychological distress, suggesting males were better adjusted (experienced less distress) than females. Contrary to initial

hypotheses, male gender was significantly associated with poorer physical health outcomes; female gender was significantly and negatively associated with poor physical health.

It is interesting to note that the direct associations of the personality prototypes with the outcome variable physical health, as well as the associations mediated by social support and positive affect, were not statistically significant. These non-significant associations were, however, in the anticipated direction (that is, overcontrolled and undercontrolled types were inversely associated with high social support and high positive affect, and were positively associated with psychological distress and poor physical health).

In light of the fact that no associations with physical health were significant, it is important to consider that the sample employed was a community sample not a clinical sample. Add Health data was collected from a nationally representative sample of young adults and thus more closely approaches the normal curve than a clinical population recruited for study would. It may be that the non-significant associations are due to a lack of reportable symptoms. Participants' self-report of their own symptoms may also influence the results as their perceptions and recollections of experienced symptoms may be unreliable. It is also established that individuals are predisposed to how they report physical health symptoms due to factors including gender, personality, and life experiences (Pennebaker, 2000).

Interestingly, the only significant association with physical health in the current study was the direct path from gender indicating females report less negative

symptomatology than do males. Prior findings that women tend to report higher depression rates than men (Gibson, Baker, & Milner, 2015; McPhie & Rawana, 2015) and also are more likely than men to endorse negative affect items including worry items (Feldt, 2014) suggest a tendency towards negative affectivity which has the potential to impact symptom perception and reporting.

Finally, examining the items comprising the physical health variable reveals implications regarding the non-significant paths. The physical health variable included Add Health questionnaire items inquiring about general health, health and illness questions regarding the past four weeks and the past two weeks, and questions regarding activity levels. The Cronbach's alpha for the items was .64, considered acceptable when using latent variable methods with sufficiently large sample sizes (Little et al., 1999). Because it is not a previously adapted scale used in prior research, it could be that it does not truly capture the physical health construct in the manner the present study intended.

Mediating Relationships

The path model determined that the anticipated relationships of resilience to the mediating and outcome variables are independent of the associations of gender on these same variables. It is clear that in the present study, social support and positive affect are a mechanism by which resilience then facilitates positive psychological adjustment. Resilient personality was predictive of lower endorsement of psychological distress symptoms through its beneficial influence on adaptive protective factors including greater social support and greater positive affect. In contrast, undercontrolled and overcontrolled personalities confound adjustment and hinder protective factors.

Interpersonal relationships are essential to resilience (Luthar, 2006). This concept features prominently in Attachment Theory (Ainsworth, 1989; Bowlby, 1982) in which young children must be secure in their relationships with caregivers in order to confidently explore and engage in their environments. Such engagement in turn facilitates social competency and connectedness. Individuals who are enjoyable and likeable in social settings tend to be those with positive emotion (Fredrickson, 2013).

Resiliency lends itself to social competence, in both childhood and adulthood (Caspi & Silva, 1995; Chapman & Goldberg, 2011). Resilient individuals tend to be low in neuroticism (depression, negative emotionality) and above average in traits associated with sociability: extraversion, agreeableness, openness. Resilients are more actively engaged in their environments than overcontrolled or undercontrolled types (Block & Block, 1980a). They are also above average in conscientiousness which implies self-control; this ability is related to social competence (Eisenberg et al., 2007). Put another way, this may express Block and Block's (1980a, 1993) concept of ego control. This theory is supported in the present study: simply put, resilients have something overcontrolled and undercontrolled types do not have. They are higher in positive emotion and social support, which in turn mediate the psychological distress outcome variable.

This mediation relationship is expected because of the cycle generated through the interplay of positive emotion and social support. Positive emotion fosters social relationships and also promotes cognitive flexibility essential to effectively cope with stressors (Fredrickson, 2013). Social connectedness is a positive emotion byproduct that

maintains the cycle because positive social interactions cultivate more positive emotions (Cohn et al., 2009; Kok et al., 2013).

Findings from the present study suggest that positive emotion is the driving force in the mediation relationship, which could indicate that positive emotion is the key variable that jumpstarts the cycle. Once activated with positive emotion, the interaction between social support and positive emotion perpetuate the loop. The present results indicating positive emotion explains most of the mediation is theoretically justified. Fredrickson (2013) asserted that positive emotion may be the key to resilience because it fosters problem-solving, flexible thinking, and social relationships (Bonnano et al., 2011; Ong et al., 2009). Positivity has been found to predict later ego-resiliency (Milioni et al., 2016) as well as protect against depression and poor mental health which in turn cultivates positive affect that engages an individual in a positive emotion cycle (Fredrickson et al., 2003).

Importantly, positive emotions can also foster a sense of closeness and connectivity with others, thus bolstering social support (Kok et al., 2013). Young adults are in a developmental stage where they must resolve an Intimacy vs. Isolation conflict (Erikson, 1963) by establishing close social connections. This developmental stage closely links their well-being to social support and their ability to meaningfully connect with others, which is frequently considered an advantageous resilient trait (Bonanno, 2005). Because resilient individuals are more actively engaged in their environments than their over-and-undercontrolled counterparts (Block & Block, 1980a; Farkas &

Orosz, 2015), it is logical that social support partially mediates the relationship between resiliency and psychological distress for the young adult population in the present study.

Emerging adult social roles, developmental changes, and life events can affect resilient personality development (Block & Block, 1980a). Resilient individuals appear to be on-track developmentally (Dennissen et al., 2008) as they resist stress and successfully cope with challenges. In other words, they resolve the Intimacy vs. Isolation conflict in favor of intimacy and social connectivity (Erikson, 1963). The interplay between positive affect and social support in the contextual model presently under study supports positive emotion's role as a protective factor associated with high resilience (Bonnano et al., 2012; Charney, 2004; Davydov et al., 2010).

It is also noteworthy to consider the items comprising the social support and positive affect variables. Positive affect may drive the mediation in the present study because the items comprising the social support variable that were available with the Add Health data may not capture the variable in the most accurate way. The thirteen items used ($\alpha = .799$, very good) came from a previously employed five-item scale by Musliner and Singer (2014) regarding friendships and parental relationships as well as eight items focusing on adult romantic relationships included in the Add Health questionnaire. If a more standard and commonly used scale was available, social support may have been a stronger variable more accurately capturing the construct. In contrast, the positive affect scale was comprised of two items from the CES-D10, a subscale of the well-established Center Epidemiologic Studies Depression scale (CESD; Radloff, 1977).

It is evident from other studies using contextual models (Elliott et al., 2015; Walsh et al., 2016) that there is a mediating effect, rather than a direct effect, from resiliency to positive adjustment. Unlike these studies, however, the present findings show a partially mediated model in which direct effects as well as indirect ones explain the outcome. In fact, the original model without direct effects from personality prototype to the distress outcomes was lacking in model fit but the corrected model including direct paths from indicator to outcome variables partialled out the variance directly attributable to personality and resulted in excellent fit indices. It is clear therefore that both direct and indirect effects influence the outcome variables.

Partial mediation could be due to the large sample ($N = 5,020$). Sample size combined with the fact that Add Heath is a community sample not a clinical sample implies that more variance exists in this sample as opposed to a smaller, clinical sample. It then stands to follow that the present sample more closely approximates a normal curve. In this context, the large sample size allows the direct paths to emerge that likely exist in the population but are not visible in smaller, clinical samples whose members are specifically selected based on particular characteristics.

For example, recent resilience research studying traumatic brain injury (Elliott et al., 2015) and traumatic limb loss (Walsh et al., 2016) involved very specific populations exposed to certain traumas and had sample sizes less than 150. These studies found complete mediation effects with similar mediators to the social support and positive affect mediators in the present study. It could be that with a larger sample size direct paths would appear along with the indirect paths in prior research. In the context of the

Add Health data, the mediation is real and the indirect and direct paths are both true. The direct and indirect paths' mutual existence does not negate the importance of the mediating effects. Together, the variance attributable to the mediators and the variance attributed to personality explain more of the outcome.

Prior Research

Personality can be a powerful influence on resilience (Bonanno, Westphal, & Mancini, 2011). Resilient, overcontrolled, and undercontrolled types derived from McCrae & Costa's (2010) Big Five personality traits have predictive utility because they are stable over time and influence human functioning (Berry et al., 2007; Dennissen et al., 2008; Ong, Bergeman, & Boker, 2009).

Similar to the present study, a lack of resiliency has been linked to higher rates of depression and social isolation in traumatic disability research (Berry et al., 2007), poor psychological well-being in adulthood including depressive symptoms (Ong et al., 2009), adolescent psychopathology (Asendorpf & van Aken, 1999, Weir & Gjerde, 2002) and increased risk for depression and negative emotion (Davydov et al., 2010; Fredrickson, 2003). Also similar to the current study, positive emotion mediated the relationship between resilience and outcomes including depression and PTSD in traumatic limb loss research (Walsh et al., 2016). Indirect effects were also observed from personality prototype on distress outcomes through social support in the present study and in prior research (Elliott et al., 2015).

While the present study supports previous research, it is unique in that it studies individuals as they cope with the transition into young adulthood and confront the

challenges of Intimacy vs. Isolation (Erikson, 1963) while navigating milestones such as a first job or living independently from parents (Alessandri et al., 2016). It is important to understand resiliency across the lifespan because resilience is a pattern of adaptation over time (Masten & Wright, 2009) and changes as an individual grows, develops, is exposed to different environmental factors, and is or is not faced with threats and adversity (Shiner & Masten, 2012). Resiliency involves both adjustment throughout the lifespan and responses to specific stressful events; it is dynamic by nature.

The presence of resilient, overcontrolled, and undercontrolled prototypes have been found in childhood (Caspi & Silva, 1995) as well as adolescence and adulthood (Alessandri et al., 2014; Chapman & Goldberg, 2011; Letzring, Block, & Funder, 2005). Evidence of their pervasiveness across the lifespan is unmistakable in the present study as the prototypes emerged in a nationally representative sample of young adults. In this context, understanding the mediating relationship of positive affect and social support sheds some light on what drives the relationship of personality prototypes with psychological distress (depression, anxiety, or lack thereof) over time.

Predictive utility potential is a key aspect of the present results. Costa and McCrae's (2010) Big Five measure was used to create resilient, overcontrolled, and undercontrolled prototypes in a sample of people not necessarily in the context of trauma. Prior research has utilized personality measures to define the three prototypes after traumas such as military combat and traumatic disability occurred (Elliott et al., 2015). Screening with personality measures such as the Big Five to determine resilient, overcontrolled, and undercontrolled characteristics in the context of typical, expected

development may be used to preemptively assess a person's likely response to adversity and extreme stress. This has potential to influence selection processes for high-stress jobs such as military and first responders who are expected to perform under stressful and sometimes traumatic conditions. It also has the potential to predict who might be more susceptible to developing anxiety, depression, or PTSD and can be used to help determine appropriate treatment and therapeutic interventions. This predictive power could be used broadly in a variety of situations from counseling centers to communities faced with tragic events to military personnel support.

Study Limitations and Future Research

The present findings should be interpreted within the context of the study's limitations. First, the cross-sectional design prohibits drawing strong causal inferences about the relationships between the variables. Determining if the pathways identified between the variables in the present study are in fact causal requires a longitudinal design. Exploring the potential and possibly reciprocal effects of positive affect to social support and how these interactions influence individuals and their overall adjustment and well-being across the lifespan would also entail longitudinal research.

Furthermore, it is possible that the large sample size may have inflated the significance, as studies involving very large sample sizes have a tendency to reject null hypotheses (Hays, 1981; Thompson, 1994). Additionally, because the present study does not include a measure of symptom exaggeration we cannot be certain if the results could have been affected by over-reporting symptoms, and if so how much over-reporting influenced the results. Finally, it is noteworthy that all Add Health data are collected via

self-report with the computer-assisted personal interview technology administered by an in-home interviewer, and computer-assisted self-interview instruments (Harris, 2013). As such, there is potential not only for over-reporting, but for participant and interviewer error with the technology. The presence of an interviewer may have also inadvertently influenced participants' responses, perhaps causing participants to engage in social desirability responding (van de Mortel, 2008). Because the interviews were typically 90 minutes (Harris, 2013), participant fatigue could also influence responses.

Future research is needed to assess whether personality prototypes influence effectiveness of interventions aimed at reducing depression and anxiety symptoms indicative of psychological distress. Longitudinal research evaluating if resilient, overcontrolled, and undercontrolled personality prototypes are stable over time or if they change in different developmental stages could also be valuable. Context is an essential factor affecting adjustment; relationships/social support, jobs, finances, goals and priorities, stressors, exposure to traumatic events are not static and one might anticipate that as humans develop and enter different life stages their circumstances would also modify and change.

Prospective research can benefit from studying Add Health subsamples with disability or trauma to better understand the mediating relationships. As previously discussed, it might be expected that with smaller and more specific samples complete mediation may result. It would be especially advantageous to explore resiliency with disability and trauma subsamples within the Add Health data to compare those results with that of their peers and the Add Health sample as a whole. Such comparisons could

deepen our understanding of how individuals with trauma or disability differ from their counterparts with unremarkable developmental trajectories. It would allow exploration of if and how resilience and its mediators are different in the course of lifespan development versus in traumatic contexts.

Perhaps the most influential and interesting future research potential is incorporating the present findings into research involving the biospecimen data Add Health collected in Wave IV to explore genetic links to resiliency. Because the existence of the prototypes in this non-clinical population is already established, determining if genetics predispose individuals to resiliency is a crucial step in advancing how people prone to overcontrolled and undercontrolled responses are identified and when early and preventative intervention is provided. This line of research could be particularly promising in a developmental context that considers the interplay of one's environment and genetic predispositions on overall well-being and healthy psychological adjustment throughout the lifespan. It would also further support previous work regarding the biological bases of personality. For example, McCrae et al., (2000) summarizes behavior genetics studies, linking it to their research reflecting developmental trends in the Big 5 traits. McCrae et al., (2000) considers that there is ample research evidence linking child temperament to adult personality but notes that environment and developmental stage across the lifespan causes traits to fluctuate and vary.

The present study cannot answer all questions, but rather sets the foundation for a body of research with Add Health data that refines our understanding of resilience. Future accumulation of such studies will gradually hone in on answers to more specific

questions by building off previous results. Such a body of work would offer further support for Block & Block's (1980a) resiliency theory while demonstrating the importance of positive affect and social support as mediators. This prospective work has the potential to further establish the credence of a holistic approach to mental health that deviates from a focus on symptomatology and acknowledges the importance of protective factors and well-being (Bonanno et al., 2012). Resiliency facilitates psychological well-being and epitomizes humanity's remarkable ability to persevere; a deeper understanding of this construct and its interplay with beneficial mediators is a valuable strategy to enlighten how we perceive, prevent, and treat distress outcomes.

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APPENDIX A

Big 5 Items Included in Wave-IV Interview

Neuroticism

I have frequent mood swings
I worry about things
I get angry easily
I am relaxed most of the time
I am not easily bothered by things
I rarely get irritated
I get upset easily
I get stressed out easily
I lose my temper
I seldom feel blue
I don't worry about things that already happened
I keep my cool

Extraversion

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

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

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

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

Physical Health Items

General Health and Functioning

In general, how is your health?

In the past 30 days, how often did a health problem cause you to miss a day of school or work?

How much does your health now limit you in these activities: moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, playing golf?

Health in the Last Four Weeks

Have you had gum disease (gingivitis; periodontal disease) or tooth loss because of cavities in the last four weeks?

Have you had active infection in the last four weeks?

Have you had injury in the last four weeks?

Have you had acute illness in the last 4 weeks?

Have you had surgery in the last 4 weeks?

Have you had active seasonal allergies (hay fever) in the last four weeks?

Have you had none of the above in the last four weeks?

Health in the Last Two Weeks

Have you had cold or flu-like symptoms such as sore throat, runny nose, or cough in the last two weeks?

Have you had fever in the last two weeks?

Have you had night sweats in the last two weeks?

Have you had nausea or vomiting or diarrhea in the last two weeks?

Have you had blood in stool (feces) or in urine in the last two weeks?

Have you had frequent urination in the last two weeks?

Have you had skin rash or abscess in the last two weeks?

Have you had none of the above in the last two weeks?

Daily Activities (In the Past Seven Days)

How many hours did you watch television or videos, including VHS, DVDs, or music videos?

How many times did you bicycle, skateboard, dance, hike, hunt, or do yard work?

How many times did you roller blade, roller skate, downhill ski, snow board, play racquet sports, or do aerobics?

How many times did you participate in strenuous team sports such as football, soccer, basketball, lacrosse, rugby, field hockey, or ice hockey?

How many times did you participate in individual sports such as running, wrestling, swimming, cross-country skiing, cycle racing, or martial arts?

How many times did you participate in gymnastics, weight lifting, or strength training?

How many times did you play golf, go fishing or bowling, or play softball or baseball?

How many times did you walk for exercise?

Were the past seven days typical in terms of your physical activity?

APPENDIX B
TABLES AND FIGURES

Table 1

Self-reported race of Wave IV respondents

Self-Reported Race	<i>N</i>	Percent
White	3,454	67.54
Black	1,229	24.03
Other	218	4.26
Asian	156	3.05
American Indian	52	1.02
Don't Know	4	0.08
Refused	1	0.02
	5,114	100.00

Table 2
Mean Score Differences Among Mediators and Distress Outcomes by Personality Prototype

Measure	Personality Prototype						post hoc test
	Undercontrolled (Cluster 1)		Overcontrolled (Cluster 2)		Resilient (Cluster 3)		
	M	SD	M	SD	M	SD	p
Mediators							
Social Support	3.76	0.53	3.78	0.50	3.95	0.50	<.001
Positive Affect	2.11	0.76	2.09	0.78	2.48	0.65	<.001
Distress Outcomes							
Psychological Distress	0.56	0.40	0.48	0.39	0.35	0.30	<.001
Physical Health	1.06	0.56	1.03	0.58	1.02	0.49	0.12
							1>2<3
							1&2<3
							1>2>3
							NA

Table 3
Results of t-Tests and Descriptive Statistics for Self-Report Variables and Gender

Measure	Gender						t	df	
	Male			Female					
	M	SD	n	M	SD	n			
Big 5 Traits									
Extraversion	3.26	0.59	2,308	3.33	0.60	2,712	.0004*	1.96	4,896
Agreeableness	3.64	0.39	2,308	3.89	0.29	2,712	0.000*	1.96	4,603
Conscientiousness	3.58	0.43	2,308	3.72	0.47	2,712	0.000*	1.96	4,945
Neuroticism	2.60	0.36	2,308	2.87	0.37	2,712	0.000*	1.96	4,897
Openness	3.71	0.40	2,308	3.57	0.35	2,712	0.000*	1.96	4,782
Mediators									
Social Support	3.84	0.25	1,791	3.83	0.28	2,063	0.37	1.96	3,820
Positive Affect	2.24	0.53	2,308	2.22	0.60	2,712	0.40	1.96	4,972
Distress Outcomes									
Psychological Distress	0.40	0.11	2,305	0.51	0.16	2,712	0.000*	1.96	5,015
Physical Health	1.08	0.28	2,267	0.99	0.30	2,695	0.000*	1.96	4,859

Note: * $p < .05$

Table 4

Descriptive Statistics and Correlations for All Measured Variables

Variable	1	2	3	4	5	6	7	8
1. Undercontrolled	—	-.48**	-0.45	0.01	-.09**	-.01**	.17**	.03*
2. Overcontrolled		—	-.58**	-.06**	-.08**	-.15**	.05**	-0.01
3. Resilient			—	.05**	.17**	.24**	-.22**	-0.02
4. Gender				—	-0.01	-0.01	.15**	-.08**
5. Social Support					—	.31**	-.26**	0.02
6. Positive Affect						—	-.53**	-.03*
7. Psychological Distress							—	.06**
8. Physical Health								—
<i>n</i>	5020	5020	5020	5020	3854	5020	5017	4962
<i>M</i>	0.27	0.38	0.35	1.54	3.83	2.23	0.46	1.03
<i>SD</i>	0.49	0.44	0.48	0.50	0.52	0.75	0.37	0.54

Note: * $p < .05$, ** $p < .01$

Table 5
Standardized Path Coefficients of the Final Model

Dependent Variable	Independent Variable	Maximum Likelihood Estimation			p value
		Estimate	Standard Error	CR	
Social Support	Undercontrolled	-0.062	0.016	-3.873	<i>p</i> <.001
	Overcontrolled	-0.105	0.016	-6.616	<i>p</i> <.001
Positive Affect	Undercontrolled	-0.217	0.015	-14.182	<i>p</i> <.001
	Overcontrolled	-0.254	0.015	-16.698	<i>p</i> <.001
Psychological Distress	Undercontrolled	0.15	0.013	11.168	<i>p</i> <.001
	Overcontrolled	0.053	0.014	3.903	<i>p</i> <.001
	Gender	0.141	0.012	12.154	<i>p</i> <.001
	Social Support	-0.037	0.012	-3.114	<i>p</i> <.01
	Positive Affect	-0.505	0.011	-47.163	<i>p</i> <.001
Physical Health	Undercontrolled	0.023	0.016	1.425	0.154
	Overcontrolled	-0.015	0.016	-0.922	0.356
	Gender	-0.07	0.014	-4.946	<i>p</i> <.001
	Social Support	-0.013	0.014	-0.944	0.345
	Positive Affect	-0.017	0.015	-1.169	0.243
Social Support with Positive Affect		0.148	0.014	10.705	<i>p</i> <.001
Psychological Distress with Physical Health		0.059	0.014	4.191	<i>p</i> <.001

Note: CR=Critical Ratio. The variable Physical Health measures poor health. Gender is coded 1 = male, 2 = female.

Table 6
Indirect Effect Estimates from Predictors to Outcomes through the Mediators in Final Path Model

Effect	Unstandardized	Standardized	Standardized 95% CI
Under-->Social Support-->Psychological Distress*	0.002	0.002	0.0, 0.003
Under-->Positive Affect-->Psychological Distress**	0.092	0.110	0.078, 0.106
Over-->Social Support-->Psychological Distress*	0.003	0.004	0.001, 0.005
Over-->Positive Affect-->Psychological Distress**	0.098	0.128	0.086, 0.111
Under-->Social Support-->Physical Health	0.001	0.001	-0.001, 0.003
Under-->Positive Affect-->Physical Health	0.005	0.004	-0.003, 0.012
Over-->Social Support-->Physical Health	0.002	0.001	-0.002, 0.005
Over-->Positive Affect-->Physical Health	0.005	0.004	-0.003, 0.013

Note: the reference group for the personality subtypes was the resilience group.

The variable Physical Health measures poor health. Gender is coded 1 = male, 2 = female.

*Over=overcontrolled; Under=undercontrolled. CI= regular (uncorrected) confidence interval (lower bound, upper bound). *p<.01, **p<.001.*

Figure 1. *A priori* Path Model Including Predictor, Mediator, and Outcome Relationships

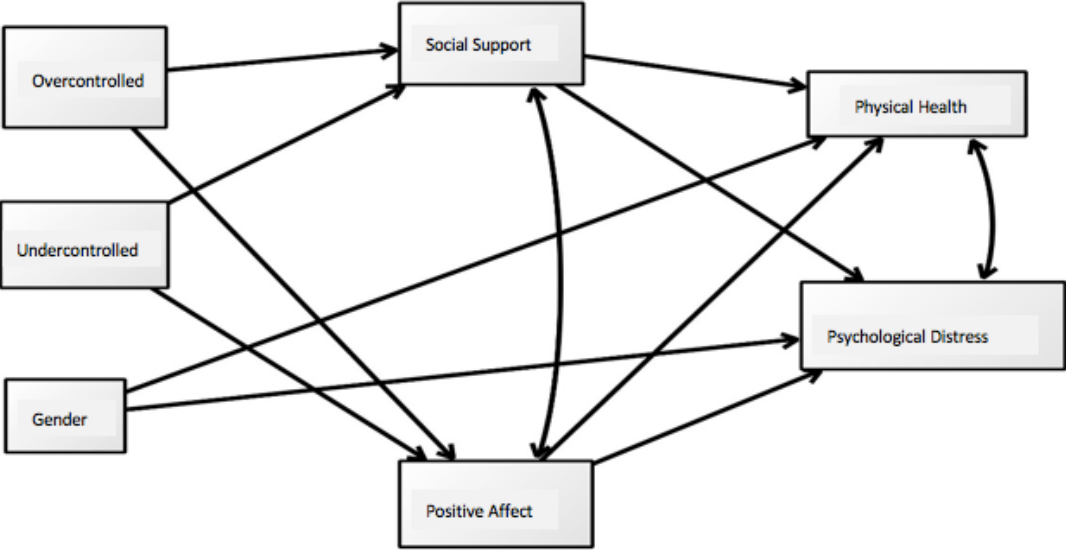


Figure 2. Personality Prototypes Based on the Big Five Trait Taxonomy

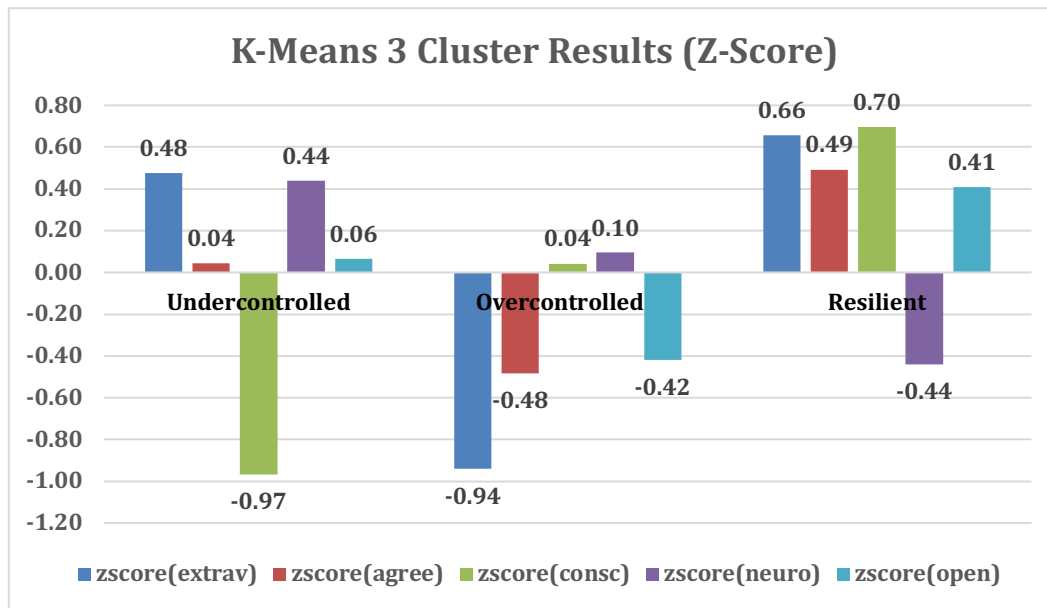
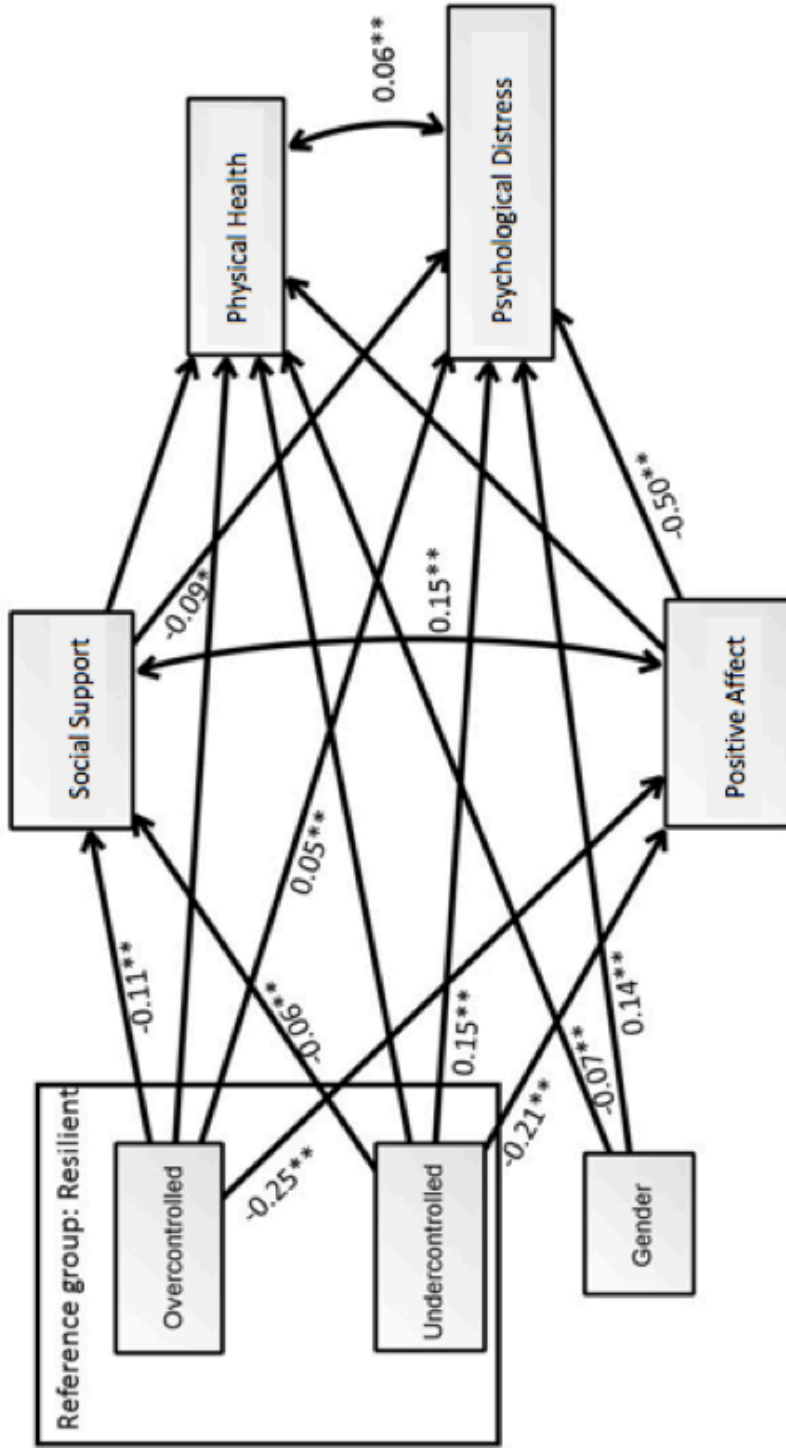


Figure 2. Three personality prototypes based on the Big 5 personality factors in the sample of 5,020 young adults. Resilient prototype = 35% ($n = 1,757$) of the sample, undercontrolled = 26.85% ($n = 1,348$), and overcontrolled = 38.15% ($n = 1,915$). Extrav = extraversion; agree = agreeableness; consc = conscientiousness; neuro = neuroticism; open = openness to experience.

Figure 3. Final Path Model Including Predictor, Mediator, and Outcome Relationships



* $p < .01$, ** $p < .001$. Path coefficients are noted for statistically significant paths only.